THE IMPLEMENTATION OF SOCIAL POLICY:

AN ASSESSMENT OF ORGANIZATIONAL CAPABILITY

by

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Submitted to the Alfred P. Sloan School of Management in January, 1979, in partial fulfillment of the requirements for the Degree of Doctor of Philosophy.

ABSTRACT

Several important federal programs of the last decade have encouraged organizations in cities and towns to develop and implement large-scale comprehensive projects in education, health, job development, and housing. Often, however, the results of these efforts have been disappointing. Program ideas that appeared promising proved exceedingly difficult to implement.

The dissertation is an investigation of this problem. Why is the implementation of large social action projects difficult, and what, if anything, can be done? In particular, how do the efforts of the local organization initiating a project contribute to the eventual outcome? Are there strategies that an implementing organization can employ to make successful implementation more likely?

The study contains three closely related strands of research: an exploration of some theories of implementation, particularly the organization theory of decision making associated with Cyert and March; the formulation of a System Dynamics model of the implementation process, based on some of the concepts of organization theory; and the preparation of two original case studies of large-scale reform efforts in the public schools. These cases are the Southeast Alternatives Program in Minneapolis, Minnesota; and the Piedmont Schools Project in Greenville, South Carolina--two projects associated with the federal Experimental Schools Program. I have used an interpretive case study methodology, based on extended, semi-structured interviews with project staff, to assess the adequacy of the simulation model.

Taken together, the case studies, simulation model, and theoretical work provide an account of implementation that differs in certain respects from the conventional view. Usually, implementation is understood as an attempt to produce a faithful translation into organizational practice of policy objectives defined before implementation begins. I argue, however, that implementation is better understood as a continuing effort to initiate new programs and modify them in response to problems, to express an evolving set of policy intentions. Thus, implementation is an iterative process, in which policy is constantly made and revised.

This perspective suggests a number of conclusions about the assessment of implementation and the management of social action projects. These are considered in the final sections of the dissertation, along with a discussion of the implications of the study for further research.

Committee:

Professor Edward B. Roberts, Chairman, Sloan School of Management, MIT
Professor Hayward R. Alker, Jr., Department of Political Science, MIT
Professor David K. Cohen, Graduate School of Education, Harvard University

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It is difficult to imagine a better thesis committee than Ed Roberts, Hayward Alker, and David Cohen. David introduced me to the study of social policy, and the idea of attempting to relate case materials and a simulation model first occurred to me while reading several excellent case analyses written by some of his former students. Throughout the project, David has asked penetrating questions, ranging from the details of interview methodology to the adequacy of alternative theories of implementation. Hayward Alker introduced me to social theory and the philosophy of the social sciences. His ideas on the relationship between interpretive sociology, computer simulation, and the analysis of political and organizational capability have had a large influence on the course of my research. Finally, my chairman, Ed Roberts, managed to find a way of integrating the theory, model, and case study portions of my work, which always seemed on the verge of moving in three different directions. To the extent that the three elements of my dissertation work as one, it is due to Ed's continuing guidance and insight. In addition, his enthusiasm and encouragement have been remarkable.

The System Dynamics Friday Morning Group, an informal student seminar, provided a friendly atmosphere in which to test some of my ideas. Ali Mashayekhi's insight into System Dynamics helped me reduce ten pages of diagrams into a simple, much more sensible model. Mats Lindquist called attention to a "discrete hangover" in my analysis. George Richardson, during his visits from Simon's Rock College, repeatedly asked about the progress of my program components. And David Andersen, about whom I will say more (but not enough) below, somehow always knew much better than I which were the main questions and which were the side issues.

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Bob Skenes originally called my attention to the Southeast Alternatives Program, and thus part of the credit (or blame) for my choice of case materials rests on his shoulders. Furthermore, he provided constant encouragement, as well as an occasional reminder that, for a study about education, this one has oddly little to say about students.

I have spent many evenings and weekends in Cambridge and Albany attempting to sort out my thoughts with David and Debbie Andersen. They talked, had me plant lilac trees, and helped me set schedules which I never was able to meet. They are both partners in the project, and many of my happiest moments working on it were spent with them.

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TABLE OF CONTENTS

APPENDICES PAGE

CHAPTER I

INTRODUCTION

> The new always happens against the overwhelming odds of statistical laws and their probability, which for all practical purposes amounts to certainty; the new therefore always appears in the guise of a miracle. The fact that man is capable of action means that the unexpected can be expected from him, that he is able to perform what is infinitely improbable.
>
> Hannah Arendt,[1]
> The Human Condition

> He spent days walkin' through the glen, thinkin'. An' if ye had passed his house any hour of the night, ye would have seen the candles lit an' Mr. Forsythe sittin' in his chair, thinkin'. Then one day he came to me an' told me he had decided to ask God for a miracle.... He consulted with me about it because he knew I had a highly logical mind, an' he figured as long as he was goin' to ask for a miracle, it might as well be a well-organized miracle.
>
> Alan Jay Lerner,[2]
> Brigadoon

The idea of a political democracy rests in part on the theory that citizens through speech disclose and elaborate public purposes and through concerted action demonstrate and achieve them. Several important federal programs of the last decade have given new emphasis to this theory by encouraging organizations in cities and towns to engage in large-scale, comprehensive demonstration projects in education, health, job development, and housing. While these projects were announced in excitement, however, their results have been discouraging.

When programs fail to meet expectations, there are several places to look in attempting to explain the disappointing outcomes. The policies being pursued may be based on faulty premises about society and the value of proposed reforms. Or programs may succumb as a result of insufficient resources. Or projects may falter because they lack necessary political support. But in addition, there is another explanation. Even when premises are valid and political and monetary resources are forthcoming, complex new policies may simply prove difficult to carry out.

This last explanation has been given increasing attention in recent discussions of demonstration projects and social policy. In a growing collection of books and essays, observers have begun to analyze the issues involved in executing politics. A new area of policy research has emerged, focusing on what has come to be called "the implementation problem." Jeffrey Pressman and Aaron Wildavsky, in their fine account of the implementation of an employment program in Oakland, have described the problem in vivid terms:

> People now appear to think that implementation should be easy; they are, therefore, upset when expected events do not occur or turn out badly. We would consider our effort a success if more people began with the understanding that implementation, under the best of circumstances, is exceedingly difficult. They would, therefore, be pleasantly surprised when a few good things really happened.[3]

Some of the difficulties involved in implementation are discussed in several recent case studies of large scale demonstration projects. Pressman and Wildavsky's monograph on the Economic Development Administration (EDA) in Oakland is one of the first careful analyses of

implementation.[4] The EDA in Oakland was established in 1966 to provide about $23 million in federal grants and loans to local business and public works departments, with the restriction that the funds were to be used for projects that would create new jobs for underemployed local minorities. Three years later, only $3 million had been spent, largely on projects which probably would have proceeded without the EDA, and almost no new jobs had been formed.

The EDA case in Oakland is particularly informative because the program initially seemed to be without controversy. Everyone agreed, at least in principle, that the program should be enacted. Disagreement was quick to develop, however, on specific decisions concerning matters such as allowable costs, appropriate projects, enforcement of minority hiring, arrangements for training programs, and selection of contractors. The EDA had limited capacity to resolve disputes. Disagreement generated significant delay, which increased the opportunity for new problems to arise.[5]

The difficulties faced by EDA in Oakland appear in other examples of project implementation. Martha Derthick has assessed the administration of President Johnson's New Towns In-Town Program, an unsuccessful effort to use surplus federal land located in American cities for new model communities.[6] Derthick describes numerous conflicts and problems generated by the local projects—from San Antonio to New Bedford--and argues that Washington was unable to use its limited stock of incentives to overcome local disagreements. In part, conflict developed because the Program suffered from confusing and possibly contradictory objectives. New Towns

In-Town to varying degrees emphasized the rapid construction of housing for the poor, the development of integrated neighborhoods, the participation of the community in planning, and the use of innovative urban design--objectives local project organizations were unable to balance.

Related lessons emerge in studies of the Model Cities Program,[7] local compensatory education projects under Title I of the Elementary and Secondary Education Act,[8] and efforts to adopt the "New Math" in elementary school classrooms.[9] These cases suggest that, as Pressman and Wildavsky have written, the implementation of coherent local demonstration projects, "under the best of circumstances, is exceedingly difficult."[10] When projects survive, they tend to resemble existing practices more than they do comprehensive political and social inventions.

The study that follows is an investigation of this problem. Why are large social action projects difficult to implement, and what, if anything, can be done? I am mainly interested in understanding how the efforts of the local organization initiating a project contribute to the eventual outcome. Are there strategies that an implementing organization can employ to make successful implementation more likely?

The study contains three closely related strands of research: the elaboration of an organization theory of implementation; the formulation of a System Dynamics model of the implementation process, based on the theory; and the preparation of two original case studies of large scale reform efforts in the public schools.

The theory of implementation I develop in the study is derived in part from the organization theory of decision making, associated with Herbert Simon, Richard Cyert, and James March.[11] This approach differs in certain respects from the conventional view of implementation. Usually, implementation is understood as an attempt to produce a faithful translation into organizational practice of policy objectives defined before implementation begins. I argue, however, that this view is inadequate in some important ways. Implementation is better understood as a continuing effort to initiate new programs and modify them in response to problems, to express an evolving set of policy intentions. Thus, implementation is a serial process, in which policy is constantly made and revised.

Drawing on this view, I have formulated a System Dynamics model of implementation, to explore the character of the implementation process over time. The model focuses primarily on the efforts of the organization engaged in implementing a new policy. In particular, it considers the implementing organization's capacity to initiate new programs and respond to the problems they generate.

I have used this System Dynamics model to guide two case studies of the implementation process: the Southeast Alternatives Program in Minneapolis, Minnesota; and the Piedmont Schools Project in Greenville, South Carolina--two projects associated with the federal Experimental Schools Program. Both projects were large and ambitious. Each involved several

elementary schools, a middle school, and a high school. The projects were designed to influence educational practices, not only in the individual project schools and the project communities, but also district-wide.

These three strands of research--the theory, model, and cases--are oriented toward several questions. First, what model of the implementation process does organization theory suggest, and what implementation scenarios does this model generate? Second, how well is the model supported by empirical evidence--and how should one make such a judgment? Third, what strategies does the model indicate are likely to improve an organization's implementation capacity? Finally, what are the normative implications of an organization theory view of implementation? What does all of this suggest about research on implementation? And what does it suggest about the prospects for reform in complex organizations?

These questions are considered in the following chapters, more or less in turn. Chapter II reviews several research traditions that have some relevance to the study of implementation and then develops a theory of implementation, derived from the organization theory of decision making. Chapter III describes a simple System Dynamics model of the implementation process, based on some of the ideas developed in Chapter II.

The next two chapters consider the issues involved in assessing the model. Chapter IV describes a two-phase interview methodology, designed to explore the extent to which the simple model offers an adequate interpretation of the two case examples of attempted implementation.

Chapter V begins by describing an extended model of the implementation process, which incorporates some of the lessons learned from the first round of interviews. The chapter then considers four sets of assumptions underlying the extended model. Finally, the chapter sets out an approach to be followed in assessing the adequacy of these assumptions, with respect to the two case studies.

Chapters VI and VII present analyses of the two cases. Chapter VI reviews the Experimental Schools Program in Minneapolis, at three levels: the project level, the school level, and the district level. At each level, the adequacy of the assumptions underlying the extended model is examined. Chapter VII reviews the Experimental Schools Program in Greenville, following the same procedure.

The final two chapters draw some conclusions about the model and the view of implementation on which it is based. Chapter VIII begins by assessing the overall adequacy of the model. The model is then used to explore some alternative implementation scenarios. Chapter IX starts with some conclusions about organizations and implementation strategies, based on the alternative implementation scenarios discussed in Chapter VIII. The Chapter then turns to a broad discussion of organization theory, methodology, and future research on implementation.

CHAPTER II

THEORIES OF IMPLEMENTATION

> In the entire field of policy analysis, no issue is more obviously practical, none closer to the nuts and bolts of political and administrative tinkering, than implementation. Or so we thought. Now we realize its pragmatic appeal was only Reason's cunning way of facing us with conceptual problems that could glibly be evaded so long as implementation was not our explicit concern. The secret of implementation is that of understanding how non-physical things like ideas, plans, decisions, values, and dispositions can bring about material changes in nature and in society. This is the policy version of the venerable body-mind problem--the problem of how to account for the interrelation of the material and mental world when both are granted independent existence.
>
> Giandomenico Majone and
> Aaron Wildavsky,
> "Implementation as Evolution"[1]

While the literature on implementation is growing rapidly, few theories of implementation have been formulated and fewer still have been used as a basis for empirical study. This situation is complicated by the fact that the term "implementation," which appears quite transparent at first glance, hides some fairly difficult conceptual problems. One sensible way to think about implementation is to begin with the concept as it is used in ordinary language. This is the approach taken by Pressman and Wildavsky in their monograph on the Economic Development Administration.

> Implementation, to us, means just what Webster and Roget say it does: to carry out, accomplish, fulfill, produce, complete. But what is it that is being implemented? A policy, naturally. There must be something out there prior to implementation; otherwise there would be nothing to move toward in the process of implementation.[2]

In ordinary language, implementation is simply an attempt to carry out a policy. As will become evident, this definition contains the seeds of some puzzling conceptual issues. But it is a useful place to start.

Theoretical traditions: Before turning to the puzzles contained in the concept of implementation, it will be helpful to review some of the theoretical traditions that have guided research on the implementation process or have been proposed in discussions of implementation. There are, in fact, quite a few research traditions that seem at least potentially helpful to the study of implementation. Indeed, several authors have proposed typologies of implementation research.

Erwin Hargrove, in a recent review essay, identified three more-or-less distinct threads in research on implementation, corresponding roughly to the disciplines of political science, public policy, and management science.[3] And Richard Elmore, drawing on Graham Allison's account of the Cuban Missile Crisis, has developed four organizational models of the implementation process, based on alternative traditions of research on organizational decision making.[4]

As these two review essays indicate, discussions of implementation have drawn from almost the entire range of the social sciences. The disciplines of political science, management science and economics, social psychology, and sociology all seem at least potentially relevent to the study of implementation, and at least some research related to implementation has been conducted within each of these disciplines.

Political science offers a number of perspectives on implementation. There is, for example, a fairly sizeable body of political science theory on intergovernmental relations and the administration of federal programs.[5] In this tradition, implementation is seen as a process in which "politicians, bureaucrats, interest groups, and publics vie for control over the direction of the program."[6] Martha Derthick's study of New Towns in Town is an excellent example of this research tradition;[7] another is Stephen Bailey and Edith Mosher's fine account of the administration of Title I of the Elementary and Secondary Education Act of 1964.[8]

A second area of political science research relevant to the study of implementation is community politics. The distribution of both the political resources in a community and the skills necessary to mobilize them might well have an influence, not only on the decision to adopt a new program, but also on the course of its implementation. There is certainly some debate over the proper methodology for research on community politics, and this debate has produced an overwhelming set of alternative definitions of concepts such as power, influence, and authority.[9] But whatever the theoretical conception of community power selected, an analysis of implementation in terms of community politics would hinge on an assessment of the social and economic structures of the community, their stability and change over the period in question, and their impact on the implementation process. A particularly important study that falls in this tradition is

Frederick Wirt's analysis of the effort to carry out the 1964 Civil Rights Act in Panola County, Mississippi.[10]

Another tradition of political science research that touches on implementation is bureaucratic decision-making. New programs, after all, like old ones, are administered by bureaucracies. According to a prominent view of bureau decision making, policy is the result of bargaining among bureaucrats holding diverse interests and unequal power. Government decisions emerge from " . . . intricate and subtle, simultaneous, overlapping games among players located in positions in a government. . . . Regular channels structure the game; deadlines force issues to the attention of incredibly busy players."[11] From this point of view, the implementation process might be understood as a set of bargaining games played by various agency members in response to the introduction of a new program. Eugene Bardach has developed a typology of political "implementation games" in his analysis of the implementation of mental health reform in California.[12]

The fields of management science, operations research, and microeconomics offer a second broad approach to the study of implementation. Here, the focus is the design of management procedures to promote rational decision making and effective planning and control.[13] Writers in this tradition generally characterize a rational decision process as one involving the formulation of clear organizational objectives, the generation and evaluation of alternative courses of action to reach them, the selection of the most

effective of these to follow, and finally the design of a management system to insure the implementation of the courses of action selected. This formulation is particularly clear in Robert Anthony's discussion of planning:

> Strategic planning is the process of deciding on objectives, on resources used to obtain these objectives, and on the policies that are to govern the acquisition, use, and disposition of these resources. . . . Management control is the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives. . . . [And] operational control is the process of assuring that specific tasks are carried out effectively and efficiently.[14]

From this perspective, implementation is primarily a technical problem of management control, arising once the decision is made to adopt new programs. Walter Williams, relying on principals of organizational planning and control, has developed a set of normative prescriptions for the management of the social policy implementation process.[15]

The social psychology of organizations provides a third broad tradition of research related to implementation.[16] The social-psychological theory of organizations has concentrated on the motivation, morale, and cohesiveness of organization members and the effects of different management strategies on productivity. From this perspective, implementation is a process of planned organizational intervention, and the analysis might focus on leadership, the communication process, the involvement of organization members in decision making, and the sources and consequences of resistance to change. The RAND study of Federal Programs Supporting Educational Change has given these social-psychological issues particular

emphasis--especially in its discussion of the "mutual adaptation" that takes place when innovative programs are introduced in school organizations.[17]

Sociology, and in particular the sociology of organizations, offers a fourth general body of research related to implementation. Traditionally, sociological theories of organizations have focused on Max Weber's ideal-typical construction of bureaucratic administration as a system of organization based on hierarchical authority and impersonal rules.[18] In particular, these theories have examined the latent and manifest functions and dysfunctions of bureaucratic structures.[19] An analysis of implementation based on the sociological theory of organizations might explain the implementation process as an elaboration of bureaucratic structures in response to the stresses, strains, and unanticipated consequences generated by the program being implemented. Louis Smith and Pat Keith have studied the implementation of an open elementary school in these terms.[20]

There is, in addition, a second, somewhat related view of organizations, which has emerged from a mixture of sociology, economics, and political science. This developing theoretical tradition is sometimes called the organization theory of decision making.[21] One of the central assumptions of the theory is that an organization is a coalition of actors with numerous and conflicting goals. The organizational goal structure (that is, the set of goals actually imposed upon decision) is established over time, through bargaining among coalition members, changes in coalition membership, and experience. According to the theory, organizational goals

take the form of aspiration-level constraints. Ordinarily, these constraints influence organizational decisions through standard operating procedures. Only when a situation arises that calls attention to a failure to perform satisfactorily with respect to a goal does a search for new practices occur. From this perspective, attempted implementation is a more-or-less deliberate effort by an organizational sub-unit (i.e., a sub-unit of the overall organizational coalition) to change the goal structure of the organization and to change the standard operating procedures through which these goals are imposed. Jerome Murphy relied on organization theory in his elegant analysis of the impact of Title V of the Elementary and Secondary Education Act on State Departments of Education.[22]

Establishing a perspective: It is tempting to think that one of these theoretical traditions might in some general sense provide the best understanding of the implementation process, but this hope is probably false--for two reasons. First, the adequacy of each theory surely depends to some degree on the type of program being implemented. An analysis of the implementation of school desegregation in a large Northern city, for example, would certainly differ in important ways from an analysis of the implementation of the "New Math" in a single elementary school (although there might also be some similarities). Second, the theoretical traditions focus on somewhat different aspects of implementation--and thus several traditions might be helpful in analyzing a particular program.

One way of responding to the diversity of theoretical traditions is to analyze case materials from multiple perspectives. Graham Allison employed this approach in his review of the Cuban missile crisis, for example, and David Andersen used multiple theories in his case study of the role of mathematical modeling in a state bureaucracy.[23] This approach has not yet been applied to a case study of the implementation process, although several authors have discussed the importance of such an enterprise.[24]

Another way of responding to theoretical diversity is to attempt a deliberate synthesis of several theoretical traditions. Rein and Rabinovitz, for example, argue that the implementation process is governed by three concerns: what is legally mandated, what is administratively defensible, and what is politically feasible. According to their theory, the course that implementation takes is influenced by the interaction of these three considerations.[25]

While multiple-theory views and multiple-view theories have much to recommend them, there is, in addition, a third approach to the diversity of theoretical traditions, and that is to concentrate in detail on one tradition, in a self-conscious attempt to explore both its strengths and limitations in interpreting case materials on implementation. There are several reasons why this approach might be helpful. First, such a study would provide an opportunity to explicate the "metaphor" of the implementation process suggested by the tradition. Bardach, for example, made progress in that direction, in his case study of mental health reform in terms

of bureaucratic politics.[26] Also, working out a detailed model of the implementation process based in empirical research within one theoretical tradition would seem to be a prerequisite for any multi-perspective anlaysis. Finally, empirical work on implementation conducted within a relatively well-defined theoretical tradition might provide insight into the strengths and limits of the tradition as a whole. That is, such research might say something about the theoretical tradition as well as about the case.

In the analysis that follows, I plan to take this last response to the diversity of research traditions and concentrate on only one of them--the organization theory of decision making. While all of the traditions discussed above seem, at least on the surface, to offer plausible accounts of certain aspects of implementation, I believe organization theory provides insight into some particularly interesting and critical features of large-scale reform efforts in the public schools. This conviction, of course, is a form of hypothesis. The proof, as they say, is in the pudding.

What, then, is organization theory, and what model of the implementation process does it suggest? To begin, it is of course somewhat difficult to identify the exact boundaries of the theory. Organization theory originated in the work of Chester Barnard[27] and Herbert Simon,[28] and it was further developed in James March and Herbert Simon's Organizations[29] and Richard Cyert and James March's A Behavioral Theory of the Firm.[30] The assumptions about organizational decision making worked out in A Behavioral Theory have formed the basis of quite a number of empirical studies,

including Allison's organizational account of the Cuban missile crisis,[31] Alker's model of UN peacekeeping,[32] and Crecine's model of municipal budgeting.[33]

The organization theory of decision making, as formulated in A Behavioral Theory, rests on four "relational concepts."[34] The first of these is quasi-resolution of conflict. According to the theory, organizations have multiple, conflicting goals, which operate as a "series of independent, aspiration-level constraints."[35] In other words, organizational goals influence decisions by serving as standards of satisfactory or acceptable performance. Different goals are usually assigned to different organizational subunits, and "organizations resolve conflict among goals, in part, by attending to different goals at different times."[36] Organizations, tend to "grease the squeaky wheel."[37]

The second relational concept is uncertainty avoidance. According to the theory, organizations generally face a fairly uncertain and unpredictable environment. To control this uncertainty, organizations make decisions, whenever possible, on the basis of standard operating procedures. Cyert and March speak of several types of procedures used to guide daily decisions, including task performance rules, records and reporting systems, information handling rules, and budgets.[38] These decision rules provide the basis for the organization's response to the regular problems in its environment.

The third relational concept formulated by Cyert and March is problemstic search. When an organization's performance falls below the satisfactory level for some goal, the organization initiates a search for an alternative policy.* Generally, the search procedure examines only a few alternatives. Furthermore,

> search within the firm is problem-oriented. A problem is recognized when the organization either fails to satisfy one of its goals or when such a failure can be expected in the immediate future. So long as the problem is not solved. search will continue. The problem is solved either by discovering an alternative that satisfies the goals or by revising the goals to levels that make an available alternative acceptable.[39]

The fourth relational concept is organizational learning. According to the theory, organizational learning occurs through the adaptation of goals, operating procedures, and search rules. Goals are gradually adjusted upward or downward on the basis of organizational experience. Operating procedures are modified to take new information into account. And search rules are adjusted on the basis of their success in solving previous problems.[40]

While the concepts developed in A Behavioral Theory form the core of the organization theory tradition, work based explicitly on Cyert and March should not be taken as the complete body of the theory. Several authors seem to fall within the organization theory tradition, even though their

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*There is a certain amount of ambiguity in the theory, concerning the distinction between an operating procedure and a search rule. I understand an operating procedure to be a routine used in making regular decisions. A search rule is a procedure used to select a new alternative when standard operating procedures fail. Search usually results in the modification of one or more operating procedures.

work is not directly linked to A Behavioral Theory of the Firm. Aaron Wildavsky's theory of federal budgeting, for example, seems to have much in common with Crecine's analysis of municipal budgeting derived from Cyert and March.[41]

Furthermore, David Braybrooke and Charles Lindblom's analysis of the policy making process bears a close relationship to some of the central themes of A Behavioral Theory.[42] Since Braybrooke and Lindblom concentrate in particular on social policy, it is worth reviewing some of their work. They have developed a theory of policy making which they call "incrementalism," in contrast to the classical conception of rational choice. In the classical conception, rational choice depends on two fundamental requirements: a method of predicting the complete set of social states resulting from policy alternatives; and a method of assigning value to these states. Braybrooke and Lindblom argue that these requirements are generally difficult if not impossible to fulfill. First, it is impossible to predict the entire set of consequences flowing from a potential policy alternative, due to the limits of theory, inadequate information, and the costliness of analysis.* Second, it is impossible to elaborate a welfare function that takes all values and consequences into account, due to the multiplicity of values, the instability of values over time, the conflict among competing values, and the disagreement among social actors.[43]

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*This is not to say that it is impossible to predict any of the consequences of a proposed policy. Braybrooke and Lindblom simply argue that it is impossible to predict enough of them to allow a full comparison of alternatives.

Braybrook and Lindblom argue that policy making ordinarily proceeds, not by approximating the rational conception, but instead through the strategy of incrementalism. Policy making proceeds through the serial examination of policy alternatives, each designed to change existing policies at the margins. At any one time, decision makers and policy analysts pay attention to only a few consequences and values, those that seem problematic about existing policies. With respect to this restricted range of values and consequences, they examine only a few policy alternatives. Over time, attention may shift to new consequences, new values, and new policies; and thus large changes sometimes accumulate from a series of incremental steps.

> A policy analyst who appreciates a next chance, exploits feedback, and keeps his eye on ills to be remedied will come to take for granted that policy making is typically serial, or sequential. He will see that policy making is typically a never-ending process of successive steps in which continual nibbling is a substitute for a good bite. He will design policy not merely on the expectation of a second step but on the project of a third, or a fourth--of an endless series. In this style of policy analysis, he sees possibilities for revising both policies and objectives, and he comes to treat policy making as openended in all its aspects. In a system in which policy making is frankly recognized to be serial or sequential, the whole system may be tailored to rapid sequences so that, though no one policy move is great, the frequency of small moves makes rapid social change possible.[44]

Braybrooke and Lindblom's discussion of policy making extends several central themes of the organization theory tradition, particularly the notion of a sequential attention to goals and problem-directed search. These ideas are given further elaboration in the recent work of James March and Johan Olsen.[45] March and Olsen have begun to focus explicitly on

decision making in educational organizations. Decisions in such organizations, they argue, are dominated by "the pervasiveness of ambiguity."[46] In educational organizations, there is ambiguity of purpose, technology, history, and participation.

> By the term ambiguity we intend to signify four major kinds of opaqueness in organizations. The first is the ambiguity of intention. Many organizations are characterized by inconsistent and ill-defined objectives. It is often impossible to specify a meaningful preference function for an organization that satisfies both the consistency requirements of theories of choice and the empirical requirements of describing organizational motive. The second lack of clarity is the ambiguity of understanding. For many organizations the causal world in which they live is obscure. Technologies are unclear; environments are difficult to interpret. It is hard to see the connections between organizational actions and their consequences. The third lack of clarity is the ambiguity of history. The past is important, but it is not easily specified or interpreted. History can be reconstrcuted or twisted. What happened, why it happened, and whether it had to happen are all problemmatic. The fourth lack of clarity is the ambiguity of organization. At any point in time, individuals vary in the attention they provide to different decisions; they vary from one time to another. As a result, the pattern of participation is uncertain and changing.[47]

According to March and Olsen, these ambiguities influence decision making in educational organizations in several ways. First, given the ambiguity of objectives, it is often difficult to know how they apply to specific decisions. As a result, objectives often are discovered and formulated in the effort to respond to problems as they occur. Second, given the ambiguity of technology, it is difficult to calculate the consequences of decisions in advance of making them. Consequences often are discovered once a decision is made. Third, given the ambiguity of history, it is difficult to learn from experience. Finally, given the ambiguity of

participation, it is difficult to predict who will become involved in any particular decision. Potential participants in a decision have a limited stock of time, and not all decisions can be given attention at once. The allocation of attention is subject to pressures and deadlines.

> The routines of attention allocation tend to give priority to those things that are immediate, specific, operational, and doable; they tend to ignore things that are distant, general, and difficult to translate into action. . . As a result, attention allocation is vulnerable to deadlining, and some things rarely secure attention unless there is nothing else to do.[48]

Altogether, the organization theory tradition, broadly defined to include the work of Simon, Cyert, March, Wildavsky, Lindblom, and Olsen, rests on a number of inter-related themes. First, organizations have multiple, conflicting goals, which are given attention more-or-less independently and sequentially. Second, decisions are usually made according to standard operating procedures and routines, each of which attends to only a small subset of the organization's goals. Third, when problems arise, the search for solutions generally focuses on a limited number of alternatives and consequences. Fourth, organizations learn by slowly adjusting the set of goals, routines, and search procedures. Fifth, particularly in educational organizations, there is a large degree of ambiguity regarding goals, technology, history, and participation.

Organization theory and implementation: The central themes of organization theory produce some puzzling questions about the nature of implementation. At the start of the Chapter, I tentatively defined

implementation as "an attempt to carry out a policy." This definition appears to rest on an implicit assumption that it generally is possible to describe a set of policy goals in fairly specific terms and then carry them out. The definition also assumes that it is generally possible to judge in a fairly straightforward way whether what was done matches what was intended.

These two assumptions, however, are not entirely consistent with the organization theory tradition. As the discussion in the previous section indicates, policies generally have multiple goals, which to some extent are both conflicting and ambiguous. Thus, a set of policy goals cannot serve as a complete blueprint for implementation. Many of the implications of a set of policy goals will be discovered over the course of implementation, as specific problems and obstacles arise.

Implementation, then, is not strictly an attempt to carry out a policy; it is also to some extent an attempt to fashion one. Majone and Wildavsky, in an elegant and amusing critique of Wildavsky and Pressman's earlier work on implementation and the Economic Development Administration, consider some of the puzzles that flow from this seemingly dual aspect of implementation.

> Everyone knows that in most policies of interest, objectives are characteristically multiple (because there are many things we want, not just one), conflicting (because we want different things), and vague (because that is how we agree to proceed without having to agree exactly on what will be done). Often the first task of an evaluator is not to determine whether a policy has achieved certain specified objectives, but to discover what those objectives were supposed to have been in the first place. The lesson is inescapable: if the objectives are not uniquely determined, neither is their implementation.[49]

The shape of a policy is defined in the gradual construction of organizational routines and procedures and in the adjustement of these routines in response to problems. Thus, over the course of implementation, policy is continuously made and revised. Implementation, then, is the effort to introduce, adjust, and maintain new organizational routines and procedures to express an evolving set of policy goals.

In this respect, implementation is an attempt to create new organizational capacities. Indeed, March and Simon suggested this in their early writing on organizations.

> Initiation and innovation are present when change requires the devising and evaluation of new performance programs that have not previously been a part of the organization's repertory and cannot be introduced by a simple application of programmed switching rules.[50]

From this perspective, the study of implementation is not simply a search for the causes of successful or unsuccessful (faithful or unfaithful) execution of a policy. Instead, it is the study of a policy in the course of being defined. This conclusion is consistent with the view taken by Majone and Wildavsky:

> When we study implementation, we are not inquiring into causes or functional links, but into capacities, potentialities, and other dispositional qualities of a policy idea, and of its implementers or developers. We are not examining two distinct things--a plan and its execution--but a single development exhibiting certain characteristics.[51]

The analysis of implementation in these terms is particularly suited to computer simulation. A simulation model of the implementation process, based on the concepts of organization theory, can be used to study

alternative implementation scenarios, under different assumptions about manatement strategies, organizational conditions, and the characteristics of the policies being implemented. The model-based analysis of organizational processes is developing a fairly rich history. Edward B. Roberts has conducted an extensive model-based analysis of organizational performance in these terms, in his System Dynamics study of large-scale research and development projects.[52] Michael Cohen, James March, and Johan Olsen have completed an intriguing simulation analysis of organizational choice under ambiguity.[53] And Hayward Alker is currently engaged in basic research on the model-based measurement of political capabilities.[54]

In the following Chapter, I will describe a simple System Dynamics model of the implementation process. The model was formulated as a formal representation of some of the ideas of organization theory, in an attempt to draw some specific inferences about the character of implementation and its development over time. I then used the model to guide the first phase of two case studies of large-scale educational reform.

Before considering the model in detail, it may be helpful to summarize some of the central strands of the theory on which it is based. First of all, to paraphrase Majone and Wildavsky, the character of the implementation process is determined by the capacities of a policy and its implementers. (I call the implementers of a policy the "implementing organization.") Second, the policy goals with which the implementers begin are necessarily multiple, conflicting, and ambiguous. Third, the attempt

to implement a policy involves and initiation, adjustment, and maintenance of organizational routines and procedures. (I call these routines and procedures "program components.") Fourth, as implementation proceeds, unexpected problems are likely to appear, which often lead to the redefinition of policy goals and the revision of routines and procedures.

These themes are nicely illustrated in Braybrooke and Lindblom's account of a policy proposed by a city traffic engineer:

> A city traffic engineer, for example, might propose the allocation of certain streets to one-way traffic. He may be quite unable to predict how many serious bottlenecks in traffic will arise and where. Nevertheless, he may confidently make his recommendations, assuming that, as bottlenecks arise, appropriate steps to solve the new problem will be taken at the time--new traffic lights, assignment of traffic patrolmen, or further revision of the one-way plan itself. He may also correctly anticipate certain other consequences he will nevertheless ignore in drawing up his traffic plan. Instead, he will, in separate consideration of each of various anticipated problems, decide to alter parking regulations, ease pedestrian traffic in certain areas, or turn some other policy to reduce the business losses ruled irrelevant to his first policy problem.[55]

In other words, once the implementation process begins, the implementers are engaged both in introducing new routines and procedures and framing and responding to problems. And, as problems are resolved, policies are defined and redefined. According to Majone and Wildavsky:

> If problems are understood through solutions, implementation includes not only finding answers, but also framing questions. . . . As time goes by, hidden constraints make themselves felt and new ones appear. The solution space is in constant change, shrinking in one direction, expanding in another. Since it is impossible to execute any plan whose feasibility is undecided, the implementer's left hand is constantly probing the feasibility boundary, just as his right hand tries to assemble the various program components.[56]

Thus, as implementation proceeds, the implementing organization is engaged both in "probing the feasibility bounds" of the policy being implemented and assembling program components. These are the major activities of implementation.

A final strand of theoretical materials concerns the implementing organization's ability to carry out the activities involved in implementation. While many organizational characteristics are certainly important, organization theory suggests that a critical influence on performance is the organizational attention the implementing organization has available to allot. March and Olsen, in particular, have emphasized the relation between attention, organizational load and performance.

> [The decision making] process is thoroughly and generally sensitive to variations in load. An increase in the net energy load on the system generally increases problem activity, decisión maker activity, decision difficulty, and the uses of flight and oversight. Problems are less likely to be solved, decision makers are likely to shift from one problem to another more frequently, choices are likely to take longer to make and to be less likely to resolve problems.[57]

These, then, are some of the central themes in an organization theory account of implementation. In the following Chapter, I will present a simple System Dynamics model based on these ideas, formulated in order to draw some inferences about the development of implementation over time. Chapters IV-VIII are devoted to an examination of the model and its empirical adequacy. Finally, in Chapter IX, I will return to some of the theoretical ideas presented above, to review them in the light of my empirical research, and to consider some of their implications for the management and assessment of implementation.

CHAPTER III

A SIMPLE MODEL OF THE IMPLEMENTATION PROCESS

Before I began working on the case studies, I formulated a simple System Dynamics model of the implementation process, based on some of the concepts of organization theory considered above. The model was intended as a tentative "first cut," to provide guidance for my initial empirical research. As one might expect, my field research revealed a number of important shortcomings in the model, and these will be discussed below, in Chapter IV. Before turning to the cases, however, it is important to discuss, in some detail, the model of the implementation process with which I began.

The model is supposed to apply to cases of (attempted) implementation that meet the following conditions. First, there must be an identifiable organizational unit engaged in implementation. This organizational unit might be part of a local government agency (for example, a division of the local school department), or it might be a less formal organization representing some larger community and assembled for the express purpose of implementing a program. For simplicity, I'll term this organizational unit the "implementing organization." Second, the implementing organization must have some vision of the program it seeks to implement--no matter how rough or internally inconsistent this vision might be. Finally, the program to be implemented must require the cooperation and participation of individuals and organizations outside the implementing organization

itself. I'll call this overall constellation of individuals and organizations the "organizational setting." These conditions obviously exclude certain potentially interesting possibilities: for example, the model might not apply to a small group interested primarily in internal changes that do not require outside cooperation; or a local government agency more interested in securing federal monies to supplement local funds than in implementing a program. Nevertheless, at least some cases of implementation surely meet these conditions, and, to the extent that they do, the model should apply.

I will begin by presenting several assumptions about the implementation process. The first of these concerns the program the implementing organization seeks to implement. In general terms, new programs are, as March and Simon have written, "performance programs that have not previously been a part of the organization's repertory and cannot be introduced by a simple application of programmed switching rules."[1]

Whatever else the implementing organization's initial vision of its new program might be, this vision is necessarily abstract and incomplete. It is hardly a final blue-print for action. Much of what will be done remains to be improvised. A program, therefore, should not be thought of as one-dimensional change in an existing practice; a program is better envisioned as a complicated and developing set of ideas and program components. It is more helpful to think of a program as a drama to be written and staged than as a "treatment" to be adopted.

Thus, implementation (to the extent it succeeds) involves a more-

or-less continuous process of inventing and initiating new program components. A comprehensive project in education, for example, may come to include a new curriculum, a new set of relations among teachers, new types of supplies, new physical arrangements, new school-community relations, new ways of allocating resources, and so on. Components of this sort might be initiated now and again to modify others that fail, to direct attention to new program areas, or to meet changing conditions.

This brings us to a second assumption about the implementation process. The continuous attempt to initiate program components occupies a considerable part of the implementing organization's energies. Initiating new components entails inventing and planning new aspects of the program, discussing them with groups whose cooperation would be required for their enactment, and securing whatever agreements are necessary to get action on these program components started. How rapidly might the implementing organization be able to do these things? This would seem to depend on the size and ability of the implementing organization: the larger its staff, for example, the more rapidly it should be able to initiate new programs. For purposes of discussion, I'll assume that the implementing organization can initiate three components per year. That is, over the course of the first year of operations, the organization initiates three components; over the second year it initiates a second three, and so on.

But implementation does not end here. Once new programs are initiated, they begin to generate problems--both political and technical. Disagreements--or simply puzzles--might develop concerning matters of

authority, design, training, staffing, regulations, enforcement, and costs. Worries such as these may arise quite unpredictably--both within the implementing organization and in its relations with the individuals, agencies, and interest groups that make up the organizational setting. Different bureaus, practitioners, clients, and related agencies are faced with different consequences of new programs. For this reason, roughly independent problems and different criteria for satisfactory resolution emerge in scattered locations.

A third assumption, then, is that once new programs are initiated, the implementing organization faces a range of problems that must be resolved if these programs are to be implemented successfully. The implementing organization presumably must maintain old agreements and secure whatever new ones are required; it must find ways to translate general program ideas into day-to-day practices and routines; and it must attempt to resolve whatever puzzles and conflicts arise in the process of doing these things.

From this point of view, implementation is a two-part process, that involves both initiating new programs and then resolving the problems (or solving the puzzles or responding to the demands) associated with new programs once they are initiated. This means that an implementing organization generally is engaged in two types of activities at once. At any moment, an implementing organization might be at work initiating new components, at the same time it is attempting to meet some of the demands associated with programs already initiated.

Once initiated, how long does a program component continue to place

demands on the implementing organization? The answer to this question involves a fourth assumption: presumably, a component continues to generate problems for the organization to worry about until one of two things occurs. First, and more happily, the component may after a time become institutionalized as a "mature program"--a regular part of the repertory of programs in the organizational setting, which is widely accepted and therefore stops placing demands on the implementing organization. Second, and less happily, the component may be terminated or emasculated, thus eliminating a source of difficulty. For simplicity, I'll label these two fates "acceptance" and "termination."

Thus, one can imagine that program components, once initiated, accumulate as a "pool" of new programs. It is this pool of new programs that places demands on the implementing organization. Every time a new program component is initiated, the pool of new programs is enlarged; and every time an old component finally is accepted as a mature program or terminated, the pool is reduced.

For purposes of discussion, let's assume that it takes, on average, one and one-half years for acceptance or termination to occur. This 1.5-year period might be thought of as the time required to implement a new program component. New program components, if they are successfully implemented, leave the pool of new programs in 1.5 years--as newly accepted mature programs--at which point they no longer generate problems for the implementing organization. By the same token, components which fail to be implemented successfully in 1.5 years also leave the pool of new

programs: they are terminated.*

One important assumption remains to be discussed. I pointed out above that an implementing organization generally is engaged in two types of activities at once--initiating new program components and responding to the demands and concerns raised by the pool of new programs already initiated. For purposes of discussion, I then made an explicit assumption regarding the implementing organization's program initiation abilities: I assumed that the implementing organization was able to initiate components at a rate of 3 per year. I now need to make a similar type of assumption about the ability of the organization to resolve the problems generated by new programs once initiated. Once components are started up, how well can the implementating organization follow through?

The ability of the organization to follow through would seem to depend, first of all, on the number of problems the pool of new programs generates. If new programs generated no demands or problems at all, the organization would presumably have no difficulty following through: new

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* A slight detour may be helpful here. Might not a program component undergo a process of adaptation during implementation, so that it is neither accepted "whole" nor terminated "whole," but is instead accepted in some modified form? Of course, this is quite likely to occur, and it is implicitly taken into account in the assumptions, in two ways. Minor adaptation is presumed to occur continuously, as part of the implementing organization's efforts to solve problems and respond to demands. Major adaptation is a bit more complex. Suppose a program component is initiated, but later it turns out that the component needs to be modified in certain large respects. Consequently, a portion of the component (say, one half) might be terminated; another one-half component might be initiated in its place; and both halves eventually might be accepted. In this view, adaptation would be represented as some combination of initiation, termination, and acceptance.

programs, once initiated, would be "self-implementing." It is more sensible to suppose, however, that new programs do generate demands which the implementing organization must face, if programs are to be implemented successfully. One way to think about this is to imagine that a program component, once initiated, stirs up problems, or creates new areas of disagreement, or develops a need for new materials or training, or whatever, with some average frequency. Each year, new program components manage to generate some average number of problems for the implementing organization to face. For purposes of discussion, let's assume that new program components, once initiated (and until they are accepted or terminated), each generate twenty problems per year.

These problems, once generated, pile up until the implementing organization is able to do something about them--that is, until it is able to obtain the needed agreements, and develop the new materials, and do whatever else needs to be done. How long might this take? Even in the best of circumstances, demands like these surely could not be met instantly. It takes time to obtain agreements, order new materials, tear walls down, and put walls up. Furthermore, if staff time is limited, then, if too many problems pile up, some will have to wait while others are being considered. Let's assume that, when the implementing organization faces thirty problems, it can complete them in about six months. If the organization faces fewer than thirty tasks, less time will be required to complete them, down to a minimum of about four months. If the organization faces more than thirty problems, on the ohter hand, more than six months

will be required to complete them.

What would happen if the implementing organization became swamped with problems--so that some demands had to be put off for a considerable period of time, while others could not be attended at all? This would undoubtedly have several effects. If problems remained unattended for long, fewer program components, once initiated, would be accepted and a greater number would be terminated, due to the absence of needed agreements, materials, training sessions, and other prerequisites to successful implementation. Let's assume that if no problems are piled up unattended, 100% of the program components, once initiated, are accepted. As tasks pile up uncompleted, the proportion accepted gradually declines, to a minimum of 10%.

A pile-up of unattended demands would probably have another consequence as well: the initiation of new components would become increasingly difficult--due to the conflict, problems, and uncertainty resulting from programs already initiated. Let's assume that, when no problems are piled up waiting for attention, the implementing organization can initiate program components at its maximum rate (3 per year). As problems build up unattended, the initiation rate gradually falls.

The details of these new assumptions are less important than the broad picture. The important thing to observe is that the implementing organization's capacity must be measured along two dimensions--the organization's ability to initiate new programs and its ability to respond to demands generated by programs already initiated (i.e., its ability to

obtain agreements or solve problems).

This two-dimentional aspect of capacity raises an intriguing question: How do these two capacities work together to determine the implementing organization's performance? In other words, what implementation scenario is likely to unfold over time, as the implementing organization begins its efforts to implement new programs? And how does this scenario depend on the implementing organization's program initiation and problem-solving capacities?

To answer these questions, I have formulated a simple System Dynamics simulation model based on the assumptions discussed above.[2] (The structure of the model is shown in Figure 3.1.) The behavior of the model can be depicted in a straightforward graph, displaying over time the pools of new and mature programs, as well as the number of new program components initiated each year. Figure 3.2 below shows the performance obtained when the implementing organization's program initiation and problem-solving abilities are as discussed in the text. (For a computer listing for the simple model, see Appendix A. For an analysis of the differential equations see Appendix E.)

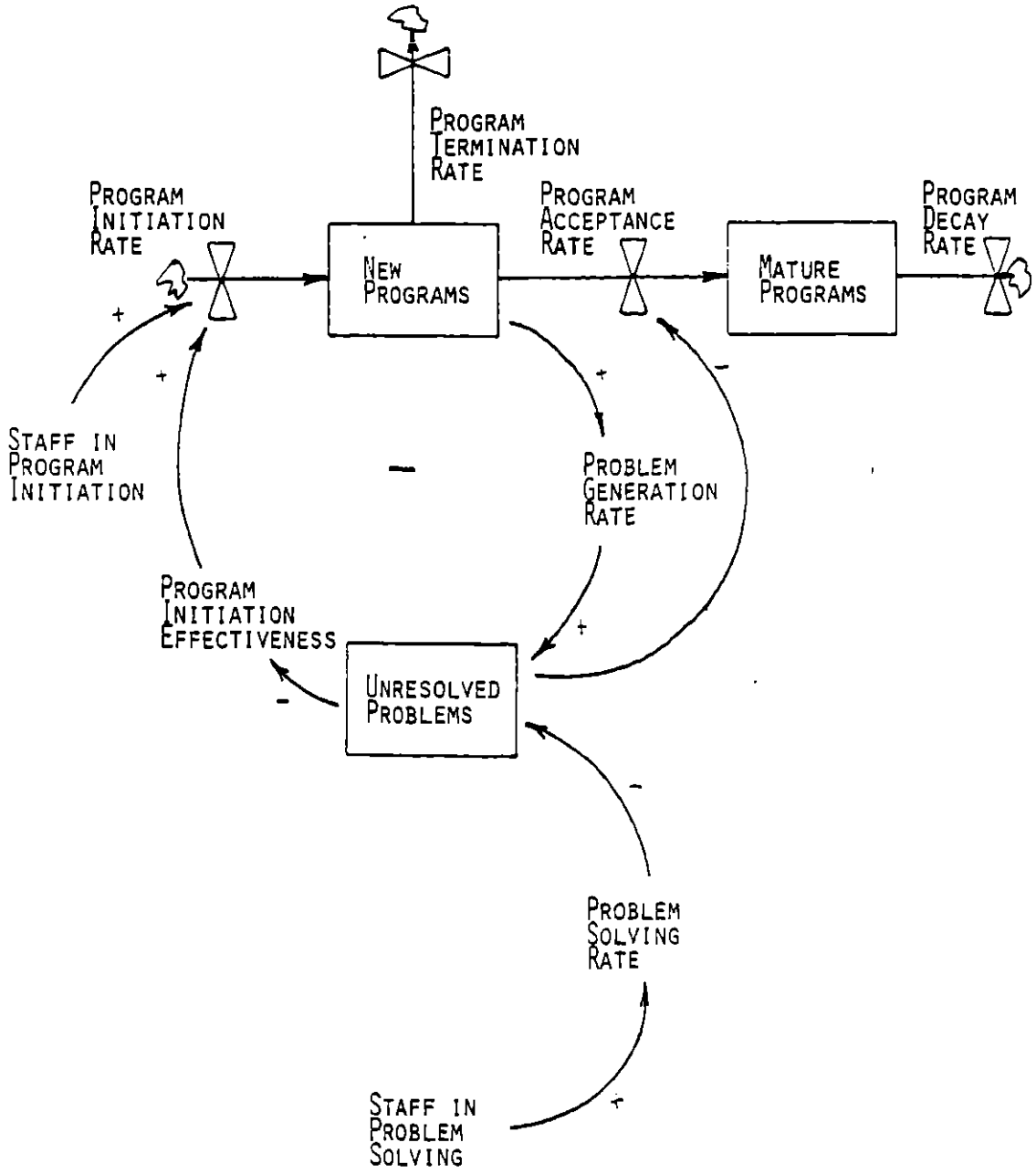

Figure 3.1. A simple model of the implementation process.

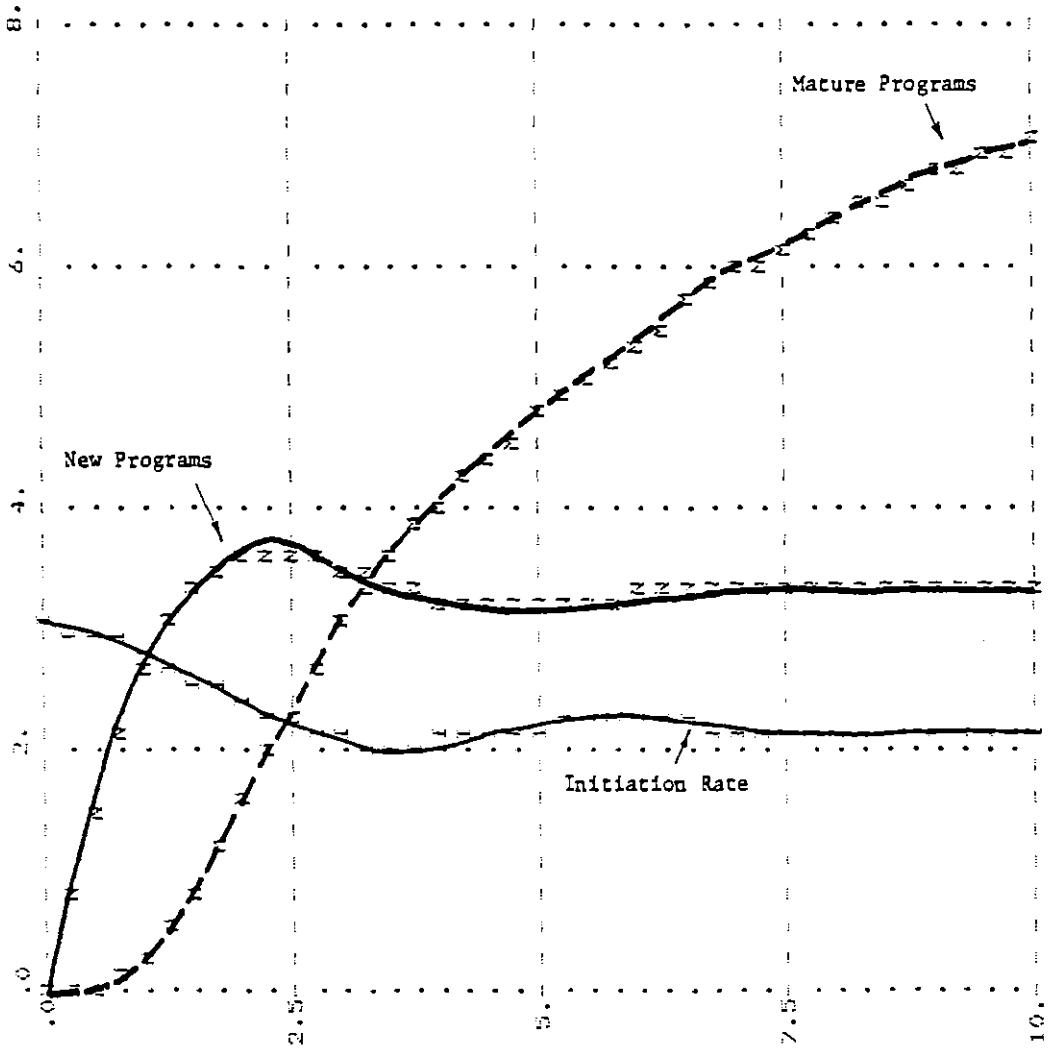

Figure 3.2. Simple model.

The results, at first glance, may appear surprising. The pool of new programs grows rapidly at first. Soon, however, it reaches a peak and then begins a slow decline. After a gradual period of descent, it then rises a bit, to reach a state of equilibrium.

In more dramatic language, the implementing organization seems to charge ahead rapidly at first, only to over-extend itself. The organization then retreats, but goes a bit too far, again to be reversed, Finally, the organization reaches a stable level of performance. Why does this occur, and what does it mean?

The explanation is roughly this. At first, when the organization begins, there are no new programs generating demands. Consequently the initiation of new programs is easy, and new programs, once initiated, are given considerable problem-solving attention. Thus, the program components initiated at the beginning stand a relatively good chance of being accepted. At the same time, however, these new programs begin to generate problems for the organization to face. By the end of the first year, these tasks begin to pile up and the organization's problem-solving capacity becomes strained. This leads to a slow-down in the rate at which the implementating organization can initiate new programs, and it also causes a fall-off in the proportion of new programs accepted. This decline continues until the pile of problems stops growing and begins to shrink. Eventually, the pile-up of problems diminishes to such an extent that it becomes easy to initiate new components once again, and thus the initiation rate begins to rise. At this point, the decline is reversed, and growth begins again.

I should perhaps mention that this scenario should not be taken too literally. The sharp transition following the early period of growth in new programs might take various specific forms, in a real case. The pile-up of unresolved problems might result, for example, in a major change in local project leadership, or in an extreme alteration in the project's mandate or scope. These events would be consistent with the model if--as is likely--they tended to reduce program initiation activity.

The important point here is that the implementing organization begins off-balance, emphasizing one foot more strongly than the other. It starts by initiating too many program components, eventually exhausting its problem-solving capacity and causing demands to pile up. This pile-up of demands in turn leads the organization to initiate too few components, eventually leaving its problem-solving capacity relatively untaxed, and causing the pile of problems to fall too far.

To test this interpretation, let's look at an example in which the organization begins more severely off-balance than in the first case. Suppose the implementing organization has a program initiation capacity one-third higher than in the original case, and a problem-solving capacity one-third smaller. (This might correspond to an organization that puts more of its energies into starting things up, than did the organization in the previous case, and less into following through. See Figure 3.3.)

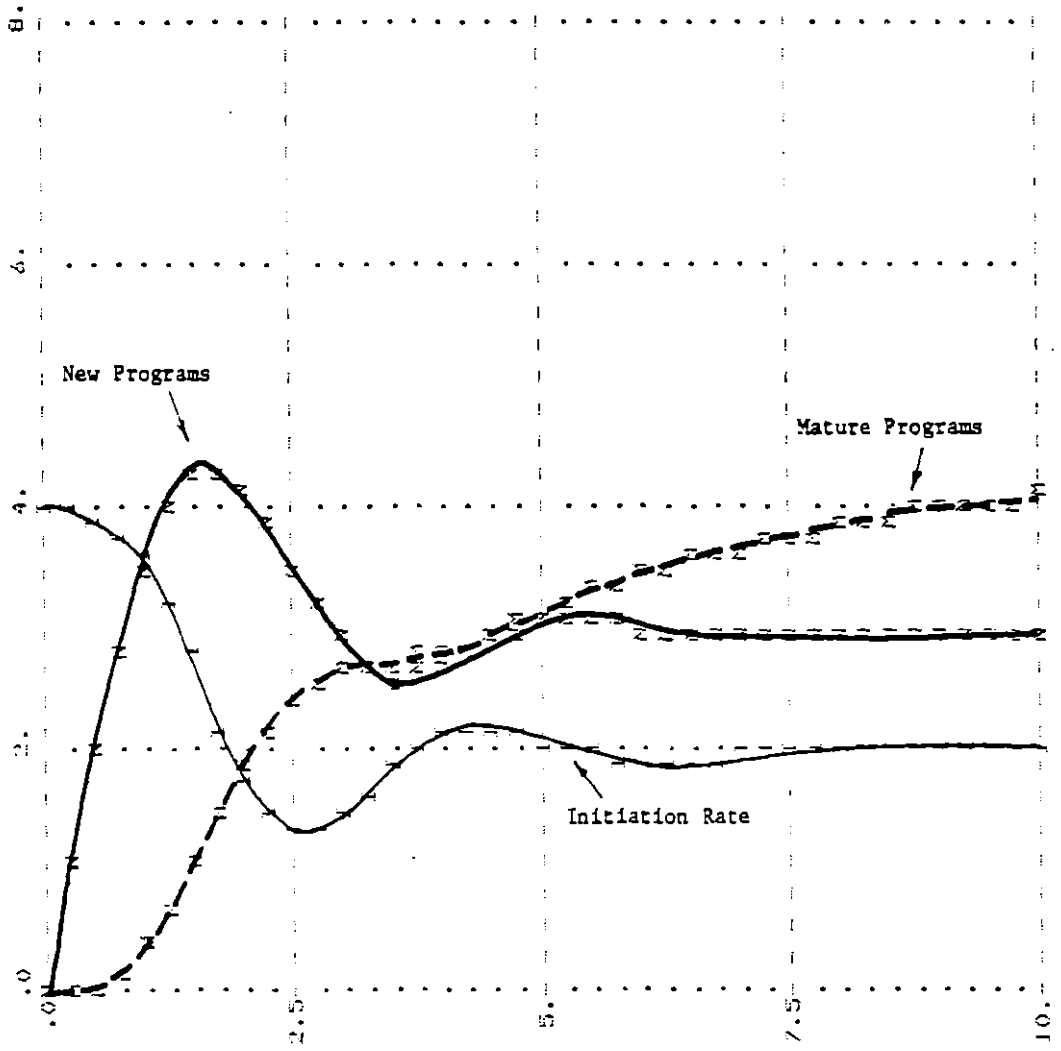

Figure 3.3. Simple model. An organization with larger program initiation capacity and smaller problem solving capacity.

The results are as we would expect. The initial over-extension is much larger than in the original case, and the retreat is more severe.

Suppose, on the other hand, that the organization is less off-balance than in the original case. Suppose the implementing organization has an initiation capacity one-third less than in the original case, and a problem-solving capacity one-third greater. (See Figure 3.4.)

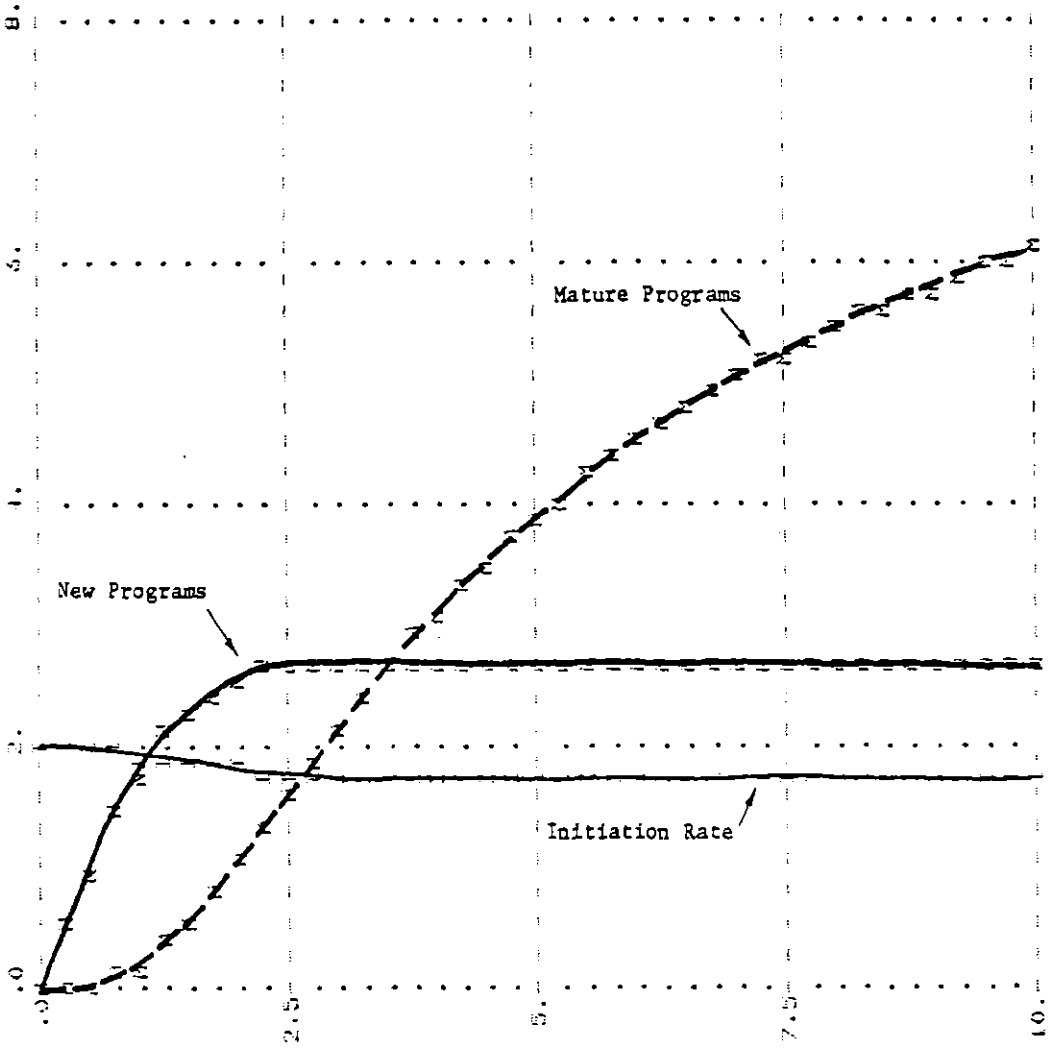

Figure 3.4. Simple model. An organization with smaller program initiation capacity and larger problem solving capacity.

The results are quite a bit less dramatic. The organization's performance grows smoothly to a stable level.

Note, however, that the stable level achieved in the third case is not as high as that achieved in the first. This is a consequence of the third organization's rather weak initiation ability compared to its problem-solving capacity. While much of what the third organization initiates is successful, the organization does not initiate a great deal. The second case is just the reverse. A great deal is initiated, but little is accepted. The first case is somewhere in between.

All of this seems to indicate that an organization's strategy has a large influence on its performance at implementation. If the organization emphasizes program initiation, at the expense of problem-solving and meeting the demands created by programs already in place, one implementation scenario is likely. If, on the other hand, the organization is conservative about program initiation, so that it can concentrate on problem-solving, another scenario may occur.

At first glance, it would appear that an organization, if it wishes to maximize its effectiveness, ought to begin by calculating the best possible combination of program initiation and problem-solving, a combination emphasizing neither one too strongly. This solution has only one drawback--which, unfortunately, is rather large: how could an organization know what its abilities in program initiation are, per unit of effort spent on it; or what its skills in resolving problems generated by programs already initiated might be? If an organization doesn't know these

abilities, it wouldn't know how much organizational effort to allot to each. For example, if an organization elects to spend half its time doing program initiation, and the other half doing problem-solving, what would that mean, in terms of its initiation capacity (program components per year) and problem-solving capacity (problems solved per year)? Would that be a good balance, or not?

Furthermore, an organization might end up moving its attention from program initiation to problem-solving and back again, in a kind of sequential attention to goals. When demands pile up, the organization might contract its work initiating new programs, and expand its effort in problem-solving. And conversely, when initiation performance falls below an initiation goal, the organization might contract its work in problem solving, and increase its effort in program initiation.

To examine some of these ideas, I have formulated a second version of the simple model, incorporating a sequential attention to program initiation and problem solving goals. The behavior generated by the model is shown in figure 3.5. (For a computer listing of the model and additional model output, see Appendix A.)

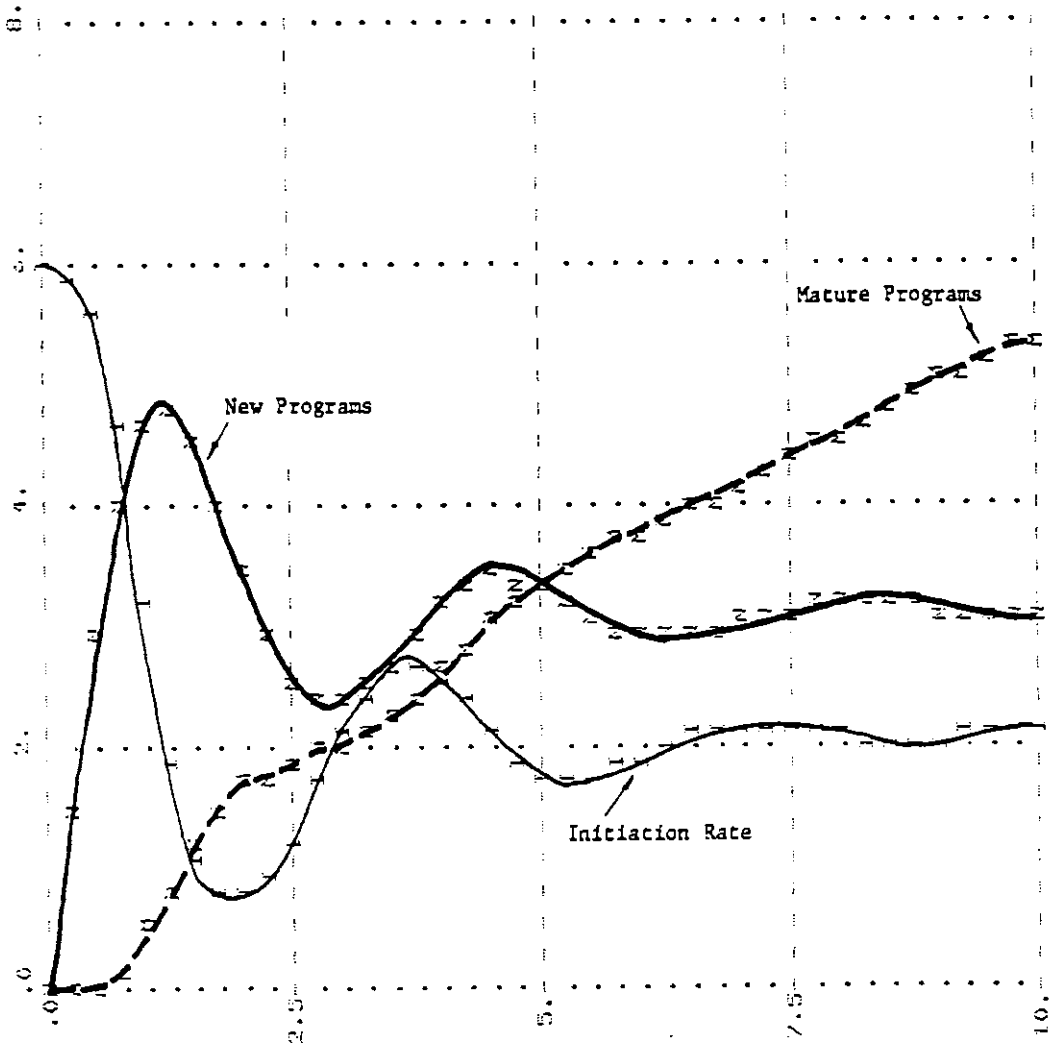

Figure 3.5. Simple model. Staff allocation based on sequential attention to program initiation and problem solving.

Perhaps surprisingly, the scenario generated by this new, more complete model involves even more dramatic periods of overextension and retreat than the initial simple model. The pool of new programs grows quite rapidly at first. In a little over a year, however, it reaches a peak and begins a sharp decline. Then, after another year, the pool of new programs starts to rise again. Several cycles occur before a stable level of performance is achieved.

The explanation for the model's behavior is this. When implementation begins, the implementing organization can devote its full attention to initiating new programs, and thus the pool of new programs rises quickly. Soon, however, as the demands generated by these programs start to pile up, the organization begins to shift staff attention to problem solving.

Of course, as staff attention is shifted to problem solving, the attention available for program initiation is reduced. And as the gap between initiation performance and the organization's initiation goal increases, pressure begins to rise to shift attention back to the initiation of new programs.

Slowly, then, the shift of organizational attention to problem solving begins to taper off. It eventually comes to a halt after the pool of unresolved problems begins to shrink, and the pressure on the organization to allot attention to problem solving begins to diminish. By then, however, the pool of new programs has fallen dramatically. Attention begins to shift back to the initiation of new programs, in response to the pressure created by the gap between the initiation goal and initiation performance. This in turn leads to a renewed period of growth in new programs.

As attention slowly shifts from program initiation to problem solving and back again, the implementing organization eventually reaches a division of attention in which the new programs the organization manages to initiate generate just enough problems to match its problem solving capacity. And the initiation goal eventually drifts to actual initiation performance.

In general, then, the simple model indicates that the implementation process is characterized by alternating periods of overextension and retreat, as the implementing organization seeks to balance the activities of program initiation and problem solving. In other words, according to the assumptions underlying the model, implementation is an iterative process, in which the introduction of new programs is adjusted in response to the problems they generate.

But to what extent can this "implementation search process" be observed in actual case histories of implementation. That is, to what extent does the model offer an adequate interpretation of case study evidence? Some of the issues involved in addressing this question will be considered in the following chapter.

CHAPTER IV

THE CASE STUDY METHODOLOGY

The tentative model I described in Chapter III was formulated to guide my initial field research for two case studies of the implementation process. These two cases are the Southeast Alternative Program in Minneapolis, Minnesota; and the Piedmont Schools Project, in Greenville, South Carolina--two projects associated with the federal Experimental Schools Program. Each of these two school districts was granted approximately $5 million over a 5-year period, to implement a program of locally-defined comprehensive change in a small subset of its schools. This comprehensive change was supposed to include "compatible and mutually reinforcing curriculum reform, staff training, administrative reorganization, community participation, and evaluation strategies."[1]

Minneapolis began its project in the Summer of 1971; Greenville in the Summer of 1972. Each school district selected a target area of the city, including one high school, one middle school, and several elementary schools (4 in Minneapolis, 6 in Greenville). Minneapolis planned a program based on the notions of choice and alternative schools; Greenville planned a program based on individualization and the formation of multi-teacher learning communities.

A number of features of the cases stand out as being particularly important:

1. Both cases involved large school districts.

2. The programs being implemented were extremely ambitious and required fundamental changes in many traditional practices.

3. They involved a sizeable number of schools.

4. In each district, there was a strong and committed core program staff.

5. The programs were not completely overwhelmed by political controversy--although there was certainly a good deal of community politics involved.

6. Most observers agree that some successful implementation occurred in both sites.

7. But most observers also agree that the school districts were unable to implement important components of their programs--particularly at the middle and high school levels.

8. The programs had some indirect effects in the school districts, many of which are quite difficult to trace.

9. The termination of federal funds at the end of 5 years appeared to threaten the continuation of important aspects of the programs.

In preparing the case studies, I relied primarily on extended, semi-structured interviews, which I conducted with key actors involved in the Minneapolis and Greenville school systems. I also employed project records, memoranda, and letters; reports and project histories prepared by the internal evaluation teams for each site; and reports and project histories prepared by the external evaluation teams for each site.

An interpretive methodology: Determining the proper role of empirical evidence in a computer simulation study is a difficult issue--particularly when the model purports to deal with such a murky and qualitative area as the implementation of social policy. By what standards of evidence

should such a model be judged? How should such evidence be gathered and reported?

Traditional hypothesis testing seems especially ill-suited for a qualitative simulation model--since we do not expect even an approximate point-by-point fit between the model's behavior and a case history. Nevertheless, we do expect some systematic relationship between model and evidence.[2] In principle, the model and the case are supposed to show a structural similarity--which is to say that important events observed in the case should in some sense be understandable in terms of the structure of the model. Demonstrating that this structural similarity in fact exists seems to require "rules of recognition" or "rules of translation"--ways of arranging, categorizing, or synthesizing events that occur in the case so that these events can be expressed in the language of the model.[3]

In my effort to relate model and evidence, I have tried to follow what might be called an "interpretive" case study methodology, involving several steps.[4]

Stage 1

1. Formulate a tentative simulation model, to be used in focusing the initial empirical work.

2. Using the model as a very general guide, develop a broad set of interview questions.

3. Obtain a case history (for each case), from the perspectives of the actors involved, through extended, open-ended interviews, as well as through the review of program documents, letters, and other materials.

4. Once these interviews are completed, attempt to "translate" the events

reported by respondents into the language of the model, being quite self-conscious about the rules being used in carrying out the translation. This first attempt at translation should call attention both to important weaknesses in the tentative model and important gaps (or inaccuracies or misperceptions) in the case histories.

Stage 2

5. On the basis of this initial translation effort, reformulate the simulation model.

6. Using this new model as a guide, develop a new set of interview questions. This set should include questions designed to obtain respondent reactions to the tentative translation worked out in Stage 1 (Step 4). The set should also include questions designed to fill gaps in the record and examine contradictions.

7. Conduct a second set of interviews, based upon these questions.

8. On the basis of these new interviews, assess the adequacy of the revised simulation model and the initial translation of evidence. This assessment may call attention to important problems in the translation of the evidence, as well as new weaknesses in the model and gaps in the evidence.

In principle, this process-reformulating the model (M_i), generating new questions (Q_i), obtaining responses to these questions through interviews (R_i), and interpreting this new evidence (I_i) could continue, as a kind of controlled dialogue, for as many stages as might be necessary to reach a point where little more is learned.

Stage 1 Stage 2

$$M_1 \rightarrow Q_1 \rightarrow R_1 \rightarrow I_1 \rightarrow M_2 \rightarrow Q_2 \rightarrow R_2 \rightarrow I_2$$

Hopefully, each stage would provide new and better examples drawn from the cases--examples which, on the basis of a progressively more adequate

interpretation, could be understood in terms of the structure of a better-formulated model. But it could also happen that each stage might indicate more clearly that the central assumptions of the model are in important ways inadequate. Thus, the process might result in a major reassessment of basic premises.

The most important element of the interpretive methodology is that, at each stage, use is made of evidence that does not seem to "fit" as well as evidence that does. The point is not to reject or accept the model on the basis of a single pass through the evidence. Instead, the point is to reflect upon the new evidence produced at each stage, in the light of what was expected based upon the preceding stages. Consequently, it is particularly important to maintain a clear record, at each stage, of expectations based upon the model, what happened in the interviews, and how the attempt to interpret the evidence worked out.

The first round of interviews: The section above describes the interpretive methodology "in principle"--but of course, as usual, there is a gap between "in principle" and "in practice." My ideas on methodology have been developing as my empirical work has proceeded, so that I didn't begin with a precisely worked out scheme (such as the one described above). Nevertheless, what I have done follows the methodological principles I have outlined fairly well.

I began my empirical work by preparing a paper describing the tentative, bare-bones simulation model discussed in Chapter III (Step 1).

I then reflected a bit on the paper to design an initial set of interviews (Step 2). I then tested my initial plan by interviewing a former project director for one of my sites, who is now living in the Boston area. Then, after revising my interview plan a bit, I spent one week doing interviews in Greenville and second week in Minneapolis. I took detailed notes during the interviews, which I later dictated and had transcribed. Each interview produced about 15 pages of typewritten notes (Step 3).

Then I began to interpret the evidence I had collected, in terms of the language of the simulation model (Step 4). This involved three levels of analysis. First, I hoped to be able to categorize or identify the major events described by my respondents, according to the basic structural concepts of the simulation model (i.e., implementing organization, new program components, mature program components, unresolved problems, staff in program initiation, staff in problem-solving). Then, using these categories, I hoped to be able to find examples in the cases of the structural relationships assumed in the model. Finally, I hoped to find some indication that the case histories corresponded to one or another of the scenarios generated by the model.

This attempt to make sense of the evidence proved to be revealing (Step 5). Several basic assumptions of the model required additional thought. First, the tentative model had rested on an assumption that, within each site, it was sensible to think in terms of a single, fairly well-defined implementing organization responsible for implementing the

Experimental Schools Program in that site. (I assumed that this organization might nevertheless have multiple, conflicting goals.) This did not appear precisely correct, in either Greenville or Minneapolis. In each case, there seemed to be a multiplicity of quasi-independent implementing organizations, at different levels of the project. In each case, there was indeed a project-wide implementing organization, and it is possible to speak of project-wide programs and project-wide problems, and so forth. But at the same time--and equally important to an understanding of the cases--there were also somewhat distinct implementing organizations at the project schools (or at least at several of them), and thus it also makes sense to speak of school-wide programs and problems. It is even possible to speak of programs, problems, and implementing organizations at still lower levels--for example, within academic departments at the high school, or within classrooms at the elementary school. At the opposite extreme, it is also possible to speak of implementation at the district-wide level--since, in both cases, the Experimental Schools Program was seen (at least by some respondents) as an important ingredient in the development of district policy (for example, school desegregation policy).

This difficulty seemed to have a number of potential solutions. I thought about developing a more complex, hierarchical model that would incorporate quasi-independent implementing organizations at multiple levels. This approach suffered from the drawback of feasibility: I feared becoming

lost in the intricate details of programming and interpreting such a large model. I decided instead that a more sensible procedure (and one that would be necessary anyway before a larger model could be constructed) would be to select several of the quasi-independent implementing organizations at each site, and to analyze each of these separately, in terms of the model. I would then be able to compare the implementation process at several levels (the school level, the project level, and the district level), for the two sites, and to discuss the hierarchy issue informally.

With this question of interpretation out of the way, I began to try to catalog the major events reported by respondents according to the categories of the model, for four separate implementing organizations at each site: the project-wide organization; two representative school-level organizations (one elementary school and the middle school); and the district-wide "organization."

This led to the revision of several additional assumptions.

1. I had assumed that once accepted, mature programs stop placing demands on the implementing organization. This appeared to be false (at all three levels). Mature programs also generate problems, although at a somewhat lower rate than new programs.

2. I had assumed that the staff of the implementing organization are engaged in two principal activities: initiating new programs and reacting to the problems generated by these programs. This appeared to be incomplete. In addition to these two activities, the staff also engage in two other activities: reacting to the problems generated by mature programs and searching for ways to maintain organizational capacity, once federal funds are exhausted.

Thus, my analysis of the initial round of interviews indicated that

several assumptions underlying the Simple Model needed to be revised. Furthermore, I learned something about the quality of the evidence I had gained through the interviews.

1. I had reasonably good evidence on new programs, mature programs, and the problems they generated.

2. My evidence was less strong on staff allocations among the principal staff activities. What evidence I had, however, was broadly consistent with a "sequential attention" to pressures in the four areas.

The second round of interviews: Armed with the new assumptions developed during my attempt to translate my initial interview evidence, I planned a second round of interviews (step 6). The major purpose of this second round was to obtain respondent reactions to my preliminary interpretation of the evidence. In an effort to give some structure to the interviews, I prepared four separate "discussion guides" for each site--one at the project-wide level; two at the school-level (one elementary school and one middle school); and one at the district-wide level. (See Appendix B.) For each of these four levels, the discussion guide included a list of the program components I believed were initiated at that level; the problems I believed were generated by these components; the organizational responses to these problems; the tasks required to maintain the components that were eventually adopted as mature programs; and the organizational procedures and staffing available to perform these tasks.

Using these discussion guides, I then re-interviewed about ten people in each site. I began each interview by saying that I was interested

in testing my initial interpretation of what had happened in the site. I then explained that, from what I had learned during my first visit, it seemed possible to view the Experimental Schools project in the site in several ways. Although it was possible to think of the Experimental Schools project in the site as a single, unified effort, it was also possible to think of the program as a set of somewhat independent projects taking place at different levels--at individual schools, in the project community, and district-wide. I went on to explain that, while the goals and activities at one level sometimes supported those at another, sometimes they were unrelated, and other times they conflicted. Nearly everyone agreed with this characterization, and a few respondents took the opportunity to talk about some "hidden agendas" at various levels.

I continued each interview by explaining that I wanted to use the rest of the interview to focus on just one level (either a school, or the project-wide or district-wide level). I then gave the respondent a copy of the appropriate discussion guide. I began by asking the respondent to look over the list of program components on the guide and tell me if it seemed accurate. Usually, the respondents would add one or two components to the list, or delete a few. Occasionally, a person would suggest that, while the components seemed correct, they ought to be grouped differently, or given different names.

We then went down the problems listed on the guide, one by one, and I asked whether the problems included actually occurred, whether the

outcomes I described were accurate, and whether the list was complete. That turned out to be extremely productive. People tended to add problems not on the list and expand upon the outcomes. Often, a respondent would look at a problem on the list, grimace, and say, "Unfortunately, we were never able to solve that one."

I then used the same procedure to discuss the list of tasks required to maintain the program components eventually adopted as mature programs. Finally, if there was time, I also asked each respondent to tell me which program components he believed would survive over the next five years, and what procedures and staffing would be necessary to support them. I took extensive notes during all of this, which I later dictated and had transcribed (step 7).

Altogether, the second round of interviews produced a substantial body of evidence. Interpreting this evidence (step 8--the final step in the case study methodology) proved to be by far the most taxing aspect of the study. The procedures involved are discussed in the following Chapter.

CHAPTER V

AN EXTENDED MODEL

The initial round of interviews revealed some important shortcomings in the simple model of the implementation process discussed in Chapter III. To correct some of these, I revised some of the assumptions underlying the simple model (see the discussion in Chapter IV) and used these revised assumptions to guide a second round of interviews. But how valid are these new assumptions? That is, to what extent do they provide an adequate account of the evidence obtained during the two rounds of interviews?

In order to answer this question, it is necessary to consider the revised assumptions in some detail. Taken together, these assumptions form a new model, which might be called "an extended model of the implementation process." This extended model differs from the simple model in three important respects. First of all, the initial simple model of the implementation process rested on an assumption that, in each site, the local program being implemented was conducted by a single, identifiable implementing organization, with at least some vision of the program to be implemented, operating in a wider organizational setting. This assumption proved false. Instead, the local program in each site appeared to be a collection of projects at various levels, being conducted by quasi-independent implementing organizations. The extended model is supposed to

apply to each of these quasi-independent implementing organizations separately. (For simplicity, I'll call each of these quasi-independent implementing organizations an "implementing organization".)

Second, the simple model rested on an assumption that once accepted, mature programs stop placing demands on the implementing organization. In the extended model, I assume instead that mature programs generate tasks for the implementing organization to face--although at a somewhat lower rate than new programs.

Finally, in the simple model, I assumed that the staff of the implementing organization engage in two principal activities: initiating new programs and reacting to the problems generated by these programs. In the extended model, the staff also engage in two additional activities: reacting to the tasks generated by mature programs and searching for ways to maintain organizational capacity, once outside funds are exhausted.

The structure of the extended model is shown in figure 5.1, and the implementation scenario it generates is shown in figure 5.2. For each simulation run of the extended model, it is necessary to make an explicit assumption about the level and duration of outside funds available to the implementing organization. To obtain the simulation run shown in figure 5.2, I assumed an annual level of funding qualitatively similar to the funding patterns for the Experimental Schools Programs in Minneapolis and Greenville. That is, I assumed a constant level of outside funds for the first three years of implementation, followed by a declining level of outside funds, reaching zero by the end of year six. (For a computer listing

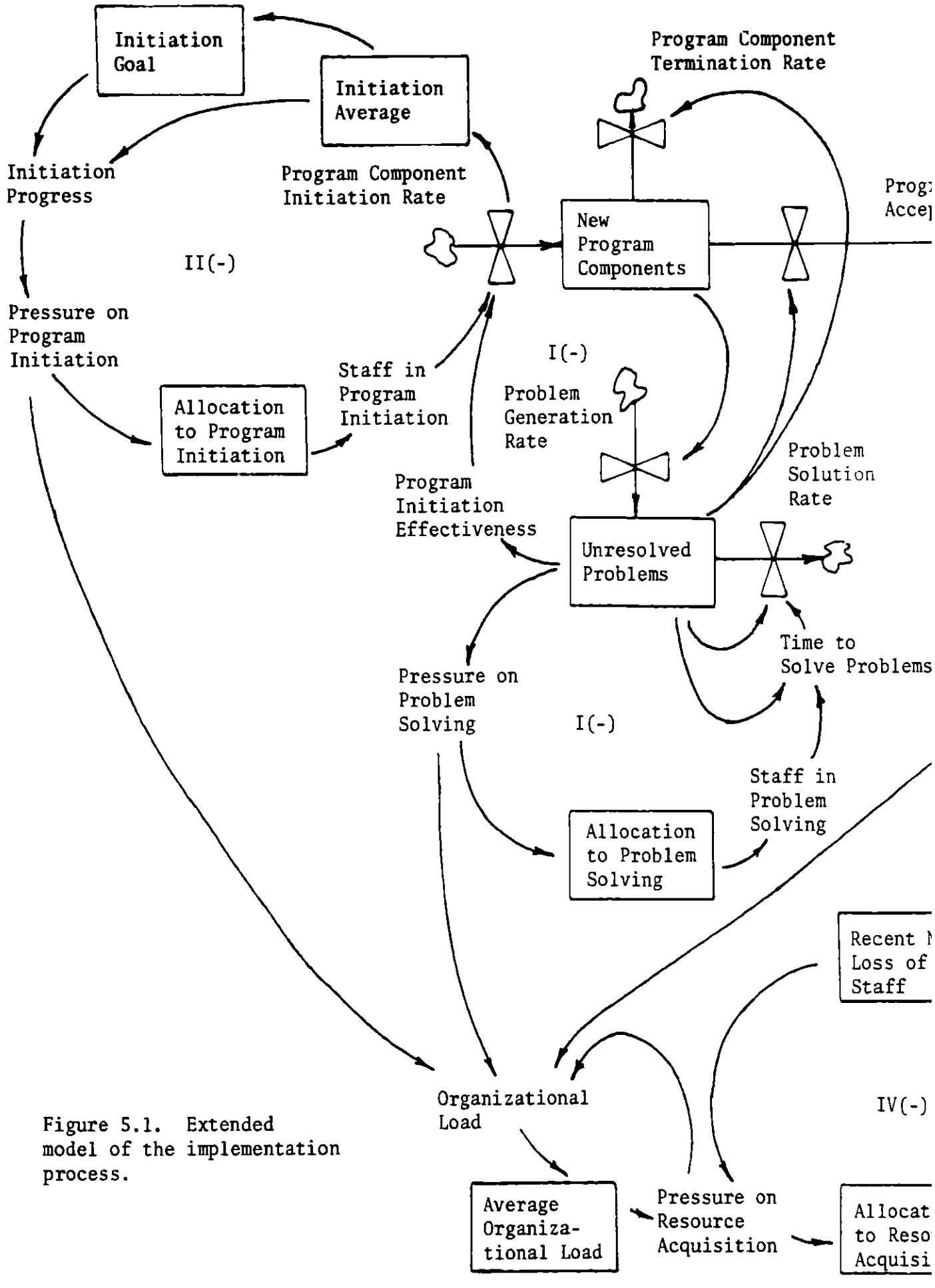

Figure 5.1. Extended model of the implementation process.

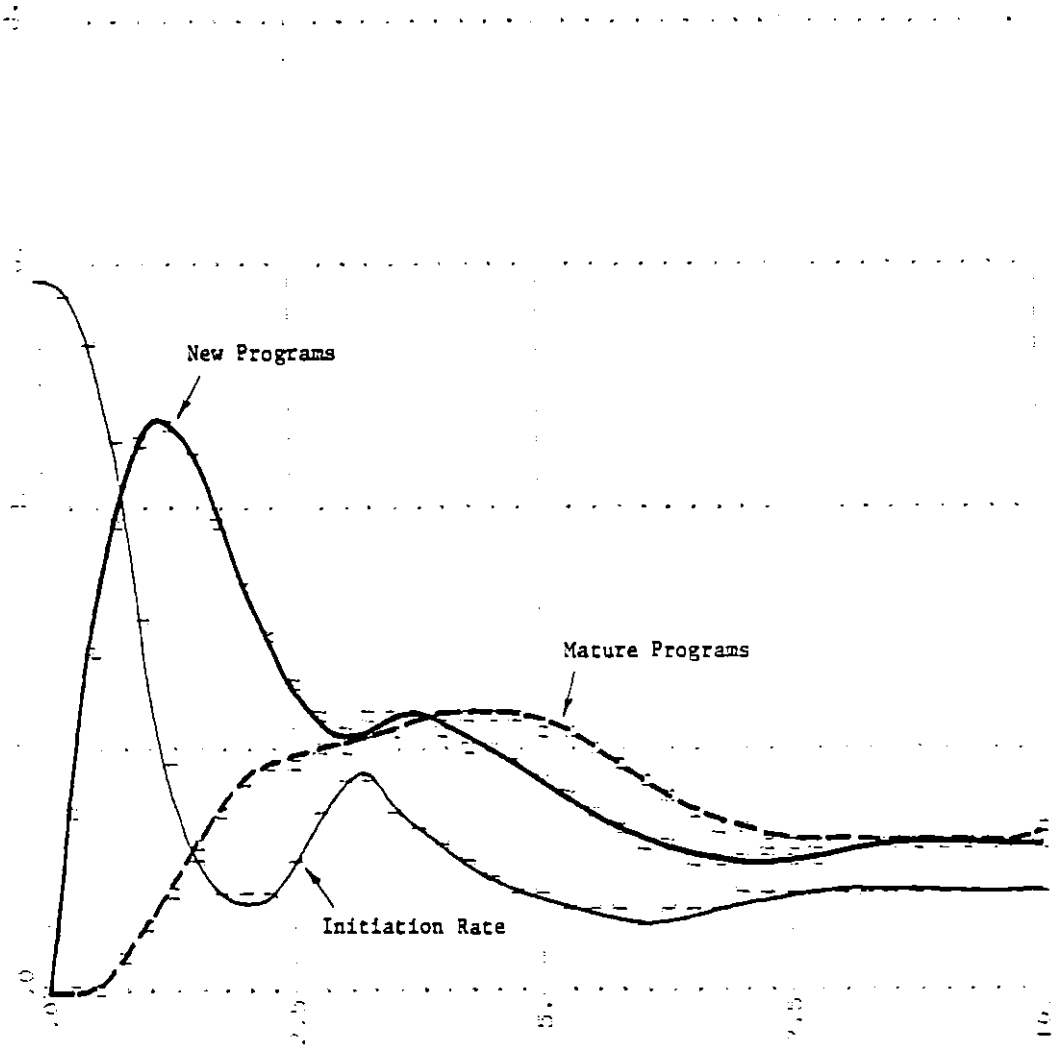

Figure 5.2. Extended model.

For the first three years of the implementation process, the behavior generated by the extended model is quite similar to the behavior generated by the simple model. (Compare figure 5.2 with the scenario generated by the simple model, in figure 3.5). The pool of new programs rises rapidly at first, reaches a peak, and then undergoes a period of decline. At the end of year three, however, the behavior of the extended model begins to diverge from the simple model, reflecting the tasks generated by mature programs and the drop in outside funding. The renewed period of growth in new programs observed at the end of year three in the simple model is quite curtailed in the extended model. Furthermore, in the extended model, there is very little growth in mature programs after year four. Indeed, by year five, the level of mature programs begins a slow decline, and by year seven, the number of mature programs is only about half of its value in year five.

Why does the number of mature programs undergo a period of decline, and why does the decline eventually come to a stop? The explanation concerns the implementing organization's effort to secure permanent staff to replace the temporary staff that are terminated beginning at the end of year three. As temporary outside funds begin to decline, two things occur. First, the implementing organization has fewer resources available to allot to the activities of implementation. Second, of the resources that remain, an increasing proportion must be alloted to the effort to secure local resources to replace the declining outside funds--and this decreases still further the attention available to maintain mature programs. As a result,

the number of mature programs begins to decline.

When outside funds are exhausted, at the end of year six, the implementing organization must rely completely on the permanent staff it has managed to secure. And as a result of the pressure generated by the loss of outside funds, a fairly substantial portion of the implementing organization's attention is alloted to recruiting additional permanent staff. Thus, for the first year after federal funds are exhausted, the implementing organization is able to increase its total number of permanent staff. But as the tasks generated by mature programs remain uncompleted, pressure persists to shift attention to the maintainance of mature programs. Eventually, the allocation of organizational attention shifts from securing permanent resources to maintaining mature programs and initiating new programs to replace older ones that are occasionally lost. Over time, the number of mature programs falls until the pool of mature programs can be maintained at a constant level.*

In more general terms, the extended model indicates that, in response to the termination of outside funds, the implementing organization adjusts its allocation of attention and searches for a level of permanent staff and mature programs that is sustainable in the long run. Like the "implementation search process" that occurs when implementation begins, the

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*Given the parameter values I selected for the model, the implementing organization is able to sustain a gradual rate of growth in mature programs and permanent staff, once a steady state is reached.

"phase out search process" that takes place when outside funds are terminated involves a period of overextension and retreat. The implementing organization generates more mature programs and secures more permanent staff than it can sustain, and both the level of mature programs and the number of permanent staff decline until the implementing organization achieves a balance among the activities of program initiation, problem solving, task completion, and securing permanent resources.

HYPOTHESES ABOUT IMPLEMENTATION

The extended model is a second genration working hypothesis (or rather an inter-related collection of hypotheses) about the implementation process, whose adequacy is to be judged on the basis of the evidence obtained during the two rounds of interviews. In attempting to determine whether the interview evidence offers some support for the model, it will be necessary to be a bit more precise about the hypotheses the model contains.

At the greatest level of detail, these hypotheses are just the differential equations that make up the computer simulation model. But there are many potential mathematical representations of the qualitative assumptions discussed above and in Chapter III. The computer model is just one. No doubt there are several mathematical formulations different from those chosen for the model that would be equally consistent with the qualitative assumptions. Indeed, I experimented with a few alternative formulations, to convince myself that the simulation model behavior is in fact a consequence of the qualitative assumptions rather than an artifact resulting from a hidden detail of the mathematics.*

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*In both the simple model and the extended model, for example, I assumed that new program components, once initiated, mature according to a third-order delay process, with a time constant of 1.5 years. I assumed that all program components initiated survive the delay process, at the end of which some are accepted as mature programs and some are eliminated. It would probably be more realistic, however, to assume that program components are eliminated throughout the delay process. I therefore experimented with a "leaky" third-order delay, in which some program

If, for purposes of comparing model and evidence, the mathematical description of the model is too detailed, the discursive account provided above (and in Chapter III) is too vague. Some formal statement of hypotheses is required. The extended model contains hypotheses concerning the initiation of new programs, the generation and resolution of problems associated with new programs, the generation and completion of tasks associated with mature programs, and the acquisition of permanent resources. The following organization of these hypotheses provides a framework for the analysis of the case materials in Chapters VI and VII.

I. New Programs and Problems

a. New programs are initiated continuously by the staff of the implementing organization.

b. Once initiated, new programs generate problems for the implementing organization to face. Eventually, some new programs survive to become mature programs. The rest are terminated.

c. The problems generated by new programs pile up until they are solved by the implementing organization (or until they are eliminated when new programs are terminated).

d. As the pool of unresolved problems increases, it becomes more difficult to initiate new programs.

e. Furthermore, as the number of unresolved problems per new program increases, the fraction of new programs surviving to become mature programs declines.

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components were eliminated after each stage of the delay process, rather than only at the end. The addition of the leaky delay made little difference in the behavior of the model, however, and so I retained the simple third-order delay formulation.

f. The rate at which problems are solved depends on the amount of staff time allotted to problem solving.

g. The pressure to allot staff to problem solving is a function of the number of unresolved problems per new program.

II. The Pressure to Initiate New Programs

a. The rate at which new programs are initiated depends on the amount of staff time allotted to initiation.

b. The pressure to allot staff to initiation is a function of the difference between an "aspiration level" initiation goal and actual initiation performance.

c. The aspiration level initiation goal, which at the start is based (informally) on the program proposal, drifts over time toward actual performance.

III. Mature Programs and Tasks

a. Throughout their lifetime, mature programs generate tasks for the implementing organization to face.

b. These tasks pile up until they are completed by the implementing organization staff.

c. As the pool of uncompleted tasks rises, the average lifetime of mature programs fails.

d. The rate at which tasks are completed depends on the amount of staff time allotted to task completion.

e. The pressure to allot staff to task completion is a function of the number of uncompleted tasks per mature program.

IV. Acquiring Permanent Resources

a. As temporary outside funds are exhausted, the implementing organization is faced with the need to seek permanent resources, in order to maintain its implemented programs.

b. The rate at which permanent resources are acquired depends on the amount of staff time allotted to acquiring resources.

c. The implementing organization competes for resources with other programs in the organizational setting. Thus, the implementing organization's ability to secure additional resources depends on the organizational cost of its implemented programs, in terms of the resources already committed, relative to the costs of competing programs. The higher the cost, the more difficult it becomes to secure additional permanent resources.*

d. The pressure to allot staff to acquiring permanent resources is a function of the overall load on the implementing organization (that is, of the total pressure on the organization).

The first set of hypotheses above, on "New Programs and Problems", forms the basis of the initial simple model of the implementation process presented in Chapter III. When the second set of hypotheses is added to the first, the combined hypotheses form the basis of a second simple model, the one discussed at the end of Chapter III. When the third set

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*Hypothesis IVb incorporates the common observation that, as organizational units grow, they become self-maintaining. The more permanent resources an implementing organization can manage to secure, the more staff it will be able to devote to securing still more. Hypothesis IVc reflects the assumption that this process is subject to diminishing returns. An organization unit with few programs to maintain will eventually have to initiate some more, to justify additional permanent resources.

of hypotheses, on "Mature Programs and Tasks", is added to the first two, a third model is produced. (A simulation run of the third model is presented in Appendix A, along with computer listings for the four model versions discussed in the text.) Finally, when all four sets of hypotheses are taken together, the model that results is the extended model presented at the beginning of this Chapter (see figures 5.1 and 5.2.).

THE ORGANIZATION OF THE CASE STUDIES

In the two chapters that follow, these nineteen hypotheses, together with the overall model behavior they generate, will be considered in relation to the two case studies. The primary question to be addressed is: to what extent are the hypotheses and model behavior supported by the case materials?

In the end, of course, answering this question is a matter of judgment based on multiple grounds that are difficult to define precisely. Nevertheless, it is at least necessary to clarify these grounds to some extent. To begin, the model is supposed to apply separately to each of several quasi-independent implementing organizations in each site, and consequently, the adequacy of the model must be examined separately for each of a number of distinct implementing organizations. For each site, the adequacy of the model will be judged at the district level, the project level, and at the individual school level (an elementary school or a middle school). It will then be possible to consider the overall degree of support given the model in each site, as well as the support given at each level across sites. Altogether, the adequacy of the model will be examined for three separate implementing organizations in each site--or six in all. For simplicity, I'll call each of these six analyses "case studies."

The first issue, in each of the six case studies, is to identify the implementing organization, the organizational setting, and the

implementing organization's initial vision of the program to be implemented. This is simply a matter of setting the stage and naming the chief characters--which is to say, it is a matter of indicating that the case represents an example of attempted implementation to which the model, at least in principle, ought to be expected to apply. Whether it does, of course, is what is to be determined.

The next issue, in each of the six cases, is to examine the history of the implementation process, to determine whether the history is consistent with the basic scenario generated by the extended model. This is primarily a problem of interpretation: what new programs, problems, mature programs, and tasks occurred over the course of each case history? A fairly rich and detailed account of each case, employing the language of programs, problems, and tasks, was obtained during the second round of interviews, relying on the discussion guides described in Chapter IV. Using this information, it is possible to compare each case history and the model scenario in a fairly careful way.

The sequence of important events in each case can be presented in a chart displaying the new programs initiated, the problems generated and their outcomes, and the tasks generated and their outcomes, during each three-month period over the history of the project (six years for Minneapolis, five for Greenville). Figure 5.3a, for example, is the first page of the school-level chart for the Experimental Schools Program in Minneapolis. (The school is the Marcy Open Elementary School. The

Marcy case is discussed in detail in Chapter VI.) The program components initiated at Marcy are shown in the first column of the chart, the problems and tasks generated by these programs are shown in the second, and the outcomes associated with the problems and tasks are shown in the third.[1]

Figure 5.3a. A portion of the "Marcy Open School" implementation chart.

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Summer 1	PC1. While working on the SEA proposal, the Marcy staff and members of the Southeast Parents for Open Classrooms visited a number of ongoing open schools. On the basis of these visits, they proposed dividing Marcy into 2 parts, one employing an "integrated day (K-6) approach" (Model I), and the other employing the Mankato open education model, based on eleven "resource rooms" (Model II). The 2 models were put in operation in the Fall.		
	PC2. Marcy developed a plan to involve parents in the classroom, and a new staff position--the Community Resource Coordinator--was established.		
	PC3a. Marcy staff and parents instituted a program of pre-service and in-service training sessions, field visits, and workshops to support the operation of open classrooms.		
Fall 1		P1.1. Not all Marcy parents had chosen the program for the same reasons. Some wanted Marcy to be a Free School, some wanted it to be an open school, and some wanted it to be a regular neighborhood school. Some parents feared the changes wouldn't go far enough; others feared they would go too far.	
		P1.2. Feelings of mistrust developed among the staff.	

Figure 5.3b. A portion of the Marcy chart (continued).

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		P1.3. Dissatisfaction with Model II developed over such issues as: how to integrate each child's multiple classroom experiences, how to schedule each child's day, and how to teach as a subject matter specialist rather than as a generalist.	R1.1., 1.2., 1.3. During a staff-only retreat, the staff decided to reorganize Marcy. They elected to terminate the Mankato Model (Model II) and to establish "families," each composed of two integrated day (K-6) classrooms.
		P1.4. Parents were angered over their lack of involvement in the reorganization of Model II.	R1.4. A joint staff/parent meeting was called, and the reorganization of Model II was put to a vote. It passed.
	PC.4. A provisional steering committee on governance was established, to examine various models of decision making. It proposed 2 choices: an advisory board and a policy-making board. In December, during a heated meeting of parents and staff, the advisory option was adopted. The Marcy Advisory Council began meeting in January.	P4.1. Strong disagreement developed concerning the role of the Marcy Council. Many parents (perhaps 1/3) supported the view that the Council should be a policy-making body--not simply an advisory board.	
		P1.5. Continuing questions were raised by parents and teachers throughout Minneapolis, concerning the legitimacy of open education.	
	PC5a. A committee was established to define the goals of the school--for purposes of formative evaluation.	P5.1. Disagreement developed, particularly between parents and staff, concerning the goals of the school.	R5.1. A document was completed containing 50 fairly general and difficult to evaluate goals.
		P2.1. The staff was uncertain about the role of parents in decision making and classroom instruction.	

Figure 5.3c. A portion of the Marcy chart (continued).

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
			R1.10. A survey of Marcy parents was conducted, to determine their attitudes about the splitting of families. Parents supported the decision, but disapproved of the fact that it was not properly brought before the Marcy Council.
			R1.10. By November, the splitting of families was fairly well accepted by the Marcy Community.
Winter 2		P4.2. Marcy's principal resigned, to coordinate the development of alternative schools in another area of Minneapolis.	R4.2. The Marcy Council developed a procedure to be followed in selecting a new principal.
		PØ.1. Marcy had to prepare its section of the SEA continuation application required by NIE.	RØ.1. A writing team was selected.
Spring 2		PØ.2. NIE rejected the SEA continuation application. Marcy had to rewrite its section.	RØ.2. Re-writing the NIE continuation application was used as an opportunity to unite some of the feuding parties within Marcy against a common "enemy": Washington.
	PC6. Marcy began planning an arrangement through which University students and Minneapolis teachers could attend an internship program at Marcy for credit. The internship program was introduced in the Fall.		

Figure 5.3d. A portion of the Marcy chart (continued).

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
			R1.12. Kindergarten children were placed in separate classrooms, thus making the K-3 classrooms 1-3 instead.
		T5.1. The Marcy internal evaluation staff member no longer could be supported on federal funds.	S5.1. Marcy decided not to seek funds to support a permanent internal evaluator staff position. Formative evaluation was eliminated.
Winter 5			
Spring 5		T8.1. Marcy parents and staff had to put continuing pressure on the MUHS faculty to maintain the open middle program.	S8.1. Pressure on the MUHS faculty was sustained through voluntary efforts by the Marcy community.
Summer 6		T2.1. Maintaining parent and volunteer involvement at Marcy required continuing staff resources.	S2.1. Marcy found support form the West Area to continue the Community Resource Coordinator position for a year. Long-term support remained unsettled.
Fall 6		T1.1. Resource room instruction required more staff than the regular Minneapolis elementary school allotment.	S1.1. The Community Resource Coordinator obtained foundation support for resource room instruction in music. Some resource rooms were staffed part-time using special funds obtained from the West Area. Others were closed or cut back.
		T3.1. Staff development programs required coordination, consultants, and materials.	S3.1. Limited staff development activities could be supported through regular West Area resources. Most staff development was eliminated.

Figure 5.3e. A portion of the Marcy chart (continued).

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Winter 6			
Spring 6		TØ.1. Marcy faced 3 interrelated worries; declining enrollment, a building soon to be torn down, and falling budgets.	SØ.1. The Marcy Council developed plans for the creation of a K-12 open program--in response to the threatened closing of the Marcy building.
		T4.1. Continuing staff effort has been required to maintain the Marcy governance system, involving parent and teacher participation in staff selection, budgeting, and instructional policy.	S4.1. The Marcy governance system has been maintained primarily through voluntary participation in after-school and evening meetings and negotiation sessions.

Each program component initiated as part of the Experimental Schools Program at Marcy is displayed on the chart, along with a reference number. For example, PC1 is the open classroom component at Marcy, and PC2 is the parent involvement component. Sometimes, program components at Marcy were introduced in stages over time, and this is indicated by a letter following the program component reference number. PC3a, for example, is the first stage of the staff development component at Marcy.*

The problems generated by each new program component are shown in the second column on the chart and are numbered according to the program components that generated them. Thus, problem P1.1 is the first problem generated by program component 1, and problem P4.1 is the first problem generated by program component 4. (See figures 5.3a and 5.3b.)

The outcomes associated with each problem are shown in the last column of the chart. Not all problems, of course, were successfully solved. Problem resolution took varying forms, and problems sometimes led to the termination of program components. These varied outcomes appear on the chart and are numbered according to their associated problems. Thus,

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*The division of a new program into discrete program components is of course somewhat artificial, in that the elements of a new program are often interrelated, and the boundaries separating one program component from another are not always easy to draw. These difficulties are outweighed, however, by the fact that an analysis in terms of program components permits at least a rough characterization of changes in program initiation, problem generation, and problem solving over time. Some of these issues are given additional attention in the section on Identifying program components, in Chapter VIII.

outcome R1.1, R1.2, R1.3 is the outcome associated with problems P1.1, P1.2 and P1.3. (See figures 5.3a and 5.3b.)

Some problems faced by the implementing organization at Marcy were generated by conditions essentially external to the program components initiated at the School. These problems are labeled with the symbol "Ø." For example, PØ.1 was the first external problem Marcy faced (see figure 5.3c). During the second year of the program, Marcy was asked to prepare a section of the Minneapolis School District's Experimental Schools Program "continuation application," which was required in Washington to continue federal funding for the second half of the five-year Program. RØ.1 is the outcome associated with PØ.1.

The tasks generated by mature programs at Marcy, along with the outcomes associated with them, are represented in more or less the same fashion as the problems generated by new programs. There is one difference, however. Each task (such as coordinating parent involvement in the classroom, or whatever) was usually generated repeatedly, for as many years as the associated mature program survived. For simplicity, the charts show each task only once. I have generally entered each task during a period in which it was particularly burdensome to the implementing organization--usually at the point at which local resources had to be found to do what up until then had been done on federal funds. Each task generated by a mature program at Marcy is entered in the second column of the chart and is numbered according to the associated program component.

Thus, T2.1 is a task associated with PC2, parent involvement. (See figure 5.3d.)

The outcome associated with each task is shown in column three. Usually, an outcome indicates whether local resources were secured to continue carrying out the task. Outcomes are numbered according to the associated tasks. Thus, S2.1 indicates how (and to what degree) local resources were secured to carry out task T2.1. (See figure 5.3d.)

From the evidence displayed in the Marcy chart, it is possible to determine the rate at which new program components, once initiated, were accepted as mature programs or terminated. The termination of new programs can be inferred by examining the manner in which the problems new programs generated were resolved. Often, the resolution of a problem clearly entails the termination of some part of an associated program component. For example, R1.1, R1.2, R1.3 indicate that some part of PC1 (open classrooms) was terminated, in response to problems P1.1, P1.2, and P1.3. (See figures 5.3a and 5.3b) The acceptance of new program components as mature programs is somewhat more difficult to gauge. Acceptance can be inferred whenever a program component (or part of a component) has survived and has generated no new problems for one or two three-month time-intervals.

The survival and decay of mature programs can be determined from the chart in a similar fashion. The decay of mature programs can be inferred by examining the manner in which local resources were or were

not acquired to continue completing tasks. The failure to find resources to complete task T3.1, for example, indicates that most of program component PC3, staff development, failed to survive beyond the Fall of year 6. (See figure 5.3d.)

The evidence displayed in the chart can be analyzed in two ways. First, it can be reviewed informally, for signs of the periodic over-extension and retreat phenomena characteristic of the implementation search and phase-out search processes exhibited in the scenario generated by the extended model. (See figure 5.2.) Or, more formally, the evidence on new and mature programs can be quantified (very roughly--see Appendix C) and plotted over time, allowing the possibility of checking the model-based scenario graphically. For an example of such a graph, see figure 5.4, which represents the Marcy case. (The Marcy graph is discussed in detail in Chapter VI).

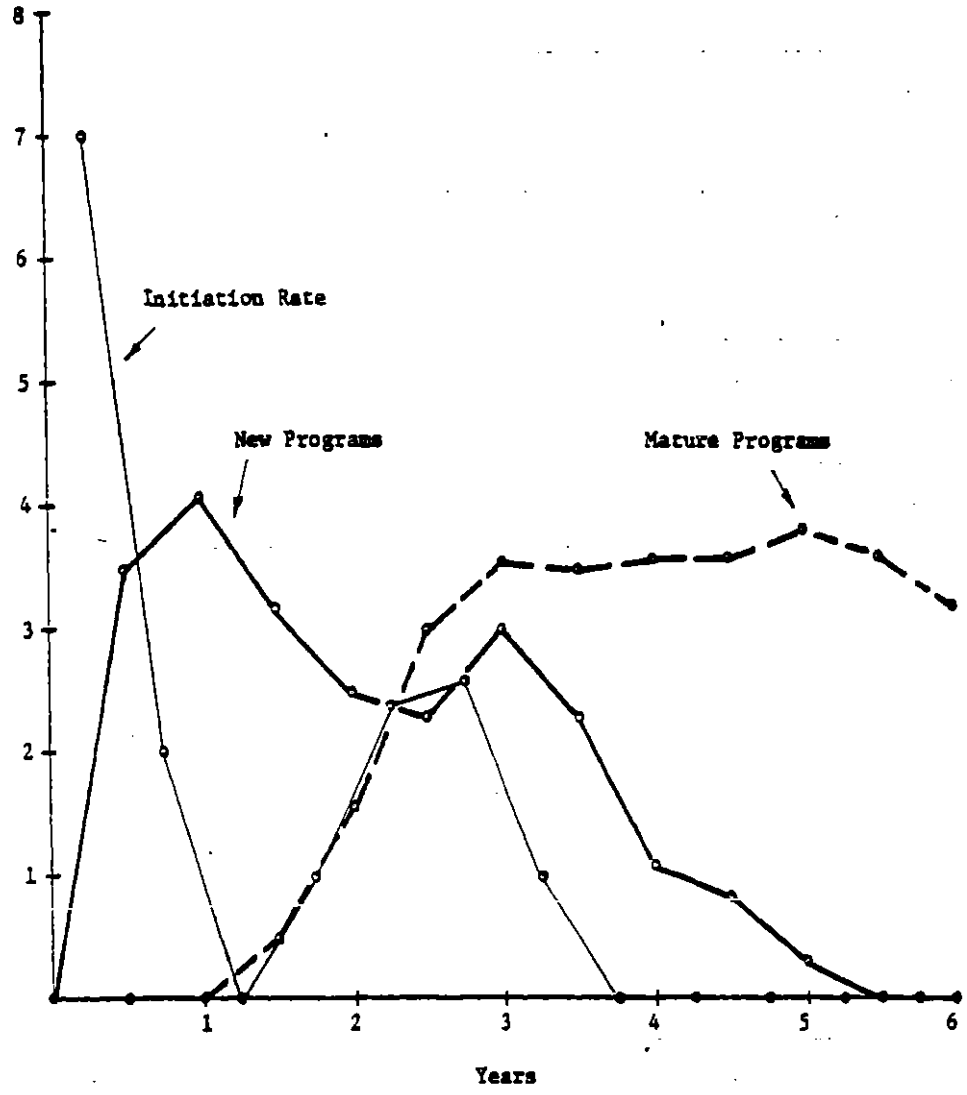

Figure 5.4. The Marcy Implementation Scenario

It is important to emphasize that whatever method is used to compare each case history and the model scenario, there is no precise way to measure the "goodness of fit." Instead, the question is: Do the six cases exhibit the characteristics of the implementation search and phase-out search processes generated by the model, and if so, how dramatically? That is, do the case histories reveal alternating periods of overextension and retreat? If so, how visible are these periods, against a background of other occurrences?

For each case study, once the stage has been set, the characters have been introduced, and the case history and model scenario have been compared, the next step is to consider the nineteen model hypotheses. It should be clear by now that "testing" these hypotheses in any statistical sense is inappropriate: time series data on the variables involved are simply unavailable. Instead, it is necessary to rely on arguments of a different sort, capitalizing on the detailed picture of critical events and episodes provided by the interviews.

Support for the model hypotheses must be sought in an analysis of these critical episodes. For each case, I have made an attempt to find episodes that are <u>examples</u> of the hypothesized relationships in action. The point is to show that these events are consistent or not with the hypotheses under consideration. Using this approach, it is of course impossible to test whether all nineteen hypotheses hold true over the entire history of each case. Instead, all that can be concluded is that

certain hypotheses are or are not consistent with certain critical events. But to the extent that a large number of hypotheses are consistent with a large number of events, in both sites, there is some basis for confidence in the set of model hypotheses taken as a whole.

To reduce the presentation of each of the six cases to tolerable proportions, I have taken advantage of the division of the hypotheses into four sets. That is, for each case, I consider the hypotheses on "New Programs and Problems" as a group, followed by those on the "Pressure to Initiate New Programs," those on "Mature Programs and Tasks," and finally those on "Acquiring Permanent Resources." Each of the six cases has seven parts: an introduction on the implementing organization, the organizational setting, and the program to be implemented; a comparison of case history and model scenario; an analysis of hypotheses on New Programs and Problems; an analysis of hypotheses on the Pressure to Initiate New Programs; an analysis of hypotheses on Mature Programs and Tasks; an analysis of hypotheses on Acquiring Permanent Resources; and an overall consideration of the adequacy of the model as an interpretation of the case.

Chapter VI contains the three case studies of the Experimental Schools Program in Minneapolis. The Chapter begins with a short introduction on the origins and setting of the Minneapolis Program. This is followed by a presentation of the project-level case, the elementary school case, and finally the district-level case. Chapter VII, on the

Experimental Schools Program in Greenville, is identical in structure. On the basis of the materials presented in these two Chapters, it should then be possible to complete an overall assessment of the adequacy of the model, a task postponed until Chapter VIII.

CHAPTER VI

THE EXPERIMENTAL SCHOOLS PROGRAM IN MINNEAPOLIS

> Changes of fundamental order demand understanding and support . . . . [T]he pattern of retrenchment from innovations in timing and grouping characteristic of the few [Ford Foundation] projects that tried them, exposes, in a concrete way, fundamental issues in the relations between a school and a community and, in a theoretical way, the role of schools in society.
>
> A Foundation Goes to School[1]

> [Our project director] would continually tell us to go back to the drawing board. . . . We wanted to design a program that would last. But now, my assessment is that the Ford Foundation is going to be right. It's frightening.
>
> Minneapolis parent[2]

It is hard to imagine a more promising setting for an urban school reform effort.[3] The Minneapolis Public School System, under the guidance of Superintendent John B. Davis, had received national publicity for its progress in desegregation. Furthermore, the District had a school board supportive of many of the school reform ideas, such as individualized instruction, that were gaining attention in the sixties. Superintendent David had served on the President's Science Advisory Panel on Schools and Innovation which, in 1968, had developed the initial outline for a federal Experimental Schools Program oriented toward comprehensive change. And finally, Minneapolis had a reputation for successfully managing to avoid some of the tensions and problems that had beset other cities of similar size.

Thus, when in late December of 1970 Superintendent Davis received a telephone call from Robert Binswanger, the Director of the Experimental Schools Program (E.S.P.) in Washington, announcing a competition for five-year program grants, he was quick to respond. He assembled a planning group to prepare a short letter of interest, due by January 30.

According to the E.S.P. guidelines, school districts interested in participating in the Program were supposed to focus their projects on a small number of schools, with a total enrollment of about two thousand to five thousand students, ranging from kindergarten through twelfth grade. Superintendent Davis and his advisors soon settled upon a segment of Minneapolis called "Southeast" as the target area for the developing Minneapolis project. Partly, they selected Southeast because it was the right size: it contained four small elementary schools, which fed Marshall-University High School (MUHS), a comprehensive junior and senior high (grades seven through twelve). The total number of students in the five schools was just twenty-five hundred in all, and thus the size of the Southeast area was appropriate. But there were also several other important reasons for selecting Southeast. First, it was the site of an experimental elementary school program which had been operating for a year and was due to be expanded. Second, a well-organized group of vocal elementary school parents in Southeast had been applying pressure to establish some open classrooms in the area. Finally, one of Davis's close advisors

had a strong interest in Marshall-University High, which at the time was operated jointly by the Minneapolis Public Schools and the University of Minnesota.

Southeast, then, was already bustling with several fairly substantial reform activities. The Minneapolis planning group sought to draw on some of these innovations in developing its proposed project. In its thinking about the project, the planning group emphasized one idea in particular: that students and families in Southeast ought to have a choice of educational styles. On the basis of this idea, the planning team hurriedly drafted a letter of interest and submitted it well before the January 30 deadline.

From nearly five hundred applicants, the U.S. Office of Education selected Minneapolis and seven other cities to receive sixty-day planning grants to write complete proposals. To direct the proposal writing process in Minneapolis, Superintendent Davis chose James Kent. Kent had served as Davis's administrative assistant and was currently Director of Marshall-University High School in Southeast. Kent had just returned to Minneapolis from the Harvard Graduate School of Education where, it is interesting to note, he completed his doctorate under Robert Binswanger, the Director of E.S.P. in Washington.

Kent assembled a team of thirty parents, teachers, and principals to write the E.S.P. proposal. Under pressure of time, they began elaborating on the notion of educational choice that had been the central

theme in the successful Minneapolis letter of interest. At the elementary level, the planners proposed creating a distinct educational program in each elementary school in Southeast and offering parents a choice of whichever Southeast school they wished for their children. At the high school level, the planners described a wide-ranging system of options and electives within MUHS. At the last minute, due to the urging of some parents in Southeast, the planners somewhat reluctantly proposed adding a small K-12 Free School, as another distinct alternative.

Altogether, the proposed program--Southeast Alternatives (SEA) as it came to be called--resting on a strong belief in the possibility of substantially increasing the amount of diversity and choice in the public schools.

> Choice-making by students, teachers, and parents will become the basic way of school life for all members of the Southeast Alternatives program within the public school sector. This liberating feeling will find expression in the multiple instructional patterns offered, in the diversity of curriculum materials available, in the recasting of the teaching role so that persons of all ages can be learners and teachers and, finally, in the essential expression of a deep belief in the ability of people--students, faculty, and parents--to make their own educational decisions and to have these decisions respected by others in the school community.[4]

By the April 30 deadline, the proposal was submitted and on May 15, USOE announced that the project would be funded. It took another month of at times strenuous negotiations to prepare a revised proposal in line with questions raised by Washington. Finally, in the middle of June, Minneapolis and USOE had negotiated a final budget of $3.6 million

for the next twenty seven months. The grant was renewable, at an estimated $2.9 million more, for the thirty four months following. Altogether, Minneapolis would receive about $5.5 million over a five year period--or roughly $400 a year per student in Southeast.

THE SOUTHEAST ALTERNATIVES PROGRAM

"Southeast" is an old section of Minneapolis, cut diagonally by enormous railway yards. Located just across the Mississippi from downtown, it is the home of the University of Minnesota. Although people often refer to Southeast as if it were a community, it in fact contains four somewhat distinct neighborhoods: Como, Prospect Park, Glendale, and the University district. In 1970, these neighborhoods formed the attendance areas for the four Southeast elementary schools, and these four schools played an important role in the development of Southeast Alternatives.

The Como neighborhood is primarily made up of single-family homes, fifty or sixty years old. It is a white, middle class community, and it has a reputation for being conservative. In 1970, children from Como were assigned to the Tuttle Elementary School. Tuttle, like most elementary schools in Minneapolis, had a fairly conventional program of instruction, based on self-contained classrooms. However, in the year before SEA, some Tuttle parents who were dissatisfied with traditional ideas about education began applying pressure to create some open classrooms at the school.

Across the railway from the Como neighborhood lies Prospect Park, the most affluent residential section in Southeast. The homes in Prospect Park are located on winding hillside streets, and real estate values are high. In 1970, childrem from Prospect Park attended the Pratt Elementary

School. But during the 1970-71 school year, the same year Minneapolis prepared its application for the Experimental Schools Program, plans were being made to "pair" Pratt and the Motley Elementary School, the third elementary school in Southeast, as part of the Minneapolis School desegregation effort.

The students attending Motley Elementary School in 1970 were mainly from the Glendale public housing project, the third Southeast neighborhood. In 1970, more than 80 percent of the children at Motley were from families on AFDC. About 25 percent of the residents of Glendale are black, a higher number than elsewhere in Southeast.

Starting in the fall of 1971, kindergarten through third grade children from the Glendale and Prospect Park neighborhoods were supposed to attend school together at Pratt, and fourth through sixth grade children were supposed to attend Motley. To gain support for this plan, Minneapolis had provided extra funds for Pratt/Motley, as the combined school was called, to implement a special "continuous progress" curriculum already underway at Pratt, which was designed to encourage children to learn at their own pace. By the time the E.S.P. grant was announced, in the spring of 1971, Pratt had introduced some elements of the new continuous progress program for children aged 5-8 (grades K-3), and plans were underway to expand the program to ages 9-11 (grades 4-6) the following year.

The fourth neighborhood in Southeast is the University district. It contains many old three-story homes which have been converted into smaller units, and a number of newer apartment buildings rented by students and young families. In 1970, children of families living in the University district were assigned to the Marcy Elementary School. When SEA began, Marcy and Tuttle shared a principal.

Until 1968, Southeast had two quite distinct high schools. The first, Marshall High (grades 7-12), was the regular public high school, attended by students from all four Southeast neighborhoods (as well as by some students from attendance areas outside Southeast). The second high school, University High, was a laboratory school operated by the University of Minnesota School of Education. In 1968, leaders of the Minneapolis Public Schools and the University devised a plan to merge the two schools, under the direction of a joint policy board, with members appointed by both the School District and the University. In theory, the newly formed Marshall-University High School (MUHS) was supposed to encourage innovation and research in urban education. In practice, however, at least by 1970, MUHS was on the verge of collapse. The regular students and faculty from Marshall High and the "elite" students and faculty from University High found themselves uncertain about their status under the new arrangements. Administrative responsibilities were also unclear. MUHS had both a Director, partly responsible to the University, and a Principal. Furthermore, under a voluntary bussing

program, one hundred black students from outside Southeast started attending MUHS during the year the merger took place.

In sum, the Southeast Alternatives program began in an environment already containing several important organizational innovations, at various stages of development. Parents at Tuttle were organizing to establish some open classrooms in Southeast. Pratt was nearing the end of the first year of an effort to implement a continuous progress curriculum. Plans were underway to pair Pratt and Motley, for purposes of desegregation, and to extend the continuous progress curriculum to both schools. And finally, Marshall-University High School had completed three rather difficult years as an experimental school, governed by both the Minneapolis Public Schools and the University of Minnesota.

In June of 1971, with the final SEA proposal accepted by Washington, and the five-year five-million dollars Experimental Schools Program grant in hand, Superintendent Davis appointed James Kent director of Southeast Alternatives. Kent rented office space in Southeast and immediately began to organize a small central staff. This central staff, together with some of the thirty parents, teachers, and principals who had participated in writing the SEA proposal, became, for all intents, the implementing organization, as the project began in the summer of 1971. As this small implementing organization set out to increase diversity and choice in Southeast, they faced an organizational setting of considerable complexity--including the central office of the Minneapolis Public Schools

(affectionately called "807," its address on NE Broadway); the Office of Education in Washington; and of course the students, parents, teachers, and principals of Tuttle, Pratt/Motley, Marcy, and Marshall-University High School.

The implementation scenario: The first question to ask about the SEA implementation process is: To what extent is the SEA case history consistent with the scenario generated by the extended model? Answering this question requires examining the program components initiated, terminated, and accepted over the course of the program.

During the first summer, several important components of the Southeast Alternatives program were initiated. Capitalizing on the reform efforts already underway in Southeast, SEA introduced a system of four elementary alternatives (PC1): an open program (at Marcy), a continuous progress program (at Pratt/Motley), a "contemporary" program based on self-contained classrooms (at Tuttle), and a K-12 Free School (located in a rented church building).* The system of elementary alternatives eventually survived to become a mature program--although questions persist about the degree to which the educational programs in the four schools are actually distinct.

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*Although the Southeast Free School is K-12, people in Southeast generally speak of "four elementary alternatives," rather than "three elementary alternatives and one K-12 alternative."

At the secondary level (grades 7-12), SEA initially decided on a program of "secondary options," which was developed over the first year of the program. The first element of the secondary option program--a tri-mester system and a broad program of electives--was planned during the summer and introduced during the fall (PC2a). Several other elements of the option program were added during the first year (PC2b, PC2c). While the system of options survived to become a mature program, it was substantially curtailed when federal funds were exhausted.

A third component of the SEA program was community involvement in the schools (PC3a). Introduced during the first summer, community involvement flourished over the course of the program and survived the termination of federal funds--although the participation of blacks and other minorities was fairly limited.

Decentralization of decision-making formed a fourth component of SEA, and it was initiated slowly, in several stages. Early in the first year, the SEA director attempted to establish SEA as a decentralized unit, in which the principals of the participating schools would report directly to him, rather than to the Minneapolis Associate Superintendents for Elementary and Secondary Education (PC4a). Later in the first year, he gained acceptance for a plan to establish a Southeast Council (SEC) to advise him on program policy, with parent and staff representatives from each of the SEA schools (PC4b). The SEC began operations in the fall of year two (PC4c), and although its ability to influence the internal

programs of the SEA schools was limited, it survived to become a mature program.

A fifth component of SEA--staff development--was also initiated in several steps. Work on this component began, in the fall of year one, with the hiring of a director of staff development, the formulation of a small SEA in-service training committee, and the appointment of a "cadre" of subject-matter resource specialists (PC5a). In the middle of the first year, the director of staff development began laying plans to create a Teacher Center, controlled by a board of SEA teachers, which would conduct in-service training in Southeast (PC5b). The Teacher Center started operations in the fall of year two (PC5c).

Curriculum development and community education were the sixth and seventh components initiated over the first year of SEA. During the year, SEA launched a number of curriculum development projects--particularly relating to the environment, media, and psychology (PC6a, PC6b). Almost none of the new curricula survived the termination of federal funds. At the same time, SEA initiated an effort to expand the afternoon and evening community education offerings in Southeast (PC7a). The SEA community education component has managed to persist in the face of declining funds.

During the fall and winter of SEA year one, the first somewhat tentative steps were taken toward a formative (or internal) evaluation component. A director of formative evaluation was hired, and initial planning was conducted (PC8a). By the beginning of the second year of the

program, internal evaluators had been appointed in each of the SEA schools, and plans were adopted for both school-level and cross-school studies (PC8b). Certain aspects of the internal evaluation system, particularly the development of new achievement measures, failed to become accepted as part of the mature SEA program. Even those aspects of formative evaluation that were accepted, however, were largely eliminated with the termination of federal funds.

Altogether, by the fall of the second year of SEA, work on eight program components had been started: the system of elementary alternatives, the system of secondary options, community involvement, decentralization, staff development, curriculum development, and formative evaluation. This rate of initiation activity did not continue throughout the rest of the program, however. In contrast to the rapid initiation pace in the first year, very few components were initiated over the second.

Initiation activity resumed slowly in the spring of year two, with the beginning of an effort to extend the elementary alternatives to the secondary level (PC9a). Over the summer, plans were made for the introduction of three modest alternatives (open, ungraded, and graded) at the MUHS middle school, grades 7 and 8 (PC9b). The alternatives were put in operation in the fall of year three.

While work on the extension of the elementary alternatives began, plans were also made for yet another expansion of the staff development component of SEA. SEA staff proposed that the Teacher Center, originally

limited to Southeast Teachers and parents, be reorganized as a joint project of the Minneapolis Public Schools and the University of Minnesota. The expanded Teacher Center, which began operation in the fall of year three, was supposed to provide staff development for the entire city of Minneapolis (PC5d). Following the termination of federal funds, the Teacher Center survived as an organization, but not without shifting its emphasis from in-service training to research.

Also in the spring of year two, initiation activity reappeared in two other areas: community participation and community education. The director of community education recommended the establishment of a formal Community Resource Coordinator (CRC) position at each school and the formation of an SEA K-12 community resource team. Both actions were designed to make better use of community resources in the schools (PC3b). The task force also proposed a considerable expansion of the SEA community education program (PC7b). The new community participation and community education programs were introduced in the fall of year three.

The fall of year three also saw new program initiation activity in decentralization. To give the principals of the SEA schools a formal voice in SEA decision making, a Management Team was established, which included the five SEA principals and the SEA director, who served as chairman (PC4d). It eventually merged with the SEC.

The program initiation activity in the remaining years of SEA was devoted to the extension of the elementary alternatives to the secondary

level. In the spring of year three, elaborate plans were made to revise the three middle school alternatives and make them available to sixth graders in addition to seventh and eighth graders. The resulting programs were introduced in the fall of year four (PC9c). Later in year four, plans were made to add a small open program at the high school level (grades 9-12), and it was introduced at the beginning of year five. While the alternatives at the secondary level were eventually accepted as mature programs, there is some question about the degree to which they represent distinct educational approaches.

Overall, the process of initiating new program components in Southeast Alternatives appears consistent with the extended model. Initiation was indeed characterized by alternating periods of over extension and retreat. In the first year of SEA, work was started on eight program components, and, in fact, by the winter of year two, four of these program components were fully initiated (elementary alternatives, secondary options, curriculum development, and formative evaluation). After the fall of year two, very little initiation activity took place until the summer and fall of year three, when one new component was introduced (secondary alternatives), and two others (community education and community participation) were significantly expanded). Initiation activity then fell slowly throughout the remaining years of SEA.

The SEA implementation scenario is shown graphically in figure 6.1, which displays the program initiation rate, the level of new programs, and

the level of mature programs over time. The detailed evidence from which the implementation scenario was derived is shown in figure 6.2 (located at the end of the Chapter). For a discussion of the quantification procedure employed, see Appendix C.

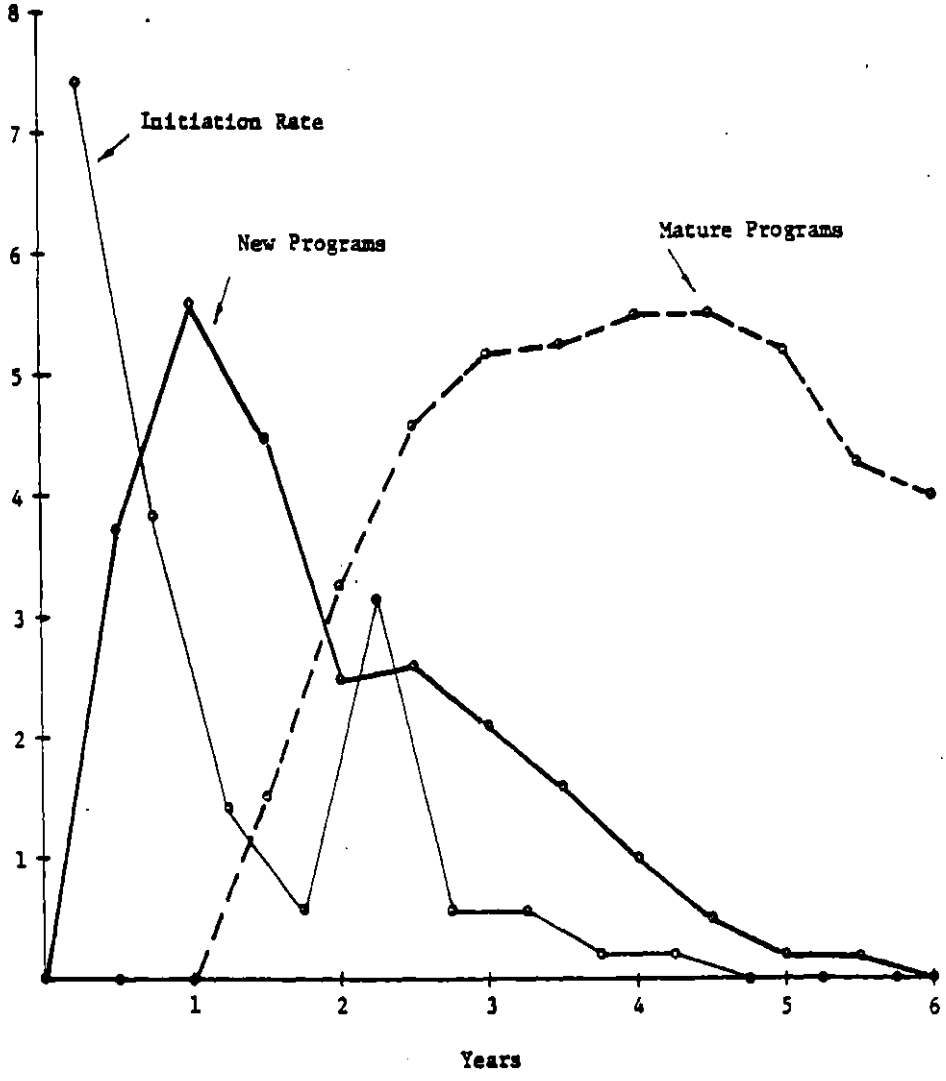

Figure 6.1. The Southeast Alternatives Implementation Scenario

New programs and problems: One particularly intriguing aspect of the SEA implementation scenario is the decline in initiation activity over the first year and a half of the program. An important question to ask about the implementation scenario is: Why did this decline occur? Do the hypotheses about problem generation underlying the extended model offer a plausible explanation? To answer this question, it will be helpful to focus on one of the program components introduced in the early years of SEA--decentralized governance (PC4a-PC4d).

Decentralized governance was doubtlessly one of the most important aspects of the initial SEA plan. In fact, some leaders of the program considered it to be at least as important as alternatives and choice. One staff member, for example, commenting on the early years of SEA, said that:

> The idea of community participation was anathema to John [Davis], but it was the principal reason SEA was funded.[5]

Decentralized governance, at least in the mind of SEA Director James Kent, involved two parts: decentralized administration, and broad community participation. To achieve these objectives, Kent hoped to establish the five SEA schools as a semi-autonomous administrative unit, holding some of the decision making powers over instruction, budget, and personnel usually reserved by the Minneapolis Public Schools central administration. Kent had a precedent for his plan. Several years before SEA, Superintendent Davis had created two somewhat independent administrative units--called "pyramids"--in the most disadvantaged areas of

Minneapolis, to give special attention to compensatory education. Each pyramid was headed by an Assistant Superintendent, and Kent hoped to have similar status in a new SEA pyramid. Under Kent's plan, the five SEA principals would report directly to him, on matters of instruction, rather than downtown.

In addition, Kent proposed moving one step further. To insure community participation in decision-making, Kent hoped to create an unusual governing board for SEA, including representatives from the Minneapolis Public Schools, the University of Minnesota, the five SEA schools, and the Southeast community. The contract establishing the joint Minneapolis Public Schools/University of Minnesota policy board for Marshall-University High School was due to expire shortly, and Kent hoped to renegotiate the contract to encompass all of SEA.

These plans were contained in the proposal SEA submitted to the U.S. Office of Education, but they were not wholeheartedly embraced in Minneapolis, either by Superintendent Davis or the principals of the SEA schools. For various reasons, both the principals and the Superintendent feared lodging too much authority at the SEA level. School principals worried about losing power over their schools.

> As the [Tuttle] Contemporary School administrator remarked, before a year had passed, "More autonomy for Southeast means less for Tuttle."[6]

And Superintendent Davis feared that community control in Southeast might ignite the kind of controversy that had erupted in New York in Ocean Hill/Brownsville a few years before.

Thus, as the first year of SEA wore on, Kent was unable to gain School District approval to establish the planned governing board for SEA. Furthermore, Kent's position as Director of the five SEA schools was insecure. One staff member who joined the project toward the end of the first year remarked that "the first thing I remember being struck by was resistance to Kent's leadership role."[7] Decentralized decision making had not taken hold: the school principals continued to report directly to their superiors downtown, rather than to Kent.

To solve this problem, Kent eventually requested Superintendent Davis to intervene. Davis wrote a memorandum to the SEA principals, requiring them to report directly to Kent on matters of budget and instruction. This reinforced Kent's position to a degree, but not all of the SEA principals complied with Davis's memorandum. One staff member commented:

> [The MUHS principal] accepted Davis's directive--but it was a formal solution only. If you were to ask Kent about his authority with respect to the MUHS principal, he would say: "Yes, he was supposed to report to me--not directly to the [Associate Superintendent for Secondary Education]--but the Associate Superintendent acted in such a way as to sabotage this.[8]

The federal project officer for SEA held a similar view. On the basis of a field visit to SEA, she wrote:

> This "line of command" had been a real problem for Jim Kent, especially regarding the high school. . . . [Davis's] memo spelling out the reporting system was cold and impersonal--almost an invitation for the principals involved to go around Kent if they wished--but this is only an impression.[9]

The administrative decentralization SEA achieved, then, was something of a compromise. The SEA Director had formal authority for the five SEA schools, but the principals of the schools were sometimes able to "go around" him if they wished, to counter his policies (as could some administrators downtown). SEA gained some autonomy from the regular Minneapolis Public Schools administration, but it was not by any means absolute.

Toward the end of the first year of SEA, as the "line of command" problem slowly faded, Kent began to search for a way to overcome resistance to the notion of a community governing board for SEA. Because Superintendent Davis was strongly opposed to granting formal decision making authority to such a board, Kent elected instead to propose a "Southeast Community Education Council," made up of school and community representatives, with carefully delimited advisory powers. Even such an advisory council, however, proved difficult to establish. Several SEA principals felt the proposed Southeast Council (SEC), even if only advisory, might threaten the internal operation of the schools:

> The Southeast Council was hard fought--it meant the principals giving up power.[10]

The proposed SEC also met resistance downtown.

> Jim did some careful negotiation with the central administration. There was probably more resistance there than at the school building level.[11]

At the end of the first year of SEA, the charter for the SEC was finally approved by the SEA schools and the central administration. The

SEC's powers were tightly circumscribed. While several attempts were made during the next few years to secure formal decision making authority for the SEC, this was never accomplished: the SEC remained an advisory council, at least in name and charter. It was considerably less ambitious than Kent's initial plans for an SEA governing body.

This is not to say, however, that the SEC was altogether powerless. At times it was quite influential.

> Davis was clear on wanting only an advisory group. He was edgy about community control. Nevertheless, he took the SEC's advice seriously. He would say, "I'd like to get your recommendations." And then he's use them.[12]

To summarize, over the first year and a half of SEA, the attempt to introduce a system of governance based on both decentralized administration and community participation generated some important problems. These problems began to pile up, and this had two effects, both of them consistent with the hypotheses underlying the extended model. First, staff energies (particularly the energies of the SEA Director) began to shift to negotiation and problem solving, leaving little remaining energy to devote to further program initiation. Second, certain aspects of the proposed governance system were terminated.

It is interesting to note that some of the problems associated with the governance component of SEA were generated during the effort to initiate the component, and this is not completely consistent with the assumptions underlying the extended model. Many of the problems

associated with the governance component occurred while governance plans were being debated; fewer occurred after the governance system was introduced. This is a complication ignored in the extended model, which rests on an assumption that problems are generated only after program components are introduced, not during initiation. This issue is given further attention in the Summary, below.

The pressure to initiate new programs: Over the first year and a half of SEA, program initiation activity slowly declined. By the end of the second year of the program, however, this decline had come to a halt, and as the third year of the program began, program initiation activity started to increase. (See figure 6.1.) To what extent do the hypotheses on initiation pressure provide a convincing explanation for the rise in initiation activity in the third year of SEA? One of the program components introduced in the third year of SEA was the extension of the elementary alternatives to the secondary level (PC9a, PC9b, PC9c). To understand the reasons for the increase in program initiation activity in the third year of SEA, it will be helpful to examine the extension of elementary alternatives in some detail.

From the initial planning stages of SEA, the idea of extending the elementary alternatives to Marshall-University High School was on the minds of several members of the SEA staff. But few if any MUHS teachers or administrators showed much interest in the notion. When SEA began, MUHS was beset with problems of its own, stemming from its creation

several years earlier out of the merger of Marshall High and the University laboratory school. MUHS was supposed to be a model urban high school, but instead it had become an arena for constant friction and status disputes between groups of students and staff from the public schools and the University. One MUHS staff member recalled:

> We had some hellish times here--and we were remarkably lucky not to have had real violence.[13]

Another commented:

> MUHS was created in the glory days of the late sixties. Marshall was as close to being unmanageable as it could become.[14]

In this environment, most MUHS faculty were not enthusiastic about SEA, and they did not participate to any important extent in early planning. When SEA got underway, those MUHS faculty who had an interest in the program saw it as an opportunity to develop new departmental electives and options. For the first two years of the program, this was the direction SEA took at the secondary level.

But while this course of action was agreeable to the faculty and administration of MUHS, it was not as popular with either the SEA leadership or the leadership at several of the SEA elementary schools. One MUHS staff member stated:

> We got lots of guff from the elementary schools. They said our program didn't amount to much. They were right.[15]

Some critics began to point to what they saw as a serious weakness in the SEA experiment. What was lacking, these critics argued, was a "K-12 continuum"--a set of distinct programs at the secondary level designed as

continuations of the elementary alternatives. Staff at MUHS, however, argued that the idea of a K-12 continuum was not part of the original SEA plan.

> There were no [planning] documents referring to a K-12 continuum. This only appeared later.[16]

Whether or not the K-12 continuum was part of the original SEA plan, by the end of the second year of the program it became apparent that some new action would be required at the secondary level. As one MUHS staff member recalled, by the end of SEA year two, he began to feel a question arising in the community:

> Where are the alternatives at MUHS for our children who have been in the open and continuous progress elementary schools? By the end of the second year, Marshall faculty understood that junior high alternatives were required.[17]

Pressure to extend the elementary alternatives also arise from one additional source: the Experimental Schools Program Office in Washington. At the end of the first year of the program, a new federal project monitor had been assigned to SEA, and she was not completely happy about what she saw in Southeast. She was especially critical of the program at MUHS, and she managed to gain a commitment from the SEA leadership to extend the elementary alternatives, beginning in the third year of the program.

In the fall of year three, the MUHS middle school, encompassing grades 7 and 8, introduced three alternative programs of instruction: an open program, an "ungraded" program (corresponding to the continuous progress elementary alternative), and a regular graded program. Planning for

the three alternatives was hurried, and there was little time for careful articulation of the new middle school programs with their elementary counterparts. In fact, parents and staff from the elementary alternatives had little opportunity to participate in the design of the middle program.

Not surprisingly then, when the new programs began operation in the fall of year three, many elementary school parents and staff were dissatisfied. Some were critical because the programs met only part of the day (mostly focussing on the core subjects of English, Mathematics, Social Studies, and Science). The rest of the day was reserved for the regular MUHS program of electives and physical education. Others were critical because the middle school programs didn't seem to mirror the philosophies of the three elementary alternatives. The elementary school staff and parents saw these problems as evidence of recalcitrance on the part of MUHS. The faculty at MUHS, of course, had a different view: They argued that the three elementary alternatives were not really distinct, and whatever differences there were between them were not easy to duplicate at the secondary level.

Dissatisfaction with the middle school program persisted through the winter of year three, when SEA was faced with a somewhat separate question. For the first three years of the program, the Southeast Free School had been housed in rented facilities. SEA planners were concerned that the Minneapolis Public Schools would be unlikely to maintain the Free School once federal funds were terminated, unless the school could be

located in a regular public school building. The problem of finding a permanent home for the Free School turned into an opportunity to attempt an ambitious expansion of the middle school alternatives at MUHS. SEA staff devised a plan to combine Pratt and Motley, the two halves of the continuous progress elementary alternative, and house them in the Pratt building. This allowed the Free School to move to Motley. But in order to fit the entire continuous progress program into Pratt, it was necessary to permit some continuous progress sixth graders to enroll at MUHS, in an expanded 6-8 ungraded program. And this required moving a number of sixth grade teachers from Pratt/Motley to the middle school. To complete the changes, sixth grade students from the Marcy Open Elementary School were permitted to enroll at MUHS, and a sixth-grade teacher from Marcy was assigned to the open middle program.

All of these changes led to a substantial consolidation of the middle school alternatives, which at the start of year four included an open 6-8, an ungraded 6-8, and a regular graded 7-8. Each of the alternatives developed a team of core teachers from the four basic skill subject-matter areas, who worked together in planning and conducting the programs. The three middle school alternatives have persisted in this form, although not all of the elements of the hoped-for K-12 continuum were accomplished. Critics continue to raise questions about the degree to which the three programs are really distinct:

> Regular teachers at the high school keep saying to the teachers in the ungraded middle program: "You're not doing anything different. You've just put kids of different ages in a regular old classroom." Perhaps they're right--but it's demoralizing to teachers trying to make things work to hear that all the time.[18]

And contact among the staffs of the corresponding elementary and middle school alternatives is limited.

> The teachers from Pratt and the middle school meet rarely--but not never.[19]

In summary, the idea of extending the elementary alternatives to the secondary level was not given much attention in the first year and a half of SEA, because energies were focused on solving the immediate problems generated by other components of SEA and responding to problems at MUHS that were generated long before SEA began. When the gap between the expectations held by the SEA leadership and the actual initiation activity at MUHS persisted, however, criticisms of the program at MUHS began to appear. Criticisms also began to appear as a result of the appointment of a new, more critical project officer for SEA in Washington. It is difficult to disentangle the relative importance of the internal source of criticism, which is explained by the model, and the external source, which is not, but toward the end of the second year of SEA, these criticisms began to have an effect. Consistent with the hypotheses underlying the extended model, energies shifted toward initiating a substantial new middle school program. After several years of initiation effort, some of the hoped-for objectives at the middle school were met, but not all of them. As the difficulties involved in establishing

elements of a "K-12 continuum" became apparent, the SEA staff began to accept a more limited vision of the secondary program.

Mature programs and tasks: Although, as we have seen, several new programs were initiated in the third and fourth years of SEA, the total number of mature programs did not rise much after the middle of the third year. (See figure 6.1.) As new programs initiated during the second half of the program began to be accepted as mature programs, some of the mature programs that had been initiated in the early years of SEA began to disappear from practice. To see whether the hypotheses on task generation offer an adequate explanation for the decay of mature programs, it will be helpful to focus on the system of elementary alternatives, one of the first program components initiated by SEA (PC1).

The system of elementary alternatives was initiated in the first year of SEA, and by the end of the second year of the program, the system of alternatives was generally accepted as a permanent part of the public school system in Southeast. Three of the four elementary alternatives--the open, continuous progress, and contemporary programs--were located in regular school buildings, relied on regular certified teachers, and enjoyed wide community support. The Free School, located in a rented church building, remained unaccredited, and its program was somewhat insecure. But apart from this one element, the system of choice was firmly established in Southeast by the end of SEA year two. Parents had the opportunity to choose among four alternative elementary schools.

This is not to say, however, that the educational programs in these four schools were completely distinct. Throughout the history of SEA, observers have wondered whether there are meaningful differences of instructional practice and environment among the four elementary alternatives. While the leaders of the elementary schools and many parents and staff are convinced that there are important differences between Marcy and Tuttle, for example, others are not so sure. One staff member at MUHS commented:

> There's as much overlap and commonality as difference among the three elementary alternatives.[20]

A senior high teacher went even further, by questioning whether distinct educational programs are possible, even in theory:

> The process of education is largely a matter of how a teacher relates to a student. No one could characterize how I teach. I relate to one student differently from another. One day I look open, another free, and another traditional. Maybe there's a predominance of one methodology in one [SEA] school, but there's considerable overlap. . . . A rose by any other name . . .[21]

Whatever the actual differences among the four SEA elementary alternatives, many SEA parents and staff have spent considerable energy in an effort to maintain the system of choice. One task that has engaged a large amount of time is selecting teachers to fill vacancies in each of the schools. This proved to be particularly vexing in the later years of SEA, because Minneapolis, like most urban school systems, was experiencing declining enrollment, and the contract with the local teacher's union determined how vacancies could be filled. In effect, the Public School

System was generally unable to hire new teachers. When vacancies occurred at one school, they had to be filled from the pool of teachers "excessed" at other schools, in order of seniority. This, of course, presented problems for SEA, because each of the four elementary schools hoped to be able to fill vacancies with teachers supporting the school's philosophy. Thus, every time a vacancy occurred in one of the SEA schools, lengthy negotiations with the Minneapolis Public Schools personnel office were required, to secure a result everyone could live with. One SEA staff member remarked:

> I spent a lot of time with the central personnel office staff. We didn't want people dumped in our laps. We usually got our way--but sometimes we didn't. We had some knock-down, drag-out sessions.[22]

Another task required to maintain the system of elementary alternatives concerns the school buildings in which the programs are housed. The four elementary school buildings in Southeast are among the oldest schools in Minneapolis and are considerably smaller than some of the newer schools in the city. Several Southeast schools are in violation of certain building codes. And as a result of declining enrollment, the School Board recently decided that, to whatever extent possible, small schools ought to be closed. Thus, SEA is faced with the possibility of losing all four elementary schools over the coming few years. Furthermore, any new schools that might be constructed in Southeast would probably be much larger than the four SEA alternatives.

In response to the expected closing of several SEA schools, the Southeast Council established a facilities committee, which devoted an extraordinary amount of energy to the development of a building plan for Southeast, to bring before the School Board. The plan called for the construction of a large educational campus in Southeast, containing facilities for all four elementary alternatives as well as a comprehensive high school. The School Board, however, rejected the plan, and the SEC facilities committee has had to start again, from scratch. According to one observer:

> Last year's [planning] exercise took an amazing amount of time and cost $10,000. . . . The SEC was "sky-bluing it." This year we're taking a second look--more realistic.[23]

Administering the choice-making process is a third task involved in maintaining the system of elementary alternatives. Each year, parents in Southeast, particularly those with children just reaching school-age or those just moving into the area, are supposed to be provided with information on the alternatives, so they can make a selection for their children. As federal funds declined, however, SEA had limited central office staff and resources available to carry out this part of the alternative program. Instead, the task of informing parents and administering the registration process fell to the principals of the four Southeast elementary schools. This arrangement, however, has a drawback. The elementary principals have each attempted to recruit as many new students as they can each year, because the size of the school budget depends on enrollment.

> There is too much selfish control by the principals. No one is objective about informing new people. It's a really touchy issue. Principals talk to new families who move to Southeast and try to get their children to enroll.[24]

Partly because of the lack of a permanent SEA-wide system to administer the choice-making process, parents have begun to choose their neighborhood schools more frequently than they did in the early years of SEA.

> There's not as much choice-making now. People are more sophisticated in choosing, and some people have decided that neighborhood schools are nice.[25]

In summary, then, consistent with the hypotheses on task generation, once the system of elementary alternatives was accepted as a mature program, the SEA staff found itself with a continuing sequence of tasks that had to be completed in order to maintain the alternatives. But in addition, SEA also found itself faced with some external circumstances, such as aging buildings and declining enrollments, which generated tasks as well. Whatever the source of the tasks, they had effects consistent with the extended model: To the extent that SEA had insufficient staff and resources to complete the tasks successfully, elements of the alternatives program began to disappear.

Securing permanent resources: In the middle of the fifth year of SEA, the final year of federal funds, the number of mature programs began a slow decline. (See figure 6.1.) As the preceding section indicated, this decline was caused in part by the lack of sufficient SEA staff and

resources to complete the tasks generated by mature programs. In response, throughout the fourth and fifth years of SEA, a substantial part of the SEA staff's energy was devoted to an effort to find local resources in Minneapolis to substitute for the dwindling federal funds.

One area in which the search for local resources was particularly important was governance (PC4a - PC4d). By the fourth year of the program, two SEA governance structures had emerged: the Southeast Council, a community-based panel designed to advise the SEA Director; and the Management Team, a committee of the five Southeast principals formed in SEA year three, for which the SEA director served as chairman. As the SEA staff began considering the phase-out of federal funds, one question seemed of special importance: How would SEA be administered, in the long run? After all, no other cluster of five schools in Minneapolis had the luxury of a Director and supporting staff. At the beginning of SEA year four, the SEA Director offered an initial solution:

> One proposal under consideration is that the project director's position as now operating be phased out, perhaps by June, 1975 [the end of SEA year 4], and that a current member of the Management Team assume the responsibilities along with other Team members. This is in keeping with the decentralized consensus approach already used by the Management Team and would serve as a transition to the time when federal funding is gone anyway. Under this plan, the Southeast Council would be advisory to the Management Team, and the Team member [holding the director's responsibilities] given K-12 authority.[26]

This proposal found little support in Southeast, however--partly, perhaps, because of the SEC's disaffection for the Management Team. The

SEC saw the recently formed Management Team as a threat to its influence over SEA. Over the course of SEA year four, the SEC gained authority to place two of its members on the Management Team, as non-voting observers. At the beginning of year five, the SEC and Management Team merged to form an expanded Southeast Council, with the five Southeast principals as voting members, along with a larger number of community and teacher representatives.

In year five of the program, the SEA staff took another look at the question of how SEA would be administered in the long run. By this time, the issue was complicated by the fact that SEA had been required to affiliate with one of the three decentralized Areas into which the Minneapolis Public School District had been divided a year earlier. After a lengthy examination of which of the three Areas to select, SEA decided upon the West Area. Soon after joining the Area, SEA requested the West Area Superintendent to provide local funds to hire an administrator for the five-school Southeast cluster, beginning in SEA year six. The West Area Superintendent turned SEA down.

This has left the Southeast Council in a somewhat ambiguous position: It has become an advisory body without an administrator to use its advice.

> Now the SEC is perhaps more fragile than it was at the outset [of SEA], since it has no administrator of its own to advise.[27]

The SEC's position is also ambiguous for another reason: with the termination of federal funds, it no longer has a budget to spend. With the exception of some occasional special funds--$10,000 from the School Board to support a study of the Southeast facilities issue, or a grant from the National Institute of Education to disseminate information on alternatives--the SEC has had no budget of its own.

The SEC's inability to secure permanent staff and budget has not gone unnoticed. Some of the principals on the SEC have begun to wonder whether time spent on meetings is worthwhile. One observer indicated that some principals feel: "It's just another meeting. Who needs it."[28] Without administrative staff or budget, cluster-level governance lacks legitimacy in the school district.

> The principals are attuned to this. Therefore, they aren't strongly supportive of the SEC--except [the principal of the Marcy Open School]. In fact, some principals are actively foot-dragging. They feel they'll get more dealing one to one with the West Area rather than through the SEC.[29]

In summary, the termination of federal funds placed pressure on SEA to find a way of insuring the continuation of a decentralized cluster-level governance system in Southeast using local resources. And consistent with the hypotheses on resource acquisition, this pressure led SEA to devote energy to the search for permanent staff. SEA attempted to secure permanent staff for the Southeast Council in several ways, but without complete success. Thus, the long-run existence of cluster-level governance in Southeast is in doubt.

Summary: In broad outline, as the previous sections have indicated, the SEA implementation scenario is consistent with the extended model of the implementation process. Both the implementation search and phase-out search processes can be observed in the history of SEA (See figure 6.1.) Furthermore, in general terms, the four sets of hypotheses underlying the extended model appear to find support in the SEA interview materials.

There are, however, certain elements of the SEA story that raise important questions about the extended model. One of these was discussed in the section on New Programs and Problems, above: in the SEA case, problems sometimes were generated by the attempt to initiate new programs. The model, on the other hand, rests on an assumption that problems are generated only after new programs have been initiated. SEA appears to have been characterized by what might be called an "initiation search" process, more or less analogous to (but separate from) the implementation search process explained by the extended model. Several quite ambitious program ideas were proposed at the staft of SEA; this pool of program proposals generated problems, which began to mount up; and this in turn both reduced the rate at which further program ideas were proposed and decreased the proportion of new program ideas actually initiated as new program components. In SEA, this "initiation search" process may well have been more important than the implementation search explained by the model.

The SEA story also raises another, more troubling issue. It is sometimes quite difficult to determine the degree to which certain components of SEA were finally accepted as mature programs. This is an especially difficult problem, for example, in the analysis of the system of elementary alternatives. (See the section on Mature Programs and Tasks, above.) In order to judge the degree to which the system of elementary alternatives was accepted, it is necessary to decide what the critical features of the system of alternatives were. One critical feature surely was the notion that the educational programs at the four alternative elementary schools were supposed to be distinct. Thus, in order to determine the degree to which the system of elementary alternatives was finally accepted, it is necessary to decide how distinct the four elementary programs were. But it is also necessary to decide how much weight to give this feature of the system of alternatives compared to others. For example, in determining the degree to which the system of alternatives was accepted, how important was the fact that parents had a choice of schools--ignoring the question of possible overlap among the ecucational programs? And how important was the existence of an SEA-wide staff to administer the choice-making process? How much was lost when that feature of the system of alternatives disappeared?

At first glance, determining the degree to which the components of SEA were implemented appears to be an empirical question. But matters are more complex. Apparently, deciding whether (and to what degree) the

components of SEA were accepted as mature programs requires taking a position on some of the central educational questions that were debated by the participants in the program. How distinct were the elementary alternatives, and how much difference does this make? How much information about the alternatives did parents have, and how much difference does this make? The fact that empirical social research apparently requires taking a position on matters such as these has been given considerable attention in recent work in the philosophy and methodology of the social sciences. The implications of this issue will be discussed further in Chapter VIII.

There is one final question raised by the SEA story. Several times over the history of SEA, the course of the program was strongly influenced by events whose origins had little to do with the program itself. The form of the SEA program at the secondary level, for example, was determined in part by the troubled history of Marshall-University High School, following its creation out of the merger of Marshall High and the University laboratory school. Or, as another example, quite a bit of energy was spent in the fifth and sixth years of SEA, in an effort to cope with the fact that the four elementary school buildings in Southeast happened to be among the oldest in Minneapolis. Finally, the overall Minneapolis Public Schools problem of declining enrollment generated a number of obstacles for SEA, particularly related to teacher selection. Thus, while the dynamics of the SEA implementation process can be explained, in part, by the extended

model, part of the explanation must also rest on larger historical changes in Minneapolis.

Altogether, the extended model explains some aspects of the SEA implementation story. But there are also some important questions that can be raised about the model's adequacy at the SEA level. In the following section, the story of the Minneapllis Experimental Schools Program will be told again, this time focusing on one school: the Marcy Open Elementary School. It will quickly become evident that the model offers a more adequate interpretation of the Marcy story than of the SEA-level case.

THE MARCY OPEN ELEMENTARY SCHOOL

Nursery school children quickly approach kindergarten age. This is a simple fact, but it struck a number of Southeast parents with particular force. For several years, a group of Southeast parents had maintained a cooperative nursery school, and in the Fall of 1970, they began to consider the prospects of enrolling their children in elementary school the following September. When these parents examined the schools in Southeast, they were not pleased with what they saw. The parents involved in the cooperative nursery school had grown accustomed to an open educational program with considerable parent participation in school decision making. Neither of these features seemed characteristic of the Minneapolis public schools, in 1970.

Disturbed by this, the parents took action. They created an organization, the Southeast Parents for Open Classrooms, drawing mainly on parents of children in the Tuttle Elementary School. Members of the new organization began reading whatever they could find on open education, and soon they set out to visit other groups, including the North Dakota Center for New Schools and the Mankato-Wilson Laboratory School. Armed with what they had learned from these visits, and supported by a membership that had reached nearly fifty, the Southeast Parents for Open Clasrooms contacted Harold Benson, the principal of both the Tuttle and Marcy Elementary Schools. They requested the establishment of several open classrooms at Tuttle, and Benson agreed, subject to the approval of the Associate

Superintendent for Elementary Education. The Associate Superintendent, in turn, suggested that Parents for Open Classrooms prepare a list of children who wished to enroll in the proposed open classrooms. By calling the parents of every child in Tuttle, the parent group eventually recruited fifty-two children. Nevertheless, there remained some resistance within the Minneapolis Department of Education. Early in 1971, the Southeast Parents for Open Classrooms threatened to keep their children out of school and to march with them in front of Tuttle, until open classrooms were approved.

Just as approval for two open classrooms was within reach, Minneapolis received an announcement of the grants competition for the Experimental Schools Program. A short time later, Minneapolis was awarded its sixty-day planning grant to support the preparation of a detailed proposal, and the Southeast Parents for Open Classrooms found themselves in a strong position to have a major influence on the proposal's contents. As soon as Superintendent David and his advisors settled on using the notion of alternatives and choice as the basic elements of the proposal, it was quite evident that open education would become one of the alternatives to be included. Suddenly, rather than simply establishing two open classrooms, the Aoutheast Parents for Open Classrooms had the opportunity to create an entire open school--the first public open school in Minneapolis.

Oddly, the site selected for the open school was not Tuttle, which had been the focus of the parent organization's year-long efforts. Instead,

the SEA leadership decided on the Marcy Elementary School, primarily because overall support for open education appeared stronger among Marcy teachers and parents. Although the Southeast Parents for Open Classrooms had been well organized and effective at Tuttle, they represented a small minority of the parents there. Establishing the open school at Marcy seemed less likely to generate resistance from the teachers and surrounding community.

When Minneapolis was awarded the five-year E.S.P. grant, Harold Benson, formerly principal for both Marcy and Tuttle, was appointed full-time principal for Marcy. Benson, together with some of the leaders of the Southeast Parents for Open Classrooms and some teachers with experience in open education, soon began their efforts as an implementing organization, to establish an open program at Marcy. The ten teachers who worked at Marcy over the preceding year were given the opportunity to remain at the school or transfer to other schools in the District. Eight (including both veteran teachers and first-year interns) elected to remain, and several additional teachers were hired to replace those who left. Also hired were about a half dozen teacher aides. Thus, the organizational setting for the implementation effort included a rather varied teaching staff. It also included the membership of the Southeast Parents for Open Classrooms (which was well organized, sophisticated, and vocal), the children at Marcy, their parents, the SEA central staff, and, of course, the administrative offices of the Minneapolis School District.

The implementation scenario: The first question to ask about the Marcy implementation process is: To what extent is the Marcy case history consistent with the scenario generated by the extended model? Answering this question requires examining the program components initiated, terminated, and accepted over the course of the program at Marcy.

The program at Marcy began with a burst of activity. Over the summer before the first year of the experiment, in a series of workshops, the Marcy leadership initiated two major components of the new program: open classrooms (PC1) and parent involveement in instruction (PC2). When the school year began, these components were in full operation although, as we shall see, one of them survived only a few months in its original form.

A third program component, staff development, was initiated in stages. The first stage, a continuing series of training sessions, began during the summer before the first year of SEA (PC3a). Once initiated, these workshops continued in operation on an ad hoc basis throughout the program, but they were sharply curtailed as federal funds were exhausted. (The second stage of the staff development program was initiated later in SEA, and that will be considered below.)

Two additional components were initiated somewhat more slowly over the first year: parent/teacher participation in governance (PC4) and formative evaluation (PC5a, PC5b). Committees were established to consider the forms these activities should take, and full operations were achieved in the winter and spring. Both of these components eventually were accepted

as mature programs, but only parent participation survived the termination of federal funds.

Thus, during the first year, four full program components and half of a fifth were initiated. Program initiation activity, however, did not continue at the same pace during the second year. In fact, no new programs were undertaken until the spring of year two, when planning began for a sixth component: Marcy internships (PC6). This internship program, in which Minneapolis teachers and university students were invited to spend a year learning about open education at Marcy, was put in operation in the fall of year three. It lasted only a year.

The fall of year three also saw the beginnings of a seventh program component: out-of-school learning (PC7a, PC7b). Plans were made over the summer and fall to provide weekly out-of-school educational experiences for all students, on a trial basis, in the spring. This component was linked with a second stage of staff development, a plan to conduct weekly day-long workshops for teachers while the children were engaged in out-of-school projects (PC3b). All of this proved extremely difficult to manage. The second stage staff development component survived only part-way through year four. The out-of-school learning component disappeared more gradually.

Later in the third year, an eighth and final program component was initiated: the extension of the open program to the middle grades, 7 and 8 (PC8). The Marcy principal and several staff members served on a committee to plan a new open program at the MUHS middle school. The program

was put in operation in the fall of year four, and it was finally accepted as a mature program.

Altogether, the process of initiating new program components at Marcy appears surprisingly consistent with the extended model. The initiation process was indeed characterized by alternating periods of overextension and retreat. Early in the first year, a sizeable number of components was initiated: open classrooms, parent involvement in instruction, the first stages of staff development, parent/teacher participation in governance, and formative evaluation. Initiation activity then declined rapidly, and it did not resume again until the end of year two. From the end of year two until the beginning of year four, several more components were initiated: Marcy internships, out-of-school learning, the second stage of staff development, and the extension of the open program to the middle grades.

The Marcy implementation scenario is shown graphically in figure 6.3, which displays the program initiaton rate, the level of new programs, and the level of mature programs over time. The evidence from which this graph was derived is shown in figure 6.4 (located at the end of the Chapter). For a discussion of the quantification procedures employed, see Appendix C.

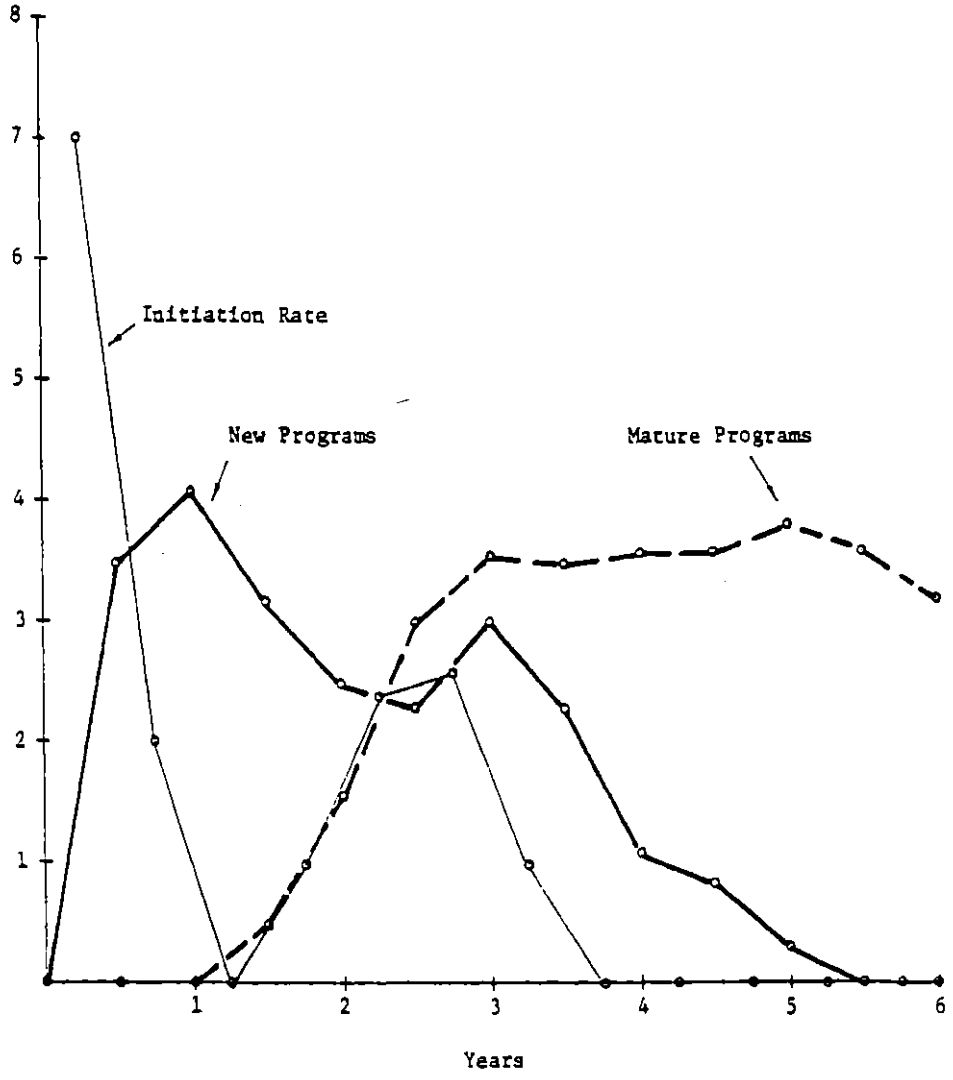

Figure 6.3. The Marcy Implementation Scenario

New programs and problems: A first question to ask about the implementation process at Marcy is: Why did the initiation of new program components drop dramatically over the first year? Do the hypotheses on problem generation underlying the extended model offer a reasonable explanation? To investigate this question, it will be helpful to examine one of the early program components, the open organization of classrooms, in somewhat more detail (PC1). Open classrooms were a key element of the Marcy program. Indeed, they were one of the central reforms demanded by the activists who wrote the Marcy section of the SEA proposal. Although these parents were strong supporters of open classrooms, however, they soon discovered that there were no clear blueprints or examples to follow in putting their ideas into practice:

> The program had to be defended to everyone, even the supporters of open education. It was difficult. We had to interpret concepts we weren't sure of. We visited some schools, and we found they didn't practice what they preached. When we got there, things didn't look like the written materials they sent us.[30]

At the beginning of the first year, the Marcy staff decided to initiate two alternative open classroom models. One of these, called Model I, was based roughly on the "integrated day" approach used in the British infant schools. According to this approach, daily instruction in each subject area (such as arithmetic or science) should be integrated with activities in other subjects. Model I involved two teachers, each of whom worked in a self-contained classroom with about twenty six children from kindergarten through sixth grade.

Model II, derived from the Mankato-Wilson Laboratory School, was much more ambitious. The ten teachers in Model II worked as subject-matter specialists, located in separate resource rooms in math, creative writing, art, social studies, science, reading, woodworking, gym, music, and media. During the day, each of the 225 children in Model II was supposed to move from room to room, engaging in projects and activities according to an individualized schedule worked out with an advisor.

Almost as soon as Model II was initiated, it began to generate unexpected problems. Even with four parent volunteers assisting each advisor, scheduling the children's daily activities and projects turned out to be nearly impossible. Things were made more difficult by the fact that children entering elementary school often cannot tell time--something overlooked during the planning stages. In addition, teachers found it difficult to teach as subject-matter specialists, and even more difficult to integrate the activities taking place in the separate resource centers.

> By November or sooner, few teachers, students, or parents were happy with what was happening. Nervous allusions to The Lord of the Flies got knowing nods in the school. After the energy required for slowing kids sown and stopping fights there was little left for the desired close relationships among students and teachers.[31]

Things were made worse by emotional stresses generated by the Marcy program and SEA. Not all parents, for example, had enrolled their children in Marcy for the same reasons:

> Some parents had enrolled their children in Marcy thinking it would become a free school. Others had enrolled their children thinking it would become an open school, and still others had enrolled their children because Marcy was their neighborhood school.[32]

Thus, the program at Marcy was pulled in several directions at once.

As these pressures and problems mounted, the Marcy teachers held a weekend retreat, to which parents were not invited. When they returned from the retreat, the teachers announced that they had decided to terminate Model II and replace it with something resembling Model I. The teachers felt that too much had been attempted, something had to be eliminated.

> The staff had taken a giant leap forward, and it was too damn far. At least it was, with all the emotional stress going on in the community. Perhaps without the stress, we might have worked it out.[33]

The unilateral teacher decision, made in response to one set of problems, ended up causing problems of its own. It violated the Marcy commitment to parent participation in decision making. Finally, in a large parent/teacher meeting characterized by considerable conflict, the Marcy community reluctantly endorsed the teacher decision and elected to reorganize Marcy into a system of two-classroom "families," resembling the classrooms in Model I.

Over the first year of SEA, then, open classrooms generated some significant problems. As these problems, together with those arising from other components of the Marcy program, began to pile up, two things occurred, both of them consistent with the hypotheses underlying the

extended model. First, the staff of the implementing organization at Marcy began to devote most of their energies to responding to perplexing and immediate concerns, leaving little remaining to initiate additional programs. Second, certain parts of the open classroom program were terminatee.

The pressure to initiate new programs: Initiation activity continued to decline over the first year and a half of the program. At the end of the second year, however, it began to rise. To investigate the degree to which the hypotheses on initiation pressure offer an adequate explanation for this change, it will be useful to concentrate on one program component in particular: out-of-school learning, (PC7a, PC7b).

The proposal for an out-of-school learning component--or Community Day, as it eventually came to be called--appeared at the beginning of the third year of SEA. The seeds of the proposal, however, were planted much earlier. From the beginnings of the program at Marcy, ongoing staff development was considered to be an essential activity, in which teachers should participate at regular intervals. While regular staff development was held to be important, however, it remained an aspiration, which was not fully acted upon over the first two years of the program. Staff development was sandwiched in between already exhausting teacher duties, or scheduled for the summer.

As the second year of SEA came to a close, and many of the problems associated with the initial burst of new programs had been resolved, staff development captured Marcy's attention.

> After two frantic years, there were signs that the Open School's shakedown cruise had been completed. . . . Marcy entered [the third year of SEA] feeling and acting like a strong school . . . . In such a state, the Open School felt ready to take on one of SEA's most ambitious brainstorms: the reorganized school week.[34]

In the fall of SEA year three, the Marcy staff developed a plan to run school as usual for four days each week. On the fifth day each week, they proposed providing community-based learning experiences for children and professional development activities for staff. Marcy obtained approvals from the city and state school departments to conduct the program on a trial basis in the spring.

The trial was held, but the outcome was not exactly what was expected. Teachers found themselves with no more time for staff development than before.

> On one memorable morning, seven classrooms went out at once. At 9 am over 50 volunteer drivers were waiting outside, wondering where to park. By the time teachers sorted kids into cars, staff development meant taking a rest before they all came back.[35]

In response to this difficulty, teachers attempted to revise the Community Day program in the fall of year four, but time for professional growth remained elusive.

Eventually, teachers came to the conclusion that the hoped-for "contracted time free of kids" was unattainable, at least through a program like Community Day.

> Toward the end of year four, all agreed that expectations of its relieving teachers for in-service should simply be dropped.[36]

The name of the out-of-school learning program was changed to "Other Ways/ Other Places," and the program was no longer considered in terms of staff development goals.

By the end of the second year of the Marcy program then, many of the problems associated with some of the initial program components had been resolved. This permitted the Marcy staff to turn their attention to aspirations that had been neglected in favor of the problems generated during the first year. Consistent with the hypotheses underlying the extended model, this resulted in new initiation activity. At the beginning of year three, Marcy began to initiate an ambitious program of staff development, involving out-of-school learning and a reorganized school week. The new program failed to provide much time for staff development, however, and expectations that staff development time was possible slowly were abandoned.

Mature programs and tasks: Even though several new programs were initiated at Marcy in the third and fourth years of SEA, the total pool of mature programs showed only a slight increase after the middle of the third year. Most of the program components initiated in the second half

of the program failed to become accepted as mature programs. And when new program components were accepted, acceptance often was accompanied by the disappearance of portions of programs accepted earlier.

As the hypotheses underlying the extended model suggest, this outcome is largely a result of the fact that new program components, even after they were accepted as mature programs, continued to place heavy demands on the Marcy staff. Consider, for example, a program component discussed earlier: open classrooms (PC1). By the third year of SEA, after a number of revisions and the elimination of several fairly ambitious features, open classrooms reached a stable form. Basically, teachers established a pattern of working with children at two or three grade levels (usually 1-3 or 4-6) in self-contained integrated day classrooms. In addition, several resource rooms, staffed by specialists in such areas as woodworking and music, were used for related arts instruction and student projects.

Initially, the Marcy staff hoped that they could maintain open classrooms at this level, on the regular Minneapolis allotment of teaching staff and supplies. This assumption, however, proved mistaken.

> There was one trap we fell into. We were told that alternative programs should require no unusual staffing considerations, that open school staff size should be no different from [traditional] school staff size. [The SEA Director] was committed to this, but I think it has to be questioned. If you've developed new roles for parents, teachers, and administrators, and you have a more comprehensive program, that requires more money.[37]

Maintaining resource rooms, for example, has required extra staff and materials. Originally, Marcy expected to be able to obtain staff for the resource rooms by increasing the student/teacher ratio in the regular classrooms. This turned out to be impossible, however, due to union regulations and the physical layout of the Marcy building. Furthermore, maintaining individualized instruction, which is an important part of the "integrated day" approach, has required continuing support from parents and university volunteers. And this, in turn, has required ongoing administration and coordination.

These demands on the implementing organization at Marcy have begun to take their toll. One Marcy staff member, discussing the fact that he must spend three or four nights a week at meetings, said that the effort required is exhausting.

> We're getting tired. But it's the only way to deal with the system--to keep the bureaucracy from doing us in . . . . [Unfortunately], when people get tired, they tend to fall back into old ways. . . . The momentum is low. It's not telling yet on kids, but it is on teachers. There's lots of teacher illness and absenteeism.[38]

Once accepted as mature programs, then, open classrooms generated significant tasks for Marcy to face. As these tasks piled up, several things occurred. First, the staff was required to devote most of their energies to recurring and burdensome maintainance work, leaving little energy remaining to resolve the problems associated with new program components recently initiated. Second, the lifetime of mature programs began to drop, as an overtaxed staff tended to "fall into old ways."

Securing permanent resources: The demands on the Marcy organization resulting from mature programs were accompanied, in the final years of SEA, by the gradual termination of federal funds. This situation forced Marcy to spend an increasing portion of its energies attempting to secure permanent staff to maintain its mature programs.

In the fifth year of SEA, Marcy successfully made arrangements to continue the Community Resource Coordinator (CRC) position for at least a year, using local funds. This position was particularly critical, since the CRC was supposed to coordinate the use of parent and university volunteers, who play a large role in Marcy instruction.

But the duties of the CRC staff person have not been restricted to organizing volunteers. One of her chief duties, she said, is "finding money." For example, in order to provide support to continue the music resource room at Marcy, the CRC worked with several Minneapolis elementary schools to obtain a grant through the Arts and General Education Program of the John D. Rockefeller Foundation.

Not all the efforts to find permanent support have been this successful, however. Sometimes, the support to continue Marcy programs has had to be sought in short-term bits and pieces. A pottery resource room is staffed by a part-time CETA aide, for example, and "hammer hall," the library, and the reading room are staffed by part-time teachers shared with other Minneapolis schools.

Other times, securing permanent resources proved impossible. For example, funds could not be found to continue the Marcy internal evaluation staff position. One Marcy staff member remarked:

> We got very tired last year, and didn't want an internal evaluation.[39]

To summarize, staff members at Marcy spent a good deal of energy, in the fifth and sixth years of SEA, attempting to secure permanent resources to support the Marcy program. The effort to sustain the Community Resource Coordinator position was particularly successful. Sometimes, however, resources could not be found, and certain mature programs, such as internal evaluation, were eliminated.

Summary: Overall, the Marcy story is fairly consistent with the extended model of the implementation process. Indeed, the correspondence between the Marcy implementation scenario and the scenario generated by the extended model is unexpectedly close. An implementation search process, involving alternating periods of overextension and retreat, is clearly visible in the initiation of new programs and in the pool of new programs initiated at Marcy. Furthermore, the Marcy case study materials are nicely consistent with the four sets of assumptions underlying the extended model. This is particularly true of the assumptions about new programs and problems--which are well supported by the evidence on Marcy's efforts to implement open classrooms (see the section on New programs and problems, above).

While the model offers a more adequate interpretation of the Marcy story than of the SEA-level case, nevertheless some of the questions raised at the SEA level can be raised about the Marcy story as well. Once again, it is somewhat difficult to determine the degree to which some of the components of the Marcy program were accepted as mature programs. As at the SEA level, to make this judgment, it is necessary to take a position on issues that were hotly debated by participants--for example, on the question of whether the termination of the Mankato Model at Marcy (Model II) was a retreat from open education principles. While determining the degree to which program components were accepted at Marcy is a problem, however, it is less severe than at the SEA level, largely because the programs initiated at Marcy were somewhat more self-contained. The methodological and philosophical problems involved in identifying program components and determining the degree to which they are accepted, at the school and project levels, will be discussed further in Chapter VIII.

The Marcy story also calls attention to a second issue mentioned at the SEA level: not all of the problems Marcy faced were generated by the Marcy program. Instead, some were caused by conditions more-or-less external to the new program. The Marcy building, for example, was the oldest in Southeast, and thus it was the first SEA elementary school likely to be closed. Consequently, Marcy parents and staff spent considerable time in the later years of SEA, devising plans for a new school. In addition, declining enrollment in Minneapolis, beginning in the middle years of SEA,

made it difficult for Marcy to select new teachers in accordance with its open education philosophy. The outcomes of these two problems have not been finally determined. Nevertheless, it appears that external problems had a smaller effect at Marcy than at the SEA level. The reasons for this will be explored in Chapter VIII.

Altogether, the extended model appears to provide a good account of the implementation process at Marcy. Indeed, the model offers a more adequate interpretation of the Marcy case than of the SEA-level story. The following section will examine the Experimental Schools Program in Minneapolis once again, this time at the School District level. It will soon become apparent that, if the correspondence between the model and the Marcy implementation scenario is unexpectedly close, the correspondence between the model and the School District scenario is relatively weak.

REFORM AND THE MINNEAPOLIS PUBLIC SCHOOLS

In the Fall of 1967, John B. Davis took over as Superintendent of the Minneapolis Public Schools, an urban school system enrolling nearly fifty-five thousand students. To his new position, Davis brought some fairly strong ideas: "The schools needed a shaking. They were islands of isolation. They were the domains of teachers and students."[40]

In his first major address after his appointment as Superintendent, Davis introduced a theme that would play a major role in his eight and one half year tenure in Minneapolis. He urged the District to decentralize its administration, to create what he called "pyramids of authority and responsibility."[41] Within a year, Davis established the North Pyramid, the first decentralized administrative unit in the Minneapolis Public Schools. The North Pyramid contained about fifteen schools, serving some of the most disadvantaged students in the city, and Davis appointed an Assistant Superintendent to direct the academic program in the newly established decentralized unit. After a year, Davis formed a second Pyramid, in the South Central area of the City.

The Superintendent's interest in decentralization was coupled with a commitment to a second issue: the desegregation of the schools. Soon after his appointment, Davis embarked on a program of human relations training, focusing on problems of segregation and racism. Plans were begun to "pair" some schools that were primarily white with partner schools

that were primarily black. And discussions were initiated concerning the possibility of creating several magnet schools across the District.

The twin themes of decentralization and desegregation were on Davis' mind when, in December of 1970, the U.S. Office of Education announced the grant competition for the Experimental Schools Program. Davis saw the program as an opportunity to "reaffirm the public schools,"[42] by enabling the District to test the notions of alternative schools and parent choice. But the concepts of alternatives and choice, while important in themselves, were in addition designed to serve a larger purpose. Davis hoped they would support the District's programs of decentralization and desegregation. Thus, the story of the Experimental Schools Program at the District level is closely interwoven with the story of some major reforms in the Minneapolis Public Schools.

The implementation scenario: The first question to ask about the Experimental Schools Program and the Minneapolis reform effort is: To what extent is the case history consistent with the scenario generated by the extended model? Answering this question requires identifying and defining the program components initiated over the course of the reform effort and estimating the rates at which these program components were accepted or terminated.

As Minneapolis began its first year of the Experimental Schools Program, the District was engaged in litigation regarding its desegregation plan. A final plan (PC1) was approved by the courts in the Spring of the

first year of Southeast Alternatives. The plan called for implementation planning in 1972-73 (the second year of SEA); full desegregation of the junior and senior high schools in 1973-74; and full desegregation of the elementary schools in 1974-75. To achieve full desegregation of the schools, Minneapolis planned to rely on four strategies: redrawing attendance zones, constructing new schools, pairing schools, and offering choice. This last strategy--choice--was the most unusual and also the most critical part of the desegregation effort. Superintendent Davis believed that if alternative schools with differing instructional programs were available in each attendance zone, and if parents had the opportunity to choose among these alternatives, desegregation would occur naturally. The Minneapolis Board of Education concurred and in the Spring of 1973 adopted a resolution requiring that, within three years, alternative schools be made available for all elementary students in the city (PC2). A City-Wide Alternatives Task Force was established to advise the District on alternatives and choice.

In the Summer of 1973, Davis initiated a substantial reorganization of the District, as part of his effort to decentralize administration (PC3). The reorganization involved dividing the District into three administrative Areas, each headed by an Assistant Superintendent. Within each Area, parents were supposed to play a strong advisory role (PC4).

The course of the reform effort shifted substantially in November of 1973, when two members of the Minneapolis Taxpayers Party were elected to

the school board. These new members were critical of the large-scale Minneapolis desegregation plan, and Davis began to lose the support of the board. At the same time, declining enrollment began to place a growing financial burden on the city schools. Nevertheless, in the Spring of 1974, the board passed a resolution urging the extension of elementary alternatives to the secondary level (PC5).

In the Spring of 1975, Davis resigned as Superintendent. Soon afterward, in the school board elections in November, the composition of the board shifted further in opposition to the Minneapolis desegregation program.

The fate of the Minneapolis reform effort is uncertain. Most observers of the Minneapolis schools believe that progress toward school desegregation has slowed or reversed. In the last two years, the creation of elementary alternatives has drifted to a stop, although many of the alternatives that were created in 1973 and 1974 still survive. Outside of Southeast Alternatives, no high school alternatives have been created. In 1977, the leaders of the City-Wide Task Force on Alternatives resigned, in the belief that the Task Force lacked an audience for its work. And the future of the decentralized Area structure appears dim, due in part to budget constraints.

The District level implementation scenario is for several reasons rather difficult to compare with the scenario generated by the extended model. First of all, it is difficult to identify the program components initiated with much precision. While the evidence certainly indicates

that programs of desegregation, elementary and secondary alternatives, decentralization, and parent involvement were introduced, it is quite difficult to decide exactly what the components were supposed to include. Second, it is difficult to determine when the programs were initiated. Most of them were introduced over a period of several years. The movement toward decentralization, for example, began in 1967, with the creation of the North Pyramid, and continued until at least 1973, when the Area structure was established. Third, it is even more difficult to assess the degree to which the programs that were initiated were eventually accepted. Certainly, some desegregation took place in Minneapolis, and some alternatives were created. But it is hard to estimate what proportion of the desegregation and alternatives programs introduced were accepted, and when.

Because of these difficulties, the construction of a quantitative implementation scenario for the District level, similar to those constructed for the project and school levels, would seem to be a rather meaningless exercise. It does, however, seem possible to say something about the broad outline of the District implementation scenario. Apparently, the initiation of new programs proceeded rapidly between 1971 and 1973. Initiation activity slowed after that, and did not appear to resume over the period for which I have evidence (1971-77).

In the implementation scenario generated by the extended model, on the other hand, there is a period of renewed initiation following the early period of decline. Thus, the qualitative District level scenario is

inconsistent with the extended model. To explore some of the reasons for this inconsistency, I will examine the adequacy of the model hypotheses at the District level in some detail, in the next four sections. Following that, in the Summary, I will discuss some of the difficulties involved in identifying and defining program components at the District level.

New programs and problems: Over the first year and a half of the Experimental Schools Program in Minneapolis, the District introduced some substantial programs of reform, beginning with the development of a full desegregation plan. But the pace of the reform effort slowed dramatically in the later years of the Program. The extended model offers a potential explanation for this decline in program initiation activity, by suggesting that the decline was caused by unresolved problems generated by new program components initiated in the early years of the reform effort. This explanation, however, appears only partly correct.

To understand the limitations of the explanation offered by the model, it will be useful to examine in somewhat more detail the District's effort to implement a city-wide system of alternatives and choice (PC2). In the minds of the Superintendent and the school board, the system of alternatives was closely linked with the 1972 desegregation plan. According to one observer:

> To understand change in Minneapolis, you have to understand desegregation. . . . The court order and the board policy on alternatives (1) are intertwined, and (2) have had lots of clout city-wide.[43]

The 1972 desegregation plan was imposed on the District as the result of a suit brought against the Minneapolis Public Schools by a civil rights group. The term "imposed" is a bit misleading, however, because both Superintendent Davis and the school board supported the plan. Apparently, the plan was the result of some clever political footwork: both parties to the litigation agreed about the course desegregation should take. According to one observer, "Through some adroit maneuvering, the pro-integration litigants froze the non-integrationists out of court."[44]

The District's approach to desegregation, as one school administrator put it, involved "bussing, with alternatives at the end of the ride."[45] The hope was that by redrawing attendance zones to encompass several alternative schools, and by offering parents choice, desegregation would result without the imposition of a rigid pupil assignment system. To pursue these objectives, the District built a number of large, modern elementary school complexes, each housing several alternative "schools within a school."

The notion of alternatives was "a gamble."[46] No one was certain that choice would produce desegregation, and indeed, when the first alternatives opened, those located in predominately minority areas of the city tended too have to few white students enrolled. With some careful recruitment effort, however, racial balance began to improve in many of the alternatives.

But in the Fall of 1973, the composition of the school board began to shift. As one supporter of desegregation put it, "Those who didn't believe in what had happened during the last five years of movement in Minneapolis moved into power."[47] The proponents of school integration, who for almost a decade had been in control of the Minneapolis schools, began losing elections. In part, this change may have been a result of changing conditions in the city itself. Residential patterns in Minneapolis had begun to shift, making desegregation more difficult to achieve. Some observers suggested, however, that the change reflected a shift in the national mood.

> Ten years ago, nationally, we had swung to the left. Now it is swinging back to the right. Who knows how far it will go. . . . People are hiding liberal views that once were safe.[48]

Whatever the reasons, the shift in the school board, coupled with changing residential patterns, had an effect. Ex-Superintendent Davis commented that desegregation has "lost momentum."[49] A parent, speaking a bit more freely, said, "A pattern is developing which is racist."[50] And recent candidates for the school board have begun to argue against alternatives, stressing the virtues of neighborhood schools. One supporter of alternatives noted:

> Unfortunately, the climate is such that today, only the [City-Wide Alternatives] Task Force is interested in alternatives. There are very few groups interested in starting any. . . . The catch word in Minneapolis today is: hold the line. Consolidate our position.[51]

This is hardly a complete account of the history of school desegregation and alternatives in Minneapolis. But it does seem clear that the

decline in the initiation of new city-wide alternatives in the last few years has been due, not to problems alternatives generated (although they generated some), but rather to larger changes in the city, particularly the shifting composition of the school board and changing residential patterns. While these changes might be termed "problems generated by desegregation," this interpretation seems weak. It is difficult to estimate the degree to which the changes in residential patterns are a direct consequence of desegregation. And the shift in the board seems to be primarily a result of the relative inability of supporters of desegregation in Minneapolis to remain mobilized in the mid-seventies; and that, in turn, is at least in part due to changes in national politics.

The pressure to initiate new programs: In the scenario generated by the extended model, the pressure to initiate new programs produces a period of renewed initiation activity following an early period of decline. In the District implementation scenario, however, it is difficult to detect this period of renewed initiation activity. At least on the surface, then, the extended model hypotheses regarding the pressure to initiate new programs seem to be disconfirmed at the District level. The notion of an initiation pressure may, however, explain one interesting feature of the District's program of alternative elementary schools (PC2).

The impetus to create elementary alternatives originally came from the hope that alternatives would support desegregation. Interestingly, however, only a paragraph of the 1972 desegregation plan referred

explicitly to the concept of alternative schools. In that respect, the plan was something of a "Trojan Horse."[52] District leaders began to use the plan as an argument in favor of alternatives, and within a year, the board adopted its policy requiring that alternatives be made available for all elementary students in the city.

In the first few years of the District effort to implement alternatives, attention was focused on schools that played an important role in desegregation. According to an early report of the City-Wide Alternatives Task Force, "Existing alternative programs are located mainly in schools which are part of the D/I [Desegregation/Integration] plan."[53] Eventually, however, at least in some areas of the city, the concept of alternatives began to take on a wider meaning.

By 1974, the concept of alternatives had grown from a means toward desegregation to an end in itself. This shift is reflected in a welcoming speech given by Superintendent Davis to the teachers of Minneapolis, at the start of the 1974-75 school year:

> With desegregation in Minneapolis has also come the impetus to provide educational alternatives, choices for Minneapolis students. . . . We are pioneers in Minneapolis in this modern attempt to provide alternative educational choices at the secondary as well as the elementary school level. Our start was southeast Minneapolis, where we began a five year experimental schools program in 1971. From this has come a new definition.
>
> In Minneapolis today, alternative education means offering students a choice between at least two different all day, every day styles of teaching in our regular school buildings. What we have begun in southeast Minneapolis has not gone unnoticed.

> The nation is watching and envious. Parents, students and our own faculty in many parts of the city have asked and have demanded alternatives for their schools, and they are being provided.[54]

This changing orientation of the alternatives program might well have been a response to the pressure placed on the School District by those who, like many of those involved in Southeast Alternatives, were committed to alternatives as a goal equal in importance to desegregation. Thus, the effort to move beyond the use of alternatives as a means toward desegregation may well have been a result of a pressure to initiate new programs.

Mature programs and tasks: With respect to the relationship between new programs and problems, the District implementation scenario is rather dissimilar to the scenario generated by the extended model. But with respect to the relationship between mature programs and tasks, there is at least some similarity. Mature programs at the District level indeed generated tasks for the District to face, and these tasks often proved more difficult to complete than those generated at the project and school levels.

The city-wide program of alternatives (PC2) offers a particularly interesting example. Once a fairly substantial number of alternative elementary school programs had been established, the City-Wide Alternatives Task Force began to recognize a series of questions that would have to be faced in order to preserve the system of choice. The following list appeared in a 1975 report of the Task Force:

- Is the goal of choice of educational learning climate consistent with guidelines for Title I and Right to Read?
- Does compliance with state and federally funded programs affect optional learning environments?
- Can personnel policies of the MPS [Minneapolis Public Schools] be implemented along with alternatives?
- Can inter-area transfer procedures, for staff and pupils alike, be defined and implemented?
- Can constraints such as travel time to schools, space limitations, the need to maintain racial balance, etc., be minimized so that educational-choice programs can truly be available to all pupils in the Minneapolis Schools?[55]

These questions are especially interesting because they suggest the sorts of standard operating routines the District will have to develop if alternatives are to survive in an environment of diverse programs and multiple objectives. Procedures are necessary to insure that the regulations for state and federal programs are consistent with alternatives; to insure that teacher assignment procedures are consistent with alternatives; and so forth. Developing these procedures is complicated by the fact that the tasks involved are performed by distinct operating units: federal programs in Minneapolis are generally administered by one branch of the Minneapolis Public Schools central office, personnel practices are administered by a second, and transportation by a third. Thus, maintaining the system of alternatives requires a set of procedures to coordinate the actions of fairly separate organizational units.

During the first few years of the alternatives program in Minneapolis, these coordination tasks were carried out in an ad hoc fashion by the City-Wide Task Force on Alternatives. In 1977, however, the leaders of the Task Force resigned, because they felt the Task Force no longer had an audience for its work. Permanent procedures to maintain alternative schools remain undeveloped, and thus, the future of the city-wide system of choice is uncertain.

Securing permanent resources: The District reform effort was by and large supported through the regular school budget. Thus, unlike the programs at the project and school levels, the District reforms were not faced with a transition from federal to local funding. But by 1975, the District found itself in the midst of a fairly substantial budget crisis, and thus the task of securing permanent support for alternatives and decentralization became an issue requiring increasing attention.

The effects of the budget crisis are particularly apparent in the District's program of decentralization (PC3) and parent participation in decision making (PC4). The program of decentralization was initiated in its full form in the Summer of 1973, when Superintendent Davis announced his plan to divide the District into three decentralized administrative units, called "Areas."* The plan called for a certain amount of delegation of administrative responsibilities, but not a complete transfer of authority

*Until the 1975-76 school year, Southeast Alternatives formed a separate fourth Area. In 1975, SEA merged with the West Area.

over the schools. As Davis put it, what he sought was "a blurring of authority,"[56] to increase the degree to which local issues would be taken into account in making administrative decisions. Davis opposed the creation of independent school boards for the decentralized Areas, and his reasons were clear:

> I knew I had eight or ten years to do something in Minneapolis. I knew what some of the Areas of the city would do if they had independent boards--remember, desegregation was a big issue. I would have supported what would have happened in some areas, but not others.[57]

The decentralized administrative offices operated fairly smoothly for several years, and they played an important role in planning the types of alternatives that would be created in each of the Areas. In addition, a fairly strong system of parent participation were slowly developed in at least one of the Areas.

But in 1976, as District enrollment started to decline, the Area offices began to face a severe challenge. Declining enrollment created several problems. First, forty percent of the District's budget was provided by the State, through a formula based on enrollment. Thus, as enrollment declined, the State contribution to the District budget began to decline. Second, the District found it impossible to reduce its expenditures in proportion to the decline in enrollment. Third, the District could no longer afford to hire new teachers, and teachers who had jobs began to fear they might lose them.

Declining enrollment caught the District somewhat by surprise. One observer commented:

> The District failed to anticipate declining enrollment, and this complicated things. When the Experimental Schools program began, Minneapolis was still on an expansion move. Teachers had lots of choice and options. That has changed remarkably in the last few years.[58]

In response to the tightening budget, "a hue and cry" has emerged across the District: "Cut the Area offices."[59] As a result, the offices have begun to lose administrative staff. One observer went so far as to say that, "an overall stripping of the Area offices had recently taken place."[60] This observer suggested that opposition to the Areas has not entirely been due to an interest in economy. The Minneapolis Teachers union has become concerned about maintaining its influence during a time of general budget cutting.

> It's too complex for the unions to control the Areas. It's more risky than dealing with the District. It's not a matter of cost.[61]

There is some evidence that in the next few years, Minneapolis will lose the Area structure. This in turn is likely to reduce parent participation in school decision making, which has been organized primarily at the Area level. In response to the anticipated loss of the Areas, some parents are beginning to search for alternative ways of sustaining parent involvement. One approach under consideration is to create joint parent/administration/teacher councils at the school building level. Indeed, parent involvement of some sort at the building level has recently been

mandated by the State law. One parent said that to create school-level councils, it will be necessary to devote attention to coalition-building between parents and teachers:

> The question is: How much conflict at the building level will be generated by trying to do this, causing the coalition not to take form?[62]

In summary, as the District budget has tightened, the Area offices have come under fire; and this in turn has threatened the system of parent participation that had been established at the Area level. This has led some parents to seek a more permanent basis for participation, at the building level. Interestingly, then, although the District reform effort was not supported by a temporary federal grant, some of the "phase-out search processes" observed at the project and school levels can be observed at the District level as well. In this respect, the hypotheses concerning the search for permanent resources seem supported by the District level case.

Summary: Altogether, the extended model appears to offer an inadequate account of the District-level reform effort. The scenario generated by the extended model and the history of the reform effort in Minneapolis are fairly dissimilar, and, in addition, the hypotheses underlying the model find little support in the case materials.

There are several reasons for the inadequacy of the interpretation of the Minneapolis reform effort offered by the extended model. First of all, the reform process in Minneapolis was influenced in some critical

ways by changes in political and social conditions in the city--changes which are not explained by the model. The problem of declining enrollment, for example, placed considerable pressure on the school budget, and this in turn threatened several components of the reform program. Furthermore, changing residential patterns in Minneapolis magnified the difficulties involved in achieving racial balance in the schools. And finally, changes in national politics reduced the capacity of local supporters of desegregation to remain mobilized. Together, these "external" changes are of much more importance in understanding the reform process in Minneapolis than are the implementation search and phase-out search processes explained by the model.

There is, in addition, another serious weakness in the interpretation offered by the model, at the District level. It is quite difficult to identify the program components that were introduced, and it is even more difficult to estimate the degree to which the program components introduced were finally accepted. This is an especially difficult problem, for example, in the District-wide program of elementary alternatives. By what standard should the acceptance of the alternatives program be judged? Is it sufficient simply to ask whether students in Minneapolis have a choice of schools, or is more involved? For example, in judging the acceptance of the program, is it necessary to ask whether the alternative schools in Minneapolis actually differ in educationally significant ways? And if so, what differences are significant? Furthermore, is it important to ask

whether parents and students are knowledgeable about the differences among the alternative schools? Is it important to consider the balance among different kinds of schools? For example, is one Free School enough? And how should the adequacy of the procedures and resources available to create new kinds of alternatives be taken into account?

Apparently, judging the degree of acceptance of the alternatives program in Minneapolis requires taking a position on various issues such as these--issues that were hotly debated by those involved in the reform program. This perplexing puzzle has already been given some attention in the discussion of the acceptance of choice at the Project level (see the Summary section on SEA, above), and it will be considered in more detail in Chapters VIII and IX.

Altogether, then, the extended model offers only a weak interpretation of the District-level story in Minneapolis. In Chapter VIII, I will draw on the District, Project, and School-level cases in Minneapolis, along with the District, Project, and School-level cases in Greenville, to conduct an overall assessment of the adequacy of the model.

Figure 6.2a SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Summer 1	PC1. As outlined in the SEA proposal, planning began for four elementary alternatives: an open program (at Marcy Elementary School), a continuous progress program (with the K-3 portion at Pratt Elementary School and the 4-6 portion at Motley Elementary School), a "contemporary" program based on self-contained classrooms (at Tuttle Elementary School), and a K-12 Free School (in a rented church building). The SEA staff developed a procedure so that parents in Southeast could choose among the four alternatives. The programs opened in the Fall.		
	PC2a. During the preparation of the SEA proposal, the SEA staff fleetingly considered the possibility of extending the elementary alternatives through grades 7-12 at MUHS. That seemed overly ambitious, however, and instead MUHS introduced a tri-mester system and a broad program of electives.	PØ.1. MUHS was torn by a number of internal conflicts, resulting from the merger of Marshall High and the University Laboratory School. It was also beset by racial tensions, spurred by the voluntary bussing of 100 black students to MUHS, from outside Southeast.	
	PC3a. A community liaison was hired in each of the SEA schools, to encourage members of the community to become involved in the schools as aides and volunteers.	P3.1. During the preparation of the SEA proposal, in the planning stages, and throughout the Program, there was limited participation by Black parents.	
	PC4a. The SEA director attempted to establish SEA as a decentralized unit, in which the principals of the participating schools would report directly to him, rather than to the Associate Superintendents for Elementary and Secondary Education.	P4.1. The principal of the Pratt/Motley elementary school resigned, over the interference of the SEA director in internal school affairs.	

Figure 6.2b SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Fall 1	PC5a. SEA established a staff development committee, which began working with the University of Minnesota to plan pre-service and in-service training activities. A director of staff development was hired, and a cadre of resource specialists was recruited to work with teachers in the SEA schools.		
	PC6a. SEA supported a collection of more-or-less independent curriculum development projects.		
	PC7a. SEA hired a director of community education to expand community education offerings in Southeast.		
	PC8a. The ESP guidelines required an internal ("Level I") evaluation, conducted by SEA, and an external ("Level II") evaluation, conducted by an outside contractor. The SEA director decided to establish the internal evaluation team (Level I) separate from the regular research and development office of the Minneapolis Public Schools. An evaluation director and 2 staff members were hired, and they initiated a baseline parent survey. At a planning meeting the Level I and Level II evaluation teams decided that the two evaluations would be conducted cooperatively.	PS.1. There were major objections to evaluation, both by teachers and the Southeast community.	

Figure 6.2c SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		P4.2. The principals in the SEA schools were accustomed to reporting directly to the Associate Superintendents for Elementary and Secondary Education, and they initially resisted reporting to the SEA director instead.	
Winter I		P2.1. One reason for including the Free School in SEA was to provide an alternative for students unable to succeed at MUHS--particularly disadvantaged blacks. When the Free School opened, however, nearly all of the 75 students were white and middle class.	R2.1. To remedy the white, middle class bias at the Free School, the Free School director worked closely with some people who had been involved in the short-lived School Without Walls program for high-school dropouts at MUHS. He attempted to establish a basic skills center as an additional school in SEA, but without success. Finally, the Glendale Street Academy was established, as an adjunct to the Free School. It merged with the Free School in year 2.
		PØ.2. The original Level II evaluation plan resulted in a community uproar.	
			R8.1. The SEA director attempted to secure support for the concept of formative evaluation, in the Southeast community.
	PC2b. MUHS introduced a "tally-registration" system, in which students could select teachers and class times. MUHS also developed a number of action-based education options, including A Wilderness And Research Experience (AWARE) and Off-Campus Learning Experience (OCLE).		

Figure 6.2d SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
	PC5b. The director of staff development proposed the formation of a Teacher Center, under the control of a board of SEA teachers.		
Spring 1	PC4b. In the original proposal submitted to the Office of Education, the SEA director proposed a joint policy board, with membership from the School District of Minneapolis, the University of Minnesota, and the Southeast Community. In the final version of the proposal, approved by the Minneapolis School Board, the policy board remained--but the plans were careful to note some "legal and fiscal constraints." Superintendent Davis continued to oppose a joint policy board, and thus the SEA director finally proposed an advisory committee instead--the Southeast Community Education Council.	P4.3. The central administration of the Minneapolis School District resisted the formation of a Southeast Council to advise the SEA director on program policy.	
		P4.4. Some SEA schools feared that the formation of a SEA Council might threaten the power of the individual school principals.	
	PC2c. MUHS planned a partial-day program for middle school students with "special difficulties." Called the Adjusted Learning Environment (ALE), it began operation in the Fall.		

Figure 6.2e SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
	PC6b. The director of student support services began developing a secondary psychology curriculum, which became known as Deliberate Psychological Education (DPE). DPE began to be used in MUHS on an experimental basis in the Fall.		
			RØ.2. Washington decided to split the Level I and Level II evaluations in Minneapolis.
		P8.2. Preparing an internal evaluation plan, acceptable to both OE and the Southeast Community, proved difficult.	R8.2. The SEA internal evaluation plan finally was accepted by OE.
		P5.1. NIE objected to the SEA Teacher Center proposal, largely on the grounds that there appeared to be insufficient guarantees that teachers would actually be in control.	
			R4.2. Superintendent Davis wrote a memo clarifying the relationships between the SEA principals, the SEA director, and the Associate Superintendents. The principals were to report to the director, who in turn would report to the Associate Superintendents.
Summer 2			

Figure 6.2f SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Fall 2	PC4c. The Southeast Community Education Council --soon known as the Southeast Council (SEC)--began meetings. It included parent and staff representatives from each SEA school, as well as representatives from the Southeast Community Planning Committee, the Park Board, and the MUHS policy board.	P4.5. The school principals who served on the SEC feared that the SEC might interfere in the internal operation of their schools.	P4.5. The members of the SEC developed a system of "senetorial courtesy," in which the SEC shied away from considering the internal affairs of the SEA schools.
		P4.6. Teachers and administrators at the individual SEA schools resisted efforts to conceptualize the program across schools.	
		P2.2. The MUHS principal decided that all SEA innovations at the high school level must be initiated through the academic departments. The SEA leadership believed this reduced the opportunity for meaningful options to be developed.	
	PC5c. The SEA proposal for the establishment of a Teacher Center was finally approved by NIE. A Teacher Center board was formed--including 7 teachers, 1 principal, 3 parents, and 2 secondary students.	P5.2. SEA resource specialists found it difficult to work in several schools at once.	
	PC8b. The Level I evaluation team settled upon a 2-pronged approach: internal evaluators were appointed in each of the SEA schools; and in addition evaluation attention was focussed on certain cross-school issues--particularly student mobility patterns, and comparative achievement levels. For work in the latter area, the Level I team proposed the development of criterion-referenced measures.		

Figure 6.2g SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Winter 2		PØ.3. Minneapolis had to prepare a "continuation application" to NIE, requesting funds for the third through fifth years of the Program.	RØ.3. SEA completed a large continuation application to NIE, involving a budget of $13,000,000.
Spring 2		P1.1. Continuing questions were raised about the degree to which the four elementary alternatives were actually distinct educational programs.	
		P1.2. The Tuttle Elementary School developed individualized programs in Math and Reading--which seemed similar to some of the elements of the Continuous Progress alternative.	R1.2. The SEA director requested Tuttle Elementary School to rely on a single basal textbook series, to prevent a blurring of the distinction between Tuttle and the Continuous Progress alternative. Tuttle refused.
		P1.3. The primary (Pratt) and intermediate (Motley) portions of the Continuous Progress Program appeared to use different educational approaches.	
	PC9a. The SEA director and the elementary principals exerted pressure to extend alternatives to the middle school level. As a result of pressure from the federal project monitor, a commitment to extend the elementary alternatives was included in the NIE continuous application.	P9.1. The MUHS principal and faculty resisted the extension of the elementary alternatives to the middle school level.	
		P9.2. The SEA staff was uncertain about the direction the secondary level program should take.	

Figure 6.2h SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		P8.2. Appropriate "criteria" for criterion-referenced measures proved impossible to develop.	R8.2. As a result of an inability to establish a system of testing and reporting acceptable to all SEA schools, the effort to formulate a criterion-referenced measurement approach was not successful.
	PC5d. A planning group developed a plan to expand the Teacher Center, by establishing it as a joint project of the Minneapolis Public Schools and the University of Minnesota. The joint Teacher Center was governed by a Board including representatives from both parent institutions, and the original SEA Teacher Center Board became a subsidiary in-service committee to administer SEA. staff development funds.		
		PØ.4. Continuing disagreements erupted between the SEA staff and the federal project monitor.	
		PØ.5. The federal project monitor placed pressure on Superintendent Davis to grant the SEC actual decision making authority. Davis refused.	
		PØ.6. NIE rejected the initial SEA continuation application.	
		PØ.7. Superintendent Davis announced a plan to divide the Minneapolis Public Schools into 3 Administrative Areas, each headed by an Associate Superintendent. Davis decided that SEA would have to join one of the 3 Areas at the beginning of the fourth year of the Program.	

Figure 6.2i SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Summer 3			RØ.7. The SEC convinced Superintendent Davis to postpone for a year the required affiliation of SEA with one of the three Administrative Areas.
			RØ.6. SEA completed a revised continuation application, with a budget of $3,000,000. It was accepted.
	PC9b. Three modest alternative programs were initiated at the MUHS middle school: an open program (7-8), an ungraded program (7-8), and a graded program (7-8).		
	PC3b. The director of community education formed a task force to consider the role of the community in SEA. The task force proposed the establishment of a Community Resource Coordinator (CRC) position at each SEA school, replacing the earlier community liaisons, and the formation of an ongoing, K-12 community resource team, headed by a project-wide CRC.		
	PC7b. The task force on the role of the community in SEA also proposed a considerable expansion and coordination of the community education program in Southeast.		

Figure 6.2j SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		P4.7. The principal of MUHS developed a plan for an advisory group, including representatives from the Southeast PTA, Black parents from outside Southeast, handicapped students, and others. It was opposed by the SEA director and the SEC, on the grounds that it failed to include enough incentives for parents and others to bring new agendas to the school.	
Fall 3			R4.7. The SEC delayed approval of the MUHS advisory group and urged an expansion of its scope.
		T1.1. As budgets tightened and enrollments declined, it became increasingly difficult to select teachers in accordance with SEA philosophy--due to seniority restrictions.	S1.1. The SEA director spent considerable time in negotiations with the Minneapolis personnel office, to attempt to maintain teachers supporting the philosophies of the SEA schools. Negotiations were required on a case-by-case basis; no permanent solution was found.
			R8.1. Members of the Level I evaluation team eventually became well-established as participant-observers at the SEA schools.
		P5.3. The SEA in-service committee found itself with little time to do more than process requests for funds. Little coordination or planning occurred.	
			RØ.4. A new federal project monitor was appointed for SEA.

Figure 6.2k SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
	PC4d. To give the principals of the SEA schools a formal role in SEA decision making, a management team was established. It included the 5 SEA principals and was chaired by the SEA director.		
Winter 3		P4.8. Tension began to arise between the SEC and the management team.	
		P4.9. The MUHS principal refused to expand the scope of the proposed advisory group.	R4.9. The MUHS advisory group went into operation, as proposed by the MUHS principal.
Spring 3			R4.8. The management team permitted 2 observers from the SEC to attend its meetings.
		P4.10. Some members of the management team were angered by the decision to permit SEC observers to attend.	
			R1.3. The SEA director secured approval for a plan to move the Motley program to the Pratt building--thereby placing the Continuous Progress Program in one building. This allowed the Free School to move to Motley.
		P9.3. The parents and staff of the Marcy elementary school were critical of the open middle program at MUHS. Similarly, parents and staff of Pratt/Motley were critical of the MUHS ungraded program.	R9.3. The SEA director secured agreement for a plan to move several 6th grade teachers from Pratt to the middle school at MUHS; and one 6th grade teacher from Marcy to MUHS.

Figure 6.21 SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
	PC9c. A joint committee of staff and parents from MUHS and Pratt/Motley was appointed to plan a new 6-8 ungraded program at MUHS; and a joint committee from Marcy and MUHS was appointed to plan a new 6-8 open program. The programs were introduced in the Fall of year 4.		
Summer 4			
Fall 4		TS.1. The Teacher Center had acquired a fairly large staff to service requests for teacher training--and this staff could no longer be supported on SEA funds.	S5.1. Because the Teacher Center was unable to obtain sufficient funds to maintain its staff from the Minneapolis Public Schools, it began to shift its emphasis from staff development to educational research --in order to seek outside grant support.
			R9.1. At the urging of the SEA director, the principal of MUHS was shifted to an administrative position in the Minneapolis School District central office, and a new principal was appointed.
		T3.1. Maintaining community involvement in the SEA schools required continuing coordination. As federal funding declined, the Community Resource Coordinator (CRC) positions became vulnerable--since they did not fit easily into either the professional or paraprofessional aide categories used by the Minneapolis Public Schools.	

Figure 6.2m SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Winter 4			S3.1. To preserve the Community Resource Coordinator (CRC) positions, the SEA director proposed to expand afternoon and evening community education into the regular school day and to support the CRC's through local community education funds. The community education office of the Minneapolis Public Schools rejected the proposal.
Spring 4			RØ.7. The SEC established a sub-committee to consider which of the 3 Administrative Areas to select. The SEC finally chose the West Area. Superintendent Davis approved.
		P9.4. Some parents and staff found the graded and ungraded middle school programs difficult to distinguish.	
	PC9d. Planning began for the introduction of a senior high (9-12) Open Program at MUHS.		
Summer 5			R4.8. Through a lengthy process of planning by the management team and the SEC, the two groups merged to form a revised SEC, which included the SEA principals as members, along with parents and teachers.

Figure 6.2n SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Fall 5		P4.11. The members of the reconstituted SEC experienced some strained working relationships. Some principals feared they would lose power as a result of the merger of the SEC and the management team.	
			S3.2. SEA managed to maintain the Community Resource Coordinator (CRC) positions on a year-to-year basis, through limited special staff allocations from the West Area.
		PØ.8. SEA experienced some hostility within the West Area--the administrative area SEA had decided to join. The West Area Parent Council appeared threatened by the SEC.	
		P9.5. The teachers in the middle school alternatives rarely met with their elementary school counterparts.	
Winter 5			
Spring 5		P9.6. When more students applied for the senior high open program than the existing facilities could support, MUHS administrators argued that, since the open program was not the "regular" MUHS program, it was permissible to impose special admissions criteria.	R9.6. SEA objected to the MUHS proposal to define admissions criteria for the senior high open option. The criteria were eliminated.

Figure 6.2o SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		PØ.9. Changing political currents caused a substantial shift in the composition of the Minneapolis School Board, leading to reduced support for desegregation and alternatives. Superintendent Davis resigned.	
Summer 6			S5.2. Last-minute lobbying was required by the SEC to convince the Minneapolis Public Schools to provide any support for the Teacher Center for the coming year. SEA staff development was almost completely eliminated.
Fall 6		T2.1. Many of the options and electives created at MUHS required greater financial support than the regular Minneapolis allotment.	S2.1. Two major SEA programs at MUHS--A Wilderness And Research Experience (AWARE) and Off Campus Learning Experience (OCLE) --were terminated due to lack of money.
		T9.1. Declining enrollment at MUHS threatened to reduce the number of students in the 3 middle school alternatives--thus raising the cost of the 3 programs relative to other middle school programs in Minneapolis.	S9.1. The SEC and the middle school administration attempted to maintain the number of students enrolled in the middle school, by encouraging students from throughout Minneapolis to enroll. At the same time, MUHS obtained limited additional resources from the West Area administration, to support the middle school programs.
		P4.12. Some residents of Southeast began to oppose the SEC, arguing that SEA had destroyed the neighborhood school concept in Southeast.	

Figure 6.2p SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		T4.1. With the termination of the SEA director position, the SEC no longer has a director to advise, nor a budget to allocate.	T4.1. The SEC has continued to operate, without a formal budget. It has continued to consider questions of SEA policy, although it lacks a formal status in the governance structure of the Minneapolis Public Schools.
		T6.1. The new curriculum units developed by SEA proved costly to maintain.	S6.1. The Deliberate Psychological Education Program--the most ambitious new curriculum developed by SEA--fell from use.
		T8.1. An internal evaluation staff could no longer be maintained on federal funds.	S8.1. Internal evaluation was largely eliminated--with the exception of one element. Some school-level parent/teacher advisory groups continued to conduct annual self-evaluations of school personnel; and the SEC continued to conduct self-evaluations of its performance.
		T7.1. The large afternoon and evening SEA community education program required a substantial staff.	S7.1. The SEA community education staff was supported by the regular Minneapolis community education resources.
Winter 6		PØ.10. All 4 SEA elementary school buildings were threatened with being closed, due to their age as well as their relatively small size.	
Spring 6			RØ.10. The SEC proposed constructing a modern K-12 complex in Southeast, containing all 4 elementary alternatives as well as the middle and high school programs.

Figure 6.2q SOUTHEAST ALTERNATIVES

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		PØ.11. The SEC plan for the construction of a K-12 educational complex was opposed by a group of merchants in the Southeast area. Eventually, the proposal was rejected by the Minneapolis School Board.	
		T1.2. Maintaining a system of choice at the elementary level required providing continuing information to parents on the differences among the alternative programs and the mechanics of the choice process.	S1.2. The SEC used resources provided by a special short-term NIE grant (awarded to Minneapolis for the dissemination of information on alternatives) to print a mail-out on the elementary alternatives. Advising parents on the elementary schools has been left to the school principals. Parents and staff have found that these arrangements are unsatisfactory, since no one is responsible for insuring that parents get a balanced view of the schools, but no long-range solution has been worked out.

Figure 6.4a MARCY OPEN SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Summer 1	PC1. While working on the SEA proposal, the Marcy staff and members of the Southeast Parents for Open Classrooms visited a number of ongoing open schools. On the basis of these visits, they proposed dividing Marcy into 2 parts, one employing an "integrated day (K-6) approach" (Model I), and the other employing the Mankato open education model, based on eleven "resource rooms" (Model II). The 2 models were put in operation in the Fall.		
	PC2. Marcy developed a plan to involve parents in the classroom, and a new staff position--the Community Resource Coordinator--was established.		
	PC3a. Marcy staff and parents instituted a program of pre-service and in-service training sessions, field visits, and workshops to support the operation of open classrooms.		
Fall 1		P1.1. Not all Marcy parents had chosen the program for the same reasons. Some wanted Marcy to be a Free School, some wanted it to be an open school, and some wanted it to be a regular neighborhood school. Some parents feared the changes wouldn't go far enough; others feared they would go too far.	
		P1.2. Feelings of mistrust developed among the staff.	

Figure 6.4b MARCY OPEN SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		P1.3. Dissatisfaction with Model II developed over such issues as: how to integrate each child's multiple classroom experiences, how to schedule each child's day, and how to teach as a subject matter specialist rather than as a generalist.	R1.1., 1.2., 1.3. During a staff-only retreat, the staff decided to reorganize Marcy. They elected to terminate the Mankato Model (Model II) and to establish "families," each composed of two integrated day (K-6) classrooms.
		P1.4. Parents were angered over their lack of involvement in the reorganization of Model II.	R1.4. A joint staff/parent meeting was called, and the reorganization of Model II was put to a vote. It passed.
	PC.4. A provisional steering committee on governance was established, to examine various models of decision making. It proposed 2 choices: an advisory board and a policy-making board. In December, during a heated meeting of parents and staff, the advisory option was adopted. The Marcy Advisory Council began meeting in January.	P4.1. Strong disagreement developed concerning the role of the Marcy Council. Many parents (perhaps 1/3) supported the view that the Council should be a policy-making body--not simply an advisory board.	
		P1.5. Continuing questions were raised by parents and teachers throughout Minneapolis, concerning the legitimacy of open education.	
	PC5a. A committee was established to define the goals of the school--for purposes of formative evaluation.	P5.1. Disagreement developed, particularly between parents and staff, concerning the goals of the school.	R5.1. A document was completed containing 50 fairly general and difficult to evaluate goals.
		P2.1. The staff was uncertain about the role of parents in decision making and classroom instruction.	

Figure 6.4c MARCY OPEN SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Winter 1			R1.3. Over Christmas break, facilities were arranged for the newly designed "families," and school opened in January with the new system in operation. Resource rooms in related-arts areas were set up to supplement instruction in the "families."
		P1.6. Disagreement developed over whether the family model was a retreat from open education principles. Some parents hoped Marcy might "evolve back" to the Mankato Model.	
		P1.7. The staff found working with children from K-6 in one classroom difficult.	
		P1.8. Teaming among pairs of teachers in each family proved difficult to achieve.	
		P1.9. Instruction in the related-arts resource rooms was hard to integrate with regular classroom instruction.	
Spring 1	PCSb. An internal evaluator position was established at Marcy.	P5.2. Conflict erupted between the internal SEA evaluation and the external "Level II" evaluation team.	
			R1.7. The Marcy Council voted to make one teacher in each family responsible for K-3 children, and the other responsible for 4-6 children. Both classrooms were still, however, to remain K-6. The decision was to take effect in the Fall.

Figure 6.4d MARCY OPEN SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
			R1.7. The Marcy evaluator was asked to observe child interaction patterns.
Summer 2			R5.2. The internal and external evaluation teams finally decided to work separately. The Marcy internal evaluator eventually became well established as a participant-observer, assisting in solving particular internal problems.
			R1.7. During a staff development workshop at the Prospect School in Vermont, the staff decided to divide each family into one K-3 classroom, and one 4-6 classroom. The two teachers in each family were supposed to develop occasional cross-age projects, allowing the students in both classrooms to work together.
Fall 2		P1.10. Parents were angered over the unilateral staff decision to divide each family into one K-3 and one 4-6 classroom.	R1.10. The staff defended their action and argued that the decision to split the families wasn't necessarily permanent. They suggested reconsidering the issues in November.
			R1.7., 1.8., 1.9. The staff decided to put a moratorium on the use of classroom volunteers for 2 weeks, to get the year off to an orderly start. The moratorium eventually lasted several months.

Figure 6.4e MARCY OPEN SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
			R1.10. A survey of Marcy parents was conducted, to determine their attitudes about the splitting of families. Parents supported the decision, but disapproved of the fact that it was not properly brought before the Marcy Council.
			R1.10. By November, the splitting of families was fairly well accepted by the Marcy Community.
Winter 2		P4.2. Marcy's principal resigned, to coordinate the development of alternative schools in another area of Minneapolis.	R4.2. The Marcy Council developed a procedure to be followed in selecting a new principal.
		PØ.1. Marcy had to prepare its section of the SEA continuation application required by NIE.	RØ.1. A writing team was selected.
Spring 2		PØ.2. NIE rejected the SEA continuation application. Marcy had to rewrite its section.	RØ.2. Re-writing the NIE continuation application was used as an opportunity to unite some of the feuding parties within Marcy against a common "enemy": Washington.
	PC6. Marcy began planning an arrangement through which University students and Minneapolis teachers could attend an internship program at Marcy for credit. The internship program was introduced in the Fall.		

Figure 6.4f MARCY OPEN SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		P4.3. The Minneapolis School District initially opposed the candidate Marcy selected for principal, because he was currently only an assistant principal and thus had to be promoted.	R4.3. The new principal was made "Acting Principal" for a year.
		P4.4. Parents began complaining about staff leadership, and this ignited staff resentment about parent leadership.	
		P4.5. Teachers felt underrepresented on the Marcy Council, since most staff seats were held by employees who were not certified teachers.	R4.5. The Marcy Council re-wrote its constitution. The new constitution stated that the Council would include 6 parents and 6 Marcy employees.
		PØ.3. Marcy's Black enrollment was "embarassingly" low.	RØ.3. Plans were made to recruit additional minority applicants. Eventually, minority enrollment rose from 3% to 23%.
	PC7a. Brainstorming began for ways of using the community as a basis for education outside the school building.		
Summer 5	PC2b. Marcy began developing plans for a reorganized school week. The idea was to run school on the normal schedule for 4 days each week and provide special activities for students on the 5th day, coupled with professional development sessions for staff. A committee was appointed to develop plans, and by September it completed a proposal for the program, which came to be called "Community Day."		

Figure 6.4g MARCY OPEN SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Fall 3		P5.3. The Marcy internal evaluator was faced with too many requests for evaluation services.	R5.3. An evaluation advisory committee was established, to set evaluation priorities. The committee defined 3 goals for Marcy, and conducted a study to examine how well the Marcy environment facilitated reaching them.
	PC7b. Approvals from the District and State were obtained, to conduct pilot trials of the "Community Day" program in the Winter and Spring. If successful, the program was to become fully operational in year 4. A parent was hired to coordinate the pilot program.		
Winter 3	PC8. Marcy parents and staff began applying pressure to extend the open program to the secondary level. They served on a committee, chaired by the Marcy principal, to design an open middle school alternative, which was to start operation in the Fall of year 4. Sixth graders were given the option of remaining at Marcy or attending the new middle program.		
Spring 3		P3.1. Teachers had to spend so much energy organizing and coordinating the Community Day experiences for their students that there was no time for the professional development sessions that were supposed to occur while the students were off in the community.	

Figure 6.4h MARCY OPEN SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		P1.11. Cross-age projects involving both classrooms in each family proved difficult to organize.	R1.11. The notion of cross-age projects involving both classrooms in each family was no longer emphasized, and the "family" concept began to give way to fairly separate, self-contained classrooms.
			R4.1. The Marcy Advisory Council became the Marcy Council--formalizing the Council's established role in school decision-making. The principal became a voting member.
		P4.6. The Marcy School building was fairly old, and the community expected it to be closed within a few years.	R4.6. Marcy attempted to obtain support for a plan to move to the Tuttle building. The venture was unsuccessful.
Summer 4		P8.1. MUHS staff resisted the open middle alternative.	R8.1. Marcy parents and staff continued to apply pressure on MUHS to support the open alternative. The Marcy internal evaluator was assigned to the middle open program part-time, and the program managed to persist.
			R6.1. The Marcy internship program for Minneapolis teachers was eliminated.

Figure 6.4i MARCY OPEN SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Fall 4		P1.12. Marcy teachers faced continuing difficulties integrating kindergarten instruction within the K-3 classroom--in part due to the fact that kindergarten children attend school for only a half day.	
Winter 4			
Spring 4			R3.1. The Marcy staff concluded that "Community Day" could not serve both student enrichment and staff development goals. Staff development goals were dropped, and the Community Day program became a smaller-scale, more flexible program called "Other Ways/Other Places."
		P4.7. SEA was required to affiliate with one of the 3 regular administrative areas of the Minneapolis School, for the 5th year of the program.	R4.7. Marcy parents and staff served on a panel to consider which Administrative Area to select. They finally decided on the West Area and obtained the Superintendent's agreement on the choice.
Summer 5		P4.8. Some schools in the West Area resented the SEA schools.	
Fall 5		T7.1. Organizing the Other Ways/Other Places out-of-school learning program required considerable staff resources.	S7.1. Applications to Title III, foundations, and local businesses for additional resources to support the program all failed. Other Ways/Other Places had to be cut back to a level which could be supported by the Marcy Community Resource Coordinator (CRC).

Figure 6.4j MARCY OPEN SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
			R1.12. Kindergarten children were placed in separate classrooms, thus making the K-3 classrooms 1-3 instead.
		T5.1. The Marcy internal evaluation staff member no longer could be supported on federal funds.	S5.1. Marcy decided not to seek funds to support a permanent internal evaluator staff position. Formative evaluation was eliminated.
Winter 5			
Spring 5		T8.1. Marcy parents and staff had to put continuing pressure on the MUHS faculty to maintain the open middle program.	S8.1. Pressure on the MUHS faculty was sustained through voluntary efforts by the Marcy community.
Summer 6		T2.1. Maintaining parent and volunteer involvement at Marcy required continuing staff resources.	S2.1. Marcy found support form the West Area to continue the Community Resource Coordinator position for a year. Long-term support remained unsettled.
Fall 6		T1.1. Resource room instruction required more staff than the regular Minneapolis elementary school allotment.	S1.1. The Community Resource Coordinator obtained foundation support for resource room instruction in music. Some resource rooms were staffed part-time using special funds obtained from the West Area. Others were closed or cut back.
		T3.1. Staff development programs required coordination, consultants, and materials.	S3.1. Limited staff development activities could be supported through regular West Area resources. Most staff development was eliminated.

Figure 6.4k MARCY OPEN SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Winter 6			
Spring 6		TØ.1. Marcy faced 3 interrelated worries; declining enrollment, a building soon to be torn down, and falling budgets.	SØ.1. The Marcy Council developed plans for the creation of a K-12 open program--in response to the threatened closing of the Marcy building.
		T4.1. Continuing staff effort has been required to maintain the Marcy governance system, involving parent and teacher participation in staff selection, budgeting, and instructional policy.	S4.1. The Marcy governance system has been maintained primarily through voluntary participation in after-school and evening meetings and negotiation sessions.

CHAPTER VII

THE EXPERIMENTAL SCHOOLS PROGRAM IN GREENVILLE

> We spent hours and hours in meetings on organization development. We played with tinker toys and learned how to listen to each other . . . . We gave people lots of good ideas . . . . [But] we didn't tell the teachers how to go slow.
>
> Project administrator[1]

> We tried to do too much too fast. Don't try to do everything. You can't follow through on everything you want to do. You're only human.
>
> Greenville teacher[2]

In the winter of 1970, in response to a court order, the School District of Greenville County began to establish a unitary school system, to replace the dual system of black and white schools which for decades had operated in the County under the doctrine of separate but equal.[3] Under the leadership of Floyd Hall, the newly appointed Superintendent from the suburbs of Chicago, school desegregation in Greenville received national attention as a rare example of "integration with grace and style."[4] But while school integration was the most visible issue of educational policy facing Greenville in 1970, it was not the only problem on the mind of the new Superintendent. Academic performance in Greenville was well behind the national average, and both Superintendent Hall and the Board of Trustees of the School District were eager to improve the achievement level of Greenville students, especially in the basic skills.

Soon after Hall became Superintendent, in July of 1979, he called

on the Combined Motivation Education Systems Corporation in Chicago, to establish a performance contracting program in reading for Greenville. While the performance contracting program itself did not turn out to be particularly successful, Greenville's association with Combined Motivation Education Systems (CMES) produced an unexpected bit of information. In March of 1971, the Director of CMES contacted Superintendent Hall to tell him that he had just received an announcement of a new competition for the federal Experimental Schools Program (E.S.P.). CMES felt Greenville was in a good position to apply: None of the projects selected by E.S.P. in the first competition were in the South. Thus, it seemed almost certain that a Southern school district would be selected in the second round. Hall was intrigued, and he invited some staff members from the performance contracting program to meet with him and some of his associates, to consider the direction an Experimental Schools project in Greenville might take.

According to the guidelines for the Experimental Schools Program, a school district interested in applying for the Program was supposed to focus its project on a small number of schools, enrolling from two thousand to five thousand students in all, from kindergarten through twelfth grade. Superintendent Hall and his advisors quickly settled on the city of Greer, at the Eastern edge of Greenville County. On the surface, the choice was a simple one. Greer was the only small geographic area in the County in which a few elementary schools all fed a single middle school, which in turn fed a single high school. Furthermore, the total enrollment in Greer, from kindergarten through twelfth grade, was four thousand.

Although size was one concern, however, there were in addition two other reasons for proposing Greer as the location of the project. First of all, academic performance in Greer seemed to be further behind the national average than performance in other areas in Greenville. As one observer put it, "if we could succeed in Greer, we could succeed anywhere."[5] Furthermore, the Superintendent hoped that locating the project in Greer might build Greer's support for the District. Greer had been an independent school district until 1951, when it was combined with a large number of small school systems in Greenville to form the School District of Greenville County. The residents of Greer had opposed joining the County system, and resentment of the County remained high.

While the choice of Greer as the project area was made fairly easily, it was somewhat more difficult to determine what the proposed project ought to contain. The planning group eventually decided that a key element in the project would be the formation of an "educational consortium," composed of representatives of the School District, Furman University of Greenville, the State Department of Education, the Regional Educational Laboratory at Raleigh, and Combined Motivation Education Systems Corporation. The planners hoped the consortium would bring together a variety of professions and interests, to focus on improving academic performance in the schools. The Superintendent and the staff from CMES hurridly drafted a letter of interest, emphasizing the consortium idea and drawing on some of the concepts Greenville had used in its desegregation effort--particularly some approaches to affective education and individualiz-

ation of instruction.

From about a thousand applicants, Greenville was selected as one of nine to receive a two-month planning grant to prepare a full proposal. The award of the planning grant, however, did not mean that the Experimental Schools Program office in Washington fully supported Greenville's ideas about the contents of the project. When representatives from the District and CMES visited the Experimental Schools Program office to negotiate the final terms of the planning grant, they learned that the E.S.P. Director opposed the educational consortium idea, which had been the central theme in the Greenville letter of interest. The E.S.P. Director requested that Greenville de-emphasize the consortium idea and eliminate the participation of the Regional Educational Laboratory at Raleigh.

Superintendent Hall accepted the changes in emphasis requested by Washington, and he appointed Charles Welch, a staff member from Combined Motivation Education Systems, to direct the preparation of a full proposal. Welch quickly moved from Chicago to Greenville, to spend half-time on the proposal and half-time on the performance contracting program. Welch put together a small committee, which conducted lengthy sessions in Greer to determine the community's educational concerns. Eventually, relying in part on what was learned in the community, Welch and his staff completed a proposal, emphasizing the notion of "individualized instruction."

In November, the Experimental Schools Program office announced that Greenville had been selected as one of two Districts to receive five years of E.S.P. support, beginning the following school year. But when represen-

tatives from Greenville arrived in Washington, they learned once again that, while Greenville had won the E.S.P. competition, Washington was not altogether in support of the contents of Greenville's proposal. The E.S.P. office requested that Greenville rewrite the proposal, to clarify its objectives and major themes. Preparing an approved proposal, which initially was expected to take only a few days, eventually required several months of painful revisions. One Greenville staff member said of the proposal-writing process:

> Revising the proposal was worse than writing a dissertation--it was worse than anything I have ever tried to do. It was agony.[6]

The final version of the proposal, completed in the winter of 1972, emphasized individualization of instruction as its central theme. In particular, Greenville proposed to implement some of the key elements of the Individually Guided Education Program (IGE) developed by the Institute for the Development of Educational Activities.[7] The Piedmont Schools Project (PSP), as the Experimental Schools Program in Greenville came to be called, hoped to:

> [P]rovide experiences for students and teachers designed to promote positive attitudes toward self, learning, and positive relationships with others . . . .
>
> To provide the means for each student who has mastered the basic skills to design his own educational program according to his needs and value structure . . . .
>
> To develop, implement, test, and refine an organizational model, K-12, that will facilitate and encourage individualized and personalized education programs.[8]

According to the terms of the Experimental Schools Program award,

the Piedmont Schools Project was to receive about three million dollars for the first two years of the project. The contract was renewable for an estimated three million additional dollars for the final three years of the project--bringing the total federal contribution to about six million dollars. Altogether, then, the Experimental Schools Program award provided about $225 per year for each student in the Greer Schools.

THE PIEDMONT SCHOOLS PROJECT

On the main highway entering Greer, South Carolina, a large sign greets visitors with the words: "Welcome to Greer, home of the Piedmont Schools Project." The sign offers a gentle reminder of the fact that, although the Greer schools are part of the School District of Greenville County, the residents of Greer still consider themselves somewhat separate from the rest of the District. Indeed, about a third of the city of Greer lies in neighboring Spartanburg County. But when the Greenville School District was formed in the early fifties, the South Carolina legislature decided that, at least for purposes of school elections and taxation, Greer should be included as part of the District.

The city of Greer has a population of about twenty thousand, and it is about twenty-five percent black. Textile mills are the largest employers in the area, and economic development has only recently begun to take place in other industries. In 1970, about twenty-five percent of the families in Greer fell below the national poverty line. Nearly seventy percent had incomes below $10,000.[9]

Perhaps as a result of the fact that Greer originated as a nineteenth century mill village, Greer lacks some of the indiginous community structures that might be expected in a small city, particularly among the working class. One observer of the Greer Schools explained, Greer is "really not a community."[10] The churches in Greer, as in much of the South, form the core of organized social life, but there are few integrated churches in the city, and neither the white nor the black churches have placed much emphasis on

social and economic concerns. Thus, to some extent, Greer has lacked an organized group of residents to influence the direction of the city's development. Indeed, some residents of Greer saw the Piedmont Schools Project as an opportunity to establish an organizational base for community action.

When the Project began, in the summer of 1972, there were six elementary schools in Greer, as well as a newly-completed open-space middle school, and a traditional high school. According to the PSP proposal, the eight Greer schools were supposed to move more-or-less in concert toward individualization of instruction, with reinforcing changes at the elementary, middle, and high school levels. The effort to individualize instruction faced somewhat distinct conditions at each of the Greer schools, however, and these conditions had a strong influence on the course of the Project.

The six elementary schools in Greer were racially integrated when the Project began, but there were nonetheless some fairly large differences among them, in terms of socioeconomic status and racial composition, and these differences persisted over the course of the project. Crestview, for example, the newest elementary school in Greer, is a modern, open-space building, located in the most affluent area of the city. The student population at Crestview is about thirteen percent black. The East Greer Elementary School, on the other hand, is a much older, traditional building, located in a severely disadvantaged area of Greer, in the midst of rows of run-down houses. East Greer was an all-black school before the dual school

system in Greenville was eliminated in 1971, and the student population at East Greer is currently about thirty percent black. There are other differences between Crestview and East Greer as well. While only two percent of the parents of children at Crestview have not completed high school, for example, more than fifty percent of the East Greer parents are not high school graduates.[11]

Students from all six Greer elementary schools attend the new Greer Middle School, which was completed just six months before the Piedmont Schools Project began. Greer Middle School was designed as an unusual, open-space building, with four large "pods" or clusters, each intended for about 250 students and 10 teachers. Unfortunately, when the Middle School opened, enrollment turned out to be several hundred students more than expected, and the four pods were fairly overcrowded. Partly as a result of overcrowding, and partly as a result of the unusual design of the building, discipline at the Middle School quickly erupted as a serious concern, and the principal of the Middle School resigned just as PSP began.

Greer High School, in contrast to the Middle School, is a fairly traditional senior high school, organized by academic department, and containing more-or-less traditional classrooms of thirty students each. At the end of the year before PSP began, the principal of Greer High, who had served for twenty-five years, retired, partly in response to the problems desegragation had generated at the school. An extremely popular coach was selected to serve as principal for the first year of PSP.

Once the Piedmont Schools Project proposal was finally approved in Washington, one additional matter remained to be settled, before the Project could begin: the appointment of a Project Director. An obvious candidate was Charles Welch, who had coordinated the preparation of the proposal. But once again, Washington intervened, requesting a more experienced administrator. Superintendent Hall selected Joseph Gentry, a former Assistant Superintendent from neighboring Spartanburg County, who had recently returned to South Carolina after completing his doctorate at Auburn University in Alabama. Gentry had been involved in the Individually Guided Education (IGE) training program at Auburn, and he participated in drafting the IGE components in the PSP proposal.

In the Spring of 1972, then, Gentry assembled a small staff, which began a five-year effort as an implementing organization to individualize instruction in the Greer schools. The PSP staff faced an organizational setting including the students, teachers, and parents of the eight Greer schools, as well as the central office of the School District of Greenville County and the E.S.P. office in Washington. And they began, as one staff member put it, with a proposal that "was theoretical in design--there wasn't much meat on it."[12]

The implementation scenario: A first question to ask about the project-level implementation process is: To what extent does the history of the Piedmont Schools Project resemble the scenario generated by the extended model? Answering this question requires an assessment of the

program components introduced, accepted, and terminated over the course of the project.

The Piedmont Schools Project began with a flurry of activity. During the summer before the first year of the Project, each of the Project schools prepared to initiate a system of individualized instruction, involving four inter-related components. The first component, learning communities, entailed a reorganization of each school into multi-teacher teams (PC1). To some degree, the learning communities component survived to become a mature program at the elementary and middle school levels. At the high school level, it was terminated.

Differentiated staffing, the second component of the program, generated some difficult problems of role and responsibility (PC2). It was eventually accepted as a mature program, but in a somewhat curtailed form. Individualized curriculum units formed the third component of the system of individualized instruction (PC3). Most of the curriculum materials introduced at the elementary and middle school levels during the first year of the program dropped from use, but some of those at the high school level survived. The fourth component of the system of individualized instruction, staff involvement in decision making, entailed the introduction of Instructional Improvement Committees at the school and project levels, designed to make decisions on issues of educational policy (PC4). While the Instructional Improvement Committee structure was accepted as a mature program, the powers of the Committees were somewhat uncertain.

To support the system of individualized instruction, the Piedmont

Schools Project also introduced several other components over the first summer and fall of the program. One of these, an ambitious program of staff development, was fully accepted as a mature program (PC5). Another component, community involvement in decision making, was less successful (PC6). Committees called "Educational Cooperatives" were introduced, designed to represent various segments of the Greer community, but many of the Cooperatives failed to meet regularly.

As a seventh component of the program, PSP established a Board of Directors, to involve professional educators from across South Carolina in the Project (PC7a). The powers of the Board were unclear, however, and the Board rarely met. It soon disbanded. Finally, as an eighth component of the program, PSP slowly introduced the initial elements of a program of formative evaluation (PC8a). The full system of formative evaluation developed over several years.

Altogether, then, over the first summer and fall of the Project, PSP began work on eight different program components. By the winter of the first year of the Project, four of these components were fully initiated, and work on the other four was well underway. The pace of initiation activity did not continue throughout the rest of the Project, however. Indeed, little more was introduced until the winter of year two, when PSP initiated a large-scale effort to prepare curriculum guides in ten subject-matter areas, designed to encourage a more integrated curriculum in the PSP schools (PC3b). The guides were completed, but they had little impact on the curriculum.

In the summer of year three, PSP introduced a program called "Transference," to promote the adoption of promising PSP practices in other Greenville schools (PC9). Transference was accepted as a mature program, but it was eliminated when federal funds were exhausted.

At about the same time, PSP attempted to devise a new organizational arrangement through which to involve professional educators in the Project, to replace the moribund Board of Directors (PC7b). The newly-formed Professional Liaison Committee met for several years, but with little sense of purpose or influence on the Project.

Two other program elements initiated during year three were more successful. The formative evaluation component initiated in the first year of the Project was significantly expanded. In particular, the formative evaluation team began to provide assistance to project teachers in the design and use of tests and evaluation (PC8b). And a new staff development committee was formed, with representatives from each of the PSP schools, to promote more focused planning of in-service training activities (PC5b).

Finally, in the summer of year four, PSP operated a six-week demonstration school, to provide on-going training in some of the central PSP instructional ideas, including team teaching (PC5c). The demonstration school was held again in the summer of year five, but it was eliminated with the termination of federal funds.

In summary, then, the process of initiating new programs in the Piedmont Schools Project is broadly consistent with the scenario generated

by the extended model. In the spring and fall of the first year of the project, four components of the program were fully initiated (learning communities, differentiated staffing, staff involvement in decision making, and community involvement in decision making). Four other components were at least partly underway (individualized curriculum units, staff development, professional involvement in decision making, and formative evaluation). Initiation activity then declined rapidly, and it did not resume for about a year. Then, beginning in the winter of year two, PSP introduced an ambitious program of curriculum development and formative evaluation. By the end of year four, this new phase of initiation activity came to an end, and little more was initiated in the remaining years of the Project.

The PSP implementation scenario is shown graphically in figure 7.1, which displays the program initiation rate, the level of new programs, and the level of mature programs over time. The evidence from which this graph was derived is shown in Figure 7.2 (located at the end of the Chapter). For a discussion of the quantification procedures involved, see Appendix C.

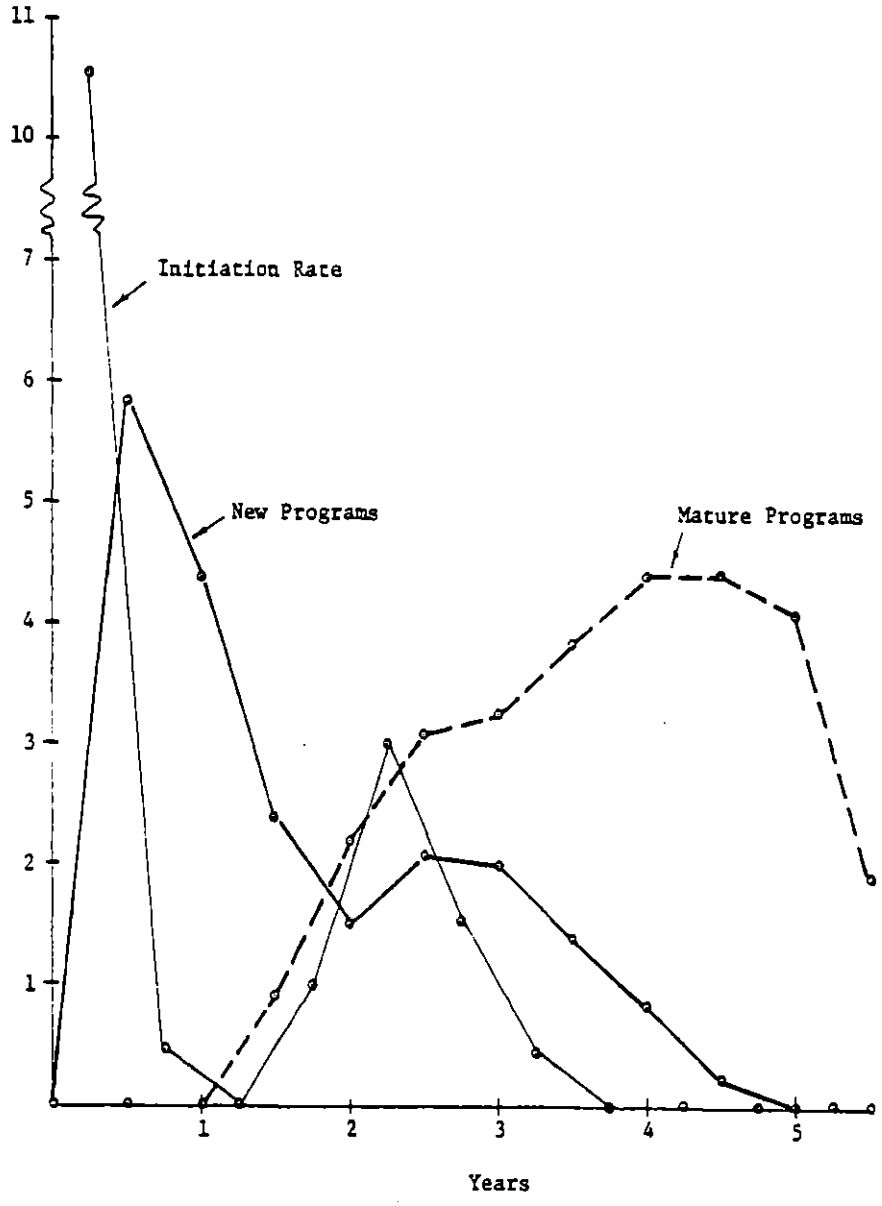

Figure 7.1. The Piedmont Schools Project Implementation Scenario

New programs and problems: A striking characteristic of the PSP implementation scenario is the sharp decline in program initiation activity over the first year of the program. To what extent do the hypotheses on new programs and problems underlying the extended model offer a reasonable explanation for this decline? To answer this question, it will be helpful to focus on an ambitious component initiated during the first year of the Project: differentiated staffing (PC2).

The PSP staff believed that changes in the organizational structure of the schools were essential to the implementation of individualized instruction. Before the Project began, each PSP school was headed by a traditional building principal, responsible for the school's instructional program, general administration, and physical plant. But the PSP staff felt this arrangement had some disadvantages. Usually principals were required to spend so much time on routine administrative matters that they had little energy left to devote to the development of a coherent, well-focused instructional program. Thus, PSP decided to replace the traditional principal role at each school with two "co-equal" roles, the Program Manager, and the Facilitator of Operations.

The Program Managers at each of the PSP schools were supposed to serve as instructional leaders for their schools, and they were expected to spend a considerable portion of their time in the classroom. The Facilitator of Operations, on the other hand, was responsible for general school administration. The hope was that the establishment of these two, co-equal roles would add coherence to the instructional program in each

PSP school. As one staff member put it,

> All the things a Facilitator of Operations has to do can be used as cop-outs by the Program Manager if there isn't a Facilitator of Operations--as reasons for not getting into the classroom.[13]

The PSP staff also introduced some corresponding roles at the Project level. To coordinate the overall instructional process in the Greer schools, PSP established a position called the Manager of School Programs. The Manager of School Programs served as chairman of the Project Instructional Improvement Committee (IIC), which was composed of the Program Managers from each of the Greer schools and was supposed to make decisions on PSP instructional policy. To coordinate the administration of the Greer schools, PSP established a Manager of Business Operations, to whom the school Facilitators of Operations were to report. And in addition, PSP also introduced a third "co-equal" role at the Project level: a Manager of Staff Support Systems, to oversee the activities of ten Resource Coordintors, who were supposed to assist the Greer teaching staff in developing new instructional methods. The Project Director, together with the Manager of School Programs, the Manager of Business Operations, and the Manager of Staff Support Services, met as a Management Team, to make daily decisions concerning the administration of the Project.

Almost as soon as these roles were introduced, problems began to appear. The precise areas of responsibilty for each position, which seemed well defined in theory, proved difficult to untangle in practice. At the PSP schools, for example, the Program Managers and Facilitators of Operations

constantly believed their turfs were being invaded. According to one former PSP administrator,

> When we first started, if one of the two made a decision, the other would automatically decide the opposite.[14]

By the end of the first year of the project, the PSP staff, in a series of lengthy meetings, developed formal role descriptions for the Program Manager and Facilitator of Operations positions, in an effort to resolve some of the disputes. This eventually reduced some of the controversy, but it did nothing to eliminate another growing difficulty. Although the two roles were supposed to be "co-equal," the Program Manager at each school seemed to dominate. For example, the Program Managers generally occupied the offices that had belonged to the school principals before PSP began, while the Facilitators of Operations tended to be assigned desks wherever there happened to be some extra space. In one school, the Facilitator of Operations had a desk in a supply room.

Although a substantial amount of staff effort and in-service training was devoted to the problem, little changed. By the end of the second year of PSP, the Facilitator of Operations position was generally accepted as the weaker of the two "co-equal" roles. One PSP administrator explained:

> There was lots of vocalizing in the first two years. The Facilitators of Operations felt like red-haired stepchildren. They were quite vocal initially, but eventually they acquiesced.[15]

Conflict was not restricted to the Facilitator of Operations and Program Manager roles. Controversy also erupted between the Project

Instructional Improvement Committee and the Management Team, and between the Resource Coordinators and the Program Managers. By the end of the first year of the Project, the PSP Manager of School Programs was fired, a new one was appointed, and the Manager of Staff Support Services position was abolished. As one observer put it, as the first year of PSP came to an end, "it was the lowest ebb of the Project, in terms of morale."[16]

In summary, then, once the system of differentiated staffing was initiated, it generated some significant problems. As these problems began to mount up, two things occurred, both consistent with the hypotheses underlying the extended model. First, the PSP staff began to devote increasing attention to resolving some of the immediate problems and role conflicts generated by differentiated staffing, and thus the staff had little attention remaining to initiate further programs. Second, certain aspects of the differentiated staffing system, such as the co-equal status of the Program Manager and Facilitator of Operations roles, were terminated.

The pressure to initiate new programs: Program initiation activity declined throughout the first year and a half of the Project, but at the end of the second year it began to increase. (See figure 7.1.) To examine the degree to which the hypotheses underlying the extended model offer a plausible explanation of this change, it will be useful to analyze one component of the PSP program in some detail: individualized curriculum units (PC3a, PC3b).

From the onset of the Piedmont Schools Project, a critical element

of the program was the use of instructional materials appropriate to the individual abilities of each child in the project schools. When the program began, the PSP staff believed this objective could be accomplished through commercially available individualized education packages, such as the Individualized Mathematics System (IMS math), or the Science Curriculum Improvement Study (SCIS science). The project purchased a large number of different packages in various subject areas, but it slowly became apparent that something was lacking. While PSP had plenty of materials, there was no way of knowing which materials to use when, or how to integrate the various materials with each other. One PSP administrator commented:

> Unfortunately, every traveling salesman in the region came to visit the [Project] to sell books and equipment . . . . Lots of this equipment is still in the original boxes.[17]

For at least the first year of the project, then, an individualized curriculum remained an aspiration which was not fully acted upon, as teachers and PSP staff focused their attention on the problems generated by other program components. But by the middle of the second year of PSP:

> teachers became more comfortable. They had a year to work out the bugs. They saw they didn't have to work twelve hours a day, like they did the first year.[18]

Thus, the new PSP Manager of School Programs and some of the other members of the PSP staff began to resssess the approach that had been taken to individualize the curriculum. As one staff member put it, PSP began to initiate "a change in the direction of the Program . . . . We stopped buying equipment."[19] The PSP staff concluded that the notion of individualizing instruction through the use of a large number of curriculum

packages was unworkable.

> It takes an expert to combine these packages, to teach something like reading . . . . It would be better to pick just one package than eight or ten.[20]

In its reassessment of the initial approach that had been taken to individualize the curriculum, the staff went well beyond simply modifying what had been done. The staff also gave consideration to an issue that had been given only passing attention in the first year of the Project: What common core of knowledge should all children be expected to master, and in what sequence should this core be presented?

To answer this question, PSP established a complex system of committees to develop curriculum guidelines and objectives in ten subject-matter areas. According to one PSP staff member:

> Their mission was to describe an exemplary educational program that was possible within PSP time and program constraints. [They were supposed] to give the Program Managers and teachers something to shoot for.[21]

The curriculum guidelines went through four drafts before they were finally approved by the various PSP governing bodies. Then, the PSP staff began an attempt to specify curriculum items for each of the objectives contained in the guidelines and to develop exercises to measure student progress toward these objectives. As time went on, however, it became apparent that developing exercises would require more staff time than PSP had available. A few exercises were written, but, as one PSP staff member put it, the attempt to develop a complete set of exercises in the ten subject-matter areas "didn't get off the ground."[22] The hope that the

curriculum guidelines could promote a more coordinated program of individual instruction was slowly abandoned.

In summary, then, as some of the problems generated in the first year of PSP were resolved, staff attention began to turn to program aspirations that were neglected in the first year of the Project. Consistent with the hypotheses underlying the extended model, the PSP staff began to initiate an ambitious attempt to coordinate the curriculum through a system of educational objectives and exercises. As the magnitude of the curriculum project became evident, however, expectations concerning the development of exercises slowly declined.

Mature programs and tasks: In the PSP implementation scenario, the pool of mature programs grows rapidly in the second and third years of the Project. The rate of growth slows somewhat in the later years, however, and the pool of mature programs begins a period of decline in the middle of the fifth year. To assess the extent to which the hypotheses on mature programs and tasks underlying the extended model offer an explanation for this pattern, it will be helpful to examine the learning communities component of PSP in some detail (PC1).

The learning communities concept formed the core of the Piedmont Schools Project reform effort. According to the PSP proposal, each project school was supposed to be divided into several instructional units, called "learning communities."

> Basic to the PSP organizational pattern was the belief that instructional units should be small enough to allow every person

> to be treated as an individual and large enough to permit role differentiation.[23]

At the elementary level, each learning community occupied a large, open-space room and it involved three or four teachers and about one hundred children.* One teacher in each learning community served as a Learning Community Coordinator (LCC), responsible for the learning community's instructional program.

By the second or third year of the Project, learning communities were by and large accepted as a mature program in the PSP elementary schools. This is not to say, however, that the learning communities in the PSP schools included all the characteristics envisioned in early plans. Although, for example, the teachers in each learning community generally engaged in team planning concerning schedules and classroom space, the degree to which teachers worked jointly to plan the instructional program was more limited. One former PSP administrator explained:

> In many cases, team teaching just turns out to be turn teaching. That is, I take them, then you take them. What is required is team planning. What should the kids learn? What's the best way to teach? How should the kids be grouped?[24]

To the extent that team planning occurred within the PSP learning communities, it required a substantial commitment of teacher time. During the period of federal funding, forty-five minutes of daily team planning time was provided at the elementary school level through the use of para-

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*At the middle school level, each learning community involved about eight teachers and 250 students. At the high school level, the learning communities concept was never fully initiated. The discussion in this section refers mainly to the learning communities program at the elementary level.

professional aides in the related arts (art, music, physical education, health, and safety). While paraprofessionals supervised related arts instruction in each learning community, the teachers in the learning community were able to spend the time planning. But even forty-five minutes of daily team planning was often insufficient, and many teachers put in long, unpaid hours after school to complete the tasks required to keep the learning communities functioning. The extra planning time required to maintain the learning communities eventually began to take its toll. In at least some of the PSP elementary schools, "people got burned out"[25] by the fifth year of the project.

With the termination of federal funds at the end of year five, the Project lost the paraprofessional aides responsible for related arts instruction, and thus the forty-five minutes of daily team planning time was no longer available. The loss of planning time has placed a serious burden on the learning communities, and some observers expect that one consequence will be a reduction in the size of the learning community teams. One PSP staff member explained,

> You'll see a shift from over-ambitious teaching teams of six teachers down to perhaps two teachers.[26]

In summary, then, consistent with the assumptions underlying the extended model, once the system of learning communities was accepted, the Project staff faced a continuing sequence of planning tasks required to maintain the learning communities in operation. Even during the period of federal funding, these tasks placed a heavy burden on the Project staff,

and by the fifth year of the program, certain elements of the learning communities component began to disappear. With the termination of federal funds and the elimination of planning time, a sharp reduction in the size of the learning community teams is likely.

Securing permanent resources: As federal funds began to decline in the final years of the Project, the PSP staff began to devote increasing attention to the search for ways of sustaining components of the program, using local resources. One component for which this issue was especially critical was staff development (PC3a, PC3b).

By all accounts, staff development was one of the most successful ingredients of the Piedmont Schools Project. In the early years of the Project, staff development consisted of a somewhat loose collection of workshops in the summer and in-service training sessions during the school year, funded through the Project, but without much central direction. In the later years of the Project, the staff development component was expanded rather considerably, and directed more specifically toward some of the most critical issues facing PSP. A staff development committee was created to coordinate the in-service training effort, and a summer demonstration school was established, to provide training and guidance in such areas as team teaching.

> During the first two years, staff development followed a scatter-gun approach, with many workshops too brief or not followed up as needed. The summer demonstration school held [in the summer of year four] marked the beginning of more peneteating and long-term staff development activities.[27]

In the fifth year of the Project, the staff development committee began to consider the prospects for the continuation of Project activities following the termination of federal funds. The committee eventually prepared a report including, in part, a recommendation concerning the future of the staff development component.

> [T]he committee believes that staff development is an essential component of continuous professional growth. There is a lack of funds and personnel, the group realizes, to meet the needs of staff in each attendance area of the district. To help meet these needs, the committee recommends that a representative from each area be appointed to a district committee on staff development or that such a committee be formed in each area; that one person (possibly a curriculum generalist) be employed in each area to coordinate staff development; and that funds for staff development be increased.[28]

In addition, the committee also recommended that the PSP schools maintain their affiliation with the regional network of Individually Guided Education (IGE) schools, which provides ongoing workshops and staff support.

The report, however, had little effect. Increased District funds for staff development appeared unlikely. Indeed, the limited financial resources required to maintain affiliation with IGE--such as a few days of teacher release time for participation in workshops--seemed unavailable. One PSP staff member characterized the situation in bleak terms: The District feels "the project is over; get back in line."[29]

In summary, then, the loss of federal funds placed pressure on the Project staff to devote attention to securing permanent resources. Consistent with the hypotheses underlying the extended model, the Project staff began to search for ways of sustaining the staff development component in

the long run. But the search was mostly unsuccessful. Thus, the continued existence of the staff development component at the Project level is in doubt.

Summary: In broad outline, as the previous sections have indicated, the PSP implementation scenario is broadly consistent with the extended model of the implementation process. Both the implementation search and phase-out search processes can be observed in the history of PSP. (See figure 7.1.) Furthermore, the four sets of hypotheses underlying the extended model appear to find support in the PSP interview materials.

There are, however, certain apsects of the PSP story that raise important questions about the extended model. One of the most troubling of these questions concerns the estimation of program component acceptance at the Project level. Much of the energy in the Piedmont Schools Project was devoted to implementing a fairly uniform set of reforms across all of the Project schools. Thus, a judgment of the degree of acceptance of some of the program components at the Project level entails a set of corresponding judgments at the school level. This issue is particularly pronounced in the case of the learning communities component. (See the section on Mature programs and tasks, abvoe.) How should the degree of acceptance of learning communities in the eight project schools be combined, to arrive at an assessment of the degree of acceptance of learning communities, project wide?

This question calls attention to the fact that the implementation

processes at the school and Project levels are only quasi-independent: there is a hierarchical relationship among program components. The extended model, of course, does not include an explicit representation of this hierarchy. In analyzing the learning communities component at the Project level, I have informally aggregated the acceptance and termination of learning communities across schools. The notion of a hierarchical relationship among program components is considered in a bit more detail in Chapter VIII.*

The Piedmont Schools Project also raises one additional question about the adequacy of the extended model. The course of the implementation effort in Greer was influenced by several events whose origin had little to do with the program itself. Shortly before the end of the period of federal funding, for example, a Greenville County referendum which would have permitted an increase in the school tax rate was defeated. As a result, the school budget for the School District of Greenville County was extremely tight during the phase-out of federal funds for PSP, and this may have reduced the Project's ability to secure permanent resources to sustain components of the program.**

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*This same issue arises in analyzing the learning communities component at the school level. Judging the degree of acceptance of learning communities at the school level entails judging the degree of acceptance of each learning community within the school.

**In fact, Greer itself voted overwhelmingly against the referendum, and some observers suggested that this may have soured the central administration's interest in PSP. This may account, in part, for the fact that PSP was less successful in securing permanent resources than was Southeast Alternatives, in Minneapolis.

The course of the Project was also influenced in important ways by the lack of strong, indiginous community leadership in Greer. While one of the early objectives of the Project was to help strengthen local leadership in Greer, this proved rather difficult to do.* The lack of a strong voice in support of the Project may have reduced the ability of the PSP staff to gain sufficient administrative assistance from downtown, during the period of federal funding; and it almost certainly reduced the staff's ability to secure permanent resources, when federal funds were terminated.

Altogether, then, the extended model explains some aspects of the PSP implementation story. But there are also some important questions that can be raised about the model's adequacy, at the PSP level. In the following section, the story of the Greenville Experimental Schools Program will be told again, this time focusing on one school: the Greer Middle School. It will quickly become apparent that the model offers a more complete interpretation of the Greer Middle School story than of the PSP level case.

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*The PSP attempt to develop an "industrial workers cooperative," for example, apparently met with resistance from the management of some local textile mills, who feared the cooperative might lead eventually to unionization.

THE GREER MIDDLE SCHOOL

The new middle school in Greer is a striking building. Planned for about one thousand students, it was constructed in 1971, a year before PSP began, to replace the old Greer Junior High, which had been destroyed in fire. As originally designed, the new school contained four large open-space "pods" or clusters, filled with modular furniture and flexible partitions, surrounding a library in the center, and adjoining a gym, little theater, and workrooms for instruction in art and music.

While the new Greer Middle School (GMS) was under construction, the teachers from the old Greer Junior High were assigned to other schools in Greenville, and thus when the Middle School finally opened in the late fall of 1971, it opened with a new teaching staff and a new principal. Most of the teachers who were assigned to Greer Middle had taught in traditional school buildings, and they were unsure what to expect in the new, open-space Middle School. One teacher explained,

> I couldn't visualize it . . . . We didn't know how it would be organized. I was under the impression that all language arts would be taught in one cluster, mathematics in another, and so on.[30]

This was not, however, what the planners of the Greer Middle School had in mind. Instead, each cluster was supposed to be occupied by a team of teachers, from the core subjects of mathematics, language arts, social studies, and science.

During the first year in the new school, the students were divided into nine groups of 150. Four groups were assigned to the large open-space

rooms in the morning, for instruction in the basic subject matter areas, while the other groups were engaged in related arts instruction. Four other groups were assigned to the open-space rooms in the afternoons. The ninth group, which was required as a result of overcrowding, was located in a portable "satellite" room. Every three weeks, the nine groups rotated, so that no single group would have to use the satellite room permanently.

The planners of Greer Middle School hoped that the large, open-space rooms would encourage teachers to work together to create a more flexible program of instruction, integrating the basic subject matter areas, and focusing on the "whole child." This is not, however, what occurred. One teacher commented:

> We went into it completely unprepared. Materials hadn't arrived, and we had no in-service training. We were a large faculty, and no one knew each other . . . . There weren't a lot of people who knew what they were doing. It was sink or swim. It was a time for suicidal thoughts.[31]

In the winter of the first year at the Greer Middle School, teachers and administrators learned that Greenville had submitted a successful Experimental Schools Program proposal, and the project was supposed to include the schools in Greer. While the proposed project provided an opportunity to expand upon some of the original hopes for Greer Middle School, it also came at a time when the staff and administration of the school were exhausted from several months of conflict and controversy.

> There was lots of jealousy among learning communities. Everyone felt frustration and exhaustion, and we turned it on each other.[32]

As Greer Middle School entered the summer of in-service training before

the Piedmont Schools Project, the original principal resigned, and he was replaced by a man who had served as principal of an open elementary school in Alabama. The new principal, together with some of the Middle School teachers who were most commited to the theories of individualized instruction outlined in the PSP proposal, began their efforts as an implementing organization, to expand on some of the program elements which had proved elusive during the first difficult year at the school.

The implementation scenario: A first question to ask about the implementation process at Greer Middle School is: To what extent does the history of the implementation effort correspond to the scenario generated by the extended model? Answering this question requires an examination of the program components initiated, terminated, and accepted over the course of the project.

In the summer before the first year of PSP, the staff at Greer expanded substantially upon some of the reforms that had been attempted during the previous year at the school. Capitalizing on the four, large open-space classrooms, the staff introduced a program of learning communities, which were supposed to involve team teaching, multi-age grouping, learning centers, and multiple learning modes (PC1). While certain elements of the learning communities component were eventually accepted as a mature program, most were not.

A second component of the new program was a system of daily advisory groups, based on the methods of William Glasser's Reality Therapy (PC2).

The advisory groups were soon terminated.

As a third component of the program, the Middle School purchased a large number of individualized curriculum packages to replace the standard sequence of textbooks (PC3a). Many of the curriculum packages were eventually discarded.

The fourth component of the program introduced at Greer Middle School was a system of differentiated staffing (PC4). The system was accepted as a mature program, but some of the new staff positions that were created did not survive the termination of federal funds.

The fifth component initiated at GMS was an Instructional Improvement Committee (PC3). The Instructional Improvement Committee (IIC), composed of a teacher representative from each learning community, was supposed to make decisions on the school's educational policy. Although the powers of the IIC were never fully clarified, it continued to meet throughout the period of federal funding.

The final component of the program initiated during the first summer of the project was a system of staff development, designed to support the other elements of the program (PC6). It was fully accepted as a mature program, and it at least in part survived the termination of federal funds.

Thus, over the first few months of the Piedmont Schools Project, six program components were initiated at the Greer Middle School. This pace of initiation activity did not continue throughout the rest of the project, however. Indeed, no new programs were initiated until the spring

of year two, when the implementing organization began work on a significant extension of one program component and started the initiation of two others.

In the spring of year two, the Greer staff began an effort to coordinate the individualized curriculum, by combining elements of the curriculum packages purchased in the first year with some more standard academic textbooks (PC3b). In part, this effort was designed to increase the continuity between grade levels at the school. The new curriculum survived to become a mature program, but some of the individualized materials fell from use with the termination of federal funds.

Also beginning in the spring of year two, the staff initiated a program to improve the use and interpretation of tests at GMS (PC7). It was fully accepted as a mature program. Finally, the staff also began an extensive effort to improve student motivation and morale (PC8).

In general, the process of initiating new programs at GMS is fairly consistent with the scenario generated by the extended model. In the first few months of the program, six program components were initiated: learning communities, advisory groups, individualized curriculum materials, differentiated staffing, the Instructional Improvement Committee, and staff development. Following an extraordinary burst of activity, little was initiated for almost a year. Then, beginning in the spring of year two, initiation activity resumed, and work began on three program components: an extension of the individualized curriculum, a program of test use, and an effort to improve motivation and morale.

The Greer Middle School implementation scenario is shown graphically in figure 7.3. The detailed evidence from which this scenario was derived is shown in figure 7.4 (located at the end of the Chapter). For a discussion of the quantification procedures involved, see Appendix C.

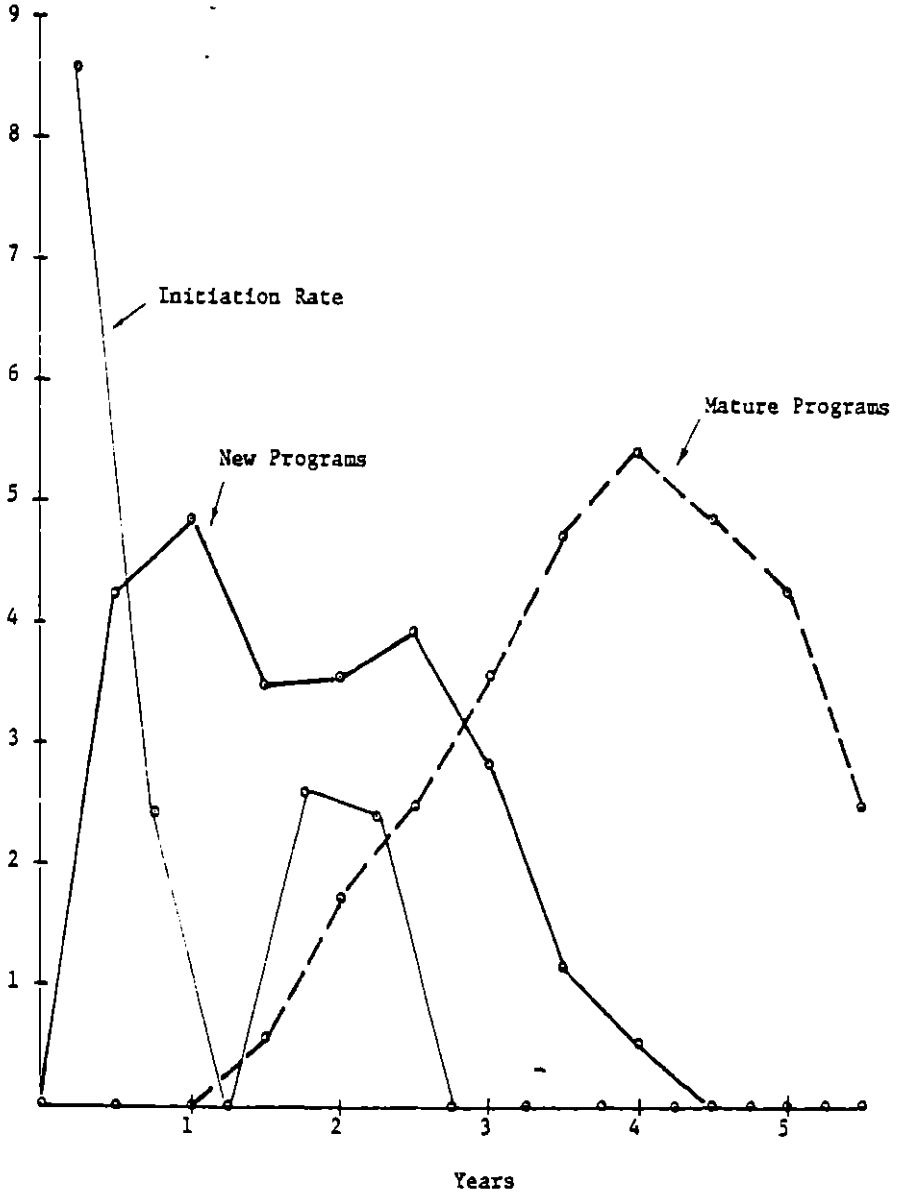

Figure 7.3. The Greer Middle School Implementation Scenario

New programs and problems: A first question to ask about the implementation scenario at the Greer Middle School is: Why did the initiation of new programs drop dramatically in the first year? To what extent do the hypotheses on problem generation underlying the extended model offer a reasonable explanation? To answer this question, it will be helpful to examine one of the early program components initiated at GMS--learning communities (PC1)--in somewhat more detail.

The learning communities program initiated during the first year of the Piedmont Schools Project differed in some important respects from the cluster arrangement that had been attempted during the previous year at Greer. Perhaps the most significant change concerned the use of space. During the year befor PSP began, there were nine learning communities, which shared the four open-space classrooms and a satellite room on a rotating basis, with each learning community meeting in one of the classrooms either in the morning or in the afternoon. For the first year of PSP, however, the number of learning communities was reduced to five. (This of course increased the number of students in each learning community from 150 to 250, and the number of teachers from five to eight.) Four of the five learning communities were permanently assigned to the four, large open-space classrooms, and the fifth learning community was permanently assigned to a new room that had been created by remodeling a portion of the gym. Thus, when PSP began, the teachers in each learning community were able to remain in the same classroom throughout the day. Students remained in their learning communities except during periods of instruction

in the related arts.

According to project plans, the eight teachers in each learning community were supposed to work together as a team to devise and conduct the instructional program in their learning community. The teaching teams were encouraged to develop flexible schedules, oriented toward the individual needs of each student. Thus, for example, class periods in each learning community were not necessarily to be restricted to forty-five minutes each, nor were students necessarily to be grouped by age, in classes each having thirty members. Furthermore, the teachers were supposed to find ways of integrating instruction across subject matter areas.

All of this proved exceedingly difficult to do. For one thing, concepts that seemed clear in the PSP proposal proved hard to apply in practice. One teacher explained:

> [One] problem was that there was no place to go to see what the words in the PSP proposal meant. What did words like "individualization" or "teaming" mean? . . . . The people who wrote about open classrooms said there should be no acceptable noise level. But what is that? How do I achieve it?[33]

Furthermore, the teachers in each learning community had little time for contact with those in the others. This promoted feelings of jealousy.

> There was never time to take a break. Each learning community became a closed community. There were five separate groups, each jealous and protective, in one school. . . . For the first time, I felt feelings of hate, and guilt, and failure.[34]

All of these problems were made worse by the logistical difficulties involved in managing the movements of 250 students in and out of the large, open-space classrooms. According to many teachers, there was "a definite

lack of discipline . . . . There was mayhem in the halls, and the noise level was ridiculous."[35]

One teacher summarized the first year of PSP at Greer by saying, "There was too much, too soon, and too fast."[36] Another said,

> Many people wanted to try everything at once. As we began working, we found we had to back up and slow down. We had to start over and try one thing at a time.[37]

The problems generated by the learning communities program at Greer took their toll. By the end of the first year of PSP, the school's Program Manager, who had served for less than a year, resigned. The man who was appointed in his place, the school's third Program Manager in less than three years, had a clear mandate from the Greenville School District: "to bring stability to the school."[38]

The new Program Manager focused his effort on getting "the teachers of the school to see the school administration as a resource for problem solving."[39] He devoted much of his attention to the problems of discipline and order at the school, and he de-emphasized some of the more ambitious objectives of the learning community program. For example, he opposed the PSP philosophy of multi-age grouping. And he eliminated the notion of interdisciplinary team teaching as a major element of the seventh and eighth grade programs.

> We don't team at the seventh and eighth grades for two reasons: state requirements, and teachers don't like it . . . . It's a waste of time unless you go the whole way, with some teachers having forty-five kids, while others have only six . . . . [And] how are you going to find ways of combining pre-algebra and science? How will a regular teacher find ways in which to do that?[40]

Over the first year of the PSP program at Greer Middle School, then, the learning communities program generated some significant problems. As these problems began to pile up, two things occurred, both of them consistent with the hypotheses underlying the extended model. First, attention began to shift from initiating new programs to solving some of the immediate problems the learning communities program had generated. Second, some of the more ambitious features of the learning communities component were terminated.

The pressure to initiate new programs: Program initiation activity declined over the first year and a half of the Project at Greer Middle School, but, beginning at the end of the second year of the Project, initiation activity started to increase. To examine the extent to which the hypotheses on initiation pressure underlying the extended model offer an adequate explanation of this charge, it will be useful to focus on two components of the program at Greer which were designed to improve motivation and morale at the school.

From the beginning of the Project, one of the critical staff concerns at Greer Middle School was the students' apparent lack of interest in education. One Greer staff member explained this lack of interest as a consequence of the socioeconomic character of the Greer community:

> Kids at the school are not overly concerned about school work, and this can't be changed over night. It's continued to be a real problem . . . . It's a rough school. Greer is a mill community, and lots of the parents of the kids in this school quit school when they were about fourteen to go to work . . . .

> The overall achievement level is not great, and it will be a long time before it is.[41]

To foster an improvement in student motivation and self-concept, a program of daily advisory groups based on the methods of William Glasser's Reality Therapy was initiated during the first year of the project at Greer (PC2). The advisory groups lasted only a year, however. As one teacher explained it, the advisory groups "were initiated and never followed up. They fizzled out."[42] The problems generated by learning communities and other components of the new program at Greer prevented the staff from giving sufficient attention to the operation of the advisory groups, and they were terminated.

By the third year of the program, things had settled down somewhat, and the new Program Manager was ready to try a second approach to improving student motivation and morale. Through a program of early morning and evening meetings with parents, and broadcasts on radio and television, the Middle School staff attempted to "publicize everything good about the school."[43] In addition, the staff developed ways of "boosting kids" who were doing good things (PC8). This somewhat informal appraoch to improving morale was much more successful than the earlier program of advisory groups. Building the self-concept of students at Greer was taken seriously by the teaching staff, and as one teacher explained, "everybody worked on it."[44]

In summary, then, consistent with the hypotheses on initiation pressure underlying the extended model, as some of the problems generated in the early years of the program at Greer Middle School were resolved,

attention returned to some issues which had been neglected. This shift of attention resulted in a program of boosting motivation and morale, which was fairly successful.

Mature programs and tasks: The growth in mature programs at Greer Middle School began to slow in the middle of the fourth year of the project, and by the fifth year, the pool of mature programs began a steep decline. To assess the extent to which the hypotheses on mature programs and tasks offer an explanation for this shift, it will be useful to return to the learning communities component discussed earlier (PC1).

By the end of the third year of the project, after a large number of revisions and the elimination of some of the more ambitious objectives, the program of learning communities reached a fairly stable form. Generally, the eight teachers in each teaching team ended up dividing their large, open-space learning community into smaller areas resembling traditional classrooms, separated by bookshelves, protable blackboards, and low partitions. Although the teachers in each team tended to teach more-or-less independently, they also engaged in a certain degree of cooperative planning, particularly concerning scheduling, student assignment to classes, and discipline. In addition, each learning community generally included a fair number of "learning centers," containing materials students could use for individualized, self-paced instruction.

Maintaining the program of learning communities at this level required a reasonable commitment of staff energy, particularly for such routine administrative tasks as keeping records on student assignment to

classes, correcting individualized tests, and repairing the materials used in learning centers. During the period of federal funding, these tasks were generally conducted by paraprofessional aides. As federal funds began to decline, however, paraprofessionals could no longer be supported, and the burden of completing these tasks fell on the regular teaching staff. Because of this extra burden, one teacher explained, "now we're going backward again."[45]

Altogether, then, consistent with the hypotheses underlying the extended model, the program of learning communities generated some fairly burdensome ongoing tasks for the staff at Greer Middle School to complete. As federal support began to decline, and less staff attention was available to complete these tasks, the program of learning communities began to drift "backward."

Securing permanent resources: As federal funds began to decline, an increasing portion of the staff attention at Greer was devoted to ways of supporting the program on local resources. To understand the character of this search process, it will be helpful to focus on one program component in particular, staff involvement in decision making (PC3).

In the first few months of the Project, in accordance with the original PSP plan, Greer Middle School introduced an Instructional Improvement Committee (IIC). The IIC, composed of the Learning Community Coordinators from each of the learning communities at Greer and chaired by the Program Manager, was designed to make decisions on educational policy for the

school. During the period of federal funding, Learning Community Coordinators were granted somewhat reduced teaching loads, to permit them to devote attention to the meetings of the IIC. Although the IIC met frequently, however, its powers were never clear. As one teacher put it, the IIC might offer advice, but "the actual final decision about instruction was made by the Program Manager."[46]

After federal funds were terminated, reduced teaching loads could no longer be granted to the Learning Community Coordinators, and this threatened the continued existence of the IIC. Indeed, it became difficult to find teachers willing to accept the Learning Community Coordinator position. One teacher explained that teachers are reluctant to take the job, because:

> You have to do a regular teaching job plus other duties as well. You get the blame when things go wrong, and you get no money.[47]

Thus, a substantial amount of staff attention at Greer has been directed toward the search for volunteers, to take on the Learning Community Coordinator role, and the search for IIC meeting times, when the Learning Community Coordinators are free to attend. The long-run prospects for the IIC are doubtful. One administrator commented:

> Teachers don't want to be bothered. They want to complain, but they don't want to meet in brainstorming sessions to come up with solutions.[48]

Whether this is true is uncertain. But it seems unlikely that a volunteer IIC can survive.

In summary, the termination of federal funds led the staff at Greer Middle School to search for ways of maintaining the program of staff involvement in decision making. Most of the staff effort has gone into an attempt to sustain the program on a voluntary basis. Little has gone into a search for additional local resources.

Summary: Overall, the Greer Middle School story is fairly consistent with the extended model of the implementation process. An implementation search process, involving alternating periods of overextension and retreat, is clearly visible in the initiation of new programs at the Middle School. Furthermore, the Middle School case materials are nicely consistent with the four sets of assumptions underlying the extended model. This is particularly true of the assumptions about new programs and problems--which are well supported by the evidence on Greer Middle School's efforts to implement learning communities. (See the section on New programs and problems, above.)

In fact, the Middle School's attempt to implement learning communities provides a particularly striking example of one possible course the implementation search process can take. The overextension of the implementing organization's capacity in the first year of the Project at the Greer Middle School resulted, not only in a decline in initiation activity and the termination of several program components, but also in the resignation of the Program Manager and the appointment of a new one,

whose main objective was to bring stability to the school. The new Program Manager opposed some of the more controversial elements of the learning community component at Greer, especially interdisciplinary team teaching, and multi-age grouping.

This raises a perplexing question. If the new Program Manager did not view interdisciplinary teaming and multi-age grouping as particularly desirable, should these two elements be included in a judgment of the degree of acceptance of learning communities at Greer Middle School? That is, should the implementation of learning communities be judged on the basis of the standards held by the Program Manager, or by the more ambitious standards held by some members of the Project-level staff? All of this is given more attention in Chapter VIII.

Altogether, the extended model appears to provide a good account of the implementation process at Greer Middle School. Indeed, the model offers a more adequate interpretation of the Middle School case than of the PSP-level story. The following section will examine the Experimental Schools Program in Greenville once again--this time at the School District level. It will soon become apparent that, if the correspondence between the model and the Middle School implementation scenario is fairly close, the correspondence between the model and the School District scenario is relatively weak.

REFORM AND THE SCHOOL DISTRICT OF GREENVILLE COUNTY

When Floyd Hall became Superintendent of the School District of Greenville County, in the summer of 1970, educational achievement in the District was well below the national average. Indeed, the Board of Trustees of the District offered Hall an unusually large salary in the hope that he would be able to produce a significant improvement in the academic performance of Greenville students. In return, as one observer explained, Hall promised the District a "measurable improvement in two or three years, or he would resign."[49]

The task Hall faced was a formidable one. The School District of Greenville County, with 55,000 students, is one of the largest in the country. It is also one of the most socioeconomically diverse. The economy of Greenville is growing rapidly, but at the same time, many residents of the County, both black and white, live in conditions bordering on rural poverty. The process of desegregation, begun just before Hall became Superintendent, to some extent made the educational and economic diversity in the District Schools more visible. Many schools in the County enroll students at both extremes of educational achievement.

When Hall learned of the Experimental Schools Program, less than a year after his appointment as Superintendent, he saw the Program as an opportunity to strengthen his attempt to improve academic performance in Greenville. In particular, he believed the Program might provide a way of expanding upon some ideas that were gaining popularity among some

members of his staff. Some of Hall's staff were beginning to take an interest in the Individually Guided Education Program (IGE) associated with the Institute for the Development of Educational Activities; others were interested in affective education; and others were interested in open classrooms. To the extent that some of these ideas succeeded in improving academic performance in the Project, they might be transplanted to other areas of the District. Thus, the story of the Experimental Schools Program at the District level is the story of Hall's effort to draw on an interconnected set of reform ideas to improve educational achievement in Greenville.

The implementation scenario: A first question to ask about the reform effort in Greenville is: To what extent is the history of the Experimental Schools Program at the District level consistent with the scenario generated by the extended model? Answering this question requires identifying the program components initiated over the course of the Project, and estimating the degree to which they were accepted or terminated.

As the Experimental Schools Program began, the District was engaged in an effort to improve academic performance through individualization of instruction (PC1). The emphasis on individualization persisted over the course of the Project, although the character of the effort changed somewhat, from instruction broadly defined to include a variety of educational subject-matter areas, to instruction in the basic skills. Indeed, by the fifth year of the Project, the District adopted a set of

minimum-competency requirements for graduation, which are currently being pilot-tested.

The District's interest in individualization was closely coupled with a second concern. When the Project began, the junior high schools in Greenville did not follow any single pattern of operation: Different junior high schools included somewhat different grade combinations, from grades six through nine. Over the first year of the Project, Superintendent Hall initiated an effort to develop a new "middle school" program in Greenville, to replace the somewhat mixed system of junior highs (PC2).

During the third year of the Project, Greenville instituted a fairly substantial reorganization of the District's decentralized Area structure (PC3). The number of administrative areas was eventually increased from four to five, each Area was provided additional staff, and new office buildings were constructed to replace the older offices, which had been located in Area schools.*

At about the same time, the District began an effort to strengthen its program of staff development (PC4). Teachers attending District-organized staff development workshops were granted credit which could be used to meet the State's professional education requirement for

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*When Greenville was awarded the E.S.P. contract, the six Greer schools were established as a separate "Piedmont Schools Project" Area, in addition to the four regular administrative Areas of the District. At the end of the period of federal funding, the six Greer schools were combined with eleven other schools to form a nineteen-school "Piedmont Area"--bringing the total number of administrative Areas in the District to five.

continuing certification.

In the final year of external funding for the Piedmont Schools Project, two additional programs were initiated in Greenville. First, in accordance with a new State law, each school in Greenville was required to form a parent advisory council, with representatives from key groups in the community (PC5). And finally, the District established a central evaluation unit, drawing on the evaluation staff from PSP (PC6).

The District-level implementation scenario is for several reasons rather difficult to compare with the scenario generated by the extended model. First of all, it is rather difficult to identify in precise terms the programs components that were initiated. While there is quite a bit of evidence to indicate that the District initiated an effort to individualize instruction, for example, it is difficult to know what the program was supposed to entail, and it is even more difficult to estimate the degree to which it was eventually accepted. Partially as a consequence of this, it is also somewhat difficult to determine when each program component was initiated. The effort to introduce individualization, for example, began at about the time the PSP proposal was written, and it continued for at least several years.

Because of these difficulties, the construction of a quantitative implementation scenario at the District level similar to those created at the project and school levels would seem to be a rather meaningless exercise. Nevertheless, the evidence does warrant some conclusions

about the broad outline of the District-level implementation scenario in Greenville.

In very general terms, the initiation of program components appears to have proceeded at a fairly constant pace over the period for which I have evidence (1972-1977). In the implementation scenario generated by the extended model, on the other hand, the rate at which new programs are initiated exhibits alternating periods of decline and renewed growth. Thus, the qualitative District-level scenario is inconsistent with the extended model. To explore some of the reasons for this inconsistency, I will examine the adequacy of the model hypotheses at the District level in some detail, in the next four sections. Following that, in the Summary, I will discuss some of the difficulties involved in identifying program components at the District level.

New programs and problems: The pace of the reform effort in Greenville remained fairly constant between 1972 and 1977. Thus, the hypotheses on new programs and problems underlying the extended model appear to be disconfirmed at the District level. To examine some of the reasons for the inadequacy of the hypotheses on new programs and problems at the District level, it will be helpful to consider one program component in some detail--individualization of instruction (PC1).

The notion of individualized instruction was gaining considerable support among the administrative staff of the School District of Greenville County, in the early seventies. Individualization formed a

central element of the PSP proposal, and, as one administrator explained, the inclusion of individualization in the proposal "was a given. No one questioned that."[50]

Apparently, the primary motivation for individualization in Greenville came from desegregation. Particularly at the elementary level, desegregation in Greenville resulted in schools with a broad range of children, from extremely poor to upper middle class. Because U.S. Office of Civil Rights guidelines prohibited assigning children to classrooms on the basis of race, socioeconomic status, or test scores, many classrooms in Greenville reflected the economic, racial, and educational diversity of Greenville itself. Individualization arose as a means of managing this diversity. By 1973, individualization of instruction emerged as a key part of the District's "sixteen goal" educational plan:

> Under the plan, every school in the District was to design and implement programs to better meet the individual needs of students.[51]

The District took several approaches to encourage individualization. Starting the third year of PSP, for example, schools from throughout Greenville were selected to participate in the PSP "Transference" program, involving workshops oriented toward the implementation of individualization and learning communities. And by 1977, the District had developed curriculum guides for individualized

instruction in five subject matter areas, to be used across Greenville.*

My evidence is insufficient to assess the extent to which individualization has been accepted as a mature program in the District. But there is some indication that the character of individualization has undergone a fairly substantial shift in the last few years. Originally, individualization was rather broadly defined to include a wide range of educational activities, emphasizing the "whole child." More recently, however, individualization has begun to focus primarily on the "three R's." Observers of the Greenville schools attribute this shift to the national back to basics movement. One commentator, for example, explained:

> [The Superintendent] isn't very good at public relations. Now he's emphasizing basic education because of public noises in that area. . . . One problem we had in IGE [Individually Guided Education] was not really establishing expectations for achievement.[52]

In summary, then, the District-level program of individualization was initiated over a period of several years. While some problems were no doubt generated by the program, it is difficult to detect either of the effects of problem-generation hypothesized in the extended model. The pace of initiation activity did not decline, nor did the proportion of new programs accepted fall off. Instead, the character of the individualization program began to shift--but this is largely a

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*These were unrelated to the curriculum guides developed by PSP in year 3.

consequence of a national movement, not of the "problems generated by new programs."

The pressure to initiate new programs: In the scenario generated by the extended model, the pressure to initiate new programs produces a period of renewed initiation activity, following an early period of decline. The fact that this renewed period of initiation activity is not present in the District-level scenario suggests that the hypotheses on initiation pressure are disconfirmed at the District level. There is, however, some indication that a "pressure to initiate new programs" had some influence on the course of the District-level reform effort--although this pressure did not operate in accordance with the hypotheses underlying the model. To examine this a bit more fully, it will be helpful to consider the history of the District-wide evaluation office, introduced in the final year of funding for PSP (PC6).

The notion of establishing a District evaluation office grew more or less directly out of the Piedmont Schools Project. Over the period of federal funding, PSP developed a formative evaluation staff especially experienced in working with teachers to help construct and interpret tests. As federal funds for the Project began to decline, the PSP evaluation director, together with a panel of three consultants, drafted a report on the feasibility of creating a similar formative evaluation unit for the School District.

The proposal was adopted by the Superintendent, and, at the

beginning of the fifth year of the Project, the PSP director of evaluation was given a joint appointment as the Greenville Coordinator of Evaluation. At the end of the period of federal funding for PSP, three of the PSP formative evaluation staff members were transferred to the new District evaluation office, to work under the Coordinator.

Apparently, the new evaluation office has begun to have some impact. One Greenville administrator explained that, before the creation of the new evaluation office, the results of the District's regular State-mandated testing program were simply filed away.[53] Now, results are returned to teachers, and members of the evaluation team provide assistance in interpreting the scores.

Perhaps one reason for the growth of the District evaluation office lies in the fact that the Board of Trustees for the District recently adopted a "promotion-retention" policy, requiring all twelfth grade students to be tested. Under the program, only those students scoring above the seventh grade level are permitted to graduate; those who score below the seventh grade level are supposed to receive remedial instruction. Presumably, the Board's minimum competency policy has placed pressure on the central office to expand its evaluation capability.*

In summary, then, the establishment of the District evaluation

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*Because the District lacks sufficient funds to support a complete remedial program, the "promotion-retention" policy has not yet been put into full effect. Instead, it is being "piloted" in a small number of schools.

office seems to have been a result of a "pressure to initiate new programs," but the pressure arose, not from the difference between an initiation goal and initiation performance, as postulated in the extended model, but rather from two somewhat different sources. First, declining federal funds placed pressure on the PSP evaluation team to find a new source of support. And second, the national "minimum competency" movement placed pressure on the District to expand its evaluation staff. In some respects, then, the introduction of a new District-level evaluation unit was the result of a lucky coincidence of two somewhat distinct pressures.

Mature programs and tasks: Although the course of the reform effort in Greenville and the scenario generated by the extended model are fairly dissimilar, the District-level case does provide some support for the hypotheses on mature programs and tasks underlying the model. This is especially clear in the District's effort to establish a new program of middle schools to replace the traditional system of junior highs (PC2).

When Superintendent Hall arrived in Greenville, the junior high system in the District was a "hodgepodge."[54] Different schools included different combinations of grades, from six through nine, and District administrators were dissatisfied with both the quality of instruction and the learning climate at the junior high level. As a result, the central office initiated an effort to reorganize the junior high program, to establish a system of middle schools, each including grades six through

eight. Instruction in the new middle schools was supposed to differ in important ways from instruction in traditional junior highs. While junior high schools are generally organized more or less like high schools, for example, with the school day divided into class periods each devoted to a single subject-matter area, middle schools are supposed to retain some of the character of elementary schools, particularly the interdisciplinary focus on the "whole child." As one middle school administrator explained,

> In a middle school, they do away with traditional junior high activities. There are no annuals, no formal dances, and no athletic inter-school competition. . . . The entire program is supposed to be devoted to the needs of this restless child [aged eleven to fifteen].[55]

While it was fairly simple to reorganize the grade levels of the Greenville middle schools, it proved more difficult to implement a successful program of instruction. For example, as one element of the middle school plan, middle school students were supposed to attend daily "special interest groups" involving a substantial amount of student choice. Interest groups were introduced, but the results were somewhat unexpected. According to one observer, the interest group program "nearly wiped out the whole middle school concept in Greenville. . . . The kids wrecked havoc. They didn't want to do anything."[56]

To move the implementation of the middle schools "off dead center," Superintendent Hall attempted to take advantage of the PSP Transference program. During the fourth year of PSP, he required the principals of all fifteen middle schools to attend a semester-long Transference course

on the administration of comprehensive change. According to the staff member in charge, the course turned out to be a disaster. Most of the middle school principals had no real interest in attending, partly because the course took time away from the critical problems at their schools.

The current status of the middle school program is uncertain. There is little if any interdisciplinary instruction, and the large, open-space classrooms that were included in some of the newly-constructed middle school buildings have generally been divided into smaller, more traditional units. One middle school administrator explained:

> Open space works well for most children, but not all. It requires a great deal of organization and structure. . . . We're moving away from it.[57]

At the same time, there are some signs of progress. For example, the District has just completed a set of curriculum guides for the middle schools, which are currently being pilot-tested. On balance, as one observer put it, the middle schools are probably "sitting on a plateau now."[58]

In summary, then, the history of the effort to implement a program of middle schools in Greenville appears to indicate that the middle schools have continued to generate problems and tasks for the District to face. In this respect, the history of the middle school program is consistent with the hypotheses underlying the extended model. In fact, although the evidence on the middle school program is somewhat thin, the extended model may well provide a reasonable interpretation of the course of

the middle school implementation effort in Greenville, even though it provides a poor interpretation of the District-level reform effort as a whole. This will be considered a bit more fully in the Summary, below.

Securing permanent resources: The reform effort at the District level in Greenville was supported primarily with local resources, and thus the hypotheses in the extended model concerning the phase-out of temporary staff do not strictly apply to the District-level case. There is, however, some indication of a search for permanent resources at the District level, not to replace temporary funds, but rather to sustain programs in the face of tightening local budgets. This is particularly evident in the District's staff development program (PC4).

Staff development at the District level was expanded considerably over the course of Greenville's participation in the Experimental Schools Program. In the middle of the Program, for example, the District established a "point system," through which teachers are able to accumulate credit by attending District-organized staff development sessions, to meet the State certification rule which ordinarily requires that each teacher complete two graduate education courses each five years. In addition, the District established a small teacher center, stocked with curriculum materials and supplies, in each Area office, to provide a place for teachers to gather for seminars and "make and take" curriculum workshops. And following the final year of federal funding

for PSP, several members of the PSP staff development team were added to the District's staff development office, more than doubling the District's overall staff development capacity. Indeed, all staff development activities in the District, including those related to special federal programs, are now coordinated through the District office.

Although the Greenville staff development team has grown remarkably, the District's current financial situation has to some extent limited the degree to which teachers are able to take advantage of this new capacity. A referendum which would have permitted the District to raise its tax rate was overwhelmingly defeated several years ago, and this has put a fairly severe strain on the Greenville budget. As a result, there are no resources available to provide "release time" for teachers to attend workshops during the regular school day. Interestingly, however, the District staff development team has found some clever short-term ways around this problem. Recently, for example, District curriculum specialists served as substitute teachers for teachers who wished to attend a day-long District-organized staff-development workshop on instruction for the gifted. But it is unlikely that strategies such as these can be used too frequently.

The search for resources to sustain the program of staff development, then, has largely involved a piecemeal effort to support one activity at a time, on a school by school basis. One District administrator explained:

> We could have the world's best staff development program in Greenville, if it were a priority in the District. . . . [As it is] there's enough to get by if the principal hustles.[59]

In summary, then, the taxpayers' revolt in Greenville has placed pressure on the staff development team to search for resources to sustain the program. At least over the period for which I have evidence, no new permanent resources have been found. But the staff development team has been able to use existing resources on a school by school basis, by "hustling." In this way, a fairly strong program of staff development has managed to survive.

Summary: Altogether, the story of reform in Greenville raises some serious questions about the adequacy of the extended model at the District level. First of all, the course of the District-level reform effort and the scenario generated by the model are rather dissimilar. Second, many of the hypotheses underlying the model receive little support at the District level.

There are several reasons for the lack of correspondence between model and evidence. First, it is quite difficult to identify the program components that were initiated at the District level, with any precision. And, as I mentioned in the discussion of individualization, there are no clear standards that can be used to assess the degree to which program components, once initiated, were accepted. (See the section on New programs and problems, above.) In addition, the course of the reform effort in Greenville was influenced by changes in the national climate

surrounding education, particularly the rise of the back to basics movement. Thus, for example, achievement in the basic skills took on increasing importance in the implementation of individualized instruction, over the course of the reform process.

Perhaps the most critical question the District-level story raises, however, concerns the notion of an "implementing organization." The extended model is supposed to apply to situations in which there is an identifiable organizational unit engaged in implementation--that is, a well-defined group of actors attempting to implement something. In analyzing the District-level case, who ought to be included in the implementing organization?

There is no clear answer to this question. Indeed, the reform process at the District level appears to be the result of a collection of somewhat independent implementation efforts, each involving a somewhat separate implementing organization. For example, staff development involved one group of actors at the District level, and evaluation involved a somewhat (but not entirely) separate group. Individualization may well have involved the activities of quite a number of somewhat distinct groups, with somewhat distinct aims, ambitions, and resources.

Altogether, then, it is probably inaccurate to analyze the District-level reform effort in Greenville as if it were the result of the activities of a single, identifiable implementing organization. Instead, the reform process at the District level ought to be analyzed as a collection of quasi-independent implementation efforts. It is

perhaps for this reason that, while the model does not provide an adequate interpretation of the overall District-level reform effort, it appears to provide a reasonable account of the effort to implement a program of middle schools.

In summary, then, the extended model offers only a weak interpretation of the District-level story in Greenville. In Chapter VIII, I will draw on the District, Project, and School-level cases in Greenville, along with the District, Project, and School-level cases in Minneapolis, to conduct an overall assessment of the adequacy of the model.

Figure 7.2a PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Summer 1	PC1. Over the first year of the program, each of the 6 Piedmont Schools Project (PSP) elementary schools was divided into a small number of open-space, multiteacher learning communities, based largely on the concepts of Individually Guided Education (IGE). Each learning community was supposed to individualize instruction, by employing team teaching, learning centers, multiple learning modes, and multiage grouping. The learning communities were also supposed to emphasize a "success orientation." Learning communities were also formed at the Greer Middle School and at Greer High School.	P1.1. Although IGE (Individually Guided Education) formed a central element of the PSP instructional process model, only the elementary-level IGE program was fully developed when PSP began. The middle-school IGE model became available in PSP year 3, and the high school model in year 5.	
	PC2. A program of differentiated staffing was introduced. One central element in the program was the division of the traditional building principle role into 2 coequal roles: the Program Manager, responsible for instruction; and the Facilitator of Operations, responsible for administration and physical plant. The Program Managers reported to the PSP Manager of School Programs, and the Facilitators of Operations reported to the PSP Project Manager of Business Operations. In addition, resource coordinator positions were gradually established in about 14 subject-matter areas. The resource coordinators were supposed to report to the PSP Manager of Staff Support Services. The Manager of School Programs, the Manager of Business Operations, and the Manager of Staff Support Services were supposed to report to the PSP Director.	P2.1. At the time Greenville applied for the ESP grant, the School District was divided in 4 administrative areas. PSP was made a fifth area, and the project Director was appointed Area Superintendent. This meant the PSP Director had to spend a good deal of his time on regular administrative duties.	

Figure 7.2b PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
	PC3a. Over the first year of the Program, PSP introduced a large number of commercial, individualized curriculum packages, especially at the elementary and middle school levels. At the high school, PSP introduced a quarter-system, short-courses, and a program of independent study called "Cooperatively Planned Units."		
	PC4. To involve the school community in decision making, the PSP staff introduced a 3-tier decision making system. Decisions on day-to-day instruction were supposed to be made within the school learning communities. Decisions on school policy were to be made by an Instructional Improvement Committee at each school, composed of the school's learning community coordinators and chaired by the school's Program Manager. Decisions on project policy were to be made by a PSP Instructional Improvement Committee, composed of the school Program Managers and chaired by the PSP Manager of School Programs.		

Figure 7.2c PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
	PC5a. PSP introduced an on-going program of summer workshops and in-service training sessions, designed to support the development of learning communities, individualized instruction, and participatory decision making. As part of the staff development program, PSP established 2 novel staff positions: the elementary and secondary "Furman Liaisons." The Furman Liaisons were members of the faculty at Furman University, who provided general direction for the staff development program and supervised in-service training sessions offered for academic credit.	PS.1. The initial elementary level Furman Liaison was new to the University and thus had few associations within the University to draw on, in her work with PSP.	
	PC6. PSP introduced a system of educational Cooperatives, each of which was supposed to represent some segment of the Greer Community. Each Cooperative appointed a representative to serve on the PSP Cooperatives Board. The position of Volunteer Agent was established, to increase community involvement in the schools.		
	PC7a. PSP established a Board of Directors, designed to advise the project and recommend broad policy. The Board included one representative from the Greenville School District Board of Trustees, the South Carolina State Department of Education, the Greenville Chamber of Commerce, Furman University, and a public service organization.		

Figure 7.2d PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
	PC8a. PSP slowly introduced a system of internal evaluation, including a testing program in the cognitive, affective, and psychometer domains, and a series of workshops designed to help teachers use tests.	P8.1. The ESP office in Washington rejected the staff person initially selected by PSP as Director of Internal Evaluation, arguing that he was young and inexperienced.	R8.1. PSP proposed that the person originally selected as Director of Internal Evaluation be appointed instead as an Evaluation Specialist, who would work with a more senior Director, to be hired as soon as an appropriate candidate could be found. An Evaluation Director was finally appointed late in the Fall.
Fall 1		P1.2. Many Greer parents feared that open space classrooms might result in a lack of discipline.	R1.2. The PSP staff spent considerable time with parent groups, to overcome their concerns about open space classrooms. At some elementary schools, the pace at which open space classrooms were introduced was slowed, but open space classrooms were eventually established at all PSP elementary schools.
		P1.3. Children tended to "tear up" or loss the individualized materials contained in the newly-created learning centers.	
		P1.4. Although, according to the PSP proposal, teachers were supposed to teach only those students assigned to their learning communities, thus proved difficult to carry out at Greer High, due to the restrictions imposed by academic requirements and scheduling.	R1.4. The notion of instruction within learning communities at Greer High was abandoned. Learning communities were used instead for occasional planning and decision-making sessions.

Figure 7.2e PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		P2.2. The Greenville School District central office and the Greer community tended to regard the Program Managers in the PSP schools as traditional principals. Questions and problems that should have been handled by the Facilitators of Operations were usually brought to the Program Managers instead.	
		P2.3. Although the Program Manager and Facilitator of Operations roles were supposed to be coequal, the Program Manager tended to be dominant, in each of the PSP schools. While the Program Managers had private offices, the Facilitators of operations generally were assigned fairly meager work space.	
		P4.1. Some conflicting interpretations arose over the meaning of "school community involvement in decision making." Some staff, for example, believed the PSP Instructional Improvement Committee was supposed to make all major project decisions. Others believed it should deal only with cross-school issues.	
		P8.2. The initial internal evaluation plan prepared by PSP was rejected by the ESP office in Washington.	

Figure 7.2f PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Winter 1			R8.2. The PSP internal evaluation team prepared a second evaluation plan. Negotiations and revisions continued for 9 months, until the plan was finally approved by the ESP office in Washington.
			R2.2,2.3. A good deal of staff development energy was devoted to the inequality of the Program Manager and Facilitator of Operations roles, but without success. The Facilitator of Operations position remained secondary.
		P2.4. Conflict erupted between the Manager of School Programs and the other members of the PSP staff.	
		P2.5. The PSP curriculum resource coordinator role proved somewhat difficult to carry out, since the coordinators were supposed to offer support for teachers rather than supervision. At the same time, the 4 resource coordinators in related arts had the additional responsibility of coordinating the elementary school paraprofessionals who served as related arts teachers.	
		P2.6. Some PSP Program Managers feared that the curriculum resource coordinators were attempting to exert too much control over the instructional programs in the PSP schools.	

Figure 7.2g PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		P3.1. The PSP Program Managers objected to some of the curriculum requirements imposed on the PSP schools by the Greenville School District--for example, the use of basal readers.	R3.1. The PSP staff was unable to persuade the Greenville School District to alter the regular curriculum requirements for the PSP schools.
		P4.2. The Program Managers were somewhat uneasy about the apparent decision making authority held by the PSP project-wide administrators (the Management Team).	R4.1,4.2. The PSP Instructional Improvement Committee eventually established a somewhat undefined realm of authority. PSP decision-making was shared by the IIC and the PSP staff.
		PØ.1. Conflict erupted between the PSP staff and the external Level II evaluation team. The PSP staff argued that the Level II evaluators were interfering in project decisions.	
Spring 1		P1.5. Staff at Greer High questioned the value of the 8 learning communities into which the school had been divided.	
			R2.4. The original PSP Manager of School Programs was fired, and a new staff member was hired.
			R2.5. An organization development consultant was employed to improve communications between the resource coordinators, teachers, and Program Managers.

Figure 7.2h PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
			R2.6. To clarify the relationship between the curriculum resource coordinators and the Program Managers in the PSP schools, the position of Manager of Staff Support Services, to whom the curriculum resource coordinators originally reported, was eliminated, and the resource coordinators reported instead to the PSP Manager of School Programs.
		P3.2. PSP teachers and resource coordinators found it difficult to establish guidelines for the systematic selection and use of new materials. As a result, too many materials were ordered, and teachers had difficulty using them properly.	
		P4.3. At some PSP schools, the Instructional Improvement Committees were dominated by the Program Managers.	R4.4. Generally, the school ICC's ended up sharing decision-making authority with the Program Managers, to different degrees at different schools.
		P4.4. Some teachers felt inadequately represented on their school Instructional Improvement Committees.	
		P4.5. The Project IIC had to spend most of its time on administrative concerns, leaving little time for instructional planning.	

Figure 7.2i PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		P6.1. Some PSP Cooperatives failed to meet regularly, particularly those that lacked a basis on well-established Greer community organizations. The industrial workers Cooperative and the Black Cooperative were particularly fragile.	R6.1. The PSP Cooperatives Board became primarily an information-sharing body, although it occasionally made recommendations about the PSP program.
		P7.1. Attendance at Board of Directors meetings was poor, partly because the authority and responsibility of the Board were unclear.	R7.1. The purposes of the Board were not clarified, and it slowly ceased operations.
			RØ.1. In response to pressure from PSP staff, the ESP office in Washington asked a consultant group to review the Level II evaluation problems in Greenville. As a result of the consultants' report, the ESP office required the Level II contractor to replace most of the original Level II staff members.
Summer 2			R1.5. Greer High was redivided into 3 learning communities. One teacher served as the "coordinator" for all 3 learning communities, which met infrequently for occasional planning sessions.

Figure 7.2j PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Fall 2		PØ.2. During the first year of the program, PSP did not spend the total amount budgeted for the year, partly as a result of an inability to fill certain staff positions. In order to use the resulting "under-run" funds for PSP year 2, PSP had to negotiate a new budget with the ESP office in Washington.	RØ.2. Negotiating a budget for the "under-run" funds from PSP year 1 proved to be a time-consuming project.
		P4.4. Some members of the Project IIC complained that too much time was being spent in meetings.	
			R3.2. Many of the new curriculum materials purchased in the first year of PSP were eventually discarded.
			R3.2. To clarify the decision-making process involved in purchasing new curriculum materials for a school, the Manager of School Programs required purchase requisitions to be signed by both the appropriate curriculum resource coordinator and the school's Program Manager.
		P3.3. The South Carolina State Department of Education opposed granting credit for the "Cooperatively Planned Units" (CPUs), units of independent study developed as part of the PSP curriculum at Greer High School.	

Figure 7.2k PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Winter 2	PC3b. To establish a more integrated curriculum for PSP, the Manager of School Programs initiated a large-scale effort to prepare curriculum guides in ten subject-matter areas. The curriculum guides were supposed to lead eventually to the formulation of pupil performance objectives and assessment exercises.	PØ.3. Conflicts continued between the PSP staff and the new Level II team.	
Spring 2			R3.3. Greer High and the State Department of Education eventually developed a system of forms which had to be filled out and approved in order for a student to obtain credit for a CPU. The procedure proved so cumbersome that few students elected to participate in the CPU program. R4.4. The Project IIC decided to meet bi-weekly rather than weekly and to delegate some of its administrative duties to the PSP staff. RØ.3. The ESP office in Washington cancelled the remaining portion of the original Level II contract. Over the following year, ESP prepared a detailed RFP for a new Level II contract competition. A new contract was awarded in the Summer of PSP year 4.

Figure 7.21 PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Summer 3	PC9. A new PSP position was established, the Coordinator of Transference, to direct a program designed to implement promising PSP practices in other Greenville schools. The transference program began in the Fall.		
		PØ.4. PSP had to begin preparation of the "Continuation Application" required by the ESP Office in Washington to continue funding for the final 2 years of the project.	
Fall 3			RØ.4. The time required to complete the PSP "Continuation Application" turned out to be much larger than anyone anticipated. The writing team eventually prepared a 1000-page draft, which was edited to 650 pages and submitted to the ESP office in Washington in mid-December.
		PØ.5. The GAO conducted an audit of the Experimental Schools Program. In its report on the Greenville project, the GAO concluded that due to the termination of the original Level II evaluation contract, there was insufficient pre-post data to evaluate the effectiveness of PSP. The GAO report threatened the continued funding of PSP.	
	PC7b. PSP reinitiated the Board of Directors as a Professional Liaison Committee, with much the same purposes.	P7.2. The new Committee faced the same problems of authority and responsibility as had the earlier PSP Board of Directors.	R7.2. The Committee continued meeting, but with little sense of direction.

Figure 7.2m PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
	PC8b. The internal evaluation team expanded its efforts to provide testing assistance to teachers and Program Managers. In addition, the internal evaluation team, together with the PSP Board of Cooperatives, initiated a survey of the Greer community, concerning their attitudes about the PSP schools.		
		PØ.6. A Greenville School District referendum requesting additional tax support for the schools was overwhelmingly defeated. This defeat threatened the continued use of paraprofessionals in PSP, following the termination of federal funds.	
		P9.1. The 10 Greenville Schools that participated in the first year of the PSP transference program were selected by the District office, and almost none of them were actually interested in participating.	
Winter 3			RØ.5. The PSP leadership together with the South Carolina Congressional delegation placed pressure on the National Institute of Education to continue PSP funding. In order to provide the pre-post evaluation data demanded by GAO, the PSP internal evaluation team agreed to begin using the CTBS-Q test, which had been given statewide in South Carolina until PSP year 2, when it was discontinued. The internal evaluation team was supposed to provide CTBS-Q data for all PSP schools and for a group of comparison schools. The data was then to be analyzed by a newly-chosen external evaluation contractor.

Figure 7.2n PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
			R9.1. A voluntary selection procedure was devised for the second year of the transference program.
		P9.2. Some Greenville schools participating in the PSP transference program complained that teachers were taken out of their classrooms too frequently for transference activities.	
		P9.3. Some PSP schools felt the transference activities disrupted their programs.	
Spring 3	PC5b. In an effort to improve the organization of the PSP staff development program, a new staff position was established (the Coordinator of Staff Development), and a staff development committee was formed, with representatives from each school. The committee drafted a plan for the continuance of staff development activities after the termination of federal funds.		
		P3.4. The broad curriculum objectives developed in the PSP curriculum guides proved difficult to translate into specific student performance objectives.	R3.4. The effort to develop specific pupil performance objectives and assessment exercises was abandoned.
Summer 4	PC5c. PSP operated a 6-week demonstration school. It was held again the following Summer.		

Figure 7.2o PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		T3.1. Insufficient funds remained in the PSP budget to maintain the curriculum resource coordinators.	S3.1. The PSP curriculum resource coordinator positions were slowly eliminated, and the PSP schools began to rely on the regular Greenville curriculum consultants. The Piedmont Administrative Area was assigned a curriculum generalist to coordinate curriculum development in the Area, and space in the Piedmont Area Office was converted into a curriculum resource room.
Fall 4		PØ.7. Recovering CTBS-Q data from the statewide testing program for the year prior to PSP and for the first 2 years of the program proved to be a monumental task.	RØ.7. Eventually, PSP contracted with a large commercial data processing firm to do the job, which remained incomplete at the end of PSP year 5.
Winter 4			
Spring 4		ST8.1. The Greenville School District lacked sufficient resources to maintain the internal evaluation team for the PSP schools alone, following the termination of federal funds.	S8.1. The Greenville School District conducted a feasibility study to examine the possibility of transferring the PSP internal evaluation team to the District level. The internal evaluation team was moved to the District office in PSP year 5, although long-run financial support remains uncertain.
Summer 5			

Figure 7.2p PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Fall 5		T4.1. Maintaining the school-level Instructional Improvement Committees required a fairly substantial amount of teacher time for meetings and preparation.	S4.1. As the availability of teacher planning time was reduced, due to the loss of PSP paraprofessionals, the school-level ICCs began to meet much less frequently. Some were eliminated completely.
Winter 5		PØ.8. PSP had to prepare its Final Report, due in Washington in June.	
Spring 5		T1.1. Planning time and teacher aides were needed to maintain the PSP system of learning communities and individualized instruction.	S1.1. During the 5 years of federal funding, teacher planning time was available for each learning community when the children were involved in related-arts instruction, which was supervised by paraprofessional aides. Greenville was unable to continue this use of paraprofessionals, and thus planning time was sharply curtailed.
		T5.1. The termination of federal funds eliminated the PSP Coordinator of Staff Development position.	S5.1. The PSP Coordinator of Staff Development was assigned to the Greenville School District staff development program. The PSP schools intended to maintain a program of staff development by continuing their affiliation with the regional network of IGE schools.
Summer 6		T5.2. Within the termination of federal funds, the Piedmont Area was unable to support the Summer demonstration school.	S5.2. The Greenville School District was unable to continue the Summer demonstration school, and as a result it was eliminated.

Figure 7.2q PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		TØ.1. At the end of the 5-year period of federal funding, the Piedmont Administrative Area was requiring to expand to include 11 additional schools, which had been assigned to adjoining Areas during PSP.	
Fall 6		T2.1. The Greenville School District lacked sufficient funds to continue the Facilitator of Operations position at each PSP elementary school and the Business Operations Manager position in the Piedmont Area Office.	S2.1. The PSP Business Operations Manager recommended to the Greenville School District that an Operations Manager position be established in each Area Office, but the recommendation was not adopted. The Facilitator of Operations positions at the elementary schools were eliminated.
		T3.2. Many of the commercial individualized curriculum materials introduced as part of PSP proved costly to maintain.	S3.2. Some of the materials were "laminated" so they could be reused. Others dropped from use.
		T4.2. With the expansion of the Piedmont Area from 8 to 19 schools, the Area-wide Instructional Improvement Committee had to be enlarged to include representatives from the schools that had not been a part of PSP.	S4.2. The outcome was uncertain.
		T5.2. Maintaining affiliation with the IGE program of staff development and training required a commitment of released-time so that teachers could attend in-service sessions.	S5.2. The Greenville School District was unable to provide the amount of teacher released-time required by IGE, and thus the PSP schools could not continue their affiliation with IGE. Several schools attempted to negotiate with IGE to rewrite the usual affiliation contract to eliminate the released-time requirement. The outcome was in doubt.

Figure 7.2r PIEDMONT SCHOOLS PROJECT

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		T6.1. With the expansion of the Piedmont Area from 8 to 19 schools, the Board of Cooperatives was no longer representative.	S6.1. The Cooperatives Board made a request to the Piedmont Area Office to continue in operation. The outcome was uncertain.
		S7.1. With the termination of federal funds, there was little reason for the Professional Liaison Committee to continue meeting.	T7.1. The Professional Liaison Committee was eliminated.
		T9.1. The Greenville schools that entered the PSP transference program in the fourth and fifth years of the program were supposed to enter the "implementation" and "continuation" phases of transference in year 6. With the termination of federal funds, however, support services for the transference schools could not be provided by PSP.	S9.1. The PSP transference program was eliminated as a distinct program. Some elements of transference were absorbed into the District's regular staff development activities.

Figure 7.4a GREER MIDDLE SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Summer 1	PC1. The Greer Middle School, which opened during the school-year before PSP began, contained four open-space learning communities, each designed to house 250 students and 8 teachers. PSP proposed to capitalize on the open-space by introducing an interrelated set of innovations in the instructional process, including team-teaching, multiage grouping, learning centers, and multiple learning modes.	P1.1. The first year in the new Greer Middle School had been a difficult one. Discipline in the large, open-space learning communities was a serious concern, and the Greer principal had resigned at the end of the year. A new principal was not selected until half-way through the Summer.	
		P1.2. Not all of the teachers at Greer fully agreed with the purposes of the PSP. Although teachers were given an opportunity to move to other Greenville schools, some teachers who lived in the Greer area preferred to stay at Greer Middle School, even though they didn't fully support the project.	
	PC2. To foster a "success orientation" among the students at Greer, the staff introduced daily advisory groups, based on the methods of Reality Therapy. The staff also decided to eliminate regular letter grades and replace them with a system of "checks and plusses."		
	PC3. As part of the effort to individualize instruction, Greer purchased a large number of commercial curriculum packages--including SCIS science, MACOS social studies, WISC reading, and IMS math. Regular text books were eliminated.		

Figure 7.4b GREER MIDDLE SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
	PC4. Greer introduced a program of differentiated staffing. The traditional building principal role was divided into two novel roles: the Program Manager, concerned with the instructional program; and the Facilitator of Operations, concerned with administration and physical plant. In addition, a Learning Community Coordinator was appointed to serve as the instructional leader in each learning community.		
	PC5. Greer established an Instructional Improvement Committee (IIC), including each of the Learning Community Coordinators and chaired by the Program Manager. The IIC was supposed to make decisions concerning the school's instructional program.		
	PC6. Greer introduced a program of staff development, to support individualized instruction.	P6.1. The preservice training program for PSP at Greer Middle School lacked direction because a new Program Manager was not appointed for the school until the middle of the Summer.	
Fall 1		P1.3. Teachers were unsure how to organize the open space in the large, 250-student learning communities.	R1.3. Slowly, teachers began to use bookshelves and blackboards to divide the large learning communities into smaller, classroom-sized areas.
		P1.4. Greer teachers found it difficult to determine what the concepts of "team teaching" and "individualization" were supposed to mean in practice.	

Figure 7.4c GREER MIDDLE SCHOOL

YEAR	PROGRAM COMPOMENTS	PROBLEMS AND TASKS	OUTCOMES
		P1.5. There was considerable jealousy among the staff and students of different learning communities.	
		P1.6. Within each learning community, teachers found they had insufficient time for team planning, and insufficient support for interdisciplinary instruction.	
		P2.1. Teachers were uncertain about the concepts of Reality Therapy. Workshops provided insufficient guidance for the teachers to rely on in organizing the daily advisory groups.	
		P3.1. Too many new curriculum materials were purchased, and this tended to create a certain amount of confusion in the curriculum.	
		P3.2. The elimination of regular text books tended to fragment the curriculum. No one was sure what to teach when.	
Winter 1			
Spring 1		P1.7. In an effort to implement the "multi-aging" concept, one learning community attempted to combine seventh and eighth grade students, but this proved difficult, because eighth graders had electives and other privileges ordinarily not granted to seventh graders.	

Figure 7.4d GREER MIDDLE SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		P1.8. Student discipline at the school continued to be a concern.	R1.8. The second program manager at Greer Middle School resigned, and a third was selected.
		P2.2. Parents were confused by the new grading scheme.	
		P3.3. The IMS math curriculum required a smaller student/teacher ratio than was possible at Greer.	
			R6.1. Over time, the Greer staff development program began to focus on specific problem-areas in the school, including, for example, the management of open space.
Summer 2			
Fall 2			R1.3. Over time, the Greer building was modified in order to reduce the size of some of the learning communities. The typical learning community eventually included about 4 teachers and 120 students.
			R1.4. "Team teaching" was eventually abandoned as an objective, in most learning communities, and "team planning and scheduling" was pursued instead. "Individualization" eventually came to mean "grouping by ability," along with an emphasis on the use of individualized curriculum materials located in learning centers.

Figure 7.4e GREER MIDDLE SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
			R1.5. Partly in order to reduce jealousy among students in different learning communities, the Greer program manager decided to assign students to learning communities at random each year--rather than maintain the sixth grade assignments for all three years.
		P1.10. The organization of Greer teachers by academic department reduced the autonomy of the individual learning communities, in devising an instructional program.	R1.10. Over time, responsibility for curriculum development and planning was localized in the academic departments. Planning within learning communities focused primarily on student scheduling and the design of occasional activities designed for the learning community as a whole.
			R2.2. The new program manager at Greer attempted to reinstate regular letter grades, but the IIC objected.
			R3.1,3.2,3.3. Most of the new curriculum materials purchased in the first year of the PSP at Greer were eliminated. Those that were not were generally combined with instruction in regular text books.
		PS.1. The Program Manager viewed the Instructional Improvement Committee primarily as an advisory rather than decision-making board.	R5.1. The IIC eventually stabilized as an advisory unit, with some decision making powers concerning the school budget for curriculum materials and supplies (about $12,000).

Figure 7.4f GREER MIDDLE SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Winter 2		P1.9. The frequent movement of students in and out of learning communities to attend classes in physical education and related arts proved disruptive.	
Spring 2	PC3. Greer began an effort to coordinate the individualized curriculum, by using elements of the commercial packages purchased earlier in PSP, as well as teacher-made materials, to supplement standard textbooks. The academic departments at Greer also attempted to increase the continuity between grade levels and learning communities.		
	PC7. The Greer faculty and administration began working closely with the PSP internal evaluation staff, in an effort to improve the use of tests at the school.		
	PC8. To improve discipline and boost community support for the program at Greer, the staff initiated an effort to increase communications between Greer parents and staff. In addition, the Program Manager introduced various activities to increase student morale.		
Summer 3			
Fall 3		PØ.1. The enrollment at Greer Middle School continued to increase, severely overcrowding the open-space learning communities.	

Figure 7.4g GREER MIDDLE SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
			R1.6. Team teaching and interdisciplinary instruction were more-or-less eliminated as objectives at the seventh and eighth grade levels. Some teaming continued at the sixth grade level.
Winter 3		RØ.1. As a result of overcrowding, some of the learning centers in each learning community had to be eliminated.	
Spring 3			R1.7. Multiage grouping was eliminated as an objective.
Summer 4			RØ.1. In order to alleviate overcrowding in the 4 open-space learning communities, the Little Theater was converted into a fifth learning community, and 11 portable classrooms were added for related-arts instruction and special education.
Fall 4			R1.9. Schedules were changed to reduce movement in and out of learning communities and to stagger attendance at related arts classes for students in different learning communities.
			R2.1. Daily advisory groups were eliminated.
Winter 4			

Figure 7.4h GREER MIDDLE SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
Spring 4			
Summer 5			R2.2. The Greer Middle School program manager finally succeeded in reinstating a system of regular letter grades.
Fall 5		T7.1. The PSP internal evaluation team was assigned to the Greenville School District office, which reduced the time it was able to spend at Greer.	S7.1. The program in testing was curtailed, and its long-term survival was in doubt.
Winter 5		T3.1. The individualized curriculum materials still in use were somewhat costly to maintain.	S3.1. Most of the materials were laminated so they could be reused. Some materials, particularly in science, were dropped.
Spring 5			
Summer 6		T4.1. The Facilitator of Operations position could not be supported on the regular administrative allotment for Greenville middle schools.	S4.1. The Facilitator of Operations position was eliminated, but some of the duties were assigned to an Assistant Principal.
Fall 6		T1.1. Paraprofessional aides could not be supported by the Greenville School District.	S1.1. The loss of paraprofessional aides substantially reduced the time available for team planning within learning communities. Thus, team planning had to be conducted on a voluntary basis after school. The staff began to search for some alternative ways to support team planning, but the outcome was uncertain.

Figure 7.4i GREER MIDDLE SCHOOL

YEAR	PROGRAM COMPONENTS	PROBLEMS AND TASKS	OUTCOMES
		T4.2. Fulfilling the learning community coordinator role required a fairly substantial amount of time, in addition to the time required for regular teaching duties.	S4.2. No permanent arrangements were made to provide extra planning time or additional compensation for teachers serving as learning community coordinators. They became essentially voluntary positions.
		T5.1. Instructional Improvement Committee meetings required a substantial commitment of time by the Learning Community Coordinators.	S5.1. Due to the loss of paraprofessional aides and the resulting reduction of team planning time, teachers no longer had time to attend IIC meetings. Thus, the IIC was eliminated.
		T6.1. Staff development activities for Greer Middle School could not be supported on the Piedmont Area budget, beyond the regular District staff development program.	S6.1. Greer attempted to maintain its affiliation with a regional network of IGE schools, which provides on-going staff development. Affiliation with IGE required a commitment of staff released-time, however, and the Piedmont Area Office did not believe the released-time could be provided. The outcome was uncertain.
		T8.1. Maintaining the program of home-school communication required on-going coordination.	S8.1. The home-school communication program was maintained by the Greer administration, using the regular school budget.

CHAPTER VIII

AN ASSESSMENT OF THE EXTENDED MODEL

In the last two Chapters, I have analyzed the Experimental Schools Program in Minneapolis and Greenville from the perspective offered by the extended model of the implementation process. Altogether, this attempt to relate a formal model and qualitative evidence has raised a somewhat surprising number of questions about implementation and organization theory. Some of these questions pertain directly to a judgment of the adequacy of the model, and I will consider them in this Chapter. Others are more general, and I will postpone them until Chapter IX.

In this Chapter, then, I will attempt to assess the adequacy of the extended model. First, I will look at what the case studies have to say about the assumptions underlying the model, at the school, district, and project levels. Then, I will examine some alternative implementation scenarios generated by the model, under various conditions. All of this suggests a number of broad conclusions about implementation and the management of demonstration projects, which I will present in Chapter IX.

THE ADEQUACY OF THE MODEL

The extended model rests on four sets of assumptions about the implementation process, and the case studies in Minneapolis and Greenville give these assumptions varying degrees of support. In general, the assumptions seem to be most adequate at the school level, less adequate at the project level, and least adequate at the district level. In addition, the cases provide some clarification of some of the central concepts underlying the assumptions, particularly the concepts of program component and quasi-independent implementing organization. In the sections that follow, I will first discuss some of the conceptual issues raised by the cases, and then I will turn to an assessment of the adequacy of the model at each of the three levels.

Identifying program components: One of the central strands of the theory underlying the extended model is the notion that implementation involves a more or less continuous effort to initiate program components--that is, new operating routines, procedures, and performance programs. A large part of the case study analysis was taken up with the task of identifying these program components. Now that the cases have been presented, it is time to consider the notion of a "program component" in somewhat more detail.

As I pointed out in the summary sections of the six case studies, it is sometimes rather difficult to identify the program components that were initiated in the cases; and it is often rather difficult to estimate the

degree to which the program components that were initiated were eventually accepted or terminated. To some extent, these difficulties are bound up in the notion of a program component itself. According to the organization theory with which I began, the objectives of a new policy are likely to be multiple, conflicting, and ambigous. As a result, the program components initiated to implement the policy are likely to be modified and defined over the course of implementation. Thus, there is no precise standard available before implementation begins which can be used in assessing the degree to which a program component has been accepted. Instead, it is necessary to examine each program component as an entity in the course of being developed. The standards to be used in judging the degree to which a program component has been accepted are themselves intertwined in the developing intentions of the implementing organization. To some degree, standards mature along with programs.

In effect, then, program components can be fully identified only retrospectively, after they have been implemented. This view of implementation is somewhat similar to Hannah Arendt's characterization of human action in general:

> In contradistinction to fabrication, where the light by which to judge the finished product is provided by the image or model perceived beforehand by the craftsman's eye, the light that illuminates processes of action, and therefore all historical processes, appears only at their end, frequently when all the participants are dead. Action reveals itself fully only to the storyteller, that is, to the backward glance of the historian, who indeed always knows better what it was all about than the participants.[1]

Identifying program components shares some of the issues involved in the task of interpreting any historical action or document. The question that must be answered is: "What did the author mean?" This is a particularly puzzling question when the program component under study was controversial -- when different actors in the implementing organization held different views of the important aspects of a program component. In this case, whose view is to be taken as authoritative?

These issues arise, for example, in analyzing the "learning communities" program component initiated at the Greer Middle School in Greenville. According to many members of the Piedmont Schools Project Staff, a well functioning learning community was supposed to involve quite a variety of elements, including open space, team teaching, multi-age grouping, mainstreaming, multiple learning modes, and the learning cycle. One difficulty in assessing the degree to which learning communities were accepted lies in determining what each of these elements was supposed to entail. What, for example, is team teaching? The Greer Middle School staff eventually came to the conclusion that team teaching means that the teachers in a learning community should meet together to plan the instructional program. Is this a legitimate approach to team teaching, or should team teaching also include a certain amount of joint instruction? That is, does team teaching require that two or more teachers work with each child in a close coordinated fashion? Is the difference between these notions of team teaching a matter of emphasis? And how much emphasis should be given to team teaching, in comparison to the other elements that are

supposed to be included in a learning community?

There is also a second difficulty involved in assessing the degree to which learning communities were accepted at Greer Middle School. Although the concept of multi-age grouping was included in the original PSP discussions of learning communities, the Program Manager and many (but not all) of the teachers at Greer Middle School did not consider multi-age grouping to be particularly desirable. Thus, the Greer Middle School did not include multi-age grouping in its effort to implement the notion of learning communities. Whose definition, then, ought to be used in assessing the extent to which learning communities were implemented at Greer Middle School? And if multi-age grouping is included in the definition, how much weight should it be given?

Apparently, in estimating the acceptance of a program component, it is necessary to select a particular definition from among the many that were advanced over the implementation effort. If these definitions tend to overlap sufficiently, they may provide a standard to use in judging acceptance. But if the definitions conflict, it is apparently necessary to take a position on issues that were under debate.

Altogether, identifying a program component requires reconstructing a plausible set of intentions and then judging the extent to which what was done in response to the problems the program component generated advanced these intentions or hindered their development. Thus, identifying program components is a process that rests both on the interpretations given by the actors and on the framework provided by theory. In the end, estimating the

degree to which a program component was accepted entails both interpreting the actors' developing intentions and asking whether the problem solutions were adequate, in the light of these intentions. This, then, means that in identifying program components, two sets of criteria -- the criteria used by the actors, and the criteria used in assessing adequate problem solutions -- are to some extent mixed.

This mixture is probably unavoidable. Social science rests on two levels of interpretation: the interpretation given by the actors and the technical interpretation offered by the theorist, and these two levels of interpretation are interrelated. Anthony Giddens, in his analysis of interpretative sociology, has focused on this issue, which he calls "the double heremeneutic."

> Now every competent social actor is himself a social theorist, who as a matter of routine makes interpretations of his own conduct, and of the intentions, reasons, and motives of others as integral to the production of social life. Hence there is necessarily a reciprocal relation between the concepts employed by members of society and those used by sociological observers, or coined by them as neologisms.[2]

The task of interpretation is fairly straightforward for many of the program components initiated in the six cases. For example, for some program components, objectives were reasonably circumscribed, and thus estimating the degree to which problems were solved and acceptance occurred is not difficult. Some program components vanished without a trace almost as soon as they were initiated. For these, estimating the degree of acceptance is not difficult either. But for at least twenty five percent of the program components, defining and estimating acceptance requires imposing

criteria for the adequacy of problem solutions which cannot be easily derived from initial plans. Criteria such as these are needed to estimate the definition and acceptance of "learning communities," for example, or "open classrooms," or "choice." When such criteria were necessary in estimating the adequacy of problem solutions and the acceptance of program components, I tended to impose them fairly loosely, without fully spelling them out. These criteria, and the grounds for choosing them, are given more attention in Chapter IX.

In sum, the study of implementation requires imposing normative criteria that are not fully given in the cases. The difficulties involved in doing this are least severe at the school level, somewhat more severe at the project level, and most severe at the district level. This is in large part due to the fact that the actors involved were more likely to agree among themselves at the lower levels. But there is also another reason, which has to do with the hierarchical relationships that appeared among program components at the three levels. These are discussed in some detail in the following section.

Quasi-independent implementing organizations: I analyzed the Experimental Schools Program in Minneapolis and Greenville on the basis of an assumption that the implementation process in each site could be viewed as a collection of quasi-independent implementation efforts at the school, project, and district levels. Now that the case analyses are complete, it is worth asking about the relationships among the quasi-independent implementing organizations at the three levels. How is

implementation at the school level related to implementation at the project level, and so forth?

While the cases indicate that implementation at each of the three levels involved the continuous initiation of program components, the nature of these program components differed rather substantially from level to level. At the school level, implementation primarily involved the initiation of routines having to do with face to face interactions among parents, teachers, and students. At the project level, implementation involved some program components of this sort, and some program components having to do with administrative and technical support. At the district level, implementation involved components having to do almost entirely with administrative and technical services.

The program of elementary alternatives in Minneapolis provides an interesting example. At the district level, the initiation of alternatives meant establishing various types of administrative procedures concerning, for example: the extra funds that would be made available for schools wishing to create alternative programs; the attendance zones that would be needed to insure racial balance; and the transportation arrangements that would be required to permit students to attend the schools they selected. At the project level, the initiation of alternatives meant deciding upon and developing a small set of alternatives programs and devising procedures for parent choice. At the Marcy Elementary School, initiation meant introducing a particular alternative programs--open classrooms, coupled with parent involvement and so forth.

In the transition from the school to the district level, an important change occurs. At the school level, actions and their consequences were at least somewhat circumscribed, in terms of the actors involved and the organizational setting. The implementing organization at Marcy consisted of a small number of actors, who met together face to face on a continuing, daily basis. The program components introduced were supposed to influence routines which everyone at Marcy could observe, at fairly close range.

At the district level, on the other hand, actions and their consequences were much more diffuse. In Minneapolis, the district level implementing organization included the Superintendent, as well as the Area Superintendents, whose offices are located in three corners of the District, and a large number of administrators responsible for individual schools and programs. The members of the implementing organization met only occasionally on a face to face basis. As a result, the identity of the implementing organization was somewhat problematic. The program components introduced at the district level were supposed to influence instruction in more than fifty elementary schools, and in addition, they were supposed to influence enrollment patterns across the city.

These differences among the three levels have several implications for the study of implementation. First, because of the diffuse identity of the implementing organization at the district level, intentions are less clear and program components are more difficult to define than at the school level. The identity of the implementing organization itself may be a matter of controversy.

Second, there is a hierarchical relationship among some of the program components at the three levels, and this relationship is not simply additive. Program components at the district level are sometimes designed to support or encourage program components at the lower levels. For example, the program of alternatives at the district level in Minneapolis was not simply supposed to be a collection of alternative schools. It was in addition supposed to be a set of support systems and administrative routines designed to encourage and maintain alternatives. In general, the successful implementation of program components at the district level may well depend on the implementation of program components at lower levels, over which the district level implementing organization has only a small influence. Thus, implementation at the district level may be a function not only of the capability of the district level implementing organization, but of the lower level organization as well.

Finally, differences among the levels have one other important implication. At the school level, the implementation process appears to be fairly self-contained. It can be analyzed, at least to a first approximation, in terms of the social system within the school. At the district level, on the other hand, the boundaries around the implementation process are less clear. The district-level reform effort in Minneapolis, for example, included an attempt to influence minority enrollment patterns. But enrollment patterns within Minneapolis are a result, not only of administrative actions by the School District, but also of general social and economic conditions. Consequently, it is difficult to separate an

analysis of implementation at the district level from an analysis of the political economy of Minneapolis.

In other words, the school-level implementation process is somewhat decomposable from the wider political and economic setting; the project level implementation process is somewhat less so; and the district level implementation process is least of all. The extended model, of course, makes no explicit reference to social and economic conditions in the city. In this sense, it treats the implementation process as if it were completely decomposable from the wider setting.

The problem of decomposibility has been studied in formal mathematical terms by Ando, Fisher, and Simon.[3] They have shown that, at least for linear systems, the assumption of complete decomposability is valid in the short run if the system under study is "nearly completely decomposable," which is to say, if the ignored feedbacks between the system and the wider setting are sufficiently weak.* Furthermore,

> If a nearly completely decomposable system is analysed as though it were completely decomposable, the results obtained will remain approximately valid even in the long run as regards the relative behavior of the variables within [the system under study].[4]

The analysis of the case studies indicates that the extended model provides a more adequate explanation of the school level implementation process than of the project or district level process. This is probably due

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*Of course, the extended model is nonlinear, and thus the Ando, Fisher, and Simon theorems do not strictly apply. But the concept of decomposability remains useful, and it provides an interesting way of thinking about the differences among the school, project, and district levels.

in part to the fact that the assumption of decomposability is reasonably valid at the school level, less so at the project level, and least valid at the district level. The following sections will elaborate on this general pattern, by considering the adequacy of the model at each of the three levels, in turn.

The district level: In both Minneapolis and Greenville, the difficulties involved in defining and estimating the acceptance of program components at the district level are severe. As a result, it is impossible to formulate a quantitative implementation scenario for the district level. It is, however, possible to say something about the qualitative characteristics of the implementation process. In both cases, initiation activity at the district level declined slowly over the period under study. There is no evidence of a second phase of increased initiation activity following the initial decline. Thus, for both Minneapolis and Greenville, the qualitative district level scenarios are inconsistent with the scenario generated by the extended model.

Support for the model hypotheses at the district level are mixed. The hypotheses on new programs and problems do not provide a complete explanation for the decline in initiation activity over the period under study. Most of the decline in both cases appears to be a result, not of problems generated by new programs, but rather of socioeconomic and political changes in the districts and changes in national politics -- both of which are external to the model.

Because the district level scenario does not exhibit a period of renewed initiation activity following the early period of decline, the hypotheses on the pressure to initiate new programs also receive little support at the district level. But there is some evidence, at least in Minneapolis, that a pressure to initiate new programs may have accounted for a broadening of the objectives of some of the programs already initiated.

The hypotheses on mature programs and tasks and on securing permanent resources are at least partly confirmed at the district level. Mature programs indeed generated tasks for both districts to face, and in a period of tightening budgets, both districts were confronted with the problem of searching for ways to maintain programs that no longer could be supported on the regular budget.

Given the rather poor pattern of empirical support at the district level, the extended model probably provides an inadequate basis for the analysis of district-level implementation strategies, at least for districts as large and programs as complex as those discussed in the cases. The study does suggest, however, that the model may provide a basis for the analysis of somewhat more circumscribed district-wide projects, presuming that the implementing organization is fairly well defined. For example, the model might provide a reasonable account of a city-wide effort to move from traditional junior high schools to middle schools, more or less analogous to the effort in Greenville, if responsibility for the transition were lodged in a well-defined project organization and if the project

were not too closely intertwined with other district-wide reform efforts. The model might have provided a reasonable account of the implementation of elementary alternatives in Minneapolis, had alternatives not been as closely tied to desegregation.

The project level: The empirical support given the model at the project level is moderately strong. While there are difficulties involved in identifying program components and estimating their acceptance at the project level, these difficulties are not nearly so severe as those at the district level. Thus, it is possible to construct quantitative implementation scenarios for both the Southeast Alternatives Program and the Piedmont Schools Project. Both of the project level scenarios resemble the scenario generated by the extended model in most respects. In both cases, there is an early period of initiation activity, followed by a period of decline, which in turn is followed by a period of renewed initiation activity.

Both cases also provide reasonable support in general for the model bypotheses, although the cases raise some questions about certain assumptions. The hypotheses on new programs and problems appear to explain a portion of the early decline in initiation activity in both cases, but, at least in Southeast Alternatives, there appears to be a second process at work, which is not represented in the extended model. In the scenario generated by the extended model, the early decline in initiation activity is caused by the pile-up of unresolved problems generated by new program components. In the Southeast Alternatives scenario, however, some problems

were generated as part of the debate that took place when new program ideas were proposed. Thus, SEA seems to have been characterized by an "initation search" process more or less analogous to the "implementation search" process explained by the extended model. At the start of the project, some ambitious program ideas were proposed; the pool of program proposals generated problems; and the pool of problems both reduced the rate at which new program ideas were proposed and decreased the proportion of program ideas actually initiated as new program components. This complication could easily be easily be added to the extended model, and it suggests one possible avenue for future model development.

The hypotheses on the pressure to initiate new programs receive a fair degree of support, in both cases. In addition, however, in both cases, external events played some role in stimulating renewed initiation activity. In Southeast Alternatives, the federal project monitor placed pressure on the project staff to extend the elementary alternatives to the secondary level, and this pressure undoubtedly contributed to the eventual initiation of secondary alternatives. In the Piedmont Schools Project, the federal project monitor required the project staff to prepare a massive continuation application, beginning in the summer of the third year of the program. The detailed statement of objectives and plans included in the continuation application may well have stimulated renewed initiation activity.

The hypotheses on mature programs and tasks and on securing permanent resources are moderately well supported. In both cases, mature programs generated significant tasks for the implementing organization to face, and

in both cases, the decline in federal funds created severe pressure to search for permanent resources. The search process was apparently more successful in Minneapolis than in Greenville, although the reasons for this difference are not entirely evident. One explanation may lie in the fact that Southeast Alternatives has had the continuing support of some well-organized Minneapolis parents; parents in Greenville were not as well-organized. Certainly, the assumptions underlying the search for permanent resources in the extended model deserve additional attention.

Altogether, the model probably provides a moderately adequate basis for the analysis of implementation strategies at the project level. Given the fact that external events are likely to play a fairly strong role in project level implementation (as they did in both of the cases under study), and given that the model representations of new programs and problems and the search for permanent resources are somewhat incomplete, scenarios generated by the model should not be taken too literally. But the empirical support provided at the project level in Minneapolis and Greenville lends some confidence in the model.

The school level: The school level implementation scenarios for both the Marcy Elementary School and the Greer Middle School bear a close resemblance to the scenario generated by the extended model. In this respect, the extended model is strongly supported at the school level.

In addition, both cases provide reasonable support for the model hypotheses. Particularly in the Marcy case, the evidence concerning the relationship between new programs and problems is striking. New programs

indeed generated problems, which began to mount up; and the growing pool of unresolved problems both reduced the rate of further initiation and decreased the acceptance of new programs.

Furthermore, there is clear evidence supporting the hypotheses on the pressure to initiate new programs. At the Marcy Elementary School, for example, an ambitious program combining out-of-school learning and staff development was initiated, once the problems generated by early program components had been resolved or eliminated and attention could be given to some of the staff development objectives that had not yet been satisfactorily accomplished.

The hypotheses on the tasks generated by mature programs are also well supported at the school level. Maintaining the program of learning communities at the Greer Middle School, for example, required a substantial commitment of teacher planning time, particularly by the learning community coordinators.

Of the four sets of hypotheses at the school level, those on securing permanent resources receive the weakest support. There is indeed evidence that the decline in federal funds placed pressure on the implementing organization to search for permanent resources. Evidence is not as strong, however, concerning the magnitude of the pressure and the structure of the search process. According to the assumptions underlying the extended model, the search pressure is a function of organizational load, and the effectiveness of the search effort is a function of the relative organizational cost of the implemented mature programs. There is little

evidence that can be used to assess the first of these assumptions, and none at all to assess the second. In both the Marcy Open and the Greer Middle School, organizational load appeared to play a part in generating the pressure to search for permanent resources, but there is insufficient evidence to draw any firm conclusions. There is no evidence one way or another on the relative organizational cost assumption.

In summary, the extended model appears to offer a fairly strong account of the school-level implementation process. There are reasonable grounds to believe that general inferences about school-level implementation drawn from the model would be likely to be born out in actual practice, at least on the average and in the absence of unusual external events. The model is surely not sufficiently precise to generate predictions about the course of specific implementation attempts. And certain aspects of the model -- notably the search for permanent resources -- deserve less confidence than others. But, at least at the school level, and to some extent at the project level as well, the evidence indicates that the model may offer some tentative conclusions about alternative implementation strategies. That is the subject of the section that follows.*

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*For a summary of the qualitative support given each of the nineteen hypotheses underlying the extended model at the school, project, and district levels in Minneapolis and Greenville, see Appendix D.

ALTERNATIVE IMPLEMENTATION SCENARIOS

The basic scenario generated by the extended model of the implementation process was presented in Chapter V, in figure 5.2. The scenario, of course, was generated under a particular set of assumptions, which by now have been discussed in some detail. But it is also worth asking about the implementation scenarios that might be generated under somewhat different assumptions. Looking at alternative implementation scenarios should help provide some insight into the sorts of consequences one might expect from various approaches that might be taken to improve the management of implementation.

One key assumption underlying the basic simulation run presented in Chapter V concerns the pattern of temporary funding provided to support the implementing organization. In the simulation run in Chapter V (reproduced in figure 8.1a), I assumed a pattern of funding qualitatively similar to the funding pattern in the Experimental Schools Programs in Greenville and Minneapolis. That is, I assumed a constant level of temporary outside funds for the first three years of the implementation effort. Outside funds then slowly decline to zero by the end of year six.

It is interesting to examine what might occur if external funds were provided for a somewhat longer period of time. For example, suppose outside funds are provided at a constant level for the first four years, rather than three; and funds decline to zero at the end of seven years, rather than six. How much difference does this make?

The results are shown in figure 8.1b. Perhaps surprisingly, the

level of mature programs at the end of year ten is identical to the level obtained in the standard run. An additional year of funds, corresponding to more than twenty percent of the total level of outside funding, has almost no impact on the eventual level of implementation. The reasons for this lack of impact lie in the system of pressures on the implementing organization.

In the standard scenario, external funds begin to decline at the end of year three. At that time, the problem solving pressure on the implementing organization is fairly low. Indeed, the pool of new programs has just begun a period of renewed growth following more than a year of decline. Thus, the implementing organization has attention available to allot to the search for permanent resources.

But in the second scenario, conditions are somewhat different when external funds begin to decline. By the end of year four, the pool of new programs has already risen for a year, and thus the pressure on problem solving is high. Consequently, the implementing organization has less attention available to allot to the search for permanent resources, and it is unable to maintain the large number of new and mature programs produced during the extra year of funding. As as result, the pool of mature programs falls to almost the level produced in the standard run.

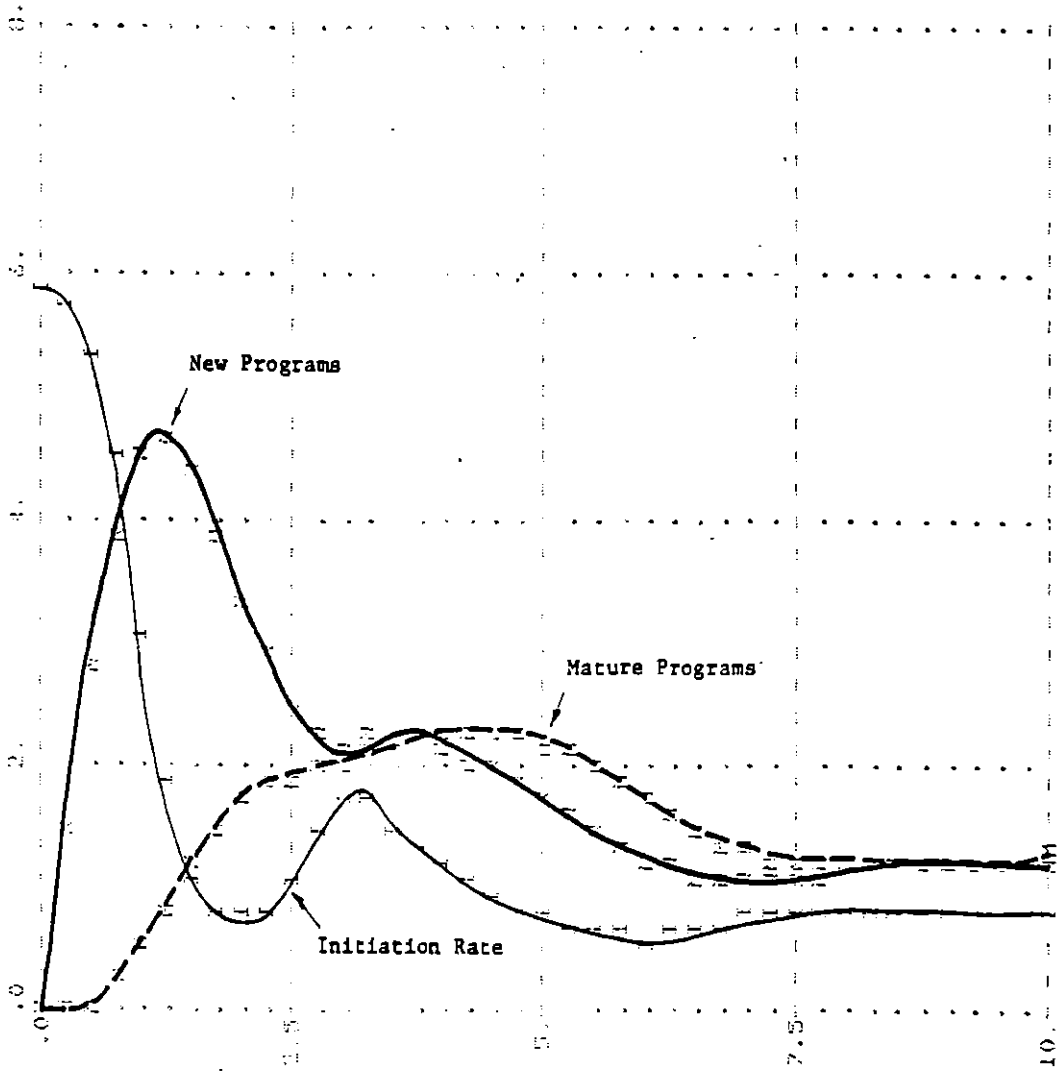

Figure 8.1a. Extended model.

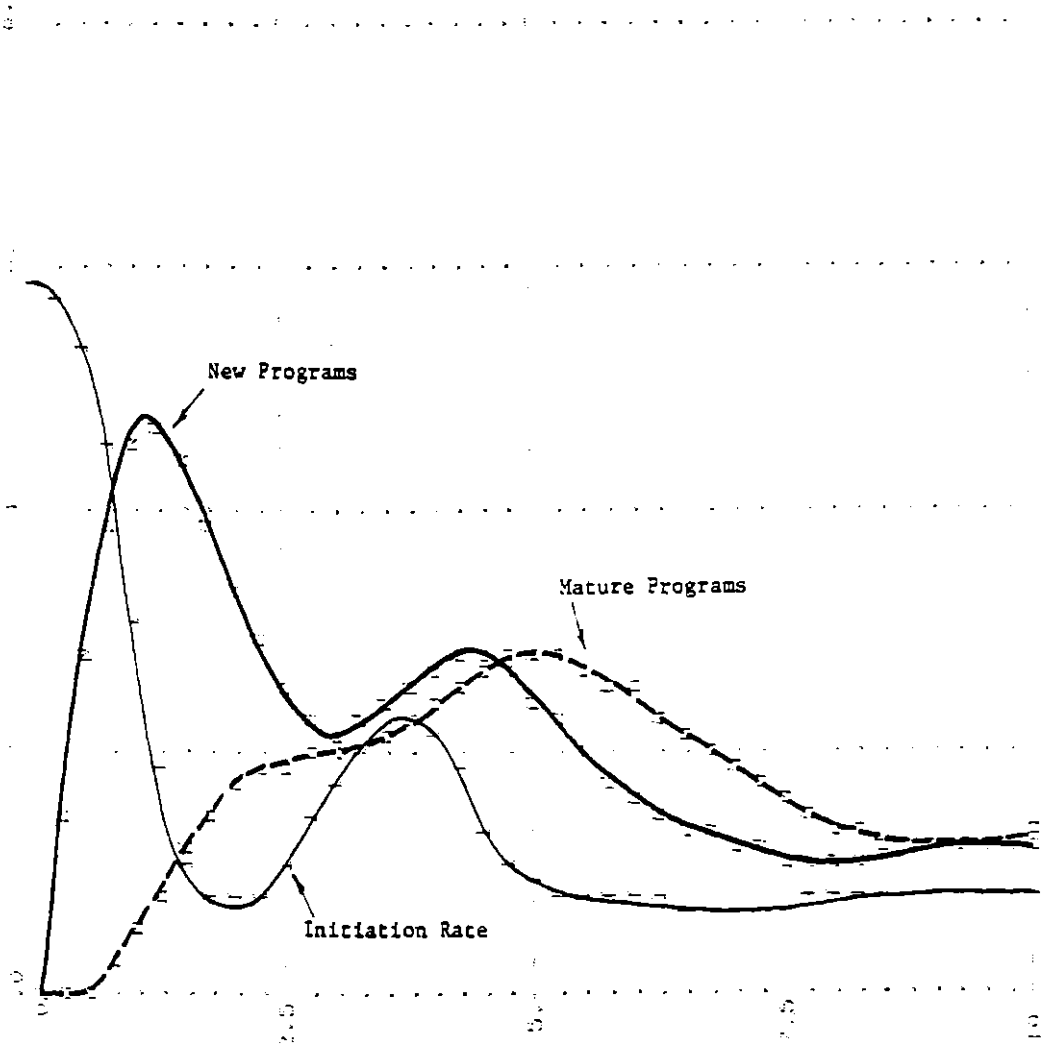

Figure 8.1b. An additional year of external funding.

Another important assumption in the extended model concerns the implementing organization's ability to initiate new programs. According to the assumptions underlying the model, the rate at which programs are initiated depends on the amount of staff attention alloted to program initiation. In other words, I assumed each staff member is able to initiate a certain number of new programs per year. (This number declines as the number of unresolved problems rises.)

Now, what might happen if each staff member's ability to initiate new programs were increased? This might represent a situation in which the implementing organization is more persuasive than in the standard scenario, or it might represent a situation in which the actors in the organizational setting have a larger willingness to innovate (or perhaps a lower resistance to change).

In the scenario shown in figure 8.2a, I assumed that the implementing organization's ability to initiate new programs is twenty percent larger than in the standard run. The results are interesting: the level of mature programs at the end of ten years is slightly lower than that in the standard run. The reason for this outcome once again concerns the system of pressures within the implementing organization. Because of the implementing organization's increased ability to initiate new programs, the pool of new programs rises more rapidly in the first year of the implementation effort and reaches a higher level than it does in the standard run. As a result, more problems are generated. And as the pool of unresolved problems rises, it reduces the proportion of new programs which

survive to become mature programs and puts pressure on the implementing organization to shift attention from program initiation to problem solving. These adjustments eventually compensate for the implementing organization's increased initiation ability.

This suggests that it might be interesting to look at the consequences of reducing the implementing organization's ability to initiate new programs. Figure 8.2b shows a simulation run in which the initiation ability is set twenty percent lower than in the standard run. This change produces a scenario in which the level of mature programs at the end of ten years is slightly higher than that in the standard run. The explanation is this. In the first year of the implementation effort, the pool of new programs grows less rapidly than in the standard run, and thus fewer problems are generated. As a result, a larger proportion of new programs survive to become mature programs, and the pressure to shift staff attention to problem solving is reduced.

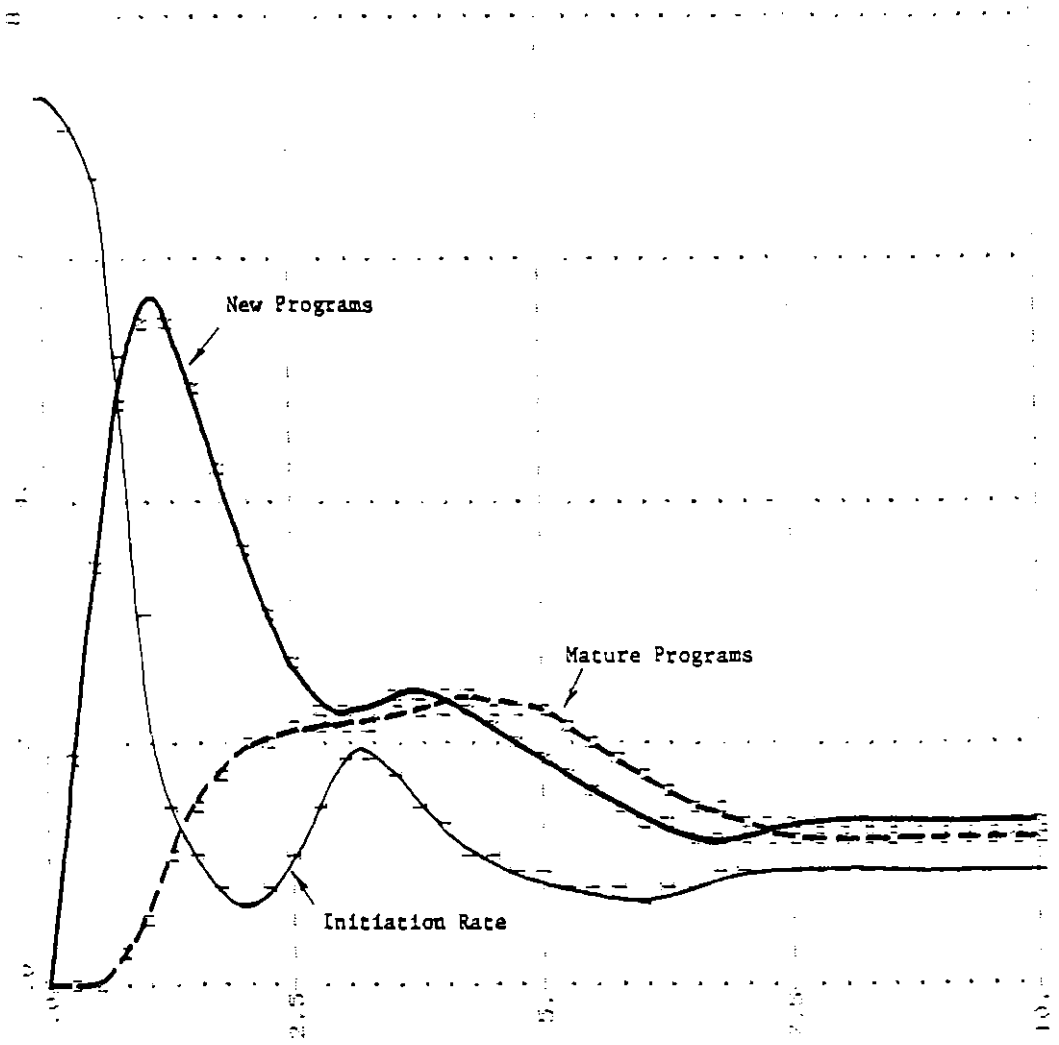

Figure 8.2a. An organization in which the staff initiate new programs at a more rapid pace.

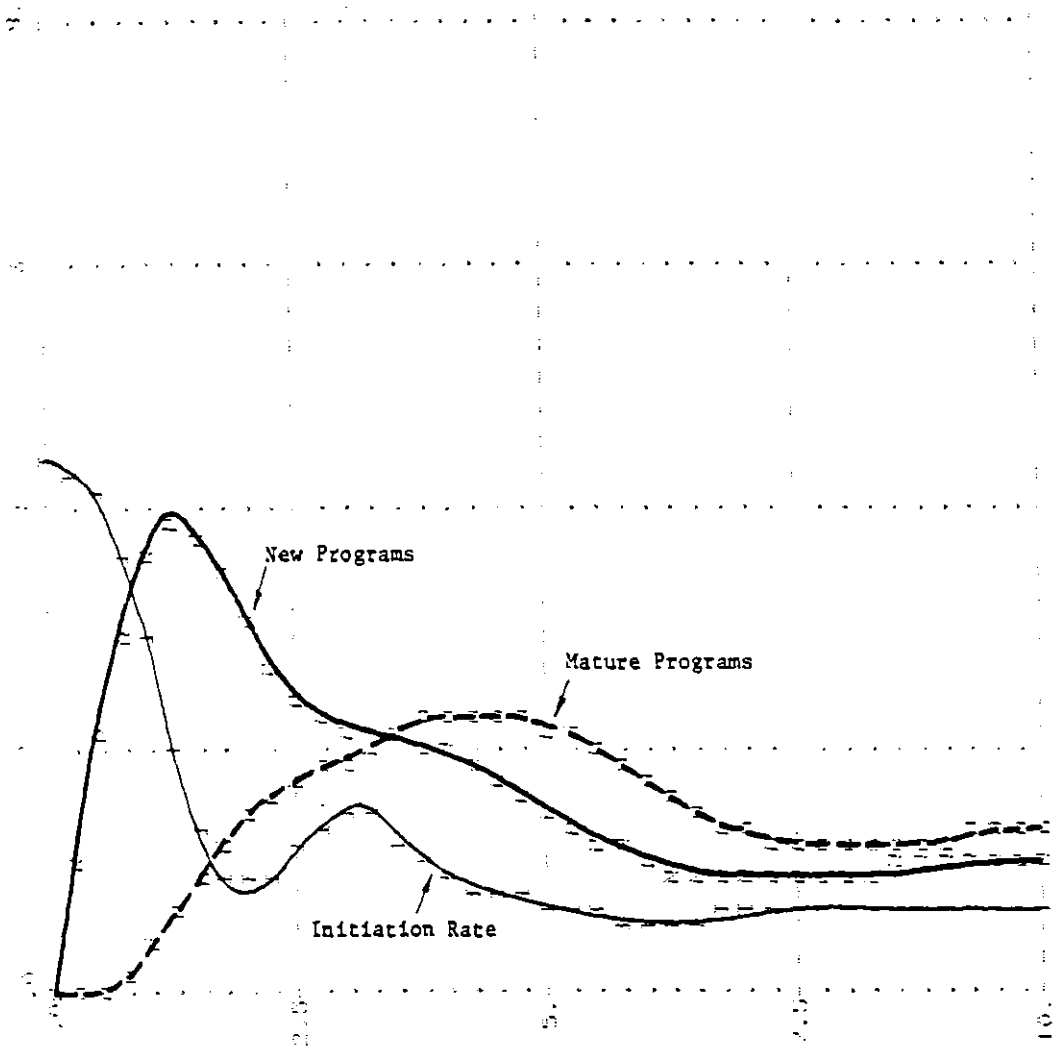

Figure 8.2b. An organization in which the staff initiate new programs at a less rapid pace.

This analysis of the scenarios presented in figures 8.1 and 8.2 indicates that the pool of unresolved problems tends to adjust to compensate for changes in program initiation. Thus, efforts to improve implementation performance by increasing program initiation are unlikely to be very successful. A more successful approach might focus directly on problem generation itself. Suppose, for example, that the implementing organization were able to reduce the number of problems each program component generates. This might be accomplished by slowing down the rate of program initiation, which might permit the implementing organization to devote additional effort to a problem-focused analysis of each program component before it is initiated.

In the scenario shown in figure 8.3, I have assumed that the staff of the implementing organization initiate new programs at a rate twenty percent lower than in the standard run, and new programs, once initiated, generate twenty-five percent fewer problems. The results show a fairly substantial improvement. At the end of ten years, the level of mature programs is sixty percent larger than the level in the standard run. This outcome is due primarily to the reduced pressure on problem solving resulting from the implementation strategy. Because fewer programs are initiated when implementation begins, and because the programs that are initiated generate fewer problems, a larger proportion of program components survive to become mature programs, and less pressure arises to shift staff attention to problem solving. As a consequence, the alternating periods of overextension

and retreat in program initiation are considerably less severe than in the standard run.

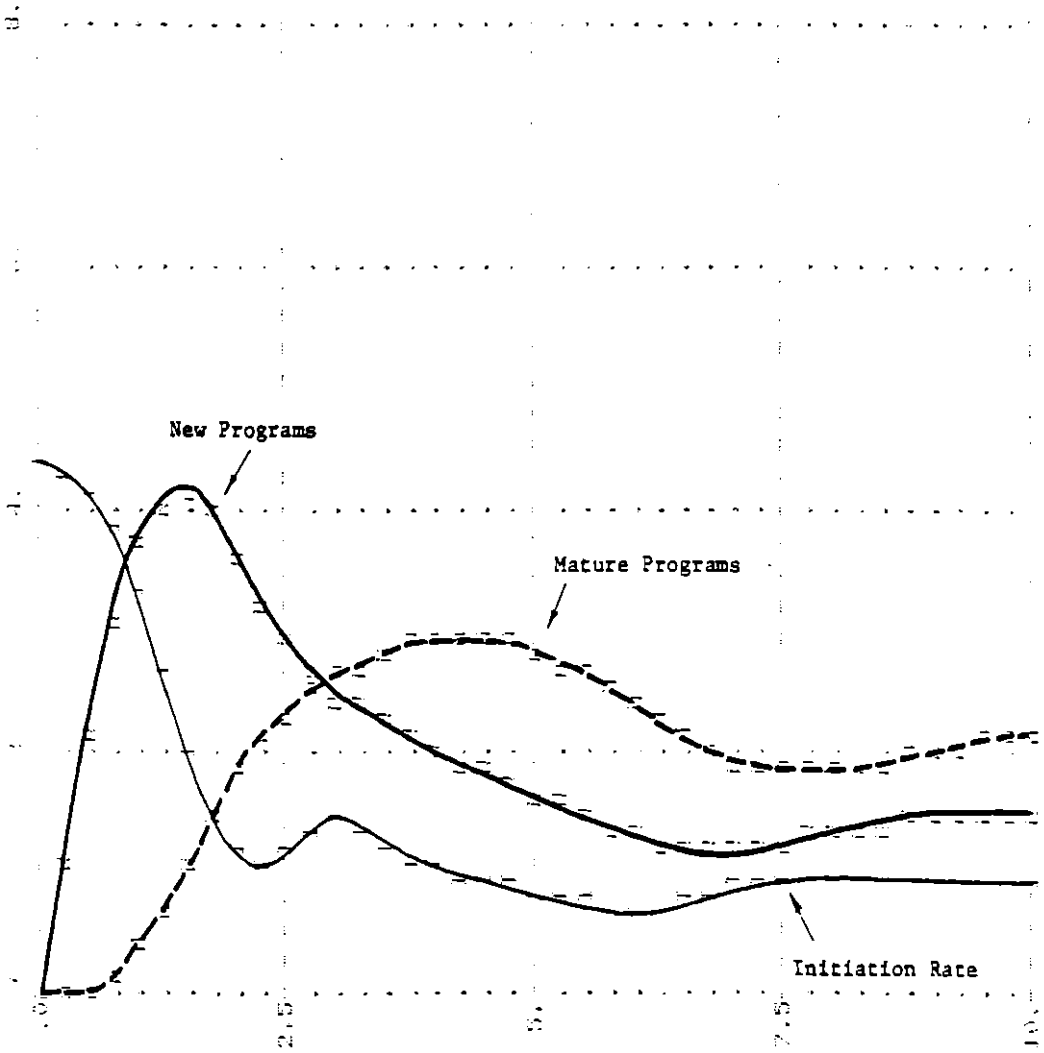

Figure 8.3. An organization in which the staff initiate new programs at a less rapid pace, and new programs generate fewer problems.

There is, in addition, another approach that might be taken to improve implementation performance. In the standard scenario, when problems are generated in the early stages of implementation, they can be resolved only by shifting staff attention away from program initiation. This in turn produces a cycle of overextension and retreat. One way of reducing this tendency toward cyclic behavior might be to begin the implementation effort with a lower level of external funding and then to provide a gradual increase in external funds over the first few years of implementation.

In the scenario shown in figure 8.4, I have assumed that when implementation begins the level of external funding is one-third of the level I assumed in the standard scenario. External funding rises to reach its maximum level at the end of year three. It then remains at that level for a year, after which it declines to zero over a period of three years. (The total level of external funding is identical to the total level in the standard run.)

The consequences of this revised pattern of funding are striking. The level of mature programs at the end of ten years is forty percent larger than in the standard run. And the overextension and retreat in new programs is considerably less severe. In the early years of implementation, the growth in external funding enables the implementing organization to resolve some of the problems generated by new programs without reducing its attention to program initiation. Indeed, in the first year of the

implementation effort, the rate at which new programs are initiated actually increases.*

*On the other hand, the strategy also produces a somewhat more exagerated overextension and retreat in the level of mature programs. One way of reducing the degree of overextension in mature programs is considered at the end of the Chapter.

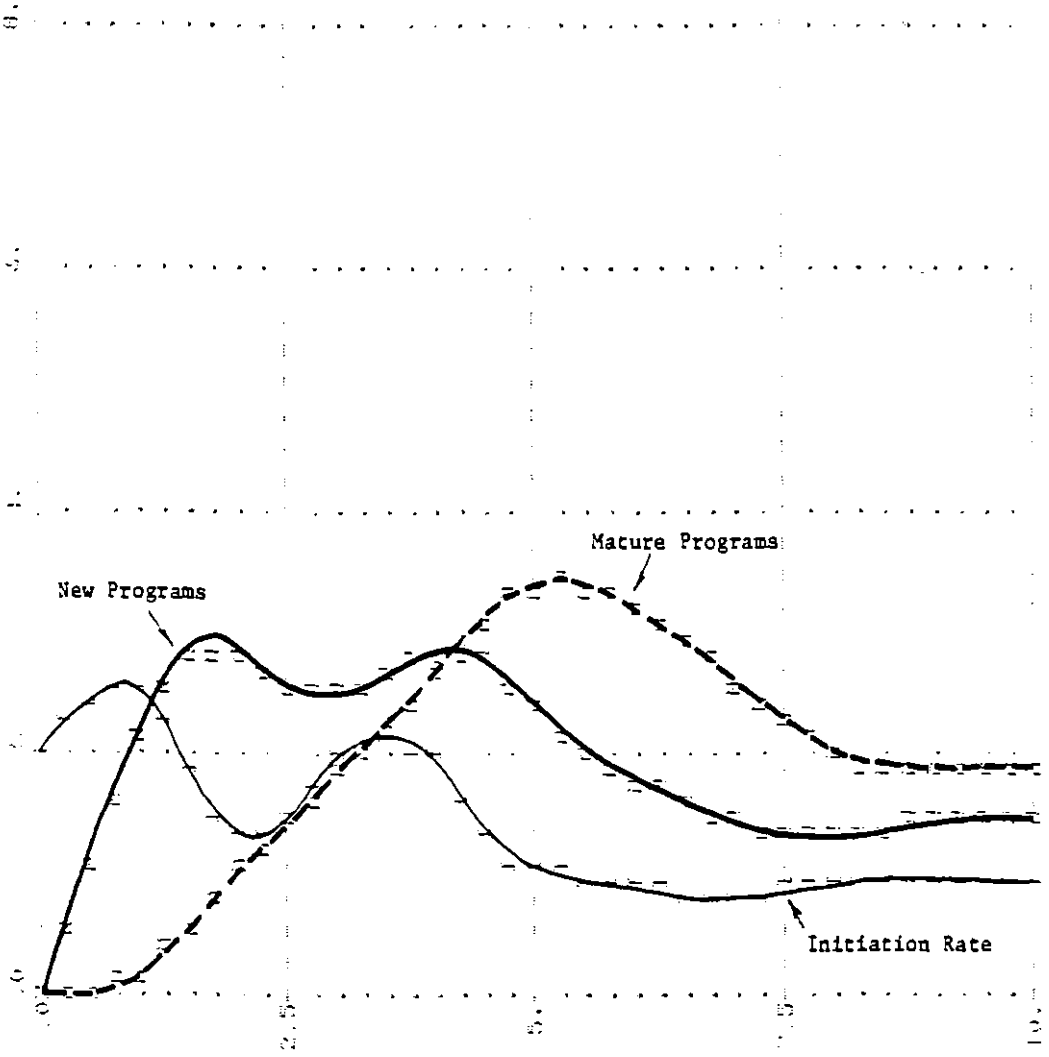

Figure 8.4. An increasing level of external funds during the first three years of implementation.

So far, I have examined several simulation experiments concerning the effects of changes in program initiation, problem generation, and external funding. In all of these experiments, I assumed that the implementing organization's capacity to solve the problems generated over the course of implementation was the same as its capacity in the standard simulation run. Suppose, instead, that the implementing organization has a somewhat larger problem solving capacity. That is, suppose that the staff of the implementing organization are able to solve problems at a faster rate than in the standard simulation.

In the scenario shown in figure 8.5, I have assumed the staff can solve problems twenty-five percent more rapidly than in the standard run. This change results in a reasonable improvement in implementation performance. The level of mature programs at the end of ten years is forty percent larger than the level in the base run. The implementing organization is able to sustain a somewhat larger number of new programs, and a somewhat greater proportion survive to become mature programs.

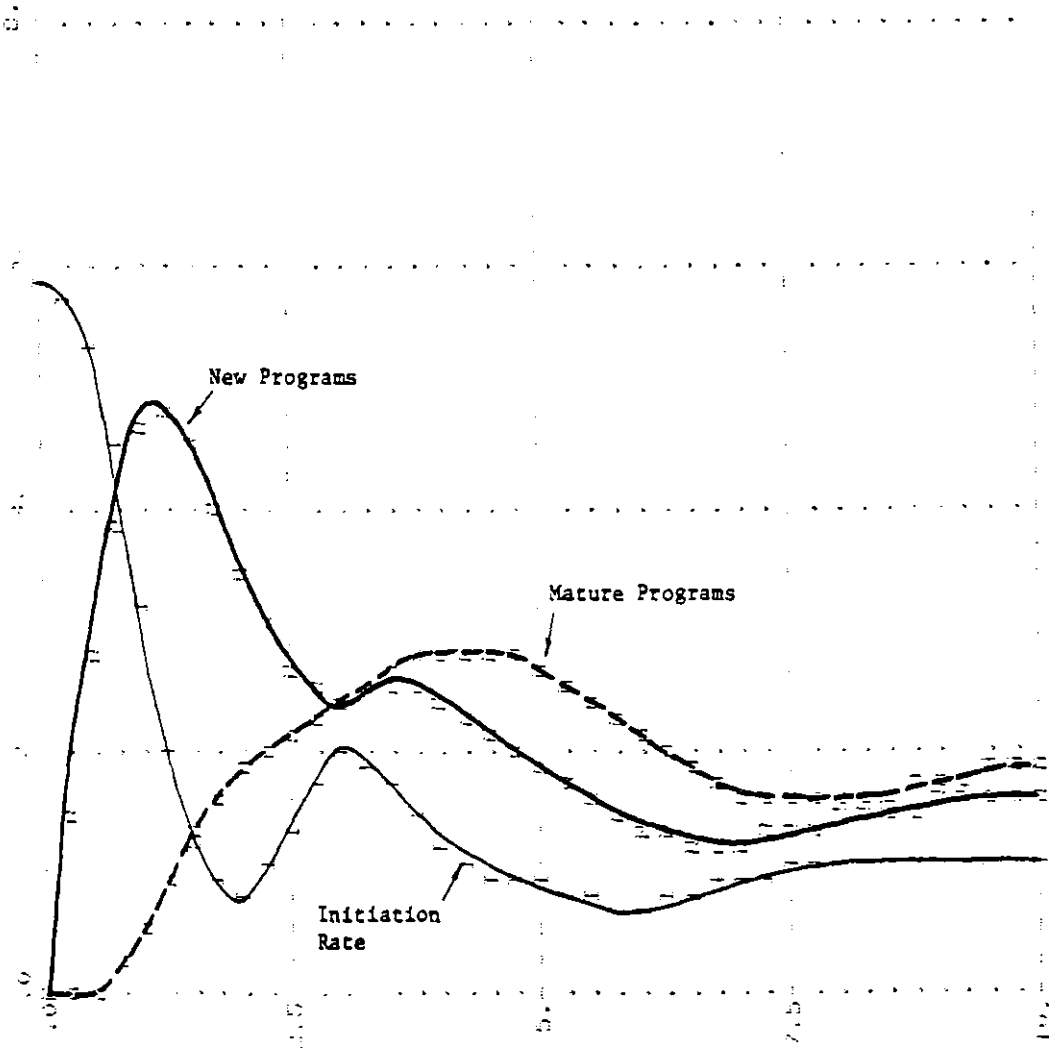

Figure 8.5. An organization in which the staff are able to solve problems at a more rapid pace.

It is possible to consider the combined effects of some of the changes discussed above. For example, what are the consequences of combining a reduction in problem generation, an increasing level of external funding in the early years of implementation, and an increase in problem solving capacity? The outcome, shown in figure 8.6, is striking. The level of mature programs at the end of ten years is two and one half times larger than the level in the standard run (even though the total level of external funding is the same). Furthermore, the degree of over-extension and retreat in program initiation and new programs is dramatically reduced.

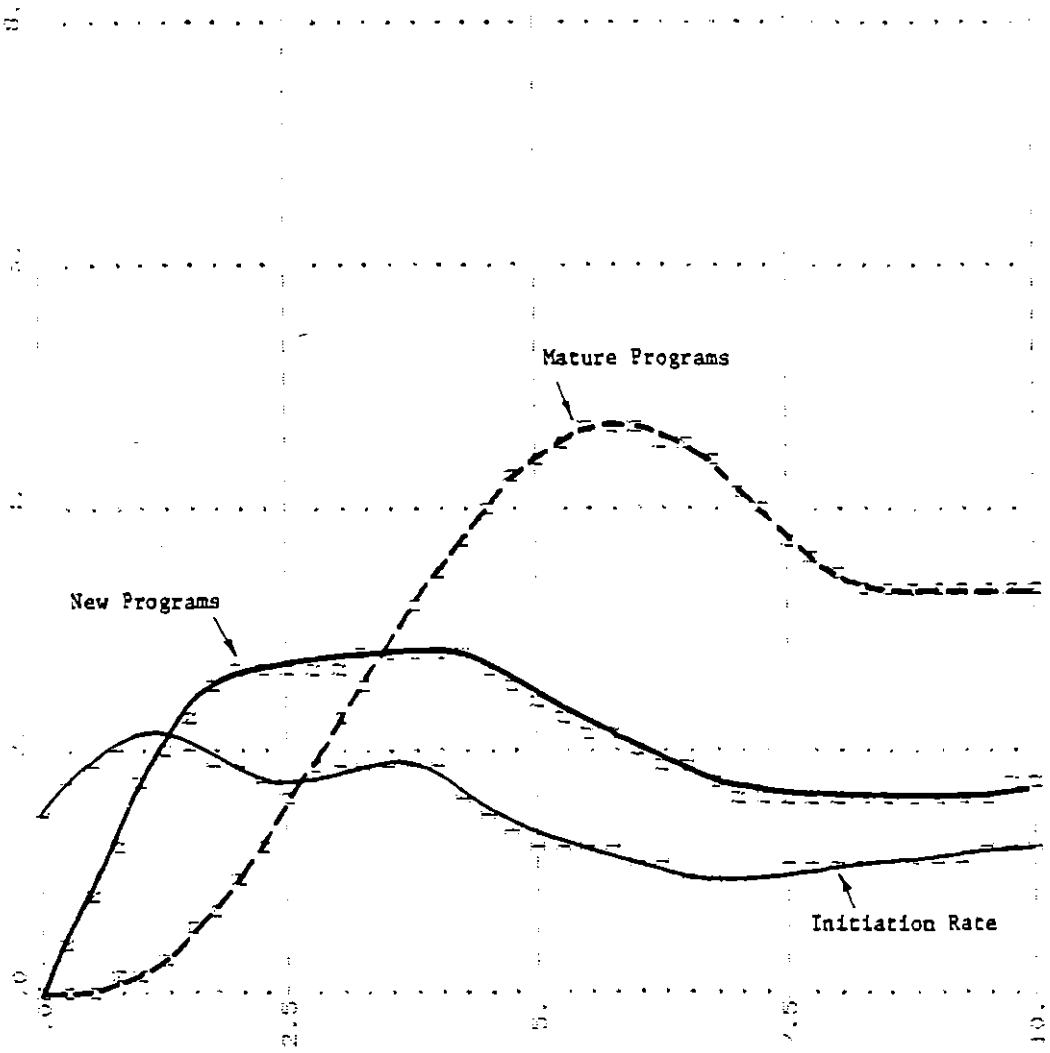

Figure 8.6. A combination of the changes shown in figures 8.3 - 8.5.

There is one characteristic of the scenario shown in figure 8.6 that is relatively similar to the standard run: A fairly substantial decline in mature programs occurs during the phase-out of external funds. One approach the implementing organization might take to reduce the overextension and retreat in mature programs might be to begin the search for permanent resources earlier in the implementation process. In the standard run, I assumed that the implementing organization starts searching for permanent resources to support each temporary staff member six months before the implementing organization expects the external support for the staff member to be lost. Suppose instead that the implementing organization begins the search a full year ahead of the projected loss of external support.

The simulation run shown in figure 8.7 combines this alteration in the search for permanent resources with the changes shown in figure 8.6. The impact is beneficial: The level of mature programs at the end of ten years is slightly higher in figure 8.7 than in figure 8.6. But the improvement is not dramatic. There is still a fairly substantial period of decline in the level of mature programs during the phase-out of external funding. This is an area in which additional model experimentation might be helpful.

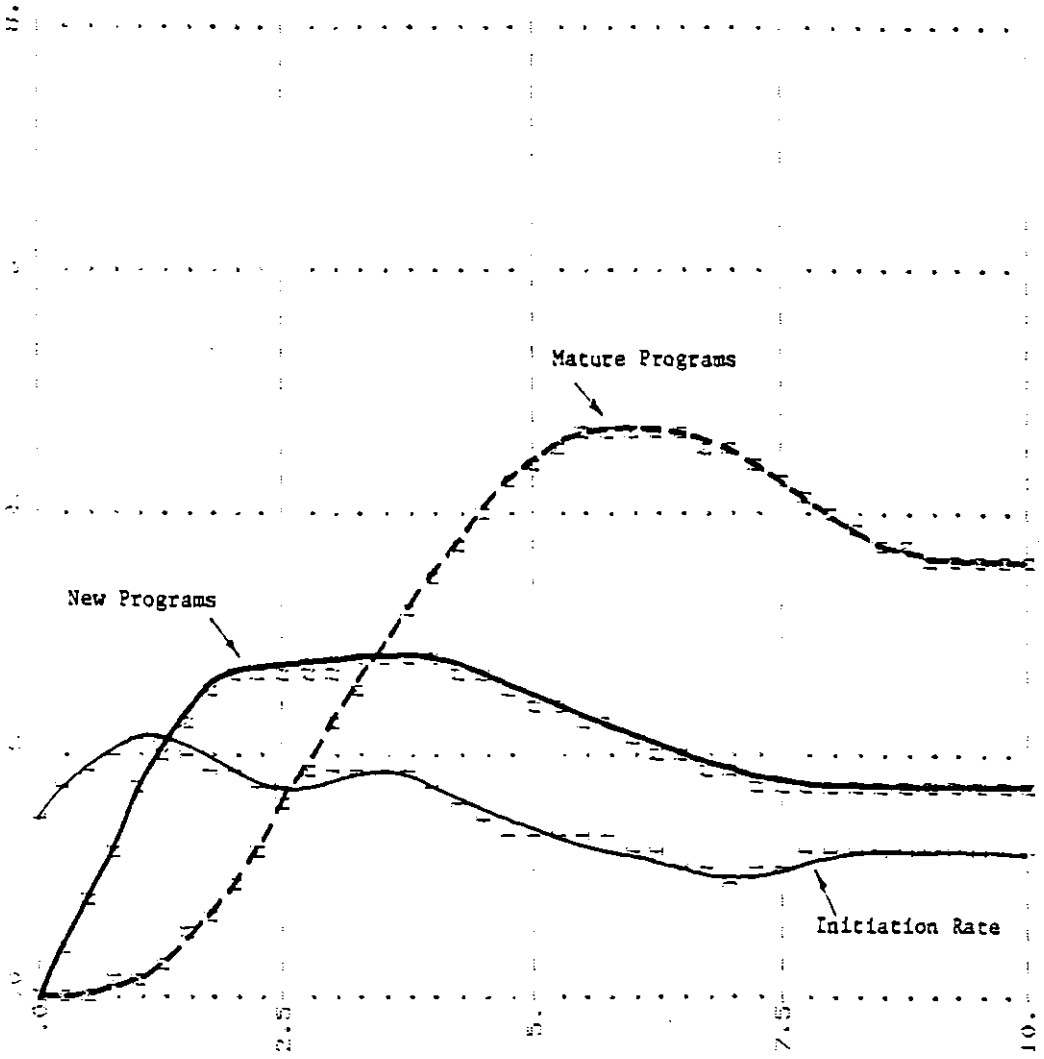

Figure 8.7. The changes shown in figure 8.6 combined with an earlier search for permanent resources.

The simulation runs shown in figures 8.1 - 8.7 provide an indication of the sorts of experiments that can be conducted with the extended model. The precise numerical results of these experiments are less important than the qualitative insights the experiments provide concerning the alternative implementation scenarios that are likely to occur under differing assumptions about the implementing organization. In general, the extended model suggests that the course of implementation is strongly influenced by the implementing organization's ability to balance the activities of program initiation, problem solving, task completion, and securing permanent resources. Some of the implications of the model for the management of implementation are considered more fully in Chapter IX.

CHAPTER IX

IMPLEMENTATION AND ORGANIZATIONAL CAPABILITY

> I remembered one morning when I discovered a cocoon in the bark of a tree, just as the butterfly was making a hole in its case and preparing to come out. I waited a while, but it was too long appearing and I was impatient. I bent over it and breathed on it to warm it. I warmed it as quickly as I could and the miracle began to happen before my eyes, faster than life. The case opened, the butterfly started slowly crawling out and I shall never forget my horror when I saw how its wings were folded back and crumpled; the wretched butterfly tried with its whole trembling body to unfold them. Bending over it, I tried to help it with my breath. In vain. It needed to be hatched out patiently and the unfolding of the wings should be a gradual process in the sun.
>
> Nikos Kazantzakis[1]
> Zorba the Greek

I have tried to show that the study of implementation is the study of an organization's capacity to begin and sustain a new course of action. When an organization sets out to implement a new policy, the policy's potential is necessarily somewhat uncertain and its consequences are somewhat unpredictable. As implementation proceeds, means and ends are discovered, revised, and redefined.

This implementation process, then, is characterized by a search for what is organizationally possible. Because, even under the best circumstances, there is no precise way for an implementing organization to estimate in advance what the problem solving requirements of a new program will be, this process is far from smooth. Thus, the implementing organization tends to overextend its capacity and then retreat, in

oscillating fashion -- a process that might be called an "implementation search." Furthermore, as temporary outside funds are exhausted, a second phase of overextension and retreat emerges, this time an overextension of permanent capacity. This process might be called a "phase-out search," as the implementing organization searches for what is sustainable in the long run.

This theory of the implementation process raises several questions, which will be addressed in this concluding chapter. First, what are the normative implications of the theory? That is, what does it suggest about the standards that should be used in assessing the degree to which a program has been implemented? Second, what strategies does the theory indicate might improve an organization's implementation performance? Third, what does the view imply about future research on implementation? Finally, what does it suggest about the role of implementation in reform? These questions will be considered in turn.

Normative implications: When implementation is viewed as an attempt to execute a policy which is fairly well-defined in advance, the standard to use in appraising the degree of implementation is straightforward. Implementation can, at least in principle, be rated in terms of the fidelity of what happened to what was intended, with one hundred percent implementation at one extreme and zero percent at the other. But when implementation is viewed as a sequential process, in which policy is continuously defined and redefined, the issues involved in assessing the degree of implementation are more complex.

Some of these issues have already been considered, in the section on identifying program components in Chapter VIII. In that section, I pointed out that the criteria required to judge the acceptance of a program component are often difficult to derive from the intentions of the actors, since intentions often are ambiguous and develop over time, and actors often disagree among themselves. Thus, to judge the degree to which a program component has been accepted, it is necessary to impose normative criteria not fully given in the cases.

In my empirical work, I took the following approach. In each of the six cases, I selected one group of actors (which I call the implementing organization) as the focus of the analysis.* For each case, I attempted to reconstruct a plausible set of initial intentions for this group of actors, for each program component the group initiated.** To judge the degree to which each program component was accepted, I looked

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*Of course, different analysts might focus on different actors. Furthermore, actors sometimes come and go, and this may raise questions about the continuity of the implementing organization's identity over time. This issue arises, for example, at the District level in Minneapolis, and at the Greer Middle School in Greenville. Also, as I pointed out in the section on Quasi-independent implementing organizations in Chapter VIII, as the focus of my analysis moves from the school to the project to the district level, it becomes increasingly difficult to identify any single group of actors as an implementing organization. Apparently, multiple, quasi-independent implementing organizations can arise, not only at different levels of implementation, but also within levels as well. All of this deserves further attention.

**It is important to distinguish intentions from plans and procedures. The intentions of an implementing organization, with respect to a particular program component, consist of a set of broad goals or program themes. Procedures are specific operating routines designed to maintain these goals, and plans are "road-maps" for the construction of procedures. Over the course of implementing a program component, procedures may be rewritten repeatedly, and it is in this sense that intentions develop. They gain specific meaning.

at the sequence of problems generated by the program component and considered, for each problem, the degree to which the problem outcome furthered or hindered the developing intentions of the implementing organization, with respect to the component.

In my empirical work, then, I judged the degree of acceptance for each program component on the basis of the adequacy of a series of problem solutions, measured against the developing intentions of the implementing organization. Informally, then, I have taken the adequacy of problem solutions as a normative standard. According to this standard, implementation is successful to the extent a sequence of problems is successfully resolved over the course of implementation. In other words, I have viewed implementation as an iterative problem solving process.*

In my analysis of the cases, I made a large number of judgments about the adequacy of problem solutions, without specifying very clearly how to distinguish an adequate from an inadequate outcome. Are there any general criteria that can be set down? One way of thinking about this is to observe that a problem is a situation in which organizational performance

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*This view differs from several others that might be taken. For example, implementation might be viewed as a technical process of management control. From this perspective, the degree of implementation would be judged on the basis of the fidelity of outcomes to plans. Or, implementation might be viewed as a process of conflict and bargaining. From this perspective, the degree of implementation would be judged separately for each actor engaged in the implementation process, according to his individual gains and losses. Or, implementation might be viewed as a process of organization development. From this perspective, the degree of implementation would be judged on the basis of the overall level of consensus and commitment to new program goals resulting from the implementation effort. See Richard Elmore, "Organizational Models of Social Program Implementation," Public Policy, 26:2 (Spring, 1978): 185-228.

lies below the satisfactory level for one or more goals of the implementing organization. When a problem arises, it persists until either a procedure is discovered through the organizational search process which brings performance up to the satisfactory level; or until the program goal drifts down to actual performance; or until some combination of both of these occurs. The adequacy of a problem solution, then, can be judged according to the degree to which the solution preserves the aspiration levels of the problematic program goals.

Although the concepts of goal and outcome enter the judgment of the adequacy of a problem solution, the concepts perform a role quite different from the role they play in a judgment of fidelity. First of all, any particular problem generally concerns only a few program goals, not all of them. Thus, a problem outcome need not be judged against the full complement of program goals. Second, and more important, it is not necessary to judge whether the problem-solution fully achieves even those goals under consideration, in some absolute sense. It is only necessary to judge whether the problem solution involves a lowering of aspirations. In other words, to judge the degree of implementation, it is not necessary to formulate a complete program definition, once and for all. It is only necessary to determine, for each problem, the extent to which the solution maintained the aspirations of the implementing organization. Thus, the judgment is an iterative one.

This might be clarified through two examples, drawn from the Experimental Schools Program in Minneapolis. The first of these concerns

the Marcy elementary school. In the first year of the program at Marcy, as I reported in Chapter VI, the implementing organization initiated an ambitious program of open classrooms, in which each student was supposed to be able to create an individualized schedule, drawing on ten resource rooms, each staffed by a subject-matter specialist. Within a few months, the open classroom program had generated a significant number of problems. Teachers found it impossible to integrate the activities in the resource rooms; developing the individualized schedules took more time than was available; and much of the day was occupied in a futile attempt to control the seemingly chaotic movement of students from resource room to resource room. In response, the Marcy staff decided to abandon the resource room model. In its place, they introduced more traditional integrated day classrooms, organized in families of two classrooms each.

What does this problem solution imply about the degree of implementation of open classrooms? It seems clear that, even though it is quite impossible to define precisely what full implementation of the open classroom program might have been, the problem solution involved a certain lowering of the implementing organization's aspirations with respect to open classroom goals. For example, the notion of an individualized curriculum for each student, drawing on the entire teaching staff of the school, was substantially weakened. Thus, it seems reasonable to conclude that the problem solution was not entirely adequate, in terms of the intentions of the implementing organization, and the degree of implementation of the open classroom program was somewhat reduced.

It is interesting to compare this outcome with a second example, in which the problem solution was more successful. At the end of the third year of Southeast Alternatives, a number of rather large problems demanded attention. First, the Southeast Free School was located in a rented church basement, and the SEA staff feared that the School District would be unwilling to support the Free School in the long run, unless the school used a regular District building. Second, the primary and intermediate portions of the continuous progress alternative, which were housed in separate elementary school buildings, were growing increasingly discontinuous. The staff sought some way of insuring that the two portions would regain a closer relationship. Finally, many Southeast parents and staff were dissatisfied with the open and ungraded middle school programs, which were supposed to correspond to the open and continuous progress elementary alternatives. The middle school programs lacked continuity with their elementary school counterparts. The SEA staff eventually responded to these problems by engaging in two related actions. First, the two halves of the continuous progress elementary alternative were combined in one building, leaving the other building available for the Southeast Free School. Second, in order to accomodate the continuous progress program in one building, the sixth grade students and teachers were shifted to the ungraded program at the middle school. This permitted a fairly substantial expansion of the ungraded middle school alternative, and it provided a basis for increased continuity between the ungraded program and the continuous progress

elementary school.

Even though it is quite impossible to define what complete implementation of choice at the elementary and middle school levels might entail, it seems reasonable to conclude that the pair of problem solutions preserved the level of choice in Southeast Alternatives. In other words, measured against the intentions of the implementing organization, the problem solutions were adequate. This example is particularly interesting, because the problem solutions involved altering a procedure that was not given any attention in the initial SEA plan: the grade-level mix at the elementary and middle schools. This provides an illustration of the fact that an adequate problem solution may quite easily entail the revision of program plans and procedures.

In summary, then, I have tried to sketch the broad outline of a method of judging the degree of program implementation, based on an assessment of the adequacy of problem solutions with respect to the intentions of an implementing organization. I have at most established the plausibility of this position. It is an area that deserves additional study.

Implementation strategies: The extended model and the organization theory on which it is based suggest a number of conclusions about managing the implementation process. Perhaps the most important implication of the study, with respect to the management of implementation, is derived from the overall view of implementation the theory provides. If implementation is an iterative process, in which policy is continuously made and revised, then managing the implementation process involves

planning and initiating programs in a series of incremental steps. Implementation cannot be fully planned in advance. Instead, the implementing organization must devise methods of adjusting the rate at which new programs are introduced, to take into account feedback from programs already underway.

In planning an implementation effort, then, it is wise to consider ways of introducing programs gradually, so that the unforseen problems associated with new programs can be given some attention once the programs have been introduced. This is not, however, a plea for conservatism. The theory does not imply that new programs, to be implemented successfully, can be only marginally different from traditional practices. It simple implies that large changes are more likely to be implemented successfully if they are introduced in a series of fairly small steps. This idea is reflected in Lindblom's account of incrementalism, discussed in Chapter II.

> In a system in which policy making is frankly recognized to be serial or sequential, the whole system may be tailored to rapid sequences so that, though no one policy move is great, the frequency of small moves makes rapid social change possible.[2]

This still leaves an important question unanswered: How should the implementing organization determine the pace at which the implementation effort should proceed? That is, how should the introduction of new programs be adjusted in response to the problems that appear over the course of the implementation effort? The extended model indicates that an implementing organization's efforts to adjust program initiation in

response to problem solving may not be completely smooth. The adjustment process may alternately overextend the organization's problem solving capacity and then leave it relatively untaxed.

The implementation scenarios presented at the end of Chapter VIII suggest some strategies that might help stabilize the implementation search process.* One of these strategies might be called problem-focused planning. The strategy would take advantage of the serial nature of implementation by encouraging the implementing organization to focus its planning effort on only a few program components at a time, those that are in the process of being initiated. The point of the strategy would be to clarify the program components being initiated, to some extent, and to estimate some of the problems that they might generate over the course of implementation. (See figure 8.3 for a simulation run that incorporates the strategy.) This might lead the implementing organization to alter the design of some program components, postpone the introduction of some, and eliminate some altogether, before they are introduced.

It is important to emphasize the fact that the purpose of the problem-focused planning strategy would not be to prepare a written, comprehensive implementation plan at the start of the project. Instead, the purpose of the strategy would be to select a few program components

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*In considering these strategies, it is important to recall that the adequacy of the extended model varies from the school to the district level. The strategies are probably most likely to be helpful at the school level, less helpful at the project level, and least helpful at the district level.

at a time, at modest intervals, and subject them to detailed analysis before they are introduced, taking into account the organization's experience with earlier program components. A typical analysis of a program component might include a consideration of alternative approaches to executing the component, as well as an assessment of timing, problem solving requirements, fall-back positions, and the prospects for long-term support.

The extended model also suggests a second strategy for improving implementation performance, a strategy that is rather different from the one just considered. This second strategy would focus, not directly on the implementing organization, but rather on the way local demonstration projects are funded. Demonstration projects supported by the federal government are generally provided funds for a several year period (usually about three years), over which the annual budget is more or less constant. The Experimental Schools Program was somewhat unusual in that the period of funding for each local project was five years, rather than three. It was also somewhat unusual in that the federal budget declined slowly over the last two years of federal funding, rather than remaining constant at a fixed level.

An analysis of the extended model indicates that, for any particular level of total funding, implementation performance might be improved if local demonstration projects were supported with an <u>increasing</u> budget for the first few years, followed by a declining budget in the last few years. (For a simulation run, see figure 8.4). This budget strategy

would be helpful because it would provide the implementing organization with increasing support during the period in which it is faced with a growing pool of problems generated by new programs. The availability of an increasing budget in the first few years might reduce, to some extent, the alternating periods of overextension and retreat which are likely to occur over the course of the implementation process.

A third strategy for improving the implementation of demonstration projects would focus on strengthening the implementing organization's problem solving capacity. The point of the strategy would be to enable the implementing organization to respond more quickly and creatively to unforseen problems when they occur. (See figure 8.5 for a simulation run.) One way of promoting this strategy might be to encourage the preparation of implementation "case histories" that focus in detail on the problem solving process. Such case histories might help implementing organizations come up with solutions in situations more or less analogous to those reported in the cases. Beyond this, implementation might also benefit from general research on organizational problem solving. One especially interesting line of work in this area is being conducted within the artificial intelligence research tradition, which I will discuss very briefly, below.

In summary, the extended model offers three strategies that might improve the implementation of local demonstration projects, the first focusing on the planning process, the second on the timing of federal funds, and the third on the implementing organization's problem solving

capacity. The details of these three strategies are probably less important, however, then the general view on which they are based. The critical task in the management of implementation involves adjusting the introduction of new programs in response to the feedback from programs already underway.

Further research: As usual, of course, this study has raised more questions than it has answered. It seems worthwhile to gather some of these questions together, to consider briefly how they might be pursued. The most critical questions raised by the study concern some of the conceptual themes in the theory itself. In particular, the study has called attention to the close relationship between implementation and problem solving. I have offered the notion of the adequacy of problem solutions as a standard to be used in assessing the degree of implementation, but this formulation certainly deserves additional work. In part, what is required is a more rigorous analysis of some of the conceptual and philosophical issues involved. In part, what is required is more detailed empirical study of organizational problem solving under conditions of ambiguity.

By and large, the organization theory tradition has concentrated on problem solving in fairly routinized settings. Less attention has been given to studying the evolution and development of new routines and performance programs. March and Olsen and their associates have begun to consider problem solving under ambiguity, but most of this recent work has focused on single decisions.[3] What is needed is an analysis of

organizational problem solving over time.

A second area of further research concerns extensions of the System Dynamics model I have developed as part of the study. Several questions about the model were identified in Chapter VIII. For example, the project-level cases seemed to be characterized by an "initiation search" process, which is not incorporated in the model. This would be a fairly easy model extension. In addition, the representation of the search for permanent resources in the model is not entirely adequate, and this deserves further work.

Beyond this, some larger extensions of the model might be informative. For example, it might be interesting to represent each program component individually in the model, rather than combining them to form a single pool of new programs, as I did in the model reported in Chapters III and V. This would permit the possibility of studying the allocation of attention between program components, and it would allow an examination of the possibility that the successful implementation of certain components (such as staff development, for example) might improve the implementation of others. Or, to move in another direction, it might be useful to consider the hierarchy issue more formally, by developing a model that includes a representation of a project-level implementing organization as well as two school-level organizations.

A third avenue for future research lies in the possibility of developing a model of the implementation process outside the System Dynamics tradition. One approach might be to formulate a discrete-event

simulation, similar to the models employed by Cyert and March and the more recent model of organizational decision making under ambiguity developed by Cohen, March, and Olsen.[4] In a discrete event model, it would be possible to represent the sequence of individual problems associated with each program component, and this would permit a more explicit representation of problem solving and program component acceptance. It would be especially interesting to compare the conclusions that might be drawn from System Dynamics and discrete-event models.

It might also be possible to formulate an artificial intelligence model of the implementation problem solving process, although this would require a great deal of new theoretical work.[5] One plausible approach would be to develop a representation of the initial implementation plan for a particularly interesting program component, as well as a representation of the task space in which the plan was supposed to be carried out. The model would simulate the problem solving and goal modification processes involved in attempting to execute the plan. Developing such a model would undoubtedly be an extremely ambitious enterprise, but it might also offer some large rewards. The approach would make detailed use of the implementation problem solving "protocols" derived from the case materials, and it might offer some important insight into the character of organizational problem solving capacity.

A fourth opportunity for further research lies in the refinement of the interpretive case study methodology. One way to begin might be to conduct a third round of interviews in Minneapolis and Greenville,

to test my interpretation of the evidence obtained during the first two rounds. In particular, it would be helpful to obtain respondent reactions to the qualitative implementation scenarios presented in chart form in Chapters VI and VII.

It would also be interesting to adapt the interpretive methodology to the study of an ongoing implementation effort, in which it would be possible to rely on participant observation as well as retrospective interviews. The study of an ongoing implementation effort would permit collecting evidence on various issues that had to be ignored in my retrospective study. For example, it might be possible to collect evidence on the attention patterns of key actors, over the course of the project. This evidence could then be analyzed for indications of a sequential attention to program initiation and problem solving. In addition, it might be possible to construct "cognitive maps" of key actors, to explore the changing perceptions of program components and problems over time.[6]

Finally, there is a question I have barely touched on in the study but which deserves attention in these final few pages. In the study, I have tried to analyze the programs in Minneapolis and Greenville at the school, project, and district levels. But it is possible to step back a bit further. The implementation search processes in Minneapolis and Greenville took place in a wider setting of changing social policy themes. It is interesting to speculate, for a moment, on the relationship between the course taken by local demonstration projects and the broader social

history of the policy ideas on which they are based. This will be taken up briefly in the following section.

Implementation and the development of policy themes: Although the Experimental Schools Programs in Minneapolis and Greenville set out on somewhat different paths, one directed toward alternatives and choice, the other toward individualization of instruction, there are some intriguing similarities in the educational concepts that motivated the projects and in the social and political issues to which the projects were forced to respond. Both projects, for example, placed a major emphasis on moving the locus of the decision making toward the school level; both sought to involve parents in the decision making process; and both attempted to establish more continuity between the elementary and middle school years. Both projects initiated programs of short courses and independent study at the high school level. Both projects began at the end of a decade of educational innovation and matured during a renewed emphasis on the basic skills. Thus, even though Southeast Alternatives and the Piedmont Schools Project were locally defined and locally implemented, they drew on a set of ideas and faced a set of issues that were not entirely local in origin.

Local demonstration projects like those under study both reflect and inform the history of social policy. When policy themes, such as decentralization, parent involvement, or the return to basics, rise to the surface in national discussions of public education, they serve as sources of legitimacy and motivation for local projects. At the same

time, local projects, through the implementation search process, develop policy themes, by exploring their potential and meaning. In local projects, policy materials are combined and redefined. Assumptions and beliefs are revised.

The evolution of a social policy idea, then, might itself be viewed as a search process, in which the boundaries of the policy are discovered, its meanings are elaborated, and its capacity to motivate action at the local level is tested. The course of implementation at the local level depends in part on the generativity of the social policy theme on which the implementation effort rests. But at the same time, the course of the local implementation effort constitutes in part what the social policy will become.

NOTES

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2. Interview with PSP teacher, November 15, p. 2.

3. General background on the Experimental Schools Program in Greenville can be found in The School District of Greenville County, Piedmont Schools Project Final Report (Greenville, South Carolina: The School District of Greenville County, June, 1977); The School District of Greenville County, Piedmont Schools Project Continuation Application (Greenville, South Carolina: The School District of Greenville County, undated); and Syracuse Research Corporation, Level II Evaluation and Analysis of the Piedmont Schools Project, "The Implementation of the New Instructional Environment in the Fourth Year of the Project: Final Report on Substudy Number 1 for 1975-76" (Syracuse, New York: Syracuse Research Corporation, October, 1976).

4. "Integration with Grace and Style," according to a former PSP administrator, was the title of a network television documentary on integration in Greenville. Interview with former PSP administrator, November 16, 1977, p. 8.

5. Interview with Greenville administrator, May 17, 1977, p. 3.

6. Interview with former PSP administrator, May 16, 1977, p. 3.

7. For a discussion of Individually Guided Education (IGE) and the Institute for the Development of Educational Activities, see John I Goodlad, The Dynamics of Educational Change: Toward Responsive Schools (New York: McGraw-Hill, 1975).

8. The School District of Greenville County, Piedmont Schools Project Final Report, section 1, pp. 12-14.

9. Ibid., pp. 2-3.

10. Interview with former PSP staff member, November 16, 1977, p. 2.

11. Syracuse Research Corporation, The Implementation of the New Instructional Environment in the Fourth Year of the Piedmont Schools Project, pp. I-17f.

12. Interview with former PSP administrator, May 16, 1977, p. 2.

13. Interview with former PSP staff member, May 20, 1977, p. 12.

14. Interview with former PSP administrator, May 17, 1977, p. 8.

15. Interview with former PSP administrator, November 17, 1977, p. 8.

16. Interview with former PSP administrator, November 18, 1977, p. 4.

17. Interview with former PSP administrator, May 19, 1977, p. 4.

18. Interview with former PSP administrator, November 18, 1977, p. 6.

19. Ibid., p. 14.

20. Interview with former PSP administrator, November 17, 1977, p. 13.

21. Interview with former PSP administrator, May 19, 1977, p. 6.

22. Ibid., p. 11.

23. The School District of Greenville County, Piedmont Schools Project Final Report, section 9, p. 2.

24. Interview with former PSP administrator, November 18, 1977, p. 19.

25. Interview with former administrator of a PSP school, November 14, 1977, p. 6.

26. Interview with former PSP staff member, November 16, 1977, p. 9.

27. The School District of Greenville County, Piedmont Schools Project Final Report, section 10, p. 15.

28. Ibid., p. 23.

29. Interview with administrator of a PSP school, November 16, 1977, p. 16.

30. Interview with Greer Middle School teacher, November 15, 1977, p. 2.

31. Interview with former Greer Middle School teacher, May 20, 1977, p. 2.

32. Interview with former Greer Middle School teacher, November 14, 1977, p. 3.

33. Interview with former Greer Middle School teacher, May 20, 1977, p. 5.

34. Ibid., p. 6.

35. Interview with Greer Middle School teacher, November 15, 1977, p. 2.

36. Interview with Greer Middle School teacher, November 15, 1977, p. 2.

37. Interview with former Greer Middle School teacher, November 16, 1977, p. 3.

38. Interview with Greer Middle School administrator, May 19, 1977, p. 1.

39. Ibid., p. 2.

40. Interview with Greer Middle School administrator, November 15, 1977, p. 9.

41. Interview with Greer Middle School administrator, May 19, 1977, p. 8.

42. Interview with Greer Middle School teacher, November 15, 1977, p. 3.

43. Interview with Greer Middle School administrator, May 19, 1977, p. 5.

44. Interview with Greer Middle School teacher, November 16, 1977, p. 4.

45. Interview with Greer Middle School teacher, November 15, 1977, p. 4.

46. Interview with former Greer Middle School teacher, November 16, 1977, p. 6.

47. Interview with Greer Middle School teacher, November 15, 1977, p. 6.

48. Interview with Greer Middle School administrator, November 15, 1977, p. 6.

49. Interview with former PSP staff member, November 16, 1977, p. 8.

50. Interview with former PSP administrator, May 17, 1977, p. 2.

51. The School District of Greenville County, Piedmont Schools Project Final Report, section 14, p. 1.

52. Interview with former PSP staff member, November 16, 1977, p. 8.

53. Interview with Greenville administrator, November 14, 1977, p. 4.

54. Ibid., p. 7.

55. Interview with administrator of a Greenville middle school, May 19, 1977, p. 1.

56. Interview with administrator of a Greenville middle school, November 15, 1977, p. 4.

57. Interview with administrator of a Greenville middle school, November 15, 1977, p. 5.

58. Interview with former PSP staff member, November 16, 1977, p. 11.

59. Interview with Greenville administrator, November 14, 1977, pp. 8-9.

NOTES: CHAPTER VIII

AN ASSESSMENT OF THE EXTENDED MODEL

1. Hannah Arendt, The Human Condition (Chicago, Illinois: The University of Chicago Press, 1958), p. 192.

2. Anthony Giddens, New Rules of Sociological Method (New York: Basic Books, Inc., 1976).

3. See Albert Ando, Franklin M. Fisher, and Herbert A. Simon, Essays on the Structure of Social Science Models (Cambridge, Massachusetts: The M.I.T. Press, 1963).

4. Franklin M. Fisher and Albert Ando, "Two Theorems on Ceteris Paribus in the Analysis of Dynamic Systems," in Ando, Fisher, and Simon, Essays on the Structure of Social Science Models, p. 108.

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IMPLEMENTATION AND ORGANIZATIONAL CAPABILITY

1. Nikos Kazantzakis, Zorba the Greek (New York: Ballantine Books, 1952), pp. 138-139.

2. Charles E. Lindblom, The Policy-Making Process (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1968), p. 26.

3. See, for example, James G. March and Johan P. Olsen, Ambiguity and Choice in Organizations (Berson, Norway: Universitets for laget, 1976).

4. See Richard M. Cyert and James G. March, A Behavioral Theory of the Firm (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963); and Michael D. Cohen, James G. March, and Johan P. Olsen, "A Garbage Can Model of Organizational Choice," Administrative Science Quarterly 17:1 (March, 1972):1-25.

5. See, for example, Roger C. Schank and Robert P. Abelson, Scripts, Plans, Goals, and Understanding: An Inquiry into Human Knowledge Structures (Hillsdale, New Jersey: Lawrence Erlbaum Associates, 1977).

6. See Robert Axelrod, ed., Structure of Decision: The Cognitive Maps of Political Elites (Princeton, New Jersey: Princeton University Press, 1976).

APPENDIX A

COMPUTER LISTINGS FOR THE MODELS DISCUSSED IN THE THESIS AND ADDITIONAL MODEL OUTPUT

Figure A.1. Equations for the basic Simple Model

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PAGE 1   FILE SIMPLE1   SIMPLE IMPLEMENTATION MODEL   10/20/
78


     NEW PROGRAMS AND PROBLEMS

NPC.K=NPC.J+(DT)(PCIR.JK-PCAR.JK-PCTR.JK)          1, L
NPC=NPCN                                           1.1, N
NPCN=.015                                          1.2, C
    NPC     - NEW PROGRAM COMPONENTS (COMPONENTS)
    PCIR    - PROGRAM COMPONENT INITIATION RATE
              (COMPONENTS/YR)
    PCAR    - PROGRAM COMPONENT ACCEPTANCE RATE
              (COMPONENTS/YR)
    PCTR    - PROGRAM COMPONENT TERMINATION RATE
              (COMPONENTS/YR)
    NPCN    - NEW PROGRAM COMPONENTS, INITIAL
              (COMPONENTS)

PCIR.KL=SPCI.K*PCIN*PCIE.K                         2, R
PCIN=1                                             2.1, C
    PCIR    - PROGRAM COMPONENT INITIATION RATE
              (COMPONENTS/YR)
    SPCI    - STAFF IN PROGRAM COMPONENT INITIATION
              (PERSONS)
    PCIN    - PROGRAM COMPONENT INITIATION NORMAL
              (COMPONENTS/YR/PERSON)
    PCIE    - PROGRAM COMPONENT INITIATION EFFECTIVENESS
              (DIMENSIONLESS)

SPCI.K=S.K*ASPI.K                                  3, A
    SPCI    - STAFF IN PROGRAM COMPONENT INITIATION
              (PERSONS)
    S       - STAFF (PERSONS)
    ASPI    - ALLOCATION OF STAFF TO PROGRAM INITIATION
              (%)

S.K=SN                                             4, A
SN=6                                               4.1, C
    S       - STAFF (PERSONS)
    SN      - STAFF, INITIAL (PERSONS)

PCIE.K=TABHL(PCIET,UP.K,0,120,15)                  5, A
PCIET=1/.9375/.8/.6/.4/.25/.1875/.125/.1           5.1, T
    PCIE    - PROGRAM COMPONENT INITIATION EFFECTIVENESS
              (DIMENSIONLESS)
    TABHL   - LOGICAL FUNCTION, TABLE LOOK-UP AND
              INTERPOLATION
    PCIET   - PROGRAM COMPONENT INITIATION EFFECTIVENESS
              TABLE
    UP      - UNRESOLVED PROBLEMS (PROBLEMS)

PCAR.KL=PCFAT.K*FPCA.K                             6, R
    PCAR    - PROGRAM COMPONENT ACCEPTANCE RATE
              (COMPONENTS/YR)
    PCFAT   - PROGRAM COMPONENTS FACING ACCEPTANCE OR
              TERMINATION (COMPONENTS/YR)
    FPCA    - FRACTION OF PROGRAM COMPONENTS ACCEPTED (%)
```

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PAGE 2   FILE SIMPLE1   SIMPLE IMPLEMENTATION MODEL   10/20/
78


PCFAT.K=DELAY3(PCIR.JK,TIPC)                                  7, A
PCIR=PCIRN                                                    7.1, N
PCIRN=NPCN/TIPC                                               7.2, N
TIPC=1.5                                                      7.3, C
    PCFAT  - PROGRAM COMPONENTS FACING ACCEPTANCE OR
               TERMINATION (COMPONENTS/YR)
    DELAY3 - THIRD ORDER EXPONENTIAL DELAY
    PCIR   - PROGRAM COMPONENT INITIATION RATE
               (COMPONENTS/YR)
    TIPC   - TIME TO IMPLEMENT PROGRAM COMPONENTS (YRS)
    PCIRN  - PROGRAM COMPONENT INITIATION RATE, INITIAL
               (REQUIRED TO INITIALIZE THIRD-ORDER
               DELAY)
    NPCN   - NEW PROGRAM COMPONENTS, INITIAL
               (COMPONENTS)

FPCA.K=TABHL(FPCAT,UPPC.K,0,40,5)                             8, A
FPCAT=1/.9375/.8/.6/.4/.25/.1875/.125/.1                      8.1, T
    FPCA   - FRACTION OF PROGRAM COMPONENTS ACCEPTED (%)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
               INTERPOLATION
    FPCAT  - FRACTION OF PROGRAM COMPONENTS ACCEPTED
               TABLE
    UPPC   - UNRESOLVED PROBLEMS PER PROGRAM COMPONENT
               (PROBLEMS/COMPONENT)

UPPC.K=UP.K/NPC.K                                             9, A
    UPPC   - UNRESOLVED PROBLEMS PER PROGRAM COMPONENT
               (PROBLEMS/COMPONENT)
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)
    NPC    - NEW PROGRAM COMPONENTS (COMPONENTS)

PCTR.KL=PCFAT.K*(1-FPCA.K)                                    10, R
    PCTR   - PROGRAM COMPONENT TERMINATION RATE
               (COMPONENTS/YR)
    PCFAT  - PROGRAM COMPONENTS FACING ACCEPTANCE OR
               TERMINATION (COMPONENTS/YR)
    FPCA   - FRACTION OF PROGRAM COMPONENTS ACCEPTED (%)

UP.K=UP.J+(DT)(PGR.JK-PSR.JK-PER.JK)                          11, L
UP=UPN                                                        11.1, N
UPN=0                                                         11.2, C
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)
    PGR    - PROBLEM GENERATION RATE (PROBLEMS/YR)
    PSR    - PROBLEM SOLUTION RATE (PROBLEMS/YR)
    PER    - PROBLEM ELIMINATION RATE (PROBLEMS/YR)
    UPN    - UNRESOLVED PROBLEMS, INITIAL (PROBLEMS)

PGR.KL=NPC.K*PGN                                              12, R
PGN=20                                                        12.1, C
    PGR    - PROBLEM GENERATION RATE (PROBLEMS/YR)
    NPC    - NEW PROGRAM COMPONENTS (COMPONENTS)
    PGN    - PROBLEM GENERATION NORMAL (PROBLEMS/
               COMPONENT/YR)
```

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PAGE 3   FILE SIMPLE1   SIMPLE IMPLEMENTATION MODEL   10/20/
78


PSR.KL=UP.K/TSP.K                                          13, R
    PSR     - PROBLEM SOLUTION RATE (PROBLEMS/YR)
    UP      - UNRESOLVED PROBLEMS (PROBLEMS)
    TSP     - TIME TO SOLVE PROBLEMS (YRS)

TSP.K=TABHL(TSPT,SLPS.K,0,40,10)                           14, A
TSPT=.375/.5/1/1.5/2.5                                     14.1, T
    TSP     - TIME TO SOLVE PROBLEMS (YRS)
    TABHL   - LOGICAL FUNCTION, TABLE LOOK-UP AND
              INTERPOLATION
    TSPT    - TIME TO SOLVE PROBLEMS TABLE
    SLPS    - STAFF LOAD IN PROBLEM SOLVING (PROBLEMS/
              PERSON)

SLPS.K=UP.K/SPS.K                                          15, A
    SLPS    - STAFF LOAD IN PROBLEM SOLVING (PROBLEMS/
              PERSON)
    UP      - UNRESOLVED PROBLEMS (PROBLEMS)
    SPS     - STAFF IN PROBLEM SOLVING (PERSONS)

SPS.K=S.K*ASPS.K                                           16, A
    SPS     - STAFF IN PROBLEM SOLVING (PERSONS)
    S       - STAFF (PERSONS)
    ASPS    - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)

PER.KL=PCTR.JK*UPPC.K                                      17, R
    PER     - PROBLEM ELIMINATION RATE (PROBLEMS/YR)
    PCTR    - PROGRAM COMPONENT TERMINATION RATE
              (COMPONENTS/YR)
    UPPC    - UNRESOLVED PROBLEMS PER PROGRAM COMPONENT
              (PROBLEMS/COMPONENT)

ASPI.K=ASPIN                                               18, A
ASPIN=.5                                                   18.1, C
    ASPI    - ALLOCATION OF STAFF TO PROGRAM INITIATION
              (%)
    ASPIN   - ALLOCATION OF STAFF TO PROGRAM INITIATION,
              INITIAL (%)

ASPS.K=ASPSN                                               19, A
ASPSN=.5                                                   19.1, C
    ASPS    - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)
    ASPSN   - ALLOCATION OF STAFF TO PROBLEM SOLVING,
              INITIAL (%)

     MATURE PROGRAMS

MPC.K=MPC.J+(DT)(PCAR.JK-PCDR.JK)                          20, L
MPC=MPCN                                                   20.1, N
MPCN=0                                                     20.2, C
    MPC     - MATURE PROGRAM COMPONENTS (COMPONENTS)
    PCAR    - PROGRAM COMPONENT ACCEPTANCE RATE
              (COMPONENTS/YR)
    PCDR    - PROGRAM COMPONENT DECAY RATE (COMPONENTS/
              YR)
    MPCN    - MATURE PROGRAM COMPONENTS, INITIAL
              (COMPONENTS)
```

```
PAGE 4   FILE SIMPLE1   SIMPLE IMPLEMENTATION MODEL   10/20/
78


PCDR.KL=MPC.K/ALMPC.K                                    21, R
    PCDR   - PROGRAM COMPONENT DECAY RATE (COMPONENTS/
               YR)
    MPC    - MATURE PROGRAM COMPONENTS (COMPONENTS)
    ALMPC  - AVERAGE LIFETIME OF MATURE PROGRAM
               COMPONENTS (YRS)

ALMPC.K=ALMPCN                                           22, A
ALMPCN=5                                                 22.1, C
    ALMPC  - AVERAGE LIFETIME OF MATURE PROGRAM
               COMPONENTS (YRS)
    ALMPCN - AVERAGE LIFETIME OF MATURE PROGRAM
               COMPONENTS, INITIAL (YRS)

     CONTROL STATEMENTS

DT=.05                                                   22.5, C
PLTPER=.25                                               22.6, C
PRTPER=0                                                 22.7, C
LENGTH=0                                                 22.8, C

PLOT  NPC=P,MPC=M,PCIR=I(0,8)/PCAR=A,PCTR=T(0,4)/        22.9
  FPCA=F,PCIE=E(0,1)
    NPC    - NEW PROGRAM COMPONENTS (COMPONENTS)
    MPC    - MATURE PROGRAM COMPONENTS (COMPONENTS)
    PCIR   - PROGRAM COMPONENT INITIATION RATE
               (COMPONENTS/YR)
    PCAR   - PROGRAM COMPONENT ACCEPTANCE RATE
               (COMPONENTS/YR)
    PCTR   - PROGRAM COMPONENT TERMINATION RATE
               (COMPONENTS/YR)
    FPCA   - FRACTION OF PROGRAM COMPONENTS ACCEPTED (%)
    PCIE   - PROGRAM COMPONENT INITIATION EFFECTIVENESS
               (DIMENSIONLESS)
```

Figure A.2. Equations for the Simple Model with staff allocation based on sequential attention to program initiation and problem solving. (This model corresponds to hypotheses I and II.)

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PAGE 1   FILE SIMPLE2   SIMPLE IMPLEMENTATION MODEL   10/20/
78


     NEW PROGRAMS AND PROBLEMS

NPC.K=NPC.J+(DT)(PCIR.JK-PCAR.JK-PCTR.JK)                1, L
NPC=NPCN                                                 1.1, N
NPCN=.015                                                1.2, C
    NPC    - NEW PROGRAM COMPONENTS (COMPONENTS)
    PCIR   - PROGRAM COMPONENT INITIATION RATE
               (COMPONENTS/YR)
    PCAR   - PROGRAM COMPONENT ACCEPTANCE RATE
               (COMPONENTS/YR)
    PCTR   - PROGRAM COMPONENT TERMINATION RATE
               (COMPONENTS/YR)
    NPCN   - NEW PROGRAM COMPONENTS, INITIAL
               (COMPONENTS)

PCIR.KL=SPCI.K*PCIN*PCIE.K                               2, R
PCIN=1                                                   2.1, C
    PCIR   - PROGRAM COMPONENT INITIATION RATE
               (COMPONENTS/YR)
    SPCI   - STAFF IN PROGRAM COMPONENT INITIATION
               (PERSONS)
    PCIN   - PROGRAM COMPONENT INITIATION NORMAL
               (COMPONENTS/YR/PERSON)
    PCIE   - PROGRAM COMPONENT INITIATION EFFECTIVENESS
               (DIMENSIONLESS)

SPCI.K=S.K*ASPI.K                                        3, A
    SPCI   - STAFF IN PROGRAM COMPONENT INITIATION
               (PERSONS)
    S      - STAFF (PERSONS)
    ASPI   - ALLOCATION OF STAFF TO PROGRAM INITIATION
               (%)

S.K=SN                                                   4, A
SN=6                                                     4.1, C
    S      - STAFF (PERSONS)
    SN     - STAFF, INITIAL (PERSONS)

PCIE.K=TABHL(PCIET,UP.K,0,120,15)                        5, A
PCIET=1/.9375/.8/.6/.4/.25/.1875/.125/.1                 5.1, T
    PCIE   - PROGRAM COMPONENT INITIATION EFFECTIVENESS
               (DIMENSIONLESS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
               INTERPOLATION
    PCIET  - PROGRAM COMPONENT INITIATION EFFECTIVENESS
               TABLE
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)

PCAR.KL=PCFAT.K*FPCA.K                                   6, R
    PCAR   - PROGRAM COMPONENT ACCEPTANCE RATE
               (COMPONENTS/YR)
    PCFAT  - PROGRAM COMPONENTS FACING ACCEPTANCE OR
               TERMINATION (COMPONENTS/YR)
    FPCA   - FRACTION OF PROGRAM COMPONENTS ACCEPTED (%)
```

```
PAGE 2   FILE SIMPLE2   SIMPLE IMPLEMENTATION MODEL   10/20/
78


PCFAT.K=DELAY3(PCIR.JK,TIPC)                                7, A
PCIR=PCIRN                                                  7.1, N
PCIRN=NPCN/TIPC                                             7.2, N
TIPC=1.5                                                    7.3, C
    PCFAT  - PROGRAM COMPONENTS FACING ACCEPTANCE OR
             TERMINATION (COMPONENTS/YR)
    DELAY3 - THIRD ORDER EXPONENTIAL DELAY
    PCIR   - PROGRAM COMPONENT INITIATION RATE
             (COMPONENTS/YR)
    TIPC   - TIME TO IMPLEMENT PROGRAM COMPONENTS (YRS)
    PCIRN  - PROGRAM COMPONENT INITIATION RATE, INITIAL
             (REQUIRED TO INITIALIZE THIRD-ORDER
             DELAY)
    NPCN   - NEW PROGRAM COMPONENTS, INITIAL
             (COMPONENTS)

FPCA.K=TABHL(FPCAT,UPPC.K,0,40,5)                           8, A
FPCAT=1/.9375/.8/.6/.4/.25/.1875/.125/.1                    8.1, T
    FPCA   - FRACTION OF PROGRAM COMPONENTS ACCEPTED (%)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
             INTERPOLATION
    FPCAT  - FRACTION OF PROGRAM COMPONENTS ACCEPTED
             TABLE
    UPPC   - UNRESOLVED PROBLEMS PER PROGRAM COMPONENT
             (PROBLEMS/COMPONENT)

UPPC.K=UP.K/NPC.K                                           9, A
    UPPC   - UNRESOLVED PROBLEMS PER PROGRAM COMPONENT
             (PROBLEMS/COMPONENT)
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)
    NPC    - NEW PROGRAM COMPONENTS (COMPONENTS)

PCTR.KL=PCFAT.K*(1-FPCA.K)                                  10, R
    PCTR   - PROGRAM COMPONENT TERMINATION RATE
             (COMPONENTS/YR)
    PCFAT  - PROGRAM COMPONENTS FACING ACCEPTANCE OR
             TERMINATION (COMPONENTS/YR)
    FPCA   - FRACTION OF PROGRAM COMPONENTS ACCEPTED (%)

UP.K=UP.J+(DT)(PGR.JK-PSR.JK-PER.JK)                        11, L
UP=UPN                                                      11.1, N
UPN=0                                                       11.2, C
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)
    PGR    - PROBLEM GENERATION RATE (PROBLEMS/YR)
    PSR    - PROBLEM SOLUTION RATE (PROBLEMS/YR)
    PER    - PROBLEM ELIMINATION RATE (PROBLEMS/YR)
    UPN    - UNRESOLVED PROBLEMS, INITIAL (PROBLEMS)

PGR.KL=NPC.K*PGN                                            12, R
PGN=20                                                      12.1, C
    PGR    - PROBLEM GENERATION RATE (PROBLEMS/YR)
    NPC    - NEW PROGRAM COMPONENTS (COMPONENTS)
    PGN    - PROBLEM GENERATION NORMAL (PROBLEMS/
             COMPONENT/YR)
```

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PAGE 3   FILE SIMPLE2   SIMPLE IMPLEMENTATION MODEL   10/20/
78


PSR.KL=UP.K/TSP.K                                          13, R
    PSR    - PROBLEM SOLUTION RATE (PROBLEMS/YR)
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)
    TSP    - TIME TO SOLVE PROBLEMS (YRS)

TSP.K=TABHL(TSPT,SLPS.K,0,40,10)                           14, A
TSPT=.375/.5/1/1.5/2.5                                     14.1, T
    TSP    - TIME TO SOLVE PROBLEMS (YRS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
               INTERPOLATION
    TSPT   - TIME TO SOLVE PROBLEMS TABLE
    SLPS   - STAFF LOAD IN PROBLEM SOLVING (PROBLEMS/
               PERSON)

SLPS.K=UP.K/SPS.K                                          15, A
    SLPS   - STAFF LOAD IN PROBLEM SOLVING (PROBLEMS/
               PERSON)
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)
    SPS    - STAFF IN PROBLEM SOLVING (PERSONS)

SPS.K=S.K*ASPS.K                                           16, A
    SPS    - STAFF IN PROBLEM SOLVING (PERSONS)
    S      - STAFF (PERSONS)
    ASPS   - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)

PER.KL=PCTR.JK*UPPC.K                                      17, R
    PER    - PROBLEM ELIMINATION RATE (PROBLEMS/YR)
    PCTR   - PROGRAM COMPONENT TERMINATION RATE
               (COMPONENTS/YR)
    UPPC   - UNRESOLVED PROBLEMS PER PROGRAM COMPONENT
               (PROBLEMS/COMPONENT)

ASPS.K=ASPS.J+(DT)(SPIPSR.JK-SPSPIR.JK)                    18, L
ASPS=ASPSN                                                 18.1, N
ASPSN=.01                                                  18.2, C
    ASPS   - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)
    SPIPSR - STAFF FROM PROGRAM INITIATION TO PROBLEM
               SOLVING RATE (%/YR)
    SPSPIR - STAFF FROM PROBLEM SOLVING TO PROGRAM
               INITIATION RATE (%/YR)
    ASPSN  - ALLOCATION OF STAFF TO PROBLEM SOLVING,
               INITIAL (%)

SPIPSR.KL=ASPI.K*PPS.K*SARP                                19, R
SARP=2                                                     19.1, C
    SPIPSR - STAFF FROM PROGRAM INITIATION TO PROBLEM
               SOLVING RATE (%/YR)
    ASPI   - ALLOCATION OF STAFF TO PROGRAM INITIATION
               (%)
    PPS    - PRESSURE ON PROBLEM SOLVING (PRESSURE
               UNITS)
    SARP   - STAFF ALLOCATION RESPONSE TO PRESSURE
               (%/YR/PRESSURE UNIT)
```

```
PAGE 4   FILE SIMPLE2   SIMPLE IMPLEMENTATION MODEL   10/20/
78


PPS.K=TABHL(PPST,UPPC.K,0,40,5)                          20, A
PPST=0/.05/.2/.4/.55/.65/.725/.775/.8                    20.1, T
    PPS     - PRESSURE ON PROBLEM SOLVING (PRESSURE
              UNITS)
    TABHL   - LOGICAL FUNCTION, TABLE LOOK-UP AND
              INTERPOLATION
    PPST    - PRESSURE ON PROBLEM SOLVING TABLE
    UPPC    - UNRESOLVED PROBLEMS PER PROGRAM COMPONENT
              (PROBLEMS/COMPONENT)

     PRESSURE TO INITIATE NEW PROGRAMS

IP.K=IA.K/IG.K                                           21, A
    IP      - INITIATION PROGRESS (DIMENSIONLESS)
    IA      - INITIATION AVERAGE (COMPONENTS/YR)
    IG      - INITIATION GOAL (COMPONENTS/YR)

IG.K=IG.J+(DT)(IA.J-IG.J)/TAIG                           22, L
IG=IGN                                                   22.1, N
IGN=6                                                    22.2, C
TAIG=3                                                   22.3, C
    IG      - INITIATION GOAL (COMPONENTS/YR)
    IA      - INITIATION AVERAGE (COMPONENTS/YR)
    TAIG    - TIME TO ADJUST INITIATION GOAL (YRS)
    IGN     - INITIATION GOAL, INITIAL (COMPONENTS/YR)

IA.K=IA.J+(DT)(PCIR.JK-IA.J)/IAT                         23, L
IA=IGN                                                   23.1, N
IAT=1                                                    23.2, C
    IA      - INITIATION AVERAGE (COMPONENTS/YR)
    PCIR    - PROGRAM COMPONENT INITIATION RATE
              (COMPONENTS/YR)
    IAT     - INITIATION AVERAGE TIME (YRS)
    IGN     - INITIATION GOAL, INITIAL (COMPONENTS/YR)

ASPI.K=ASPI.J+(DT)(SPSPIR.JK-SPIPSR.JK)                  24, L
ASPI=ASPIN                                               24.1, N
ASPIN=.99                                                24.2, C
    ASPI    - ALLOCATION OF STAFF TO PROGRAM INITIATION
              (%)
    SPSPIR  - STAFF FROM PROBLEM SOLVING TO PROGRAM
              INITIATION RATE (%/YR)
    SPIPSR  - STAFF FROM PROGRAM INITIATION TO PROBLEM
              SOLVING RATE (%/YR)
    ASPIN   - ALLOCATION OF STAFF TO PROGRAM INITIATION,
              INITIAL (%)

SPSPIR.KL=ASPS.K*PPI.K*SARP                              25, R
    SPSPIR  - STAFF FROM PROBLEM SOLVING TO PROGRAM
              INITIATION RATE (%/YR)
    ASPS    - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)
    PPI     - PRESSURE ON PROGRAM INITIATION (PRESSURE
              UNITS)
    SARP    - STAFF ALLOCATION RESPONSE TO PRESSURE
              (%/YR/PRESSURE UNIT)
```

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PAGE 5   FILE SIMPLE2   SIMPLE IMPLEMENTATION MODEL   10/20/
78


PPI.K=TABHL(PPIT,IP.K,.1,1.3,.15)                          26, A
PPIT=.8/.775/.725/.65/.55/.4/.2/.05/0                      26.1, T
    PPI     - PRESSURE ON PROGRAM INITIATION (PRESSURE
              UNITS)
    TABHL   - LOGICAL FUNCTION, TABLE LOOK-UP AND
              INTERPOLATION
    PPIT    - PRESSURE ON PROGRAM INITIATION TABLE
    IP      - INITIATION PROGRESS (DIMENSIONLESS)

     MATURE PROGRAMS

MPC.K=MPC.J+(DT)(PCAR.JK-PCDR.JK)                          27, L
MPC=MPCN                                                   27.1, N
MPCN=0                                                     27.2, C
    MPC     - MATURE PROGRAM COMPONENTS (COMPONENTS)
    PCAR    - PROGRAM COMPONENT ACCEPTANCE RATE
              (COMPONENTS/YR)
    PCDR    - PROGRAM COMPONENT DECAY RATE (COMPONENTS/
              YR)
    MPCN    - MATURE PROGRAM COMPONENTS, INITIAL
              (COMPONENTS)

PCDR.KL=MPC.K/ALMPC.K                                      28, R
    PCDR    - PROGRAM COMPONENT DECAY RATE (COMPONENTS/
              YR)
    MPC     - MATURE PROGRAM COMPONENTS (COMPONENTS)
    ALMPC   - AVERAGE LIFETIME OF MATURE PROGRAM
              COMPONENTS (YRS)

ALMPC.K=ALMPCN                                             29, A
ALMPCN=5                                                   29.1, C
    ALMPC   - AVERAGE LIFETIME OF MATURE PROGRAM
              COMPONENTS (YRS)
    ALMPCN  - AVERAGE LIFETIME OF MATURE PROGRAM
              COMPONENTS, INITIAL (YRS)

     CONTROL STATEMENTS

DT=.05                                                     29.5, C
PLTPER=.25                                                 29.6, C
PRTPER=0                                                   29.7, C
LENGTH=0                                                   29.8, C

PLOT  NPC=P,MPC=M,PCIR=I,IG=G(0,8)/PCAR=A(0,4)/            29.9
  FPCA=F,PCIE=E(0,1)
    NPC     - NEW PROGRAM COMPONENTS (COMPONENTS)
    MPC     - MATURE PROGRAM COMPONENTS (COMPONENTS)
    PCIR    - PROGRAM COMPONENT INITIATION RATE
              (COMPONENTS/YR)
    IG      - INITIATION GOAL (COMPONENTS/YR)
    PCAR    - PROGRAM COMPONENT ACCEPTANCE RATE
              (COMPONENTS/YR)
    FPCA    - FRACTION OF PROGRAM COMPONENTS ACCEPTED (%)
    PCIE    - PROGRAM COMPONENT INITIATION EFFECTIVENESS
              (DIMENSIONLESS)
```

```
PAGE 6   FILE SIMPLE2   SIMPLE IMPLEMENTATION MODEL   10/20/
78

PLOT  ASPS=P,ASPI=N(0,1)/PPI=A,PPS=B(0,.8)/UP=U(0,  30.1
  80)
    ASPS    - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)
    ASPI    - ALLOCATION OF STAFF TO PROGRAM INITIATION
              (%)
    PPI     - PRESSURE ON PROGRAM INITIATION (PRESSURE
              UNITS)
    PPS     - PRESSURE ON PROBLEM SOLVING (PRESSURE
              UNITS)
    UP      - UNRESOLVED PROBLEMS (PROBLEMS)
```

Figure A.3. Simple Model with variable staff allocation. Additional output for the simulation run shown in Figure 3.5.

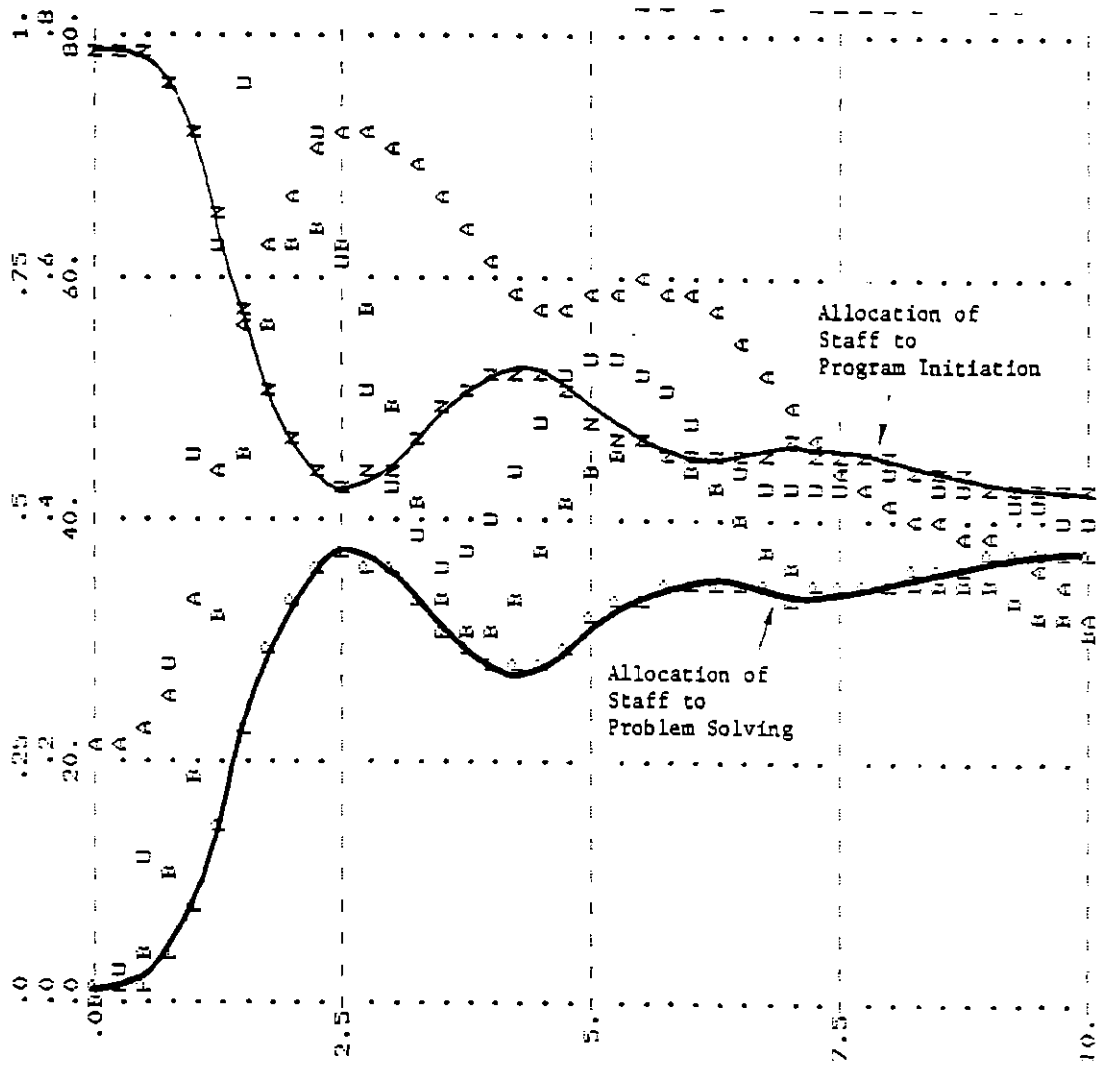
Allocation of
Staff to
Program Initiation
Allocation of
Staff to
Problem Solving
1.
.75
.5
.25
0
80.
60.
40.
20.
0
2.5
5.
7.5
10.

Figure A.4. Equations for an Extended Model with permanent outside funding. (This model corresponds to hypotheses I, II, and III.)

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PAGE 1   FILE SIMPLE3   SIMPLE IMPLEMENTATION MODEL   10/20/
78


     NEW PROGRAMS AND PROBLEMS

NPC.K=NPC.J+(DT)(PCIR.JK-PCAR.JK-PCTR.JK)          1, L
NPC=NPCN                                           1.1, N
NPCN=.015                                          1.2, C
    NPC    - NEW PROGRAM COMPONENTS (COMPONENTS)
    PCIR   - PROGRAM COMPONENT INITIATION RATE
               (COMPONENTS/YR)
    PCAR   - PROGRAM COMPONENT ACCEPTANCE RATE
               (COMPONENTS/YR)
    PCTR   - PROGRAM COMPONENT TERMINATION RATE
               (COMPONENTS/YR)
    NPCN   - NEW PROGRAM COMPONENTS, INITIAL
               (COMPONENTS)

PCIR.KL=SPCI.K*PCIN*PCIE.K                         2, R
PCIN=1                                             2.1, C
    PCIR   - PROGRAM COMPONENT INITIATION RATE
               (COMPONENTS/YR)
    SPCI   - STAFF IN PROGRAM COMPONENT INITIATION
               (PERSONS)
    PCIN   - PROGRAM COMPONENT INITIATION NORMAL
               (COMPONENTS/YR/PERSON)
    PCIE   - PROGRAM COMPONENT INITIATION EFFECTIVENESS
               (DIMENSIONLESS)

SPCI.K=S.K*ASPI.K                                  3, A
    SPCI   - STAFF IN PROGRAM COMPONENT INITIATION
               (PERSONS)
    S      - STAFF (PERSONS)
    ASPI   - ALLOCATION OF STAFF TO PROGRAM INITIATION
               (%)

S.K=SN                                             4, A
SN=6                                               4.1, C
    S      - STAFF (PERSONS)
    SN     - STAFF, INITIAL (PERSONS)

PCIE.K=TABHL(PCIET,UP.K,0,120,15)                  5, A
PCIET=1/.9375/.8/.6/.4/.25/.1875/.125/.1           5.1, T
    PCIE   - PROGRAM COMPONENT INITIATION EFFECTIVENESS
               (DIMENSIONLESS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
               INTERPOLATION
    PCIET  - PROGRAM COMPONENT INITIATION EFFECTIVENESS
               TABLE
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)

PCAR.KL=PCFAT.K*FPCA.K                             6, R
    PCAR   - PROGRAM COMPONENT ACCEPTANCE RATE
               (COMPONENTS/YR)
    PCFAT  - PROGRAM COMPONENTS FACING ACCEPTANCE OR
               TERMINATION (COMPONENTS/YR)
    FPCA   - FRACTION OF PROGRAM COMPONENTS ACCEPTED (%)
```

```
PAGE 2   FILE SIMPLE3   SIMPLE IMPLEMENTATION MODEL   10/20/
78


PCFAT.K=DELAY3(PCIR.JK,TIPC)                                  7, A
PCIR=PCIRN                                                    7.1, N
PCIRN=NPCN/TIPC                                               7.2, N
TIPC=1.5                                                      7.3, C
    PCFAT  - PROGRAM COMPONENTS FACING ACCEPTANCE OR
               TERMINATION (COMPONENTS/YR)
    DELAY3 - THIRD ORDER EXPONENTIAL DELAY
    PCIR   - PROGRAM COMPONENT INITIATION RATE
               (COMPONENTS/YR)
    TIPC   - TIME TO IMPLEMENT PROGRAM COMPONENTS (YRS)
    PCIRN  - PROGRAM COMPONENT INITIATION RATE, INITIAL
               (REQUIRED TO INITIALIZE THIRD-ORDER
               DELAY)
    NPCN   - NEW PROGRAM COMPONENTS, INITIAL
               (COMPONENTS)

FPCA.K=TABHL(FPCAT,UPPC.K,0,40,5)                             8, A
FPCAT=1/.9375/.8/.6/.4/.25/.1875/.125/.1                      8.1, T
    FPCA   - FRACTION OF PROGRAM COMPONENTS ACCEPTED (%)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
               INTERPOLATION
    FPCAT  - FRACTION OF PROGRAM COMPONENTS ACCEPTED
               TABLE
    UPPC   - UNRESOLVED PROBLEMS PER PROGRAM COMPONENT
               (PROBLEMS/COMPONENT)

UPPC.K=UP.K/NPC.K                                             9, A
    UPPC   - UNRESOLVED PROBLEMS PER PROGRAM COMPONENT
               (PROBLEMS/COMPONENT)
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)
    NPC    - NEW PROGRAM COMPONENTS (COMPONENTS)

PCTR.KL=PCFAT.K*(1-FPCA.K)                                    10, R
    PCTR   - PROGRAM COMPONENT TERMINATION RATE
               (COMPONENTS/YR)
    PCFAT  - PROGRAM COMPONENTS FACING ACCEPTANCE OR
               TERMINATION (COMPONENTS/YR)
    FPCA   - FRACTION OF PROGRAM COMPONENTS ACCEPTED (%)

UP.K=UP.J+(DT)(PGR.JK-PSR.JK-PER.JK)                          11, L
UP=UPN                                                        11.1, N
UPN=0                                                         11.2, C
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)
    PGR    - PROBLEM GENERATION RATE (PROBLEMS/YR)
    PSR    - PROBLEM SOLUTION RATE (PROBLEMS/YR)
    PER    - PROBLEM ELIMINATION RATE (PROBLEMS/YR)
    UPN    - UNRESOLVED PROBLEMS, INITIAL (PROBLEMS)

PGR.KL=NPC.K*PGN                                              12, R
PGN=20                                                        12.1, C
    PGR    - PROBLEM GENERATION RATE (PROBLEMS/YR)
    NPC    - NEW PROGRAM COMPONENTS (COMPONENTS)
    PGN    - PROBLEM GENERATION NORMAL (PROBLEMS/
               COMPONENT/YR)
```

PAGE 3 FILE SIMPLE3 SIMPLE IMPLEMENTATION MODEL 10/20/
78

```
PSR.KL=UP.K/TSP.K                                          13, R
    PSR    - PROBLEM SOLUTION RATE (PROBLEMS/YR)
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)
    TSP    - TIME TO SOLVE PROBLEMS (YRS)

TSP.K=TABHL(TSPT,SLPS.K,0,40,10)                           14, A
TSPT=.375/.5/1/1.5/2.5                                     14.1, T
    TSP    - TIME TO SOLVE PROBLEMS (YRS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
               INTERPOLATION
    TSPT   - TIME TO SOLVE PROBLEMS TABLE
    SLPS   - STAFF LOAD IN PROBLEM SOLVING (PROBLEMS/
               PERSON)

SLPS.K=UP.K/SPS.K                                          15, A
    SLPS   - STAFF LOAD IN PROBLEM SOLVING (PROBLEMS/
               PERSON)
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)
    SPS    - STAFF IN PROBLEM SOLVING (PERSONS)

SPS.K=S.K*ASPS.K                                           16, A
    SPS    - STAFF IN PROBLEM SOLVING (PERSONS)
    S      - STAFF (PERSONS)
    ASPS   - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)

PER.KL=PCTR.JK*UPPC.K                                      17, R
    PER    - PROBLEM ELIMINATION RATE (PROBLEMS/YR)
    PCTR   - PROGRAM COMPONENT TERMINATION RATE
               (COMPONENTS/YR)
    UPPC   - UNRESOLVED PROBLEMS PER PROGRAM COMPONENT
               (PROBLEMS/COMPONENT)

ASPS.K=ASPS.J+(DT)(SPIPSR.JK+STCPSR.JK-SPSPIR.JK-          18, L
  SPSTCR.JK)
ASPS=ASPSN                                                 18.1, N
ASPSN=.01                                                  18.2, C
    ASPS   - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)
    SPIPSR - STAFF FROM PROGRAM INITIATION TO PROBLEM
               SOLVING RATE (%/YR)
    STCPSR - STAFF FROM TASK COMPLETION TO PROBLEM
               SOLVING RATE (%/YR)
    SPSPIR - STAFF FROM PROBLEM SOLVING TO PROGRAM
               INITIATION RATE (%/YR)
    SPSTCR - STAFF FROM PROBLEM SOLVING TO TASK
               COMPLETION RATE (%/YR)
    ASPSN  - ALLOCATION OF STAFF TO PROBLEM SOLVING,
               INITIAL (%)

SPIPSR.KL=ASPI.K*PPS.K*SARP                                19, R
    SPIPSR - STAFF FROM PROGRAM INITIATION TO PROBLEM
               SOLVING RATE (%/YR)
    ASPI   - ALLOCATION OF STAFF TO PROGRAM INITIATION
               (%)
    PPS    - PRESSURE ON PROBLEM SOLVING (PRESSURE
               UNITS)
    SARP   - STAFF ALLOCATION RESPONSE TO PRESSURE
               (%/YR/PRESSURE UNIT)
```

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PAGE 4   FILE SIMPLE3   SIMPLE IMPLEMENTATION MODEL   10/20/
78


STCPSR.KL=ASTC.K*PPS.K*SARP                                  20, R
SARP=2                                                       20.1, C
    STCPSR - STAFF FROM TASK COMPLETION TO PROBLEM
             SOLVING RATE (%/YR)
    ASTC   - ALLOCATION OF STAFF TO TASK COMPLETION (%)
    PPS    - PRESSURE ON PROBLEM SOLVING (PRESSURE
             UNITS)
    SARP   - STAFF ALLOCATION RESPONSE TO PRESSURE
             (%/YR/PRESSURE UNIT)

PPS.K=TABHL(PPST,UPPC.K,0,40,5)                              21, A
PPST=0/.05/.2/.4/.55/.65/.725/.775/.8                        21.1, T
    PPS    - PRESSURE ON PROBLEM SOLVING (PRESSURE
             UNITS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
             INTERPOLATION
    PPST   - PRESSURE ON PROBLEM SOLVING TABLE
    UPPC   - UNRESOLVED PROBLEMS PER PROGRAM COMPONENT
             (PROBLEMS/COMPONENT)

     PRESSURE TO INITIATE NEW PROGRAMS

IP.K=IA.K/IG.K                                               22, A
    IP     - INITIATION PROGRESS (DIMENSIONLESS)
    IA     - INITIATION AVERAGE (COMPONENTS/YR)
    IG     - INITIATION GOAL (COMPONENTS/YR)

IG.K=IG.J+(DT)(IA.J-IG.J)/TAIG                               23, L
IG=IGN                                                       23.1, N
IGN=6                                                        23.2, C
TAIG=3                                                       23.3, C
    IG     - INITIATION GOAL (COMPONENTS/YR)
    IA     - INITIATION AVERAGE (COMPONENTS/YR)
    TAIG   - TIME TO ADJUST INITIATION GOAL (YRS)
    IGN    - INITIATION GOAL, INITIAL (COMPONENTS/YR)

IA.K=IA.J+(DT)(PCIR.JK-IA.J)/IAT                             24, L
IA=IGN                                                       24.1, N
IAT=1                                                        24.2, C
    IA     - INITIATION AVERAGE (COMPONENTS/YR)
    PCIR   - PROGRAM COMPONENT INITIATION RATE
             (COMPONENTS/YR)
    IAT    - INITIATION AVERAGE TIME (YRS)
    IGN    - INITIATION GOAL, INITIAL (COMPONENTS/YR)
```

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PAGE 5   FILE SIMPLE3   SIMPLE IMPLEMENTATION MODEL   10/20/
78


ASPI.K=ASPI.J+(DT)(SPSPIR.JK+STCPIR.JK-SPIPSR.JK-          25, L
  SPITCR.JK)
ASPI=ASPIN                                                 25.1, N
ASPIN=.98                                                  25.2, C
    ASPI   - ALLOCATION OF STAFF TO PROGRAM INITIATION
               (%)
    SPSPIR - STAFF FROM PROBLEM SOLVING TO PROGRAM
               INITIATION RATE (%/YR)
    STCPIR - STAFF FROM TASK COMPLETION TO PROGRAM
               INITIATION RATE (%/YR)
    SPIPSR - STAFF FROM PROGRAM INITIATION TO PROBLEM
               SOLVING RATE (%/YR)
    SPITCR - STAFF FROM PROGRAM INITIATION TO TASK
               COMPLETION RATE (%/YR)
    ASPIN  - ALLOCATION OF STAFF TO PROGRAM INITIATION,
               INITIAL (%)

SPSPIR.KL=ASPS.K*PPI.K*SARP                                26, R
    SPSPIR - STAFF FROM PROBLEM SOLVING TO PROGRAM
               INITIATION RATE (%/YR)
    ASPS   - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)
    PPI    - PRESSURE ON PROGRAM INITIATION (PRESSURE
               UNITS)
    SARP   - STAFF ALLOCATION RESPONSE TO PRESSURE
               (%/YR/PRESSURE UNIT)

STCPIR.KL=ASTC.K*PPI.K*SARP                                27, R
    STCPIR - STAFF FROM TASK COMPLETION TO PROGRAM
               INITIATION RATE (%/YR)
    ASTC   - ALLOCATION OF STAFF TO TASK COMPLETION (%)
    PPI    - PRESSURE ON PROGRAM INITIATION (PRESSURE
               UNITS)
    SARP   - STAFF ALLOCATION RESPONSE TO PRESSURE
               (%/YR/PRESSURE UNIT)

PPI.K=TABHL(PPIT,IP.K,.1,1.3,.15)                          28, A
PPIT=.8/.775/.725/.65/.55/.4/.2/.05/0                      28.1, T
    PPI    - PRESSURE ON PROGRAM INITIATION (PRESSURE
               UNITS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
               INTERPOLATION
    PPIT   - PRESSURE ON PROGRAM INITIATION TABLE
    IP     - INITIATION PROGRESS (DIMENSIONLESS)

     MATURE PROGRAMS AND TASKS

MPC.K=MPC.J+(DT)(PCAR.JK-PCDR.JK)                          29, L
MPC=MPCN                                                   29.1, N
MPCN=.01                                                   29.2, C
    MPC    - MATURE PROGRAM COMPONENTS (COMPONENTS)
    PCAR   - PROGRAM COMPONENT ACCEPTANCE RATE
               (COMPONENTS/YR)
    PCDR   - PROGRAM COMPONENT DECAY RATE (COMPONENTS/
               YR)
    MPCN   - MATURE PROGRAM COMPONENTS, INITIAL
               (COMPONENTS)
```

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PAGE 6   FILE SIMPLE3   SIMPLE IMPLEMENTATION MODEL   10/20/
78


PCDR.KL=MPC.K/ALMPC.K                                    30, R
    PCDR   - PROGRAM COMPONENT DECAY RATE (COMPONENTS/
               YR)
    MPC    - MATURE PROGRAM COMPONENTS (COMPONENTS)
    ALMPC  - AVERAGE LIFETIME OF MATURE PROGRAM
               COMPONENTS (YRS)

ALMPC.K=TABHL(ALMPCT,UTPC.K,0,20,5)                      31, A
ALMPCT=10/5/2.5/1.25/1                                   31.1, T
    ALMPC  - AVERAGE LIFETIME OF MATURE PROGRAM
               COMPONENTS (YRS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
               INTERPOLATION
    ALMPCT - AVERAGE LIFETIME OF MATURE PROGRAM
               COMPONENTS TABLE
    UTPC   - UNCOMPLETED TASKS PER PROGRAM COMPONENT
               (TASKS/COMPONENT)

UTPC.K=UT.K/MPC.K                                        32, A
    UTPC   - UNCOMPLETED TASKS PER PROGRAM COMPONENT
               (TASKS/COMPONENT)
    UT     - UNCOMPLETED TASKS (TASKS)
    MPC    - MATURE PROGRAM COMPONENTS (COMPONENTS)

UT.K=UT.J+(DT)(TGR.JK-TCR.JK-TER.JK)                     33, L
UT=UTN                                                   33.1, N
UTN=0                                                    33.2, C
    UT     - UNCOMPLETED TASKS (TASKS)
    TGR    - TASK GENERATION RATE (TASKS/YR)
    TCR    - TASK COMPLETION RATE (TASKS/YR)
    TER    - TASK ELIMINATION RATE (TASKS/YR)

TGR.KL=MPC.K*TGN                                         34, R
TGN=10                                                   34.1, C
    TGR    - TASK GENERATION RATE (TASKS/YR)
    MPC    - MATURE PROGRAM COMPONENTS (COMPONENTS)
    TGN    - TASK GENERATION NORMAL (TASKS/COMPONENT/YR)

TCR.KL=UT.K/TCT.K                                        35, R
    TCR    - TASK COMPLETION RATE (TASKS/YR)
    UT     - UNCOMPLETED TASKS (TASKS)
    TCT    - TIME TO COMPLETE TASKS (YRS)

TCT.K=TABHL(TCTT,SLTC.K,0,40,10)                         36, A
TCTT=.375/.5/1/1.5/2.5                                   36.1, T
    TCT    - TIME TO COMPLETE TASKS (YRS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
               INTERPOLATION
    TCTT   - TIME TO COMPLETE TASKS TABLE
    SLTC   - STAFF LOAD IN TASK COMPLETION (TASKS/
               PERSON)

SLTC.K=UT.K/STC.K                                        37, A
    SLTC   - STAFF LOAD IN TASK COMPLETION (TASKS/
               PERSON)
    UT     - UNCOMPLETED TASKS (TASKS)
    STC    - STAFF IN TASK COMPLETION (PERSONS)
```

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PAGE 7   FILE SIMPLE3   SIMPLE IMPLEMENTATION MODEL   10/20/
73


STC.K=S.K*ASTC.K                                          38, A
    STC     - STAFF IN TASK COMPLETION (PERSONS)
    S       - STAFF (PERSONS)
    ASTC    - ALLOCATION OF STAFF TO TASK COMPLETION (%)

TER.KL=PCDR.JK*UTPC.K                                     39, R
    TER     - TASK ELIMINATION RATE (TASKS/YR)
    PCDR    - PROGRAM COMPONENT DECAY RATE (COMPONENTS/
              YR)
    UTPC    - UNCOMPLETED TASKS PER PROGRAM COMPONENT
              (TASKS/COMPONENT)

ASTC.K=ASTC.J+(DT)(SPITCR.JK+SPSTCR.JK-STCPIR.JK-         40, L
  STCPSR.JK)
ASTC=ASTCN                                                40.1, N
ASTCN=.01                                                 40.2, C
    ASTC    - ALLOCATION OF STAFF TO TASK COMPLETION (%)
    SPITCR  - STAFF FROM PROGRAM INITIATION TO TASK
              COMPLETION RATE (%/YR)
    SPSTCR  - STAFF FROM PROBLEM SOLVING TO TASK
              COMPLETION RATE (%/YR)
    STCPIR  - STAFF FROM TASK COMPLETION TO PROGRAM
              INITIATION RATE (%/YR)
    STCPSR  - STAFF FROM TASK COMPLETION TO PROBLEM
              SOLVING RATE (%/YR)
    ASTCN   - ALLOCATION OF STAFF TO TASK COMPLETION,
              INITIAL (%)

SPITCR.KL=ASPI.K*PTC.K*SARP                               41, R
    SPITCR  - STAFF FROM PROGRAM INITIATION TO TASK
              COMPLETION RATE (%/YR)
    ASPI    - ALLOCATION OF STAFF TO PROGRAM INITIATION
              (%)
    PTC     - PRESSURE ON TASK COMPLETION (PRESSURE
              UNITS)
    SARP    - STAFF ALLOCATION RESPONSE TO PRESSURE
              (%/YR/PRESSURE UNIT)

SPSTCR.KL=ASPS.K*PTC.K*SARP                               42, R
    SPSTCR  - STAFF FROM PROBLEM SOLVING TO TASK
              COMPLETION RATE (%/YR)
    ASPS    - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)
    PTC     - PRESSURE ON TASK COMPLETION (PRESSURE
              UNITS)
    SARP    - STAFF ALLOCATION RESPONSE TO PRESSURE
              (%/YR/PRESSURE UNIT)

PTC.K=TABHL(PTCT,UTPC.K,0,20,2.5)                         43, A
PTCT=0/.05/.2/.4/.55/.65/.725/.775/.8                     43.1, T
    PTC     - PRESSURE ON TASK COMPLETION (PRESSURE
              UNITS)
    TABHL   - LOGICAL FUNCTION, TABLE LOOK-UP AND
              INTERPOLATION
    PTCT    - PRESSURE ON TASK COMPLETION TABLE
    UTPC    - UNCOMPLETED TASKS PER PROGRAM COMPONENT
              (TASKS/COMPONENT)
```

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PAGE 8   FILE SIMPLE3   SIMPLE IMPLEMENTATION MODEL   10/20/
78


AST.K=ASPI.K+ASPS.K+ASTC.K                                  44, A
    AST    - ALLOCATION OF STAFF TOTAL (%)
    ASPI   - ALLOCATION OF STAFF TO PROGRAM INITIATION
             (%)
    ASPS   - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)
    ASTC   - ALLOCATION OF STAFF TO TASK COMPLETION (%)

     CONTROL STATEMENTS

DT=.05                                                      44.4, C
PLTPER=.25                                                  44.5, C
PRTPER=0                                                    44.6, C
LENGTH=0                                                    44.7, C

PLOT  NPC=P,MPC=M,PCIR=I,IG=G(0,8)/PCAR=A(0,4)/             44.8
  FPCA=F,PCIE=E(0,1)
    NPC    - NEW PROGRAM COMPONENTS (COMPONENTS)
    MPC    - MATURE PROGRAM COMPONENTS (COMPONENTS)
    PCIR   - PROGRAM COMPONENT INITIATION RATE
             (COMPONENTS/YR)
    IG     - INITIATION GOAL (COMPONENTS/YR)
    PCAR   - PROGRAM COMPONENT ACCEPTANCE RATE
             (COMPONENTS/YR)
    FPCA   - FRACTION OF PROGRAM COMPONENTS ACCEPTED (%)
    PCIE   - PROGRAM COMPONENT INITIATION EFFECTIVENESS
             (DIMENSIONLESS)

PLOT  ASPS=P,ASTC=T,ASPI=N,AST=I(0,1)/PPI=A,PPS=B,  44.9
  PTC=C(0,.8)
    ASPS   - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)
    ASTC   - ALLOCATION OF STAFF TO TASK COMPLETION (%)
    ASPI   - ALLOCATION OF STAFF TO PROGRAM INITIATION
             (%)
    AST    - ALLOCATION OF STAFF TOTAL (%)
    PPI    - PRESSURE ON PROGRAM INITIATION (PRESSURE
             UNITS)
    PPS    - PRESSURE ON PROBLEM SOLVING (PRESSURE
             UNITS)
    PTC    - PRESSURE ON TASK COMPLETION (PRESSURE
             UNITS)
```
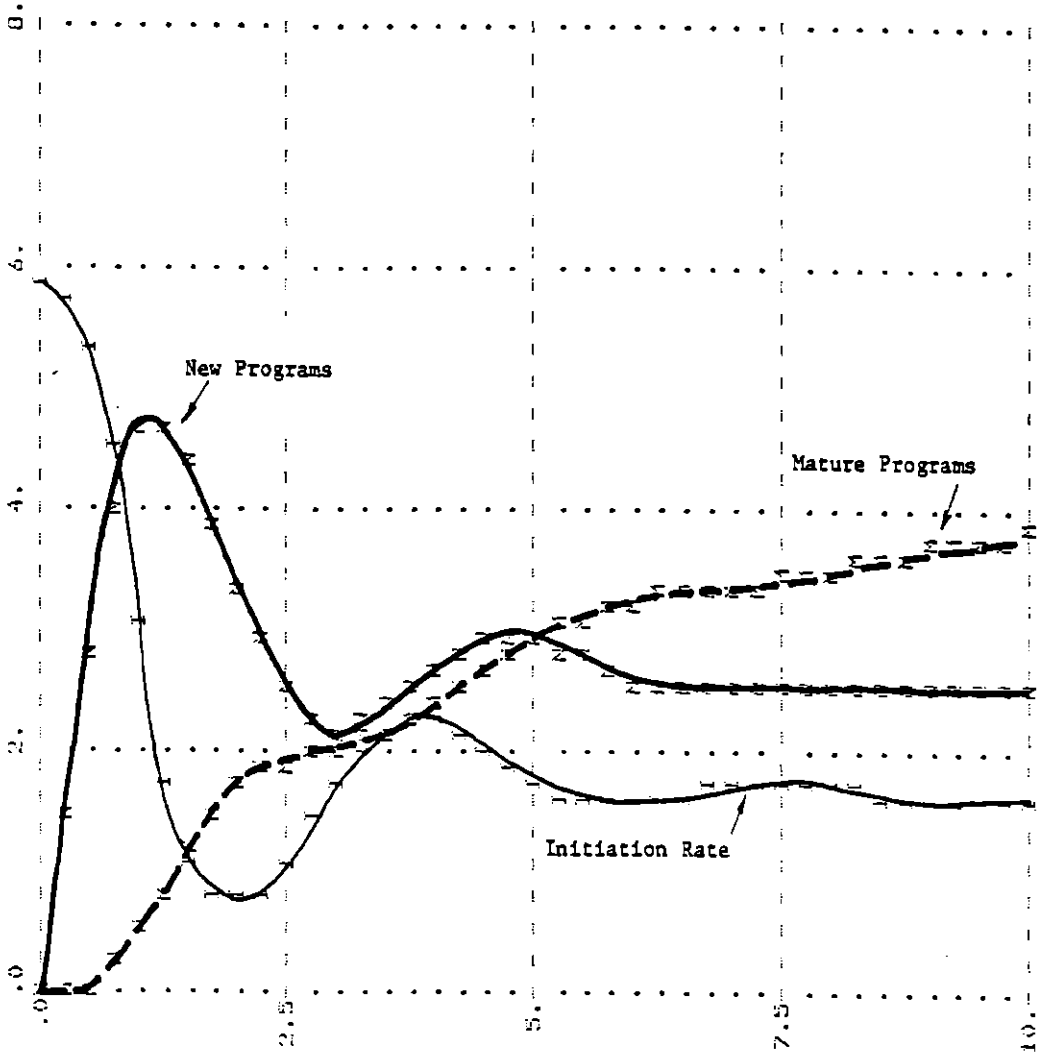

Figure A.5. A simulation run for the Extended Model with permanent outside funding.


8.
6.
4.
2.
0
0
2.5
5.
7.5
10.
New Programs
Mature Programs
Initiation Rate

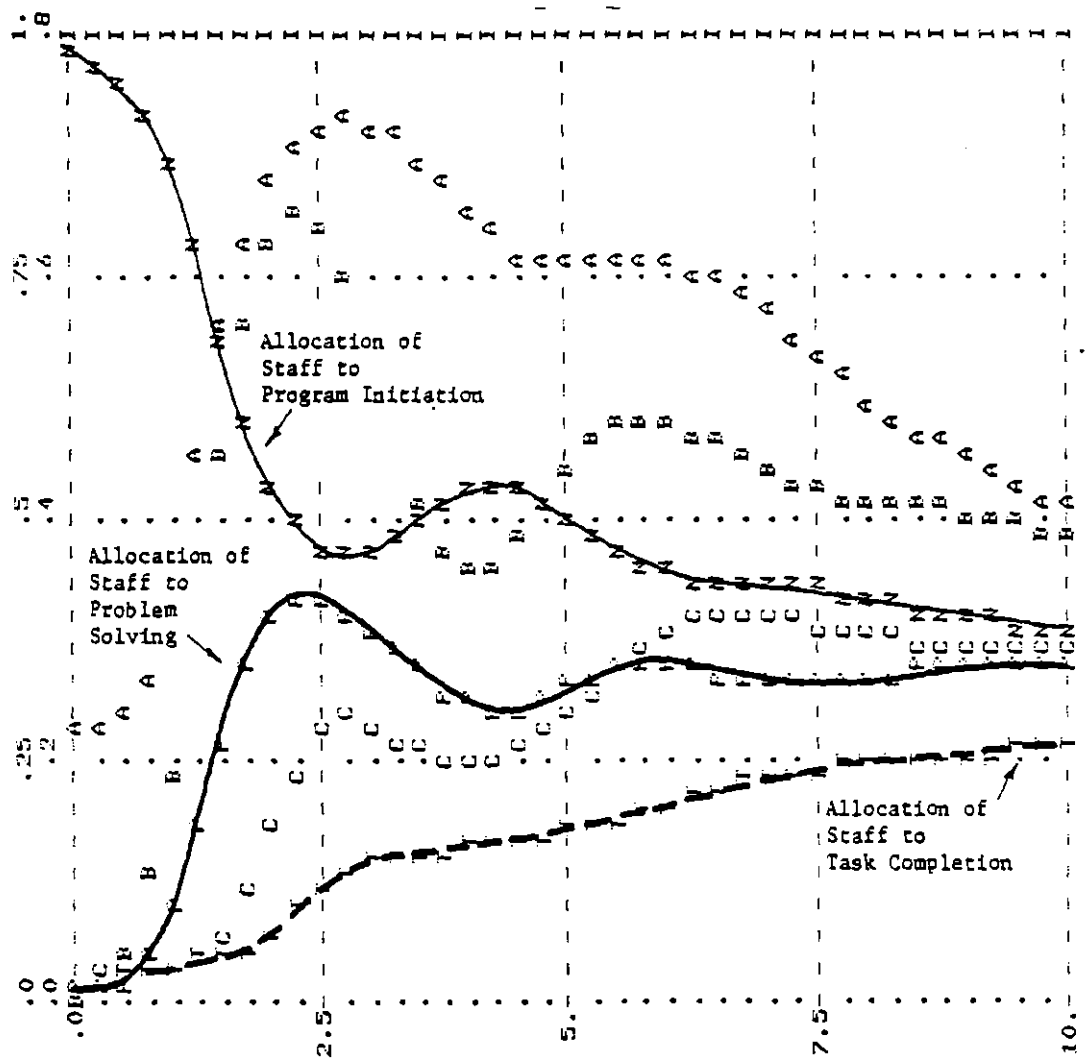

Allocation of
Staff to
Program Initiation
Allocation of
Staff to
Problem
Solving
Allocation of
Staff to
Task Completion
1.8
.75
.5
.25
0
.0
.05
2.5
5.
7.5
10.

Figure A.6. Equations for the full Extended Model. (This model corresponds to hypotheses I-IV.)

```
PAGE 1   FILE SIMPLE10   SIMPLE IMPLEMENTATION MODEL    2/01/79

     NEW PROGRAMS AND PROBLEMS

NPC.K=NPC.J+(DT)(PCIR.JK-PCAR.JK-PCTR.JK)          1, L
NPC=NPCN                                           1.1, N
NPCN=.015                                          1.2, C
    NPC    - NEW PROGRAM COMPONENTS (COMPONENTS)
    PCIR   - PROGRAM COMPONENT INITIATION RATE
               (COMPONENTS/YR)
    PCAR   - PROGRAM COMPONENT ACCEPTANCE RATE
               (COMPONENTS/YR)
    PCTR   - PROGRAM COMPONENT TERMINATION RATE
               (COMPONENTS/YR)
    NPCN   - NEW PROGRAM COMPONENTS, INITIAL
               (COMPONENTS)

PCIR.KL=SPCI.K*PCIN*PCIE.K                         2, R
PCIN=1                                             2.1, C
    PCIR   - PROGRAM COMPONENT INITIATION RATE
               (COMPONENTS/YR)
    SPCI   - STAFF IN PROGRAM COMPONENT INITIATION
               (PERSONS)
    PCIN   - PROGRAM COMPONENT INITIATION NORMAL
               (COMPONENTS/YR/PERSON)
    PCIE   - PROGRAM COMPONENT INITIATION EFFECTIVENESS
               (DIMENSIONLESS)

SPCI.K=S.K*ASPI.K                                  3, A
    SPCI   - STAFF IN PROGRAM COMPONENT INITIATION
               (PERSONS)
    S      - STAFF (PERSONS)
    ASPI   - ALLOCATION OF STAFF TO PROGRAM INITIATION
               (%)

PCIE.K=TABHL(PCIET,UP.K,0,120,15)                  4, A
PCIET=1/.9375/.8/.6/.4/.25/.1875/.125/.1           4.1, T
    PCIE   - PROGRAM COMPONENT INITIATION EFFECTIVENESS
               (DIMENSIONLESS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
               INTERPOLATION
    PCIET  - PROGRAM COMPONENT INITIATION EFFECTIVENESS
               TABLE
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)

PCAR.KL=PCFAT.K*FPCA.K                             5, R
    PCAR   - PROGRAM COMPONENT ACCEPTANCE RATE
               (COMPONENTS/YR)
    PCFAT  - PROGRAM COMPONENTS FACING ACCEPTANCE OR
               TERMINATION (COMPONENTS/YR)
    FPCA   - FRACTION OF PROGRAM COMPONENTS ACCEPTED (%)
```

```
PAGE 2   FILE SIMPLE10   SIMPLE IMPLEMENTATION MODEL    2/01/79


PCFAT.K=DELAY3(PCIR.JK,TIPC)                                    6, A
PCIR=PCIRN                                                      6.1, N
PCIRN=NPCN/TIPC                                                 6.2, N
TIPC=1.5                                                        6.3, C
    PCFAT  - PROGRAM COMPONENTS FACING ACCEPTANCE OR
               TERMINATION (COMPONENTS/YR)
    DELAY3 - THIRD ORDER EXPONENTIAL DELAY
    PCIR   - PROGRAM COMPONENT INITIATION RATE
               (COMPONENTS/YR)
    TIPC   - TIME TO IMPLEMENT PROGRAM COMPONENTS (YRS)
    PCIRN  - PROGRAM COMPONENT INITIATION RATE, INITIAL
               (REQUIRED TO INITIALIZE THIRD-ORDER
               DELAY)
    NPCN   - NEW PROGRAM COMPONENTS, INITIAL
               (COMPONENTS)

FPCA.K=TABHL(FPCAT,UPPC.K,0,40,5)                               7, A
FPCAT=1/.9375/.8/.6/.4/.25/.1875/.125/.1                        7.1, T
    FPCA   - FRACTION OF PROGRAM COMPONENTS ACCEPTED (%)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
               INTERPOLATION
    FPCAT  - FRACTION OF PROGRAM COMPONENTS ACCEPTED
               TABLE
    UPPC   - UNRESOLVED PROBLEMS PER PROGRAM COMPONENT
               (PROBLEMS/COMPONENT)

UPPC.K=UP.K/NPC.K                                               8, A
    UPPC   - UNRESOLVED PROBLEMS PER PROGRAM COMPONENT
               (PROBLEMS/COMPONENT)
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)
    NPC    - NEW PROGRAM COMPONENTS (COMPONENTS)

PCTR.KL=PCFAT.K*(1-FPCA.K)                                      9, R
    PCTR   - PROGRAM COMPONENT TERMINATION RATE
               (COMPONENTS/YR)
    PCFAT  - PROGRAM COMPONENTS FACING ACCEPTANCE OR
               TERMINATION (COMPONENTS/YR)
    FPCA   - FRACTION OF PROGRAM COMPONENTS ACCEPTED (%)

UP.K=UP.J+(DT)(PGR.JK-PSR.JK-PER.JK)                            10, L
UP=UPN                                                          10.1, N
UPN=0                                                           10.2, C
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)
    PGR    - PROBLEM GENERATION RATE (PROBLEMS/YR)
    PSR    - PROBLEM SOLUTION RATE (PROBLEMS/YR)
    PER    - PROBLEM ELIMINATION RATE (PROBLEMS/YR)
    UPN    - UNRESOLVED PROBLEMS, INITIAL (PROBLEMS)

PGR.KL=NPC.K*PGN                                                11, R
PGN=20                                                          11.1, C
    PGR    - PROBLEM GENERATION RATE (PROBLEMS/YR)
    NPC    - NEW PROGRAM COMPONENTS (COMPONENTS)
    PGN    - PROBLEM GENERATION NORMAL (PROBLEMS/
               COMPONENT/YR)
```

```
PAGE 3   FILE SIMPLE10   SIMPLE IMPLEMENTATION MODEL    2/01/79

PSR.KL=UP.K/TSP.K                                          12, R
    PSR    - PROBLEM SOLUTION RATE (PROBLEMS/YR)
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)
    TSP    - TIME TO SOLVE PROBLEMS (YRS)

TSP.K=TABHL(TSPT,SLPS.K,0,40,10)                           13, A
TSPT=.375/.5/1/1.5/2.5                                     13.1, T
    TSP    - TIME TO SOLVE PROBLEMS (YRS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
               INTERPOLATION
    TSPT   - TIME TO SOLVE PROBLEMS TABLE
    SLPS   - STAFF LOAD IN PROBLEM SOLVING (PROBLEMS/
               PERSON)

SLPS.K=UP.K/SPS.K                                          14, A
    SLPS   - STAFF LOAD IN PROBLEM SOLVING (PROBLEMS/
               PERSON)
    UP     - UNRESOLVED PROBLEMS (PROBLEMS)
    SPS    - STAFF IN PROBLEM SOLVING (PERSONS)

SPS.K=S.K*ASPS.K                                           15, A
    SPS    - STAFF IN PROBLEM SOLVING (PERSONS)
    S      - STAFF (PERSONS)
    ASPS   - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)

PER.KL=PCTR.JK*UPPC.K                                      16, R
    PER    - PROBLEM ELIMINATION RATE (PROBLEMS/YR)
    PCTR   - PROGRAM COMPONENT TERMINATION RATE
               (COMPONENTS/YR)
    UPPC   - UNRESOLVED PROBLEMS PER PROGRAM COMPONENT
               (PROBLEMS/COMPONENT)

ASPS.K=ASPS.J+(DT)(SPIPSR.JK+STCPSR.JK+SRAPSR.JK-          17, L
  SPSPIR.JK-SPSTCR.JK-SPSRAR.JK)
ASPS=ASPSN                                                 17.2, N
ASPSN=.01                                                  17.3, C
    ASPS   - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)
    SPIPSR - STAFF FROM PROGRAM INITIATION TO PROBLEM
               SOLVING RATE (%/YR)
    STCPSR - STAFF FROM TASK COMPLETION TO PROBLEM
               SOLVING RATE (%/YR)
    SRAPSR - STAFF FROM RESOURCE ACSUISITION TO PROBLEM
               SOLVING RATE (%/YR)
    SPSPIR - STAFF FROM PROBLEM SOLVING TO PROGRAM
               INITIATION RATE (%/YR)
    SPSTCR - STAFF FROM PROBLEM SOLVING TO TASK
               COMPLETION RATE (%/YR)
    SPSRAR - STAFF FROM PROBLEM SOLVING TO RESOURCE
               ACQUISITION RATE (%/YR)
    ASPSN  - ALLOCATION OF STAFF TO PROBLEM SOLVING,
               INITIAL (%)
```

```
PAGE 4   FILE SIMPLE10   SIMPLE IMPLEMENTATION MODEL    2/01/79


SPIPSR.KL=ASPI.K*PPS.K*SARP                                  18, R
    SPIPSR - STAFF FROM PROGRAM INITIATION TO PROBLEM
             SOLVING RATE (%/YR)
    ASPI   - ALLOCATION OF STAFF TO PROGRAM INITIATION
             (%)
    PPS    - PRESSURE ON PROBLEM SOLVING (PRESSURE
             UNITS)
    SARP   - STAFF ALLOCATION RESPONSE TO PRESSURE
             (%/YR/PRESSURE UNIT)

STCPSR.KL=ASTC.K*PPS.K*SARP                                  19, R
    STCPSR - STAFF FROM TASK COMPLETION TO PROBLEM
             SOLVING RATE (%/YR)
    ASTC   - ALLOCATION OF STAFF TO TASK COMPLETION (%)
    PPS    - PRESSURE ON PROBLEM SOLVING (PRESSURE
             UNITS)
    SARP   - STAFF ALLOCATION RESPONSE TO PRESSURE
             (%/YR/PRESSURE UNIT)

SRAPSR.KL=ASRA.K*PPS.K*SARP                                  20, R
SARP=2                                                       20.1, C
    SRAPSR - STAFF FROM RESOURCE ACSUISITION TO PROBLEM
             SOLVING RATE (%/YR)
    ASRA   - ALLOCATION OF STAFF TO RESOURCE ACQUISITION
             (%)
    PPS    - PRESSURE ON PROBLEM SOLVING (PRESSURE
             UNITS)
    SARP   - STAFF ALLOCATION RESPONSE TO PRESSURE
             (%/YR/PRESSURE UNIT)

PPS.K=TABHL(PPST,UPPC.K,0,40,5)                              21, A
PPST=0/.05/.2/.4/.55/.65/.725/.775/.8                        21.1, T
    PPS    - PRESSURE ON PROBLEM SOLVING (PRESSURE
             UNITS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
             INTERPOLATION
    PPST   - PRESSURE ON PROBLEM SOLVING TABLE
    UPPC   - UNRESOLVED PROBLEMS PER PROGRAM COMPONENT
             (PROBLEMS/COMPONENT)

     PRESSURE TO INITIATE NEW PROGRAMS

IP.K=IA.K/IG.K                                               22, A
    IP     - INITIATION PROGRESS (DIMENSIONLESS)
    IA     - INITIATION AVERAGE (COMPONENTS/YR)
    IG     - INITIATION GOAL (COMPONENTS/YR)

IG.K=IG.J+(DT)(IA.J-IG.J)/TAIG                               23, L
IG=IGN                                                       23.1, N
IGN=6                                                        23.2, C
TAIG=3                                                       23.3, C
    IG     - INITIATION GOAL (COMPONENTS/YR)
    IA     - INITIATION AVERAGE (COMPONENTS/YR)
    TAIG   - TIME TO ADJUST INITIATION GOAL (YRS)
    IGN    - INITIATION GOAL, INITIAL (COMPONENTS/YR)
```

```
PAGE 5   FILE SIMPLE10   SIMPLE IMPLEMENTATION MODEL     2/01/79

IA.K=IA.J+(DT)(PCIR.JK-IA.J)/IAT                          24, L
IA=IGN                                                    24.1, N
IAT=1                                                     24.2, C
    IA      - INITIATION AVERAGE (COMPONENTS/YR)
    PCIR    - PROGRAM COMPONENT INITIATION RATE
              (COMPONENTS/YR)
    IAT     - INITIATION AVERAGE TIME (YRS)
    IGN     - INITIATION GOAL, INITIAL (COMPONENTS/YR)

ASPI.K=ASPI.J+(DT)(SPSPIR.JK+STCPIR.JK+SRAPIR.JK-         25, L
  SPIPSR.JK-SPITCR.JK-SPIRAR.JK)
ASPI=ASPIN                                                25.2, N
ASPIN=.97                                                 25.3, C
    ASPI    - ALLOCATION OF STAFF TO PROGRAM INITIATION
              (%)
    SPSPIR  - STAFF FROM PROBLEM SOLVING TO PROGRAM
              INITIATION RATE (%/YR)
    STCPIR  - STAFF FROM TASK COMPLETION TO PROGRAM
              INITIATION RATE (%/YR)
    SRAPIR  - STAFF FROM RESOURCE ACQUISITION TO PROGRAM
              INITIATION RATE (%/YR)
    SPIPSR  - STAFF FROM PROGRAM INITIATION TO PROBLEM
              SOLVING RATE (%/YR)
    SPITCR  - STAFF FROM PROGRAM INITIATION TO TASK
              COMPLETION RATE (%/YR)
    SPIRAR  - STAFF FROM PROGRAM INITIATION TO RESOURCE
              ACQUISITION RATE (%/YR)
    ASPIN   - ALLOCATION OF STAFF TO PROGRAM INITIATION,
              INITIAL (%)

SPSPIR.KL=ASPS.K*PPI.K*SARP                               26, R
    SPSPIR  - STAFF FROM PROBLEM SOLVING TO PROGRAM
              INITIATION RATE (%/YR)
    ASPS    - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)
    PPI     - PRESSURE ON PROGRAM INITIATION (PRESSURE
              UNITS)
    SARP    - STAFF ALLOCATION RESPONSE TO PRESSURE
              (%/YR/PRESSURE UNIT)

STCPIR.KL=ASTC.K*PPI.K*SARP                               27, R
    STCPIR  - STAFF FROM TASK COMPLETION TO PROGRAM
              INITIATION RATE (%/YR)
    ASTC    - ALLOCATION OF STAFF TO TASK COMPLETION (%)
    PPI     - PRESSURE ON PROGRAM INITIATION (PRESSURE
              UNITS)
    SARP    - STAFF ALLOCATION RESPONSE TO PRESSURE
              (%/YR/PRESSURE UNIT)

SRAPIR.KL=ASRA.K*PPI.K*SARP                               28, R
    SRAPIR  - STAFF FROM RESOURCE ACQUISITION TO PROGRAM
              INITIATION RATE (%/YR)
    ASRA    - ALLOCATION OF STAFF TO RESOURCE ACQUISITION
              (%)
    PPI     - PRESSURE ON PROGRAM INITIATION (PRESSURE
              UNITS)
    SARP    - STAFF ALLOCATION RESPONSE TO PRESSURE
              (%/YR/PRESSURE UNIT)
```

```
PPI.K=TABHL(PPIT,IP.K,.1,1.3,.15)                          29, A
PPIT=.8/.775/.725/.65/.55/.4/.2/.05/0                      29.1, T
    PPI    - PRESSURE ON PROGRAM INITIATION (PRESSURE
             UNITS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
             INTERPOLATION
    PPIT   - PRESSURE ON PROGRAM INITIATION TABLE
    IP     - INITIATION PROGRESS (DIMENSIONLESS)

     MATURE PROGRAMS AND TASKS

MPC.K=MPC.J+(DT)(PCAR.JK-PCDR.JK)                          30, L
MPC=MPCN                                                   30.1, N
MPCN=.01                                                   30.2, C
    MPC    - MATURE PROGRAM COMPONENTS (COMPONENTS)
    PCAR   - PROGRAM COMPONENT ACCEPTANCE RATE
             (COMPONENTS/YR)
    PCDR   - PROGRAM COMPONENT DECAY RATE (COMPONENTS/
             YR)
    MPCN   - MATURE PROGRAM COMPONENTS, INITIAL
             (COMPONENTS)

PCDR.KL=MPC.K/ALMPC.K                                      31, R
    PCDR   - PROGRAM COMPONENT DECAY RATE (COMPONENTS/
             YR)
    MPC    - MATURE PROGRAM COMPONENTS (COMPONENTS)
    ALMPC  - AVERAGE LIFETIME OF MATURE PROGRAM
             COMPONENTS (YRS)

ALMPC.K=TABHL(ALMPCT,UTPC.K,0,20,5)                        32, A
ALMPCT=10/5/2.5/1.25/1                                     32.1, T
    ALMPC  - AVERAGE LIFETIME OF MATURE PROGRAM
             COMPONENTS (YRS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
             INTERPOLATION
    ALMPCT - AVERAGE LIFETIME OF MATURE PROGRAM
             COMPONENTS TABLE
    UTPC   - UNCOMPLETED TASKS PER PROGRAM COMPONENT
             (TASKS/COMPONENT)

UTPC.K=UT.K/MPC.K                                          33, A
    UTPC   - UNCOMPLETED TASKS PER PROGRAM COMPONENT
             (TASKS/COMPONENT)
    UT     - UNCOMPLETED TASKS (TASKS)
    MPC    - MATURE PROGRAM COMPONENTS (COMPONENTS)

UT.K=UT.J+(DT)(TGR.JK-TCR.JK-TER.JK)                       34, L
UT=UTN                                                     34.1, N
UTN=0                                                      34.2, C
    UT     - UNCOMPLETED TASKS (TASKS)
    TGR    - TASK GENERATION RATE (TASKS/YR)
    TCR    - TASK COMPLETION RATE (TASKS/YR)
    TER    - TASK ELIMINATION RATE (TASKS/YR)
```

```
PAGE 7   FILE SIMPLE10   SIMPLE IMPLEMENTATION MODEL    2/01/79

TGR.KL=MPC.K*TGN                                          35, R
TGN=10                                                    35.1, C
    TGR    - TASK GENERATION RATE (TASKS/YR)
    MPC    - MATURE PROGRAM COMPONENTS (COMPONENTS)
    TGN    - TASK GENERATION NORMAL (TASKS/COMPONENT/YR)

TCR.KL=UT.K/TCT.K                                         36, R
    TCR    - TASK COMPLETION RATE (TASKS/YR)
    UT     - UNCOMPLETED TASKS (TASKS)
    TCT    - TIME TO COMPLETE TASKS (YRS)

TCT.K=TABHL(TCTT,SLTC.K,0,40,10)                          37, A
TCTT=.375/.5/1/1.5/2.5                                    37.1, T
    TCT    - TIME TO COMPLETE TASKS (YRS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
               INTERPOLATION
    TCTT   - TIME TO COMPLETE TASKS TABLE
    SLTC   - STAFF LOAD IN TASK COMPLETION (TASKS/
               PERSON)

SLTC.K=UT.K/STC.K                                         38, A
    SLTC   - STAFF LOAD IN TASK COMPLETION (TASKS/
               PERSON)
    UT     - UNCOMPLETED TASKS (TASKS)
    STC    - STAFF IN TASK COMPLETION (PERSONS)

STC.K=S.K*ASTC.K                                          39, A
    STC    - STAFF IN TASK COMPLETION (PERSONS)
    S      - STAFF (PERSONS)
    ASTC   - ALLOCATION OF STAFF TO TASK COMPLETION (%)

TER.KL=PCDR.JK*UTPC.K                                     40, R
    TER    - TASK ELIMINATION RATE (TASKS/YR)
    PCDR   - PROGRAM COMPONENT DECAY RATE (COMPONENTS/
               YR)
    UTPC   - UNCOMPLETED TASKS PER PROGRAM COMPONENT
               (TASKS/COMPONENT)

ASTC.K=ASTC.J+(DT)(SPITCR.JK+SPSTCR.JK+SRATCR.JK-         41, L
  STCPIR.JK-STCPSR.JK-STCRAR.JK)
ASTC=ASTCN                                                41.2, N
ASTCN=.01                                                 41.3, C
    ASTC   - ALLOCATION OF STAFF TO TASK COMPLETION (%)
    SPITCR - STAFF FROM PROGRAM INITIATION TO TASK
               COMPLETION RATE (%/YR)
    SPSTCR - STAFF FROM PROBLEM SOLVING TO TASK
               COMPLETION RATE (%/YR)
    SRATCR - STAFF FROM RESOURCE ACQUISITION TO TASK
               COMPLETION RATE (%/YR)
    STCPIR - STAFF FROM TASK COMPLETION TO PROGRAM
               INITIATION RATE (%/YR)
    STCPSR - STAFF FROM TASK COMPLETION TO PROBLEM
               SOLVING RATE (%/YR)
    STCRAR - STAFF FROM TASK COMPLETION TO RESOURCE
               ACQUISITION RATE (%/YR)
    ASTCN  - ALLOCATION OF STAFF TO TASK COMPLETION,
               INITIAL (%)
```

```
SPITCR.KL=ASPI.K*PTC.K*SARP                                    42, R
    SPITCR - STAFF FROM PROGRAM INITIATION TO TASK
             COMPLETION RATE (%/YR)
    ASPI   - ALLOCATION OF STAFF TO PROGRAM INITIATION
             (%)
    PTC    - PRESSURE ON TASK COMPLETION (PRESSURE
             UNITS)
    SARP   - STAFF ALLOCATION RESPONSE TO PRESSURE
             (%/YR/PRESSURE UNIT)

SPSTCR.KL=ASPS.K*PTC.K*SARP                                    43, R
    SPSTCR - STAFF FROM PROBLEM SOLVING TO TASK
             COMPLETION RATE (%/YR)
    ASPS   - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)
    PTC    - PRESSURE ON TASK COMPLETION (PRESSURE
             UNITS)
    SARP   - STAFF ALLOCATION RESPONSE TO PRESSURE
             (%/YR/PRESSURE UNIT)

SRATCR.KL=ASRA.K*PTC.K*SARP                                    44, R
    SRATCR - STAFF FROM RESOURCE ACQUISITION TO TASK
             COMPLETION RATE (%/YR)
    ASRA   - ALLOCATION OF STAFF TO RESOURCE ACQUISITION
             (%)
    PTC    - PRESSURE ON TASK COMPLETION (PRESSURE
             UNITS)
    SARP   - STAFF ALLOCATION RESPONSE TO PRESSURE
             (%/YR/PRESSURE UNIT)

PTC.K=TABHL(PTCT,UTPC.K,0,20,2.5)                              45, A
PTCT=0/.05/.2/.4/.55/.65/.725/.775/.8                          45.1, T
    PTC    - PRESSURE ON TASK COMPLETION (PRESSURE
             UNITS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
             INTERPOLATION
    PTCT   - PRESSURE ON TASK COMPLETION TABLE
    UTPC   - UNCOMPLETED TASKS PER PROGRAM COMPONENT
             (TASKS/COMPONENT)

     SECURING PERMANENT RESOURCES

S.K=TS.K+PS.K                                                  46, A
    S      - STAFF (PERSONS)
    TS     - TEMPORARY STAFF (PERSONS)
    PS     - PERMANENT STAFF (PERSONS)

TS.K=TABHL(TST,TIME.K,0,10,1)                                  47, A
TST=6/6/6/6/4/2/0/0/0/0/0                                      47.1, T
    TS     - TEMPORARY STAFF (PERSONS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
             INTERPOLATION
    TST    - TEMPORARY STAFF TABLE
    TIME   - ELAPSED TIME FROM START OF PROJECT (YRS)
```

```
PAGE 9   FILE SIMPLE10   SIMPLE IMPLEMENTATION MODEL    2/01/79

PS.K=PS.J+(DT)(PSAR.JK-PSLR.JK)                          48, L
PS=PSN                                                   48.1, N
PSN=0                                                    48.2, C
    PS      - PERMANENT STAFF (PERSONS)
    PSAR    - PERMANENT STAFF ACQUISITION RATE (PERSONS/
              YR)
    PSLR    - PERMANENT STAFF LOSS RATE (PERSONS/YR)
    PSN     - PERMANENT STAFF, INITIAL (PERSONS)

PSAR.KL=SRA.K*SAN*ESA.K                                  49, R
SAN=4                                                    49.1, C
    PSAR    - PERMANENT STAFF ACQUISITION RATE (PERSONS/
              YR)
    SRA     - STAFF IN RESOURCE ACQUISITION (PERSONS)
    SAN     - STAFF ACQUISITION NORMAL (PERSONS/YR/
              PERSON)
    ESA     - EFFECTIVENESS OF STAFF ACQUISITION
              (DIMENSIONLESS)

SRA.K=S.K*ASRA.K                                         50, A
    SRA     - STAFF IN RESOURCE ACQUISITION (PERSONS)
    S       - STAFF (PERSONS)
    ASRA    - ALLOCATION OF STAFF TO RESOURCE ACQUISITION
              (%)

ESA.K=TABHL(ESAT,ROCIPC.K,0,2,.4)                        51, A
ESAT=1/.675/.45/.3/.2/.133                               51.1, T
    ESA     - EFFECTIVENESS OF STAFF ACQUISITION
              (DIMENSIONLESS)
    TABHL   - LOGICAL FUNCTION, TABLE LOOK-UP AND
              INTERPOLATION
    ESAT    - EFFECTIVENESS OF STAFF ACQUISITION TABLE
    ROCIPC  - RELATIVE ORGANIZATIONAL COST OF IMPLEMENTED
              PROGRAM COMPONENTS (DIMENSIONLESS)

ROCIPC.K=OCIPC.K/OCIPCN                                  52, A
OCIPCN=2                                                 52.1, C
    ROCIPC  - RELATIVE ORGANIZATIONAL COST OF IMPLEMENTED
              PROGRAM COMPONENTS (DIMENSIONLESS)
    OCIPC   - ORGANIZATIONAL COST OF IMPLEMENTED PROGRAM
              COMPONENTS (PERSONS/COMPONENT)
    OCIPCN  - ORGANIZATIONAL COST OF IMPLEMENTED PROGRAM
              COMPONENTS NORMAL (PERSONS/COMPONENT)

OCIPC.K=S.K/MPC.K                                        53, A
    OCIPC   - ORGANIZATIONAL COST OF IMPLEMENTED PROGRAM
              COMPONENTS (PERSONS/COMPONENT)
    S       - STAFF (PERSONS)
    MPC     - MATURE PROGRAM COMPONENTS (COMPONENTS)

PSLR.KL=PS.K/ADPS                                        54, R
ADPS=3                                                   54.1, C
    PSLR    - PERMANENT STAFF LOSS RATE (PERSONS/YR)
    PS      - PERMANENT STAFF (PERSONS)
    ADPS    - AVERAGE DURATION OF PERMANENT STAFF (YRS)
```

```
PAGE 10   FILE SIMPLE10   SIMPLE IMPLEMENTATION MODEL    2/01/79

ASRA.K=ASRA.J+(DT)(SPIRAR.JK+SPSRAR.JK+STCRAR.JK-    55, L
  SRAPIR.JK-SRAPSR.JK-SRATCR.JK)
ASRA=ASRAN                                           55.2, N
ASRAN=.01                                            55.3, C
    ASRA   - ALLOCATION OF STAFF TO RESOURCE ACQUISITION
               (%)
    SPIRAR - STAFF FROM PROGRAM INITIATION TO RESOURCE
               ACQUISITION RATE (%/YR)
    SPSRAR - STAFF FROM PROBLEM SOLVING TO RESOURCE
               ACQUISITION RATE (%/YR)
    STCRAR - STAFF FROM TASK COMPLETION TO RESOURCE
               ACQUISITION RATE (%/YR)
    SRAPIR - STAFF FROM RESOURCE ACQUISITION TO PROGRAM
               INITIATION RATE (%/YR)
    SRAPSR - STAFF FROM RESOURCE ACSUISITION TO PROBLEM
               SOLVING RATE (%/YR)
    SRATCR - STAFF FROM RESOURCE ACQUISITION TO TASK
               COMPLETION RATE (%/YR)
    ASRAN  - ALLOCATION OF STAFF TO RESOURCE
               ACQUISITION, INITIAL (%)

SPIRAR.KL=ASPI.K*PRA.K*SARP                          56, R
    SPIRAR - STAFF FROM PROGRAM INITIATION TO RESOURCE
               ACQUISITION RATE (%/YR)
    ASPI   - ALLOCATION OF STAFF TO PROGRAM INITIATION
               (%)
    PRA    - PRESSURE ON RESOURCE ACQUISITION (PRESSURE
               UNITS)
    SARP   - STAFF ALLOCATION RESPONSE TO PRESSURE
               (%/YR/PRESSURE UNIT)

SPSRAR.KL=ASPS.K*PRA.K*SARP                          57, R
    SPSRAR - STAFF FROM PROBLEM SOLVING TO RESOURCE
               ACQUISITION RATE (%/YR)
    ASPS   - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)
    PRA    - PRESSURE ON RESOURCE ACQUISITION (PRESSURE
               UNITS)
    SARP   - STAFF ALLOCATION RESPONSE TO PRESSURE
               (%/YR/PRESSURE UNIT)

STCRAR.KL=ASTC.K*PRA.K*SARP                          58, R
    STCRAR - STAFF FROM TASK COMPLETION TO RESOURCE
               ACQUISITION RATE (%/YR)
    ASTC   - ALLOCATION OF STAFF TO TASK COMPLETION (%)
    PRA    - PRESSURE ON RESOURCE ACQUISITION (PRESSURE
               UNITS)
    SARP   - STAFF ALLOCATION RESPONSE TO PRESSURE
               (%/YR/PRESSURE UNIT)
```

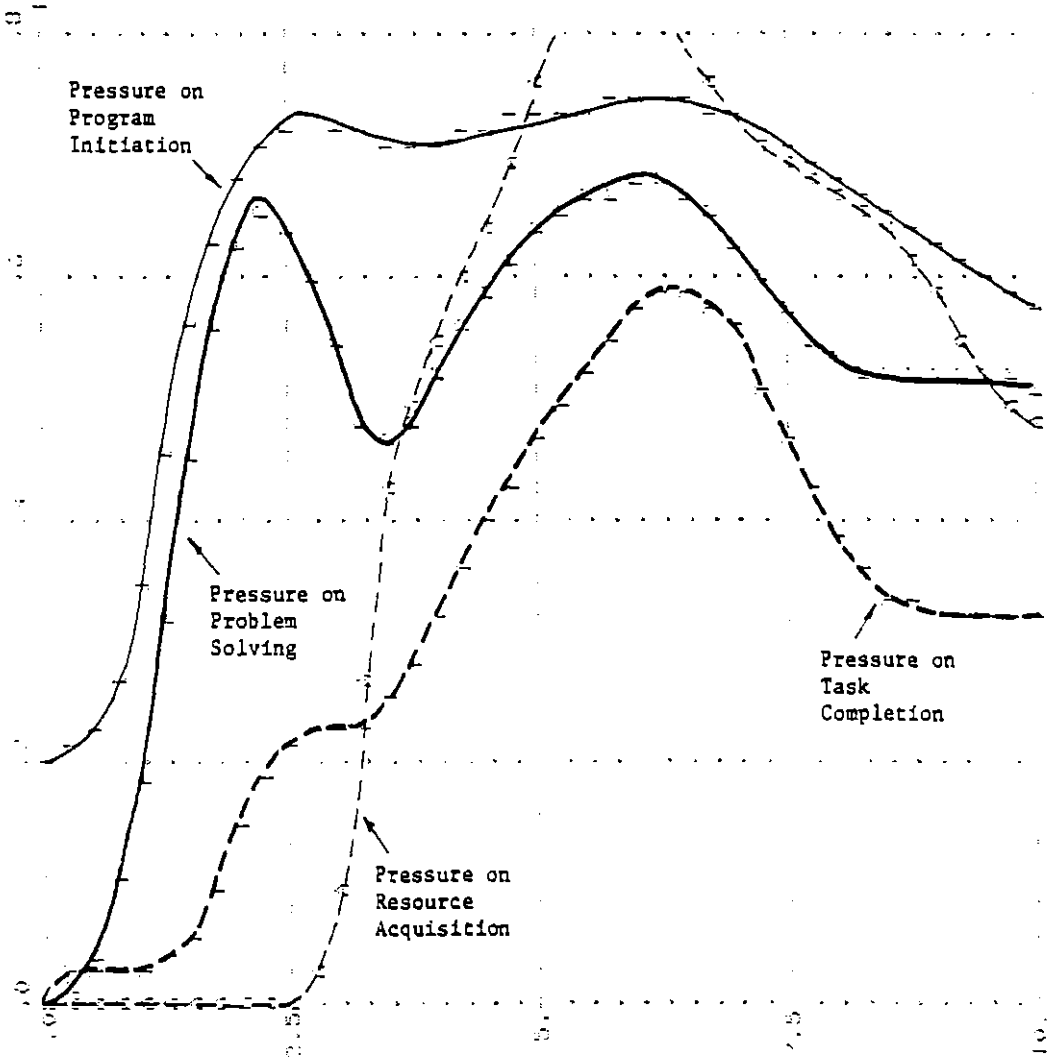
```
PAGE 11   FILE SIMPLE10   SIMPLE IMPLEMENTATION MODEL    2/01/79

PRA.K=PRALTS.K*MOL.K+PRAMPS.K                              59, A
    PRA     - PRESSURE ON RESOURCE ACQUISITION (PRESSURE
              UNITS)
    PRALTS  - PRESSURE ON RESOURCE ACQUISITION DUE TO
              LOSS OF TEMPORARY STAFF (PRESSURE UNITS)
    MOL     - MULTIPLIER DUE TO ORGANIZATIONAL LOAD
              (DIMENSIONLESS)
    PRAMPS  - PRESSURE ON RESOURCE ACQUISITION DUE TO
              MAINTENANCE OF PERMANENT STAFF (PRESSURE
              UNITS)

PRALTS.K=TABHL(PRALTST,FRNLTS.K,-.2,.6,.1)                 60, A
PRALTST=-.1/-.05/0/.1/.3/.425/.525/.575/.6                 60.1, T
    PRALTS  - PRESSURE ON RESOURCE ACQUISITION DUE TO
              LOSS OF TEMPORARY STAFF (PRESSURE UNITS)
    TABHL   - LOGICAL FUNCTION, TABLE LOOK-UP AND
              INTERPOLATION
    PRALTST- PRESSURE ON RESOURCE ACQUISITION DUE TO
              LOSS OF TEMPORARY STAFF TABLE
    FRNLTS  - FRACTIONAL RECENT NET LOSS OF TEMPORARY
              STAFF (%)

MOL.K=TABHL(MOLT,AOL.K,0,.6,.1)                            61, A
MOLT=.4/.8/1/1.15/1.25/1.3/1.33                            61.1, T
    MOL     - MULTIPLIER DUE TO ORGANIZATIONAL LOAD
              (DIMENSIONLESS)
    TABHL   - LOGICAL FUNCTION, TABLE LOOK-UP AND
              INTERPOLATION
    MOLT    - MULTIPLIER DUE TO ORGANIZATIONAL LOAD TABLE
    AOL     - AVERAGE ORGANIZATIONAL LOAD (PRESSURE
              UNITS)

PRAMPS.K=PRAMPSN*FPS.K                                     62, A
PRAMPSN=.2                                                 62.1, C
    PRAMPS  - PRESSURE ON RESOURCE ACQUISITION DUE TO
              MAINTENANCE OF PERMANENT STAFF (PRESSURE
              UNITS)
    PRAMPSN- PRESSURE ON RESOURCE ACQUISITION DUE TO
              MAINTENANCE OF PERMANENT STAFF NORMAL
              (PRESSURE UNITS)
    FPS     - FRACTION PERMANENT STAFF (%)

FPS.K=1-(TS.K/S.K)                                         63, A
    FPS     - FRACTION PERMANENT STAFF (%)
    TS      - TEMPORARY STAFF (PERSONS)
    S       - STAFF (PERSONS)

FRNLTS.K=RNLTS.K/S.K                                       64, A
    FRNLTS  - FRACTIONAL RECENT NET LOSS OF TEMPORARY
              STAFF (%)
    RNLTS   - RECENT NET LOSS OF TEMPORARY STAFF
              (PERSONS)
    S       - STAFF (PERSONS)
```

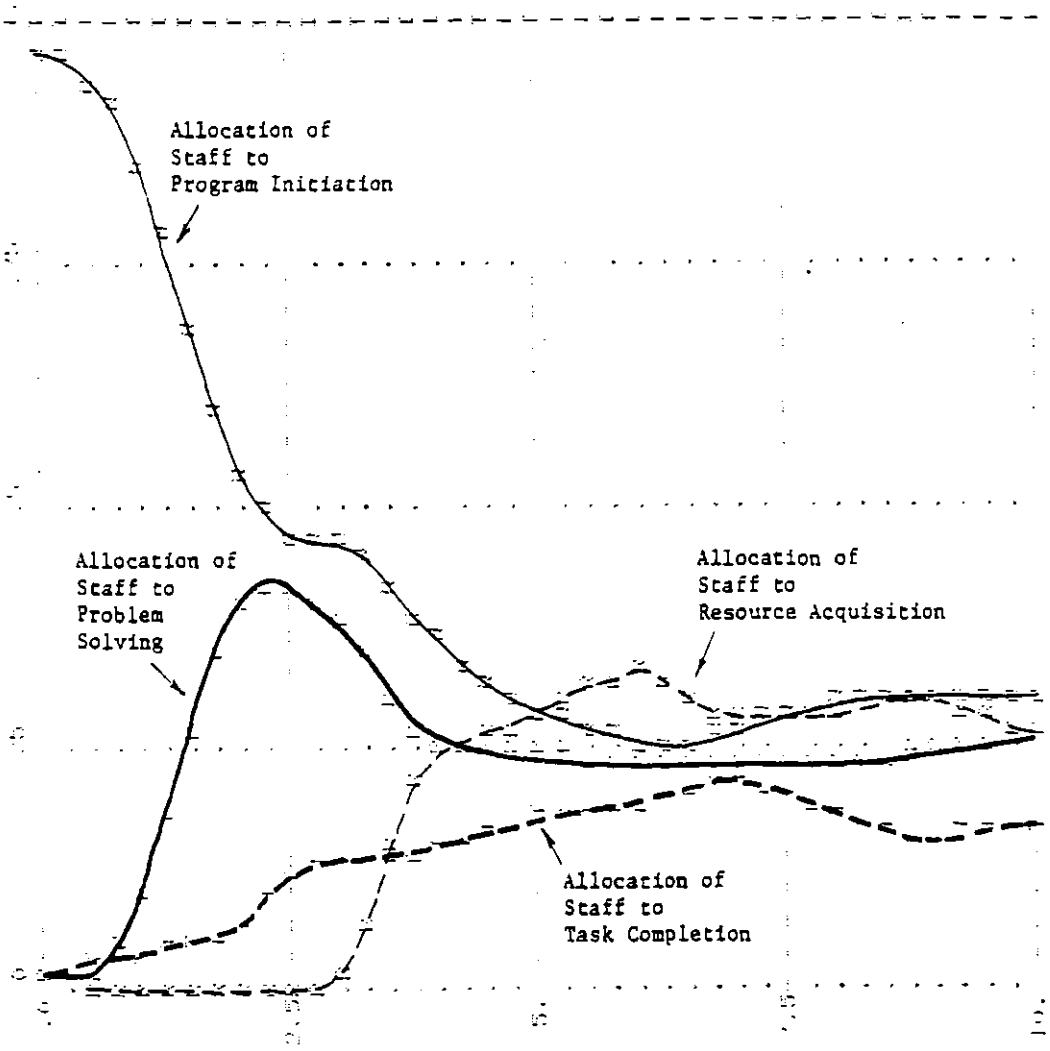
```
PAGE 12   FILE SIMPLE10   SIMPLE IMPLEMENTATION MODEL    2/01/79


RNLTS.K=RNLTS.J+(DT)(ELTS.J-PSAR.JK+PSLR.JK-          65, L
  LTSAR.JK)
RNLTS=0                                               65.1, N
    RNLTS  - RECENT NET LOSS OF TEMPORARY STAFF
               (PERSONS)
    ELTS   - EXPECTED LOSS OF TEMPORARY STAFF (PERSONS/
               YR)
    PSAR   - PERMANENT STAFF ACQUISITION RATE (PERSONS/
               YR)
    PSLR   - PERMANENT STAFF LOSS RATE (PERSONS/YR)
    LTSAR  - LOSS OF TEMPORARY STAFF ADJUSTMENT RATE
               (PERSONS/YR)

ELTS.K=MAX(0,(TS.K-ETS.K)/LTETS)                      66, A
    ELTS   - EXPECTED LOSS OF TEMPORARY STAFF (PERSONS/
               YR)
    MAX    - LOGICAL FUNCTION, MAXIMUM OF TWO VALUES
    TS     - TEMPORARY STAFF (PERSONS)
    ETS    - EXPECTED TEMPORARY STAFF (PERSONS)
    LTETS  - LEAD TIME FOR EXPECTED TEMPORARY STAFF
               (YRS)

ETS.K=TABHL(TST,TIME.K+LTETS,0,10,1)                  67, A
LTETS=.5                                              67.1, C
    ETS    - EXPECTED TEMPORARY STAFF (PERSONS)
    TABHL  - LOGICAL FUNCTION, TABLE LOOK-UP AND
               INTERPOLATION
    TST    - TEMPORARY STAFF TABLE
    TIME   - ELAPSED TIME FROM START OF PROJECT (YRS)
    LTETS  - LEAD TIME FOR EXPECTED TEMPORARY STAFF
               (YRS)

LTSAR.KL=RNLTS.K/LTSAT                                68, R
LTSAT=3                                               68.1, C
    LTSAR  - LOSS OF TEMPORARY STAFF ADJUSTMENT RATE
               (PERSONS/YR)
    RNLTS  - RECENT NET LOSS OF TEMPORARY STAFF
               (PERSONS)
    LTSAT  - LOSS OF TEMPORARY STAFF ADJUSTMENT TIME
               (YRS)

AOL.K=AOL.J+(DT)(OL.J-AOL.J)/TAOL                     69, L
AOL=AOLN                                              69.1, N
AOLN=.25                                              69.2, C
TAOL=1                                                69.3, C
    AOL    - AVERAGE ORGANIZATIONAL LOAD (PRESSURE
               UNITS)
    OL     - ORGANIZATIONAL LOAD (PRESSURE UNITS)
    TAOL   - TIME TO AVERAGE ORGANIZATIONAL LOAD (YRS)
    AOLN   - AVERAGE ORGANIZATIONAL LOAD, INITIAL
               (PRESSURE UNITS)
```

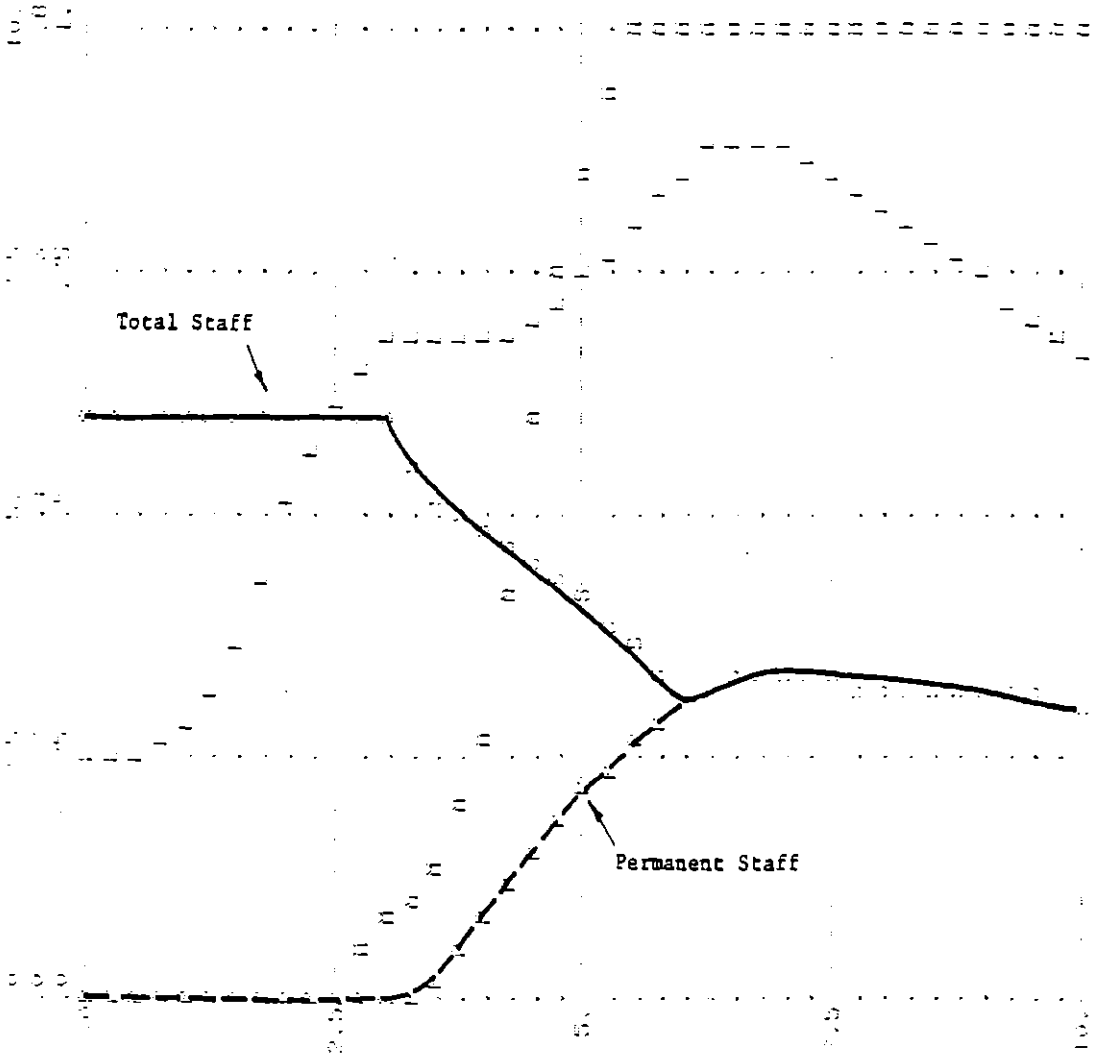
```
OL.K=OLPS.K+OLPI.K+OLTC.K+OLRA.K                          70, A
    OL     - ORGANIZATIONAL LOAD (PRESSURE UNITS)
    OLPS   - ORGANIZATIONAL LOAD DUE TO PROBLEM SOLVING
             (PRESSURE UNITS)
    OLPI   - ORGANIZATIONAL LOAD DUE TO PROGRAM
             INITIATION (PRESSURE UNITS)
    OLTC   - ORGANIZATIONAL LOAD DUE TO TASK COMPLETION
             (PRESSURE UNITS)
    OLRA   - ORGANIZATIONAL LOAD DUE TO RESOURCE
             ACQUSITION (PRESSURE UNITS)

OLPS.K=PPS.K*ASPS.K                                       71, A
    OLPS   - ORGANIZATIONAL LOAD DUE TO PROBLEM SOLVING
             (PRESSURE UNITS)
    PPS    - PRESSURE ON PROBLEM SOLVING (PRESSURE
             UNITS)
    ASPS   - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)

OLPI.K=PPI.K*ASPI.K                                       72, A
    OLPI   - ORGANIZATIONAL LOAD DUE TO PROGRAM
             INITIATION (PRESSURE UNITS)
    PPI    - PRESSURE ON PROGRAM INITIATION (PRESSURE
             UNITS)
    ASPI   - ALLOCATION OF STAFF TO PROGRAM INITIATION
             (%)

OLTC.K=PTC.K*ASTC.K                                       73, A
    OLTC   - ORGANIZATIONAL LOAD DUE TO TASK COMPLETION
             (PRESSURE UNITS)
    PTC    - PRESSURE ON TASK COMPLETION (PRESSURE
             UNITS)
    ASTC   - ALLOCATION OF STAFF TO TASK COMPLETION (%)

OLRA.K=PRA.K*ASRA.K                                       74, A
    OLRA   - ORGANIZATIONAL LOAD DUE TO RESOURCE
             ACQUSITION (PRESSURE UNITS)
    PRA    - PRESSURE ON RESOURCE ACQUISITION (PRESSURE
             UNITS)
    ASRA   - ALLOCATION OF STAFF TO RESOURCE ACQUISITION
             (%)

AST.K=ASPI.K+ASPS.K+ASTC.K+ASRA.K                         75, A
    AST    - ALLOCATION OF STAFF TOTAL (%)
    ASPI   - ALLOCATION OF STAFF TO PROGRAM INITIATION
             (%)
    ASPS   - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)
    ASTC   - ALLOCATION OF STAFF TO TASK COMPLETION (%)
    ASRA   - ALLOCATION OF STAFF TO RESOURCE ACQUISITION
             (%)

     CONTROL STATEMENTS

DT=.05                                                    75.4, C
PLTPER=.25                                                75.5, C
PRTPER=0                                                  75.6, C
LENGTH=0                                                  75.7, C
```

```
PLOT  NPC=P,MPC=M,PCIR=I,IG=G(0,8)/PCAR=A(0,4)/          75.8
  FPCA=F,PCIE=E(0,1)
    NPC    - NEW PROGRAM COMPONENTS (COMPONENTS)
    MPC    - MATURE PROGRAM COMPONENTS (COMPONENTS)
    PCIR   - PROGRAM COMPONENT INITIATION RATE
               (COMPONENTS/YR)
    IG     - INITIATION GOAL (COMPONENTS/YR)
    PCAR   - PROGRAM COMPONENT ACCEPTANCE RATE
               (COMPONENTS/YR)
    FPCA   - FRACTION OF PROGRAM COMPONENTS ACCEPTED (%)
    PCIE   - PROGRAM COMPONENT INITIATION EFFECTIVENESS
               (DIMENSIONLESS)

PLOT  ASPI=N,ASPS=P,ASTC=T,ASRA=R,AST=I(0,1)             75.9
    ASPI   - ALLOCATION OF STAFF TO PROGRAM INITIATION
               (%)
    ASPS   - ALLOCATION OF STAFF TO PROBLEM SOLVING (%)
    ASTC   - ALLOCATION OF STAFF TO TASK COMPLETION (%)
    ASRA   - ALLOCATION OF STAFF TO RESOURCE ACQUISITION
               (%)
    AST    - ALLOCATION OF STAFF TOTAL (%)

PLOT  PPI=I,PPS=P,PTC=T,PRA=A(0,.8)                      76.1
    PPI    - PRESSURE ON PROGRAM INITIATION (PRESSURE
               UNITS)
    PPS    - PRESSURE ON PROBLEM SOLVING (PRESSURE
               UNITS)
    PTC    - PRESSURE ON TASK COMPLETION (PRESSURE
               UNITS)
    PRA    - PRESSURE ON RESOURCE ACQUISITION (PRESSURE
               UNITS)

PLOT  S=S,PS=P(0,10)/AOL=L(0,.8)                         76.2
    S      - STAFF (PERSONS)
    PS     - PERMANENT STAFF (PERSONS)
    AOL    - AVERAGE ORGANIZATIONAL LOAD (PRESSURE
               UNITS)

PLOT  RNLTS=R,PSAR=A,PSLR=L,ELTS=E,LTSAR=D(-1,3)         76.3
    RNLTS  - RECENT NET LOSS OF TEMPORARY STAFF
               (PERSONS)
    PSAR   - PERMANENT STAFF ACQUISITION RATE (PERSONS/
               YR)
    PSLR   - PERMANENT STAFF LOSS RATE (PERSONS/YR)
    ELTS   - EXPECTED LOSS OF TEMPORARY STAFF (PERSONS/
               YR)
    LTSAR  - LOSS OF TEMPORARY STAFF ADJUSTMENT RATE
               (PERSONS/YR)
```

Figure A.7. Extended Model. Additional output for the simulation run shown in figure 5.2.


Pressure on
Program
Initiation
Pressure on
Problem
Solving
Pressure on
Task
Completion
Pressure on
Resource
Acquisition


Allocation of
Staff to
Program Initiation
Allocation of
Staff to
Problem
Solving
Allocation of
Staff to
Resource Acquisition
Allocation of
Staff to
Task Completion


Total Staff
Permanent Staff

APPENDIX B

DISCUSSION GUIDES USED DURING THE SECOND ROUND OF INTERVIEWS

Southeast Alternatives

Programs initiated project-wide

Alternatives at the elementary level
Alternatives at the secondary level
Continuity between elementary and secondary alternatives
Decentralization of decision making
Community participation in the schools
Staff development supporting alternatives
Curriculum development supporting alternatives
Formative evaluation

Problems generated by these programs	Outcomes
1) What alternatives to include at the elementary level.	Four alternatives (Free, Open, Continuous Progress, and Contemporary) were selected through negotiation.
2) What alternatives to include at the secondary level.	The initial solution at MUHS was to develop departmental electives.
3) Management of the school choice process at the elementary level.	A transportation system, choice cards, a lottery, etc. were developed.
4) Apparant lack of MUHS commitment to SEA goals.	Continuous cajoling by SEA staff, but little progress.
5) Undefined relationships between Level I and Level II evaluations.	Eventual separation of functions and reduction of contact.
6) Resistance at the school building level to the formation of a cross-school governing body for SEA.	Formation of SEC, after a rather extended negotiation process.
7) Undefined authority of Project Director with respect to school principals.	Superintendent eventually intervened, advising principals to report to the Director.

Problems (continued)	Outcomes
8) Resistance at the District level to formal decentralization of decision making.	Not overcome. The powers of the SEC remained advisory.
9) Uncertain role of curriculum resource persons working in multiple schools with different philosophies.	?
10) Conflict between parents and teachers.	Different solutions at each school: Free School — Continuing struggle Marcy — Formal constitution Pratt — Quiet adjustment Tuttle — No conflict MUHS — ?
11) Puzzlement over the meaning of continuity between elementary and secondary alternatives.	Eventual attempt to extend elementary options to high school level.
12) How to prepare the NIE continuation application.	Lengthy, heated negotiation with NIE.
13) How to insure that staff openings are filled by teachers supporting the philosophies of each school.	No formal solution. Bargaining with District personnel office on a case-by-case basis.
14) Resistance to the extension of elementary alternatives to MUHS.	Series of decisions designed to support alternatives at MUHS: Combine Pratt and Motley, thus requiring Pratt sixth graders to attend MUHS; Move several Pratt teachers to MUHS; Permit Marcy sixth graders to attend MUHS.
15) Demands by principals for formal role in SEA governance.	Formation of the Management Team.
16) Threatened closing of several SEA schools.	?

Tasks required to maintain programs	Procedures and staffing
1) Management of choice process at the elementary level.	?
2) Management of choice process at the secondary level.	Part of regular registration.
3) Filling teacher openings in accordance with school philosophies.	?
4) Coordinating parent involvement.	Community Resource Coordinator at each school.
5) Staff development activities.	?
6) Curriculum development activities.	?
7) Formative evaluation.	?
8) Planning new schools and closing old ones in ways that preserve choice.	?

Southeast Alternatives

Programs initiated at the Marcy Elementary School

Open organization of classrooms
Curriculum development supporting individualization and open education
Staff development supporting individualization and open education
Parent involvement in the classroom
Participatory decision making
Education outside the school building
Formative evaluation

Problems generated by these programs	Outcomes
1) How to organize open classrooms.	The staff visited a number of ongoing open schools. On the basis of these visits, the school was divided into two parts, one employing an "integrated day (K-6)" approach and the other employing the Mankato open education model.
2) How to operate the Mankato model (how to integrate each child's multiple classroom experiences, how to schedule each child's day, and how to teach as a subject matter specialist rather than as a generalist).	Termination of Mankato model; establishment of "families," each composed of two integrated day (K-6) classrooms.
3) How to involve parents and teachers in decision making.	Formation of Marcy Council.
4) How to work with both younger and older children in K-6 classrooms.	Teacher decision to split each family into one K-3 and one 4-6 classroom.
5) Parent resentment of apparant unilateral teacher decision regarding splitting families.	Formalization of Marcy Council decision process.

Problems (continued)	Outcomes
6) Uncertainty regarding role of parents in classrooms.	Gradual learning.
7) How to coordinate parent participation in classrooms.	Establishment of formal paid staff position (Community Resource Coordinator).
8) How to decide what formative evaluation studies should be conducted.	Formation of evaluation advisory board to prioritize teacher requests for evaluation services.
9) How to fill teacher vacancies.	Marcy Council reviews applicants and advises principal. Council has no formal hiring powers.

Tasks required to maintain programs	Procedures and staffing
1) Preparing curriculum materials for individualization.	Teachers and parent volunteers ?
2) Preparing curriculum materials for resource rooms.	Teachers and parent volunteers ?
3) Individualization of instruction.	Aides and parent volunteers ?
4) Resource room instruction.	? Increased class size, freeing some teachers for resource rooms.
5) Staff development activites.	?
6) Coordinating parent involvement.	Community Resource Coordinator.
7) Coordinating out-of-school learning.	?
8) Formative evaluation.	None.
9) Filling teacher openings in accordance with Marcy philosophy.	?

Southeast Alternatives

Programs initiated district-wide

System of alternatives at the elementary level
System of alternatives at the secondary level
Decentralization of decision making
Community participation in the schools

Problems generated by these programs	Outcomes
1) What alternatives to include at the elementary level.	Decisions made on the basis of local pressures. The alternatives developed are largely modified open programs or ungraded programs -- with two basic skills programs added this year.
2) What alternatives to include at the secondary level.	?
3) How to insure racial balance.	Construction of elementary school complexes, each containing several alternatives.
4) How to permit teachers to select schools.	Provision developed as part of union contract.
5) How to insure that staff vacancies are filled by staff supporting school philosophies.	Bargaining on a case-by-case basis.
6) How to plan new schools and close old ones in ways that preserve choice?	?
7) How to decentralize decision making.	Formation of three administrative Areas, each headed by an Assistant Superintendent.

Problems (continued)	Outcomes
8) What powers to delegate to decentralized Areas.	?
9) How to involve parents in decision making.	Formation of parent councils in each Area.

Tasks required to maintain programs	Procedures and staffing
1) Determining which existing alternatives should be maintained, which should be closed, and which new ones should be opened.	?
2) Allocating budget and facilities to alternatives.	?
3) Filling teacher openings in accordance with school philosophies.	?

Southeast Alternatives

Programs initiated at the MUHS Middle School

Departmental electives
Open program
Ungraded program
Graded program
Parent involvement in decision making
Formative evaluation

Problems generated by these programs	Outcomes
1) What electives to include.	?
2) Role of electives in overall "K-12 conceptualization" of SEA.	?
3) MUHS staff resistance to establishment of open and ungraded alternatives.	Series of decisions designed to support alternatives at MUHS: Combine Pratt and Motley, thus requiring Pratt sixth graders to attend MUHS; Move several Pratt teachers to MUHS; Permit Marcy sixth graders to attend MUHS.
4) How to organize open program.	Formation of planning committee, including parents and staff from Marcy and MUHS.
5) Conflict between some MUHS faculty and "process-oriented" parents and teachers from Marcy.	Teacher Center called in to observe.
6) Conflict between volunteer staff in the open program (for example, a chemistry major from the University) and some regular MUHS faculty.	?
7) Turnover in open program staff.	?

Tasks required to maintain programs	Procedures and staffing
1) Filling vacancies in the open, graded, and ungraded programs with staff sharing program philosophies.	?
2) Allocating budget and physical facilities to the three programs.	?
3) Coordinating student selection of alternatives and providing guidance in the choice process.	?

Piedmont Schools Project

Programs initiated project-wide

Learning communities
Individualization of instruction
Staff development supporting learning communities and individualization
Curriculum development supporting learning communities and individualization
Differentiated staffing
Lay community involvement in decision making
Professional community involvement in decision making
School community involvement in decision making
Evaluation
Transference

Problems generated by these programs	Outcomes
1) How to involve the school community in decision making.	Formation of an Instructional Improvement Committee (IIC) at each school, composed of the school's Learning Community Coordinators and chaired by the school's Program Manager; and formation of a project-wide IIC.
2) Uncertain powers of the school and project-wide IIC's.	?
3) Who should be appointed to the Program Manager and Facilitator of Operations roles at each school.	Generally, the school principals in the Greer schools were selected as Program Managers.
4) Conflict between the Program Manager and Facilitator of Operations roles.	Series of staff meetings, eventually resulting in formal role descriptions. The Facilitator of Operations role was never completely established as a co-equal position.
5) What instructional processes to emphasize in a well-functioning learning community.	Focus on several concepts, including teaming, multi-age grouping, open classrooms, and multiple learning modes.

Problems (continued)	Outcomes
6) Resistance to teaming and multi-age grouping at some schools.	?
7) Design and staffing of Level I evaluation.	Hiring of a "consultant in residence" to direct the evaluation, following lengthy negotiations with NIE. The accepted evaluation plan combined a standard program of testing and special studies conducted with the close involvement of the PSP teaching staff.
8) Conflict between Level I and Level II evaluations.	Replacement of original Level II evaluation staff and separation of Level I and Level II functions. Some tensions remained, until the termination, in PSP year 3, of the original Level II contractor and the selection of a new contractor in its place.
9) How to involve the lay community in decision making.	Formation of Cooperatives and a Cooperatives Board.
10) How to involve the professional community in decision making.	Formation of a Board of Directors.
11) How to support individualization of instruction in the subject-matter areas.	Establishment of Resource Coordinators, each of whom worked in a particular subject area, K-12.
12) Conflict between the secondary level Furman Liaison and the staff of the Greer Middle School.	Furman Liaison stopped working in the Middle School.
13) Jealousy in other areas of Greenville over Greer's special status.	?
14) How to prepare the NIE continuation application.	Lengthy, heated negotiation with NIE.
15) What role should the Cooperatives Board play in the decision process.	The Cooperatives Board tended to become primarily an information sharing rather than decision making or advisory body.
16) Weak professional participation in Board of Directors.	Reestablishment of Board of Directors as a Professional Liaison Committee.

Problems (continued)	Outcomes
17) Weak professional participation in the Professional Liaison Committee.	?
18) How to operationalize the learning community notion at the middle and high school levels.	?

Tasks required to maintain programs	Procedures and staffing
1) Assigning students and staff to learning communities.	?
2) Filling teacher openings in accordance with learning community needs.	?
3) Formative evaluation.	Establishment of evaluation office as part of District support services.
4) Coordinating Cooperatives Board.	?
5) Maintaining and developing individualized curriculum materials.	Attempt to extend life of materials where possible.
6) Continuing staff development necessary to support individualization.	?

Piedmont Schools Project

Programs initiated at the Greer Middle School

Large, open-space learning communities
Individualization of instruction
Staff development supporting learning communities and individualization
Curriculum development supporting learning communities and individualization
Differentiated staffing
School community involvement in decision making
Evaluation

Problems generated by these programs	Outcomes
1) When the Greer Middle School opened during the year prior to PSP, most teachers were drawn from other Greenville schools and did not know one another.	Gradual adjustment.
2) How to arrange large, open-space clusters, each housing 7 teachers and 200 students.	Teachers eventually divided the space into smaller, semi-enclosed areas of varied sizes.
3) Jealousy among students and teachers in different learning communities.	Gradual adjustment. Eventually, teachers were assigned to spend several days teaching in different learning communities.
4) Turnover in learning community teaching staffs.	?
5) How to involve teaching staff in school decision making.	Formation of school IIC, including the Learning Community Coordinators and the Program Manager.
6) Lack of student discipline. Community fear and opposition.	Eventual resignation of first two Program Managers. The third Program Manager emphasized discipline and the establishment of good relations with the community.

Problems (continued)	Outcomes
7) Uncertain decision making powers of the learning communities and IIC.	?
8) How to choose Learning Community Coordinators.	?
9) How to assign teachers to learning communities?	?
10) Uncertainty concerning desirability and feasibility of multi-age grouping.	A task group was appointed by the IIC to recommend whether to multi-age. The decision was delayed. Outcome ?
11) How to team teach.	Originally, time for team planning was available only after the regular school day. A task group explored the possibility of arranging a common planning period for the members of each learning community. Outcome ?
12) How to individualize the curriculum.	Use of commercial curriculum packages (IMS, SCIS, IMB, IME, MACOS, etc.).
13) How to integrate each child's instructional program.	Establishment of a teacher-advisor system. Each student has an advisor from his learning community. Advisee groups meet 25 minutes/day.
14) How to articulate each student's middle program with his program at the elementary and high school level.	?

Tasks required to maintain programs	Procedures and staffing
1) Preparing and maintaining individualized curriculum materials.	?
2) Filling teacher vacancies in ways consistent with the needs of learning community teams.	?
3) Team planning.	?

Piedmont Schools Project

Programs initiated district-wide

Emphasis on academic performance
Learning communities
Lay community involvement in decision making
School community involvement in decision making
Evaluation

Problems generated by these programs	Outcomes
1) How to improve academic performance.	The Board of Trustees established 16 goals for educational improvement in Greenville.
2) How to operationalize the educational improvement goals.	Formation of district-wide Program Coordinating Committee.
3) How to organize community participation in the schools.	Formation of Advisory Councils (at the Area level?).
4) Uncertain powers of Advisory Councils.	?
5) How large should decentralized Areas be?	Appointment of a study committee. Eventual expansion of number of Areas from 4 to 5.
6) Uncertain powers of Area offices.	?

Tasks required to maintain programs	Procedures and staffing
1) Continuing staff development supporting learning communities and academic improvement.	?
2) Preparing and maintaining curriculum materials supporting learning communities and academic improvement.	?
3) Filling teacher openings in ways consistent with learning community needs.	?
4) Formative evaluation.	Establishment of District evaluation office.

Piedmont Schools Project

Programs initiated at the East Greer Elementary School

Open space learning communities
Individualization of instruction
Staff development supporting learning communities and individualization
Curriculum development supporting learning communities and individualization
Differentiated staffing
School community involvement in decision making
Evaluation

Problems generated by these programs	Outcomes
1) Prior to PSP, East Greer had been a predominantly Black school. In September, 1972 (the beginning of PSP), Victor, a predominantly White school, was closed, and its children were moved to East Greer. Some Victor parents were apprehensive about this arrangement.	?
2) How to involve teaching staff in school decision making.	Formation of school IIC, including Learning Community Coordinators and the Program Manager.
3) How to assign students to learning communities.	Responsibility of Program Manager, with recommendations from the IIC.
4) How to assign teachers to learning communities.	?
5) How to arrange the open space in each learning community.	?
6) How to team teach.	Each learning community team has one hour/day of joint planning time.
7) How to organize multi-age learning communities.	Initially, some learning communities had an age range of 3 years. This later was reduced to 2 years. Multi-aging was to be reviewed in the final year of PSP. Outcome ?

Problems (continued)	Outcomes
8) How to group children within learning communities.	?
9) How to evaluate school functioning.	Use of a self-evaluation instrument developed by O. V. Wheeler for IGE.
10) How to integrate each student's instructional program.	Establishment of teacher-advisor system. Each student has an advisor from his learning community.
11) How to articulate each student's elementary program with his program at the middle level.	?

Tasks required to maintain programs	Procedures and staffing
1) Preparing and maintaining individualized curriculum materials.	?
2) Filling teacher vacancies in ways consistent with the needs of learning community teams.	?
3) Team planning.	Each learning community team has one hour/day of joint planning time, partly maintained through the use of paraprofessionals.

APPENDIX C

QUANTIFICATION PROCEDURES

The quantitative implementation scenarios for Minneapolis and Greenville in Chapters VI and VII were derived directly from the qualitative charts discussed in the Chapters. The following procedures were used to assign numbers.

General strategy. I based the quantitative scenarios on an analysis of the individual program components identified in each of the charts in Chapters VI and VII. I began by assuming that the implementation process for each program component could be described in terms of the categories of the extended model. That is, I assumed that once each program component was initiated, some fraction of the component was eventually terminated and the rest was accepted as a mature program. I also assumed that some fraction of the portion of each program component accepted as a mature program eventually decayed. Given these assumptions, I attempted to obtain numerical estimates for the rates at which initiation, termination, acceptance, and decay occurred, for each program component. I also attempted to obtain estimates for the portion of each program component surviving as a new or mature program, over time. I tried to use fairly simple rules to assign numbers for the initiation, termination, acceptance, and decay rates, based on the evidence in the charts. I then derived numerical values for the level of new and mature programs over time, by direct computation based on the rates.

Units. All numerical values are measured in program component units. A program component unit is defined as a program element of standard size and organizational complexity. Within each case, the program components seemed to be of approximately equal size and complexity. Thus, for simplicity, I assumed each program component indicated on the charts for each case involved the initiation of one program component unit.

Computation period. To reduce the volume of compuations, I assigned numerical values twice a year (rather than quarterly, which is the way events are displayed on the charts in Chapters VI and VII). The first computation period (P_1) corresponds to the Summer and Fall of year 1; the second computation period (P_2) corresponds to the Winter and Spring of year 1; and so on.

For each time period, I determined the initiation rate, the level of new programs, the acceptance rate, the termination rate, the level of mature programs, and the mature program decay rate, for each program component separately. I then summed these values to obtain overall values for each case. All numbers are rounded to tenths.

For each time period (P_n), I assigned numerical values in the following order (for each program component separately).

a. I assigned an initiation rate for period P_n.

b. I assigned a termination rate for period P_n.

c. I assigned an acceptance rate for period P_n.

d. I assigned a mature program decay rate for period P_n.

e. I computed the level of new programs at the end of period P_n according to the formula:* New Programs(P_n) = New Programs(P_{n-1}) + Initiation Rate(P_n) - Acceptance Rate(P_n) - Termination Rate(P_n)

f. I computed the level of mature programs at the end of period P_n according to the formula:* Mature Programs(P_n) = Mature Programs(P_{n-1}) + Acceptance Rate(P_n) - Decay Rate(P_n)

Initiation rates. Initiation rates were assigned in the following way. When a program component was planned and introduced entirely within time period (P_n), I assigned an initiation rate of 1 program component unit for (P_n).** The initiation of some program components took place over several time periods. When a program component was planned in one period and introduced in the following period, I assumed one-half of the component was initiated in each of the two periods. That is, the initiation values assigned were 0.5 for period (P_n) and 0.5 for period (P_{n+1}). When a program component was planned and introduced in several stages, I assumed each stage was of roughly equal weight (except where there was clear evidence that one stage was much larger or smaller than the others).

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*I assumed initial values of zero for new and mature programs.

**Technically, of course, rates should be measured in units per year. Since the time-period used in making the calculations described above was six months, one program component unit per period corresponds to a rate of two units per year.

Termination rates. Termination rates were assigned on the basis of problem outcomes. When, in time period (P_n), a problem outcome indicated that some portion of a new program component was terminated, I assigned a termination rate according to the apparant magnitude of the loss. Thus, if 0.8 units of a particular program component remained as a new program at the beginning of period (P_n) (of the 1 unit originally initiated), and a problem outcome indicated that half of this remaining program component was terminated, I assigned a termination rate of 0.4 for period (P_n). This is clearly a matter of judgment, particularly in the case of controversial program components. See the discussion in the concluding sections of Chapters VI, VII, and VIII.

Acceptance rates. Acceptance rates were assigned on the basis of problem generation and problem outcomes. For each program component, I assumed acceptance had begun in period (P_n) if the program component generated no (significant) new problems in (P_n) and all the problems generated in earlier time periods had been eliminated or resolved (either during earlier time periods, or during period P_n). I also assumed that the acceptance of a program component, once begun, was spread equally over three consecutive time periods.

Thus, if in period (P_n), 0.8 units of a particular program component remained as a new program, no new problems were generated by the program component in period (P_n), 0.2 units were terminated in period (P_n) as a result of problem-outcomes, and no other problems generated by the program component in earlier periods remained unresolved, I assigned an acceptance rate of

0.2 for period (P_n), 0.2 for period (P_{n+1}), and 0.2 for period (P_{n+2}).

When a program component was initiated in several stages, I treated the acceptance of each stage separately. (That is, I assumed that the acceptance of the first stage of a two-stage program component had begun when the first stage generated no new problems, and so forth.) When a program component was planned in one period and introduced in the next, I treated the acceptance of the two portions jointly, but I spread the acceptance over three time periods in proportions of roughly 1-2-1 rather than equally.

There is one additional complexity. I assumed that it might take a time-period or two for the problems generated by a program component to begin to show up. For this reason, I assigned an acceptance rate of zero for each program component for both the period in which it was initiated and the period immediately following -- even if the program component generated no problems during these periods, or if those it generated were resolved.

Decay rates. Mature program decay rates were assigned on the basis of task outcomes. When a task outcome in a particular time period indicated that some portion of a mature program component had decayed, I assigned a decay rate according to the apparant magnitude of the loss, spread equally over two or three periods. Thus, if 0.6 units of a particular program component remained as a mature program in period (P_n), and a task outcome indicated that half of the mature program had decayed, I assigned a decay rate of 0.1 in period (P_n), 0.1 in period (P_{n+1}), and 0.1 in period (P_{n+2}).

The adequacy of the procedures. At best, the numerical values obtained through the procedures discussed above are rough, order-of-magnitude estimates. For one thing, the accuracy of the estimates depends on the historical accuracy and completeness of the charts on which the estimates are based. In addition, somewhat different quantification rules or somewhat different interpretations would probably have led to somewhat different results.

The measure of the initiation rate is undoubtedly the most reliable and accurate measure obtained through the procedures, both because it is the most direct measure and because the rules involved are easiest to apply. The measure of the termination rate is probably next most accurate. The evidence is reasonably direct, but assigning quantitative values requires a fair amount of interpretation.

The measure of the acceptance rate is without question the least accurate and reliable. Since acceptance is (by definition) a slow, undramatic process, direct evidence of the rate at which it occurred is difficult to find. Thus, I had to rely on indirect evidence, and this led to an elaborate set of rules which are not always easy to apply. By and large, the fraction of each program component ultimately accepted was probably measured more accurately than the time interval over which acceptance occurred.

The accuracy of the measure of the mature program decay rate is probably somewhere in between the accuracy of the measures of the new program termination and acceptance rates. While there was often direct evidence of termination, assigning a proper value depended on the proper prior assignment of values for acceptance.

Since numerical values for the level of new and mature programs were obtained by computation, based on the initiation, termination, acceptance, and decay rates, the accuracy of the measures of the levels depends on the accuracy of the measures of the rates. Presumably, the measure of the level of new programs is less accurate than the measure of the initiation rate, but more accurate than the measure of the acceptance rate. The measure of the level of mature programs is probably about as accurate as the measure of the acceptance rate.

All in all, I believe it is reasonable to take the large, qualitative trends observed in the quantitative scenarios seriously -- particularly in the initiation rate. A consistent rise or fall of one or two units occurring over several periods is unlikely to be simply an artifact of the quantification procedures. On the other hand, variations of a half-unit or so from period to period surely have no empirical meaning.

Figure C.1a Southeast Alternatives

Year		1		2		3		4		5		6	
	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp
PC1. ELEM ALTERNATIVES													
Rates													
Initiation		1	0	0	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0.3	0.2	0.2	0	0	0	0	0	0	0
Termination		0	0	0.1	0.2	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0.1	0	0	0	0	0	0.1	0
Levels													
New Programs	0	1	1	0.6	0.2	0	0	0	0	0	0	0	0
Mature Programs	0	0	0	0.3	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5
PC2. SECONDARY OPTIONS													
Rates													
Initiation		0.5	0.5	0	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0.4	0.4	0.2	0	0	0	0	0	0	0
Termination		0	0	0	0	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0.2	0.3	0.2
Levels													
New Programs	0	0.5	1	0.6	0.2	0	0	0	0	0	0	0	0
Mature Programs	0	0	0	0.4	0.8	1	1	1	1	1	0.8	0.5	0.3
PC3. COMM. PARTICIPATION													
Rates													
Initiation		0.5	0	0	0	0.5	0	0	0	0	0	0	0
Acceptance		0	0	0.2	0.2	0.1	0	0.2	0.2	0.1	0	0	0
Termination		0	0	0	0	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0.1	0	0.1	0
Levels													
New Programs	0	0.5	0.5	0.3	0.1	0.5	0.5	0.3	0.1	0	0	0	0
Mature Programs	0	0	0	0.2	0.4	0.5	0.5	0.7	0.9	0.9	0.9	0.8	0.8

Figure C.1b Southeast Alternatives

Year		1		2		3		4		5		6	
	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp
PC4. DECENTRALIZATION													
Rates													
Initiation		0.2	0.3	0.2	0	0.3	0	0	0	0	0	0	0
Acceptance		0	0	0	0.1	0.2	0.2	0.1	0.1	0.1	0	0	0
Termination		0	0	0.2	0	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0.1	0
Levels													
New Programs	0	0.2	0.5	0.5	0.4	0.5	0.3	0.2	0.1	0	0	0	0
Mature Programs	0	0	0	0	0.1	0.3	0.5	0.6	0.7	0.8	0.8	0.7	0.7
PC5. STAFF DEVELOPMENT													
Rates													
Initiation		0.2	0.2	0.2	0.2	0.2	0	0	0	0	0	0	0
Acceptance		0	0	0	0.1	0.1	0.1	0.1	0.1	0	0	0	0
Termination		0	0	0	0.1	0.1	0.1	0.1	0.1	0	0	0	0
Decay		0	0	0	0	0	0	0.1	0	0.1	0	0.1	0
Levels													
New Programs	0	0.2	0.4	0.6	0.6	0.6	0.4	0.2	0	0	0	0	0
Mature Programs	0	0	0	0	0.1	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.2
PC6. CURRICULUM DEVELOPMENT													
Rates													
Initiation		0.5	0.5	0	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0.4	0.4	0.2	0	0	0	0	0	0	0
Termination		0	0	0	0	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0.2	0.2	0.2	0.2	0.1	0.1
Levels													
New Programs	0	0.5	1	0.6	0.2	0	0	0	0	0	0	0	0
Mature Programs	0	0	0	0.4	0.8	1	1	0.8	0.6	0.4	0.2	0.1	0

Figure C.1c Southeast Alternatives

Year		1		2		3		4		5		6	
	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp
PC7. COMMUNITY EDUCATION													
Rates													
Initiation		0.5	0	0	0	0.5	0	0	0	0	0	0	0
Acceptance		0	0	0.2	0.2	0.1	0	0.2	0.2	0.1	0	0	0
Termination		0	0	0	0	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0	0
Levels													
New Programs	0	0.5	0.5	0.3	0.1	0.5	0.5	0.3	0.1	0	0	0	0
Mature Programs	0	0	0	0.2	0.4	0.5	0.5	0.7	0.9	1	1	1	1
PC8. EVALUATION													
Rates													
Initiation		0.3	0.4	0.3	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0	0.2	0.3	0.3	0	0	0	0	0	0
Termination		0	0	0	0.2	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0.2	0.2	0.1	0.1	0.1	0.1
Levels													
New Programs	0	0.3	0.7	1	0.6	0.3	0	0	0	0	0	0	0
Mature Programs	0	0	0	0	0.2	0.5	0.8	0.6	0.4	0.3	0.2	0.1	0
PC9. SECOND. ALTERNATIVES													
Rates													
Initiation		0	0	0	0.1	0.1	0.3	0.3	0.1	0.1	0	0	0
Acceptance		0	0	0	0	0	0	0	0	0.2	0.2	0	0.1
Termination		0	0	0	0	0	0.1	0.1	0	0.1	0.1	0	0.1
Decay		0	0	0	0	0	0	0	0	0	0	0	0
Levels													
New Programs	0	0	0	0	0.1	0.2	0.4	0.6	0.7	0.5	0.2	0.2	0
Mature Programs	0	0	0	0	0	0	0	0	0	0.2	0.4	0.4	0.5

Figure C.1d Southeast Alternatives

Year		1		2		3		4		5		6	
	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp
SOUTHEAST OVERALL													
Rates													
Initiation		3.7	1.9	0.7	0.3	1.6	0.3	0.3	0.1	0.1	0	0	0
Acceptance		0	0	1.5	1.8	1.4	0.6	0.6	0.6	0.5	0.2	0	0.1
Termination		0	0	0.3	0.5	0.1	0.2	0.2	0.1	0.1	0.1	0	0.1
Decay		0	0	0	0	0.1	0	0.5	0.4	0.5	0.6	0.9	0.4
Levels													
New Programs	0	3.7	5.6	4.5	2.5	2.6	2.1	1.6	1	0.5	0.2	0.2	0
Mature Programs	0	0	0	1.5	3.3	4.6	5.2	5.3	5.5	5.5	5.2	4.3	4

Figure C.2a Marcy Elementary School

Year		1		2		3		4		5		6	
	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp
PC1. OPEN CLASSROOMS													
Rates													
Initiation		1	0	0	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0	0.1	0.1	0.1	0	0	0	0	0	0
Termination		0	0.4	0.2	0.1	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0	0
Levels													
New Programs	0	1	0.6	0.4	0.2	0.1	0	0	0	0	0	0	0
Mature Programs	0	0	0	0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
PC2. PARENT INVOLVEMENT													
Rates													
Initiation		1	0	0	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0.3	0.3	0.2	0	0	0	0	0	0	0
Termination		0	0	0.2	0	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0.1	0.1	0
Levels													
New Programs	0	1	1	0.5	0.2	0	0	0	0	0	0	0	0
Mature Programs	0	0	0	0.3	0.6	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.6
PC3. STAFF DEVELOPMENT													
Rates													
Initiation		0.5	0	0	0	0.2	0.3	0	0	0	0	0	0
Acceptance		0	0	0.2	0.2	0.1	0	0	0	0	0	0	0
Termination		0	0	0	0	0	0	0.2	0.3	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1
Levels													
New Programs	0	0.5	0.5	0.3	0.1	0.2	0.5	0.3	0	0	0	0	0
Mature Programs	0	0	0	0.2	0.4	0.5	0.5	0.5	0.5	0.4	0.3	0.2	0.1

Figure C.2b Marcy Elementary School

Year		1		2		3		4		5		6	
	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp
PC4. GOVERNANCE													
Rates													
Initiation		0.5	0.5	0	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0	0.2	0.5	0.3	0	0	0	0	0	0
Termination		0	0	0	0	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0.1	0.1	0
Levels													
New Programs	0	0.5	1	1	0.8	0.3	0	0	0	0	0	0	0
Mature Programs	0	0	0	0	0.2	0.7	1	1	1	1	1	0.9	0.8
PC5. FORMATIVE EVALUATION													
Rates													
Initiation		0.5	0.5	0	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0	0.3	0.5	0.2	0	0	0	0	0	0
Termination		0	0	0	0	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0.1	0.1	0.2	0.2	0.2	0.1
Levels													
New Programs	0	0.5	1	1	0.7	0.2	0	0	0	0	0	0	0
Mature Programs	0	0	0	0	0.3	0.8	1	0.9	0.8	0.6	0.4	0.2	0.1
PC6. MARCY INTERNSHIPS													
Rates													
Initiation		0	0	0	0.5	0.5	0	0	0	0	0	0	0
Acceptance		0	0	0	0	0	0	0	0.1	0	0	0	0
Termination		0	0	0	0	0	0	0.5	0.4	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0	0
Levels													
New Programs	0	0	0	0	0.5	1	1	0.5	0	0	0	0	0
Mature Programs	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1

Figure C.2c Marcy Elementary School

Year		1		2		3		4		5		6	
	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp
PC7. OUT-OF-SCHOOL LEARNING													
Rates													
Initiation		0	0	0	0	0.5	0.5	0	0	0	0	0	0
Acceptance		0	0	0	0	0	0	0	0.1	0.1	0	0	0
Termination		0	0	0	0	0	0	0.5	0.3	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0	0
Levels													
New Programs	0	0	0	0	0	0.5	1	0.5	0.1	0	0	0	0
Mature Programs	0	0	0	0	0	0	0	0	0.1	0.2	0.2	0.2	0.2
PC8. EXTENSION TO SECONDARY													
Rates													
Initiation		0	0	0	0	0	0.5	0.5	0	0	0	0	0
Acceptance		0	0	0	0	0	0	0	0	0.2	0.5	0.3	0
Termination		0	0	0	0	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0	0
Levels													
New Programs	0	0	0	0	0	0	0.5	1	1	0.8	0.3	0	0
Mature Programs	0	0	0	0	0	0	0	0	0	0.2	0.7	1	1

Figure C.2d Marcy Elementary School

Year		1		2		3		4		5		6	
	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp
MARCY OVERALL													
Rates													
Initiation		3.5	1	0	0.5	1.2	1.3	0.5	0	0	0	0	0
Acceptance		0	0	0.5	1.1	1.4	0.6	0	0.2	0.3	0.5	0.3	0
Termination		0	0.4	0.4	0.1	0	0	1.2	1	0	0	0	0
Decay		0	0	0	0	0	0	0.1	0.1	0.3	0.3	0.5	0.4
Levels													
New Programs	0	3.5	4.1	3.2	2.5	2.3	3	2.3	1.1	0.8	0.3	0	0
Mature Programs	0	0	0	0.5	1.6	3	3.6	3.5	3.6	3.6	3.8	3.6	3.2

Figure C.3a Piedmont Schools Project

Year		1		2		3		4		5		6
	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F
PC1. LEARNING COMMUNITIES												
Rates												
Initiation		1	0	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0.2	0.3	0.2	0	0	0	0	0	0
Termination		0	0.3	0	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0.1	0.1	0.1
Levels												
New Programs	0	1	0.7	0.5	0.2	0	0	0	0	0	0	0
Mature Programs	0	0	0	0.2	0.5	0.7	0.7	0.7	0.7	0.6	0.5	0.4
PC2. DIFFERENTIATED STAFFING												
Rates												
Initiation		1	0	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0.1	0.2	0.2	0	0	0	0	0	0
Termination		0	0.3	0.2	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0.3
Levels												
New Programs	0	1	0.7	0.4	0.2	0	0	0	0	0	0	0
Mature Programs	0	0	0	0.1	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.2
PC3. INDIVIDUALIZED CURRICULUM												
Rates												
Initiation		0.5	0	0	0.5	0	0	0	0	0	0	0
Acceptance		0	0	0.1	0.1	0.1	0.1	0	0	0	0	0
Termination		0	0.1	0.1	0	0	0.4	0	0	0	0	0
Decay		0	0	0	0	0	0	0.1	0	0	0	0.1
Levels												
New Programs	0	0.5	0.4	0.2	0.6	0.5	0	0	0	0	0	0
Mature Programs	0	0	0	0.1	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.2

Figure C.3b Piedmont Schools Project

Year		1		2		3		4		5		6
	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F
PC4. STAFF DECISION MAKING												
Rates												
Initiation		1	0	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0	0.2	0.2	0.1	0	0	0	0	0
Termination		0	0.2	0.2	0.1	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0.1	0	0.1
Levels												
New Programs	0	1	0.8	0.6	0.3	0.1	0	0	0	0	0	0
Mature Programs	0	0	0	0	0.2	0.4	0.5	0.5	0.5	0.4	0.4	0.3
PC5. STAFF DEVELOPMENT												
Rates												
Initiation		0.5	0	0	0	0	0.3	0.2	0	0	0	0
Acceptance		0	0	0.2	0.2	0.1	0	0	0.1	0.2	0.2	0
Termination		0	0	0	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0.7
Levels												
New Programs	0	0.5	0.5	0.3	0.1	0	0.3	0.5	0.4	0.2	0	0
Mature Programs	0	0	0	0.2	0.4	0.5	0.5	0.5	0.6	0.8	1	0.3
PC6. COMMUNITY DEC. MAKING												
Rates												
Initiation		1	0	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0.1	0.1	0	0	0	0	0	0	0
Termination		0	0.4	0.4	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0
Levels												
New Programs	0	1	0.6	0.1	0	0	0	0	0	0	0	0
Mature Programs	0	0	0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Figure C.3c Piedmont Schools Project

Year	1		2		3		4		5		6	
	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F
PC7. PROF. DECISION MAKING												
Rates												
Initiation		0.5	0	0	0	0.5	0	0	0	0	0	0
Acceptance		0	0	0	0	0	0	0.1	0	0	0	0
Termination		0	0.3	0.2	0	0	0.2	0.2	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0.1
Levels												
New Programs	0	0.5	0.2	0	0	0.5	0.3	0	0	0	0	0
Mature Programs	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0
PC8. EVALUATION												
Rates												
Initiation		0.3	0.2	0	0	0.5	0	0	0	0	0	0
Acceptance		0	0	0.2	0.2	0.1	0	0.2	0.2	0.1	0	0
Termination		0	0	0	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0.4	0.4	0	
Levels												
New Programs	0	0.3	0.5	0.3	0.1	0.5	0.5	0.3	0.1	0	0	0
Mature Programs	0	0	0	0.2	0.4	0.5	0.5	0.7	0.9	0.6	0.2	0.2
PC9. TRANSFERENCE												
Rates												
Initiation		0	0	0	0	0.5	0.5	0	0	0	0	0
Acceptance		0	0	0	0	0	0	0.3	0.3	0.3	0	0
Termination		0	0	0	0	0	0.1	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0.8
Levels												
New Programs	0	0	0	0	0	0.5	0.9	0.6	0.3	0	0	0
Mature Programs	0	0	0	0	0	0	0	0.3	0.6	0.9	0.9	0.1

Figure C.3d Piedmont Schools Project

Year	1		2		3		4		5		6	
	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F
PIEDMONT OVERALL												
Rates												
Initiation		5.8	4.2	0	0.5	1.5	0.8	0.2	0	0	0	0
Acceptance		0	0	0.9	1.3	0.9	0.2	0.6	0.6	0.6	0	0
Termination		0	1.6	1.1	0.1	0	0.7	0.2	0	0	0	0
Decay		0	0	0	0	0	0	0.1	0	0.6	0.5	2.2
Levels												
New Programs	0	5.8	4.4	2.4	1.5	2.1	2.0	1.4	0.8	0.2	0	0
Mature Programs	0	0	0	0.9	2.2	3.1	3.3	3.8	4.4	4.4	4.1	1.9

Figure C.4a Greer Middle School

Year		1		2		3		4		5		6
	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F
PC1. LEARNING COMMUNITIES												
Rates												
Initiation		1	0	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0	0	0.1	0.2	0.1	0	0	0	0
Termination		0	0.2	0.2	0.1	0.1	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0.2
Levels												
New Programs	0	1	0.8	0.6	0.5	0.3	0.1	0	0	0	0	0
Mature Programs	0	0	0	0	0	0.1	0.3	0.4	0.4	0.4	0.4	0.2
PC2. SUCCESS ORIENTATION												
Rates												
Initiation		0.5	0.5	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0	0	0	0	0	0	0	0	0
Termination		0	0	0	0	0	0	0.5	0	0.5	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0
Levels												
New Programs	0	0.5	1	1	1	1	1	0.5	0.5	0	0	0
Mature Programs	0	0	0	0	0	0	0	0	0	0	0	0
PC3. INDIVIDUALIZED CURRICULUM												
Rates												
Initiation		0.3	0.2	0	0.3	0.2	0	0	0	0	0	0
Acceptance		0	0	0	0.1	0	0.2	0.2	0.1	0	0	0
Termination		0	0.2	0.2	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0.2	0.1	0
Levels												
New Programs	0	0.3	0.3	0.1	0.3	0.5	0.3	0.1	0	0	0	0
Mature Programs	0	0	0	0	0.1	0.1	0.3	p.5	0.6	0.4	0.3	0.3

Figure C.4b Greer Middle School

Year		1		2		3		4		5		6
	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F
PC4. DIFFERENTIATED STAFFING												
Rates												
Initiation		1	0	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0.3	0.4	0.3	0	0	0	0	0	0
Termination		0	0	0	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0.5
Levels												
New Programs	0	1	1	0.7	0.3	0	0	0	0	0	0	0
Mature Programs	0	0	0	0.3	0.7	1	1	1	1	1	1	0.5
PC5. STAFF DECISION MAKING												
Rates												
Initiation		1	0	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0	0.2	0.1	0.1	0	0	0	0	0
Termination		0	0.3	0.3	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0.4
Levels												
New Programs	0	1	0.7	0.4	0.2	0.1	0	0	0	0	0	0
Mature Programs	0	0	0	0	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0
PC6. STAFF DEVELOPMENT												
Rates												
Initiation		0.5	0.5	0	0	0	0	0	0	0	0	0
Acceptance		0	0	0.3	0.4	0.3	0	0	0	0	0	0
Termination		0	0	0	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0.7
Levels												
New Programs	0	0.5	1	0.7	0.3	0	0	0	0	0	0	0
Mature Programs	0	0	0	0.3	0.7	1	1	1	1	1	1	0.3

Figure C.4c Greer Middle School

Year		1		2		3		4		5		6
	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F
PC7. TEST USE												
Rates												
Initiation		0	0	0	0.5	0.5	0	0	0	0	0	0
Acceptance		0	0	0	0	0	0.3	0.4	0.3	0	0	0
Termination		0	0	0	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0.4	0.4	0
Levels												
New Programs	0	0	0	0	0.5	1	0.7	0.3	0	0	0	0
Mature Programs	0	0	0	0	0	0	0.3	0.7	1	0.6	0.2	0.2
PC8. DISCIPLINE AND MORALE												
Rates												
Initiation		0	0	0	0.5	0.5	0	0	0	0	0	0
Acceptance		0	0	0	0	0	0.3	0.4	0.3	0	0	0
Termination		0	0	0	0	0	0	0	0	0	0	0
Decay		0	0	0	0	0	0	0	0	0	0	0
Levels												
New Programs	0	0	0	0	0.5	1	0.7	0.3	0	0	0	0
Mature Programs	0	0	0	0	0	0	0.3	0.7	1	1	1	1

Figure C.4d Greer Middle School

Year	1		2		3		4		5		6	
	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F	W-Sp	S-F
GREER OVERALL												
Rates												
Initiation		4.3	1.2	0	1.3	1.2	0	0	0	0	0	0
Acceptance		0	0	0.6	1.1	0.8	1.1	1.1	0.7	0	0	0
Termination		0	0.7	0.7	0.1	0.1	0	0.5	0	0.5	0	0
Decay		0	0	0	0	0	0	0	0	0.6	0.5	1.8
Levels												
New Programs	0	4.3	4.8	3.5	3.6	3.9	2.8	1.2	0.5	0	0	0
Mature Programs	0	0	0	0.6	1.7	2.5	3.6	4.7	5.4	4.8	4.3	2.5

APPENDIX D

A SUMMARY OF THE QUALITATIVE SUPPORT GIVEN THE MODEL HYPOTHESES AT THE SCHOOL, PROJECT, AND DISTRICT LEVELS

	SCHOOL		PROJECT		DISTRICT	
	Marcy	Greer	SEA	PSP	Minneapolis	Greenville
I. New Programs and Problems						
a. New programs initiated continuously	++	++	+	+	+	+
b. New programs generate problems	++	++	+	++	+	+
c. Problems pile up	++	++	+	++	+	+
d. Problems reduce initiation	++	++	+	++		
e. Problems reduce acceptance	++	++	+	+		
f. Problem solving depends on attention	+	+	+	+		
g. Pressure depends on problems	+	+	+	+		
II. Pressure to Initiate New Programs						
a. Rate depends on attention	+	+	+	+	+	+
b. Pressure function of goal	++	+	+	+	+	
c. Goal drifts toward performance	++	+	+	+		
III. Mature Programs and Tasks						
a. Mature programs generate tasks	++	++	++	++	++	+
b. Tasks pile up	++	++	++	++	++	+
c. Tasks reduce program lifetime	++	++	+	++	+	+
d. Task completion depends on attention	+	+	+	+	+	+
e. Pressure depends on tasks	+	+	+	+	+	+
IV. Securing Permanent Resources						
a. Loss of funds leads to search	++	+	++	+	++	+
b. Acquisition depends on attention	+					
c. Search effectiveness depends on cost						
d. Pressure depends on load	+					

++ : The hypothesis offers a strong interpretation of important events in the case

\+ : The hypothesis offers a partial interpretation of important events in the case

APPENDIX E

DIFFERENTIAL EQUATIONS FOR THE SIMPLE MODEL

The equations for new programs and unresolved problems are:

$$\dot{NP} = \left(\frac{-1}{TIP}\right) \cdot NP + SPI \cdot f(UP)$$

$$\dot{UP} = PGN \cdot NP - \frac{UP}{g(SPS,UP)} - \left[1 - h\left(\frac{UP}{NP}\right)\right] \cdot \frac{NP}{TIP}$$

NP	New Programs
UP	Unresolved Problems
TIP	Time to Implement Programs
SPI	Staff in Program Initiation
PGN	Problem Generation Normal
SPS	Staff in Problem Solving

f(UP)	Program Initiation Effectiveness
g(SPS,UP)	Time to Solve Problems
$h\left(\frac{UP}{NP}\right)$	Fraction of Programs Accepted

A linear approximation can be formed by making the following assumptions:

Assume $f(UP) = 1 - \frac{UP}{A}$ for A a constant

$g(SPS,UP) = \frac{K}{SPS}$ for K a constant

Neglect $\left[1 - h\left(\frac{UP}{NP}\right)\right] \cdot \frac{NP}{TIP}$

This produces the following equations:

$$\dot{NP} = \left(\frac{-1}{TIP}\right)\cdot NP + \left(\frac{-SPI}{A}\right)\cdot UP + SPI$$

$$\dot{UP} = PGN \cdot NP + \left(\frac{-SPS}{K}\right)\cdot UP$$

The frequency of oscillation is given by:

$$w = \sqrt{\frac{SPS}{TIP\cdot K} + \frac{SPI\cdot PGN}{A}}$$

The damping ratio is:

$$\xi = \frac{\frac{1}{TIP} + \frac{SPS}{K}}{2w}$$

In equilibrium:

$$NP = \frac{SPI\cdot TIP}{1 + \frac{SPI\cdot TIP\cdot PGN\cdot \frac{K}{SPS}}{A}}$$

$$UP = PGN\cdot\left(\frac{K}{SPS}\right)\cdot NP$$

The following parameter values were employed for the simulation run shown in figure 3.2:

TIP = 1.5

SPI = 3

PGN = 20

SPS = 3

The following choice of constants provides a reasonable approximation to the nonlinear functions employed for the simulation run:

A = 100

K = 2

Under these assumptions, the equilibrium values for the linear model are:

NP = 2.8

UP = 37

The frequency and damping ratio are:

w = 1.3 (which corresponds to a period of 4.8 years)

ζ = .8