Education as Experimentation: A Planned Variation Model

Volume IV-A

An Evaluation of Follow Through

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Volume IV-A

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ACKNOWLEDGEMENTS

This report, the fourth in a series entitled Education as Experimentation: A Planned Variation Model, has been prepared by Abt Associates Inc. under Contract Number 300-75-0134 for the U.S. Office of Education. All volumes under this title contain results of the continuing evaluation of Project Follow Through.

The national evaluation of Project Follow Through, which was begun by the Stanford Research Institute (SRI) in 1969 and continued by Abt Associates Inc., beginning in July 1972, is designed to examine the effects of a variety of compensatory education approaches for improving the performance of disadvantaged children. The national evaluations have concentrated on examining the results of tests administered to children in the program, questionnaires submitted by the teachers, and interview data collected from the parents. Each successive year since 1969, the data collected on groups of children (cohorts*), parents, and teachers have been accumulated for evaluation. At present, approximately 352,000 Follow Through and comparison children are included on the massive data base.

Obviously, the design of the analysis strategies, the performance of the analyses, and the preparation of the reports has involved the collaboration of a vast number of people. In fact, since 1972, over 75 dedicated professionals have contributed to the Follow Through evaluations prepared by Abt Associates. We wish we could appropriately review the contributions of all, but in the interest of space we will confine our acknowledgements to those who contributed to Volume IV.

---

*At present there are four cohorts of children: Cohort I entered the program in 1969, Cohort II in 1970, Cohort III in 1971, and Cohort IV in 1972. This cohort status applies to all children who entered either kindergarten or first grade (in school districts without kindergarten) during a given year. Although the largest and most intensively tested cohort is Cohort III, each cohort has been submitted to intensive analyses. (See Chapter One, Table 1-1).

In order to do so, we must first acknowledge that this document represents the collective efforts of our staff and consultants, the staff of the U.S. Office of Education's Office of Evaluation of Follow Through, and the staff of Huron Institute. While each group has had "official" responsibilities in the evaluation, there have been numerous occasions when all three staffs have worked together to develop alternative approaches to many of the complex problems encountered in the evaluation of Follow Through. Consequently, the following describes only minimally the scope of the contributions of each of the participants in this evaluation effort.

Mary Kennedy, the USOE Project Officer, has provided us with invaluable substantive and methodological assistance. Her thoughtful and creative approach to monitoring the contract has made the evaluation a satisfying project in which to participate. Eugene Tucker, Director of the Office of Evaluation of Follow Through, and David Iwamota have also provided us with many useful suggestions to guide our work.

Walter Haney, Herbert Weisberg and Anthony Bryk of the Huron Institute, through their function of assisting USOE in monitoring our contract, have also provided us with invaluable and constructive suggestions for analytic strategies and report presentation. We appreciate their performing a difficult role in a manner which was encouraging and professional.

Besides USOE and Huron Institute, the Follow Through sponsors have also contributed to this report. We thank them for their careful review and helpful criticisms of the drafts we shared with them.

In addition to thanking groups outside Abt Associates for their support and encouragement, we would also like to acknowledge the contributions of our staff. Our consultants, Jacob Cohen, Richard Light, and David Berliner have also contributed substantially through their criticisms and suggestions. Cohen has provided us with considerable assistance in the design of the analytic models. Light and Berliner have also made methodological and substantive contributions which have become part of the report.

The preparation and writing of this report has been accomplished through the collective efforts of the Abt Associates Follow Through staff. Whereas the authorship of particular sections of Volume IV is noted within the report, the following briefly describes some of the behind-the-scenes contributions which made the report possible.

The management of the entire project was the responsibility of Richard B. Anderson, Project Director. Assisting him were Linda B. Stebbins, Deputy Project Director, and Elizabeth C. Proper, Director of Analysis. The Project Secretary Yevgenia Mackiernan attended to the myriad of details in managing the contract.

The tasks of integrating the raw data into the data base, writing software for data base extraction and analyses, developing software for computer generated tables, and helping prepare data for analyses were accomplished by significant contributions of the data processing staff: Sanford Friedman, Michael Hagerty, Paul Freyheit, and Michael Duvos. Considering the massiveness of the task, their patience and technical skill were remarkable.

The wide-ranging analysis tasks were directed by Elizabeth Proper. Robert St. Pierre was the task leader for all analyses reported in Volumes IV-A, B, and C. Assisting him were Thomas Cerva, Arlene Feraco, Marty Hickok, Rosamund Ladner, Abigail Millikan, and David Poppe. Linda Stebbins and D. Catherine Baltzell conducted the parent and teacher studies, assisted by Katherine Burleson, Patricia Evans, and Ellen Katzenstein. Geoffrey Bock contributed many long hours compiling the results of analyses and preparing the drafts of Volume IV-B, under Linda Stebbins' supervision.

Thomas Ferb was the task leader for analyses and report preparation of Volume IV-D. He was ably assisted by David Napior, John Larson, Bernadette Nelson, Glen Takata, and Ennio Mingolla.

Elizabeth Proper supervised the analyses and preparation of the Non-Follow Through Study. Assisting her were Charles Brooks, Joann Jastrzab, James Molitor, David Napior, Muriel Watkins, and Tracy Stephens.

The report writing and editing was directed by Linda B. Stebbins. Claudette Piper, the Administrative Aide, assisted in managing the report production, skillfully coordinated the Typing Center staff, and provided technical advice on all table layouts. Karen Keefe assisted her in the massive effort required to produce the reports, and was responsible for producing Volume IV-C.

The staff of the Abt Associates Typing Center provided us with enormous flexibility and cooperation and Candice Cane contributed the creative design for the report cover.

Practically everyone on the staff contributed to initial written drafts of the report. Critical reviews and helpful suggestions for revisions were contributed by Michael Kane, Wendy Abt, John Doucette, Eugene Royster, and Peter Miller under the supervision of Joseph Zelan, the Technical Quality Reviewer.

In summary, this report has been a team effort. Although some members may be more visible in terms of authorship of the various chapters, we are indebted to the contributions of everyone who has participated in this evaluation.

Linda B. Stebbins, Ph.D.
Deputy Project Director
and Editor

31 March 1977

DIGEST

Poor children tend to do poorly in school. By means of Head Start and Follow Through, the federal government set out in the 1960's to learn what compensatory education, applied early, could do to reduce this tendency.

In Follow Through, a number of prominent educators, advocating various educational theories and strategies (models), were funded to become "sponsors" and to apply their insights in selected school districts (sites). The Follow Through national evaluation was assigned to document the experience. As part of this evaluation, the U.S. Office of Education commissioned Abt Associates in 1972 to analyze the data generated by the extensive program of testing and interviewing which was part of Follow Through and to draw from them appropriate conclusions about the effectiveness of the various models' approaches to compensatory education.

Each Follow Through model seeks to develop in children a wide variety of skills and attitudes. We have divided the models into three broad categories, according to their areas of primary emphasis:

- Basic Skills Models

  These models focus primarily on the elementary skills of vocabulary, arithmetic computation, spelling, and language. Four subtests of the Metropolitan Achievement Test (MAT) were administered to measure Follow Through effects in the Basic Skills domain.

- Cognitive Conceptual Skills Models

  These models place primary emphasis on more complex "learning-to-learn" and problem-solving skills. The Raven's Progressive Matrices Test, as well as the MAT Reading, Mathematics Concepts, and Mathematics Problems subtests measure effects in the Cognitive Conceptual domain.

- Affective/Cognitive Models — These models focus primarily on self-concept and attitudes toward learning, and secondarily on cognitive conceptual skills. The Coopersmith Self-Esteem Inventory and the Intellectual Achievement Responsibility Scale measure aspects of the Affective Outcomes domain.

The main body of the report presents the detailed patterns of outcomes that the testing and analysis have revealed; it describes the models, our analytic procedures, and the samples of children and associated adults from whom the data were gathered. To guide the reader, we present here several broad findings, with references to the places in the report where we display and discuss the evidence that has led us to them:

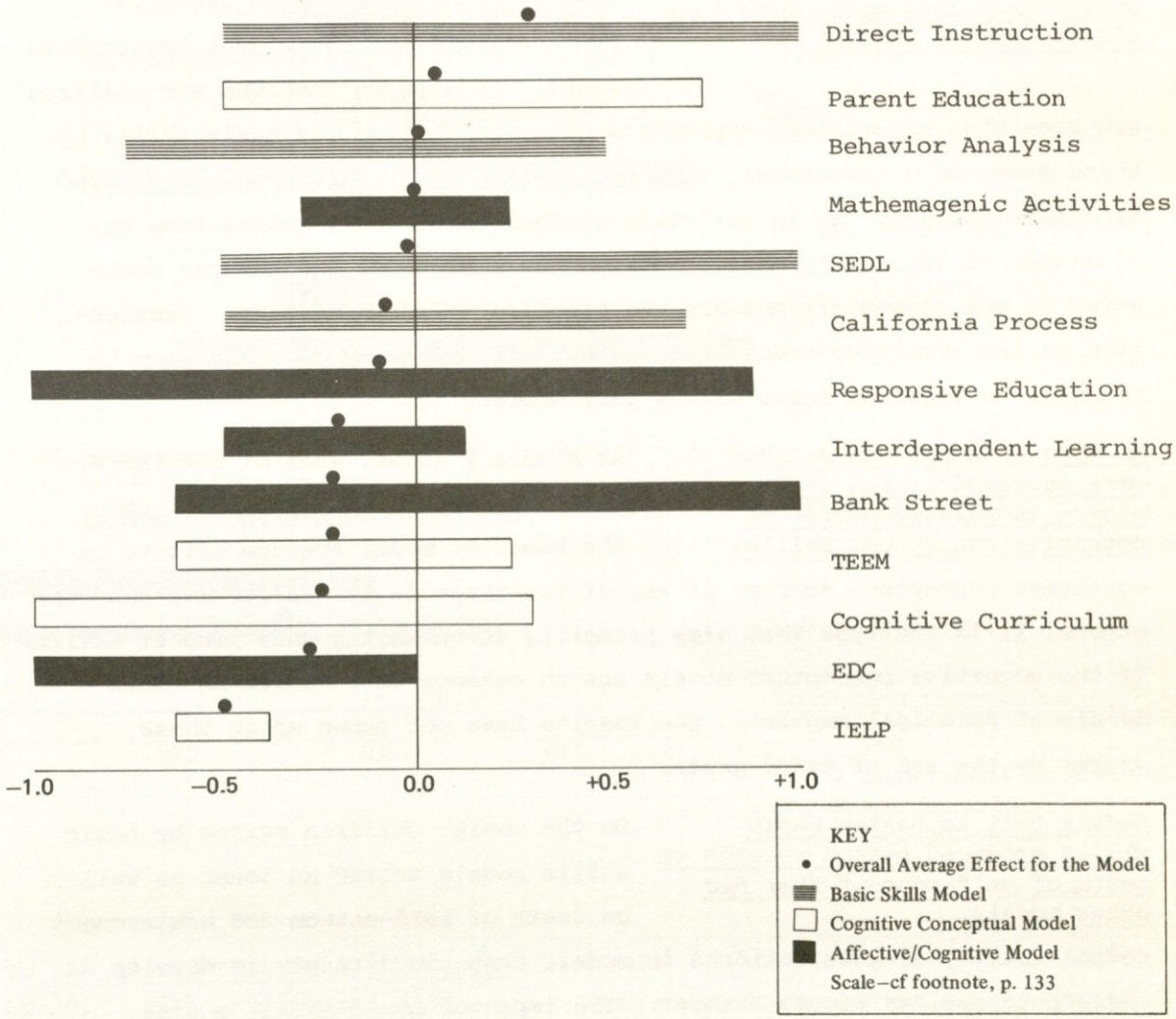
The effectiveness of each Follow Through model varied substantially from site group to site group. — No model has shown itself to be powerful enough to raise test scores everywhere it has been tried. The most successful models had unsuccessful sites. Some of the least successful models had sites in which positive effects predominated. Figure 1 illustrates each model's variability of local average effects* on basic skills test scores. Since the effectiveness of a model might have been very different in other sites, we must take care in generalizing observed performance differences. It is well that the Follow Through planned variation design called for each model to be implemented in a wide variety of places; without this diversity, we would not have been able to demonstrate so clearly the importance of site conditions.

Evidence of site group variability and its consequences appears throughout the report. We discuss it most fully in Chapter Five of Volume IV-A.

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* A positive "average effect" for a site, a model, or a model type indicates more "positive" than "negative" effects. See Chapters Four and Five of Volume IV-A for a full definition of these terms.

Figure 1
Ranges of Site Average Effects on Basic Skills
for Thirteen Follow Through Models



Models that emphasize basic skills succeed better than other models in helping children gain these skills.

Groups of disadvantaged children served by Follow Through models that give primary emphasis to basic skills training have tended to score higher on basic skills tests than have groups served by models with other emphases. In Figure 1, the four basic skills models all rank near the top in average effects. The Direct Instruction Model of the University of Oregon, a basic skills model, had substantially higher average effects than did any other model.

Where models have put their primary emphasis elsewhere than on the basic skills, the children they served have tended to score lower on tests of these skills than they would have done without Follow Through.

As Figure 1 shows, most Follow Through intervention produced more negative than positive effects on basic skills test scores. The only notable exception to this trend was the Direct Instruction Model. It appears that the NFT children are receiving educational experiences that teach them the basic skills by third grade more effectively than would the compensatory programs offered by Follow Through. It is not clear whether this result arises from the diversion of children's attention from the basics, or whether the tests given do not adequately measure the progress children do make. Instruction in the cognitive conceptual and affective domains does not seem to transfer to improved basic-skills test scores.

No type of model was notably more successful than the others in raising scores on cognitive conceptual skills.

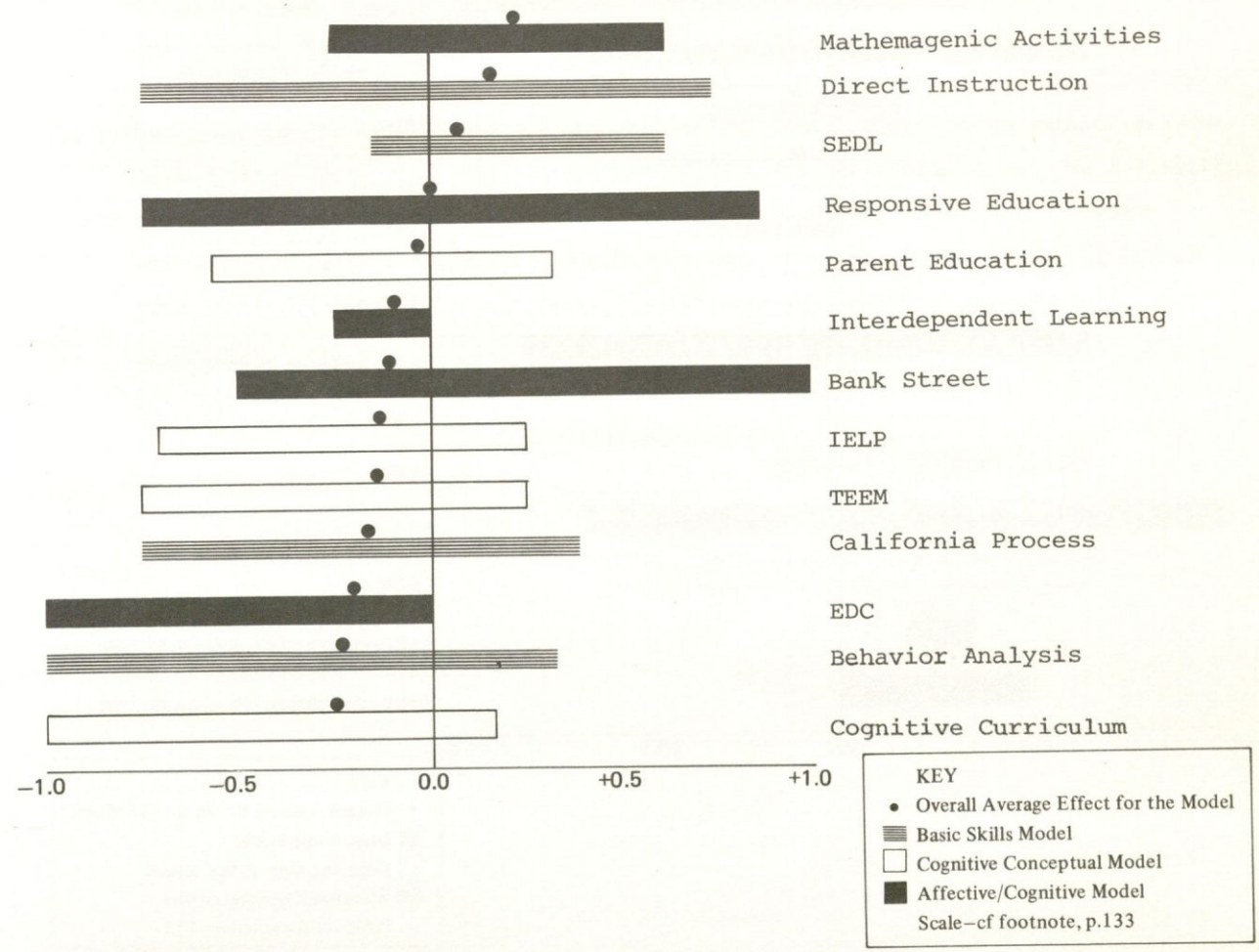
As Figure 2 shows, each of the three model types is well distributed over the range of model average effects on cognitive conceptual scores; if any of the three is less effective than the others, it is the type that aims primarily at enhancing this kind of skills. If the cognitive conceptual models are to enhance test scores in their domain of principal emphasis, the results have not shown up in these scores by the end of third grade.

Models that emphasize basic skills produced better results on tests of self-concept than did other models.

On the whole, children served by basic skills models scored at least as well on tests of self-esteem and achievement responsibility as have children in models that aim directly to develop these outcomes, as Figure 3 shows. The improved basic-skills scores, where they have been achieved, do not seem to have been bought at the price of reduced scores in the domain of feelings and motivations.

The foregoing findings reflect very clear and general patterns in the Follow Through data. Three additional observations of some substantive interest also seem to hold, but with less certainty and generality.

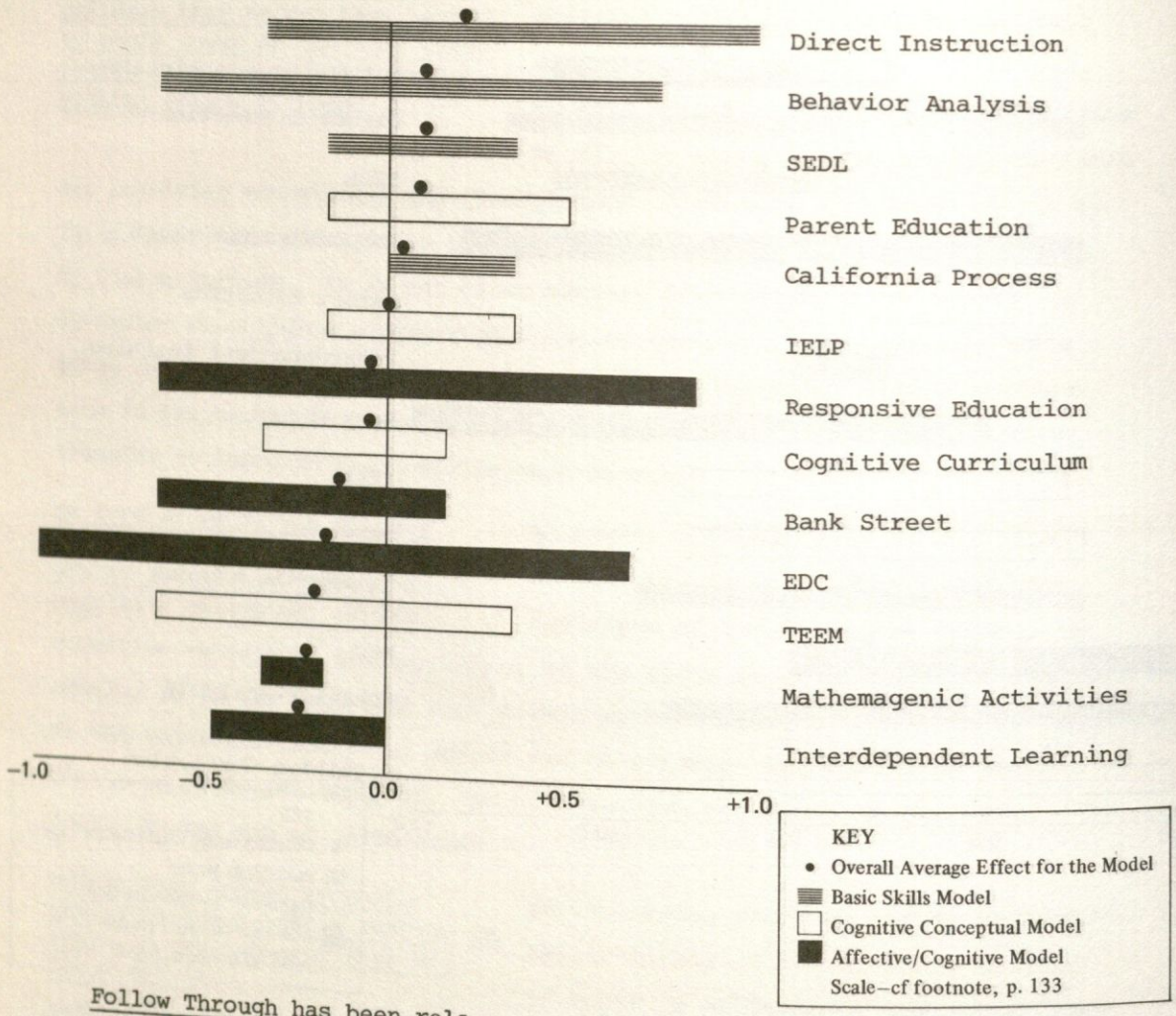
Figure 2
Ranges of Site Average Effects on Cognitive Conceptual Skills for Thirteen Follow Through Models



To the extent that Follow Through children have "caught up" with their peers in arithmetic skills, they have tended to do it during the first two years of their involvement in the program.

Groups in a variety of models gained mathematics computation skills faster than did similarly disadvantaged non-Follow Through groups during the first half of their four-year Follow Through experience. During the second half, nearly all groups either stayed even or lost ground relative to non-Follow Through. The only exception to this pattern was a part of the Direct Instruction group that sustained relative gains throughout the four-year period. Only the basic skills models showed early relative gains in the more complex skill of reading; no sustained reading gains were evident. The details of these findings appear in Volume IV-D.

Figure 3
Ranges of Site Average Effects on Affective Outcomes for Thirteen Follow Through Models



Follow Through has been relatively effective with the most disadvantaged children it has served.

Compensatory programs are often criticized for providing the most benefits to those who need them least, but Follow Through seems not to have followed this pattern. Head Start graduates have commonly gained as much from their Follow Through experience as have non-Head Start children. In two of the models, Head Start children have done substantially better. Seven models experienced more success with their lowest-income sites than with their highest-income sites. In general, this pattern in in keeping with Follow Through's mandate to serve the socioeconomically disadvantaged. See Chapter Five of Volume IV-A.

In general, Follow Through's externally-stimulated compensatory interventions do not seem to have been reliable tools for raising the average test scores of groups of disadvantaged children. Groups tended to gain both basic skills and affective benefits from involvement in programs oriented toward basic skills. Interventions with other orientations tended not to produce test score gains, on the average, relative to children outside Follow Through. Each model's results varied widely from one community to another, for reasons that the data illuminate very little. Future evaluations that aspire to explain the outcomes of compensatory intervention will do well to investigate thoroughly the local circumstances, attitudes, and activities that clearly determine whether a compensatory program can work or not.

Richard B. Anderson, Ed.D.
Project Director

31 March 1977

CHAPTER ONE

INTRODUCTION

Linda B. Stebbins

The design of the Follow Through Planned Variation study offers the opportunity to examine the various approaches to compensatory education longitudinally and through multiple replications. Every year since 1969, demographic and educational achievement data have been collected on groups of disadvantaged children throughout the United States. To date 352,000 children have been included in the Project Follow Through data collection.

Selected portions of these data have been subject to intensive continuing evaluation. In this report, the fourth in the series prepared by Abt Associates Inc., we discuss the findings from the evaluation of the Cohort III, entering-kindergarten children.* In addition, for the purpose of examining the replicability of effects, we also present a discussion of the progress of the entering-first children in Cohorts II and III, and the entering-kindergarten children in Cohort II.

Origins of Planned Variation**

The origins of Follow Through can be traced to an early evaluation of project Head Start (Wolff and Stein, 1966). This evaluation asserted (in the absence of any posttest scores) that the 1965 Head Start experiences had increased the Head Start children's school readiness.

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* See pp. 7-8 for a discussion of the groups of children included in the Follow Through evaluation.

** This section is an abstracted version of Chapter One, Volume IA of Education as Experimentation: A Planned Variation Model. A more complete discussion of this topic can be found in Haney, 1976.

The fact that these presumed increases were not reflected in the achievement test performance of the children at the end of their kindergarten experience in 1966 was attributed to the inappropriateness of traditional elementary education. Although some critics viewed this study as raising essential questions about the value of Head Start, the Johnson administration proposed an alternative program. On January 10, 1967, President Johnson's state of the union message contained a proposal in which he suggested that 120 million dollars be allocated under the Economic Opportunity Act for a Follow Through program to serve up to 200,000 disadvantaged children during fiscal year 1968.

Prior to congressional approval, officials of the Office of Economic Opportunity (OEO) and the U.S. Office of Education (USOE) developed a memorandum of understanding about the utilization of these funds. According to the memorandum, USOE would administer the program, but the final authority for allocation of the Follow Through funds would rest with OEO, and the projects funded would include all major components of the OEO community action programs. This plan insured that Follow Through would extend the Head Start community action model into the public schools and serve all children who qualified as disadvantaged under local criteria.

When the OEO budget was finally authorized by Congress, only one-eighth of the original 120 million dollars, or 15 million dollars, was allocated for the Project Follow Through. This severe reduction in expenditure made a full-scale service program impossible. Therefore, OE, in consultation with the outside experts on early childhood education, decided to use the funds for an experimental program.

Follow Through was to be implemented as an experimental program through an approach known as "planned variation." This approach would systematically introduce a variety of programs into kindergarten through the third grade in some public school districts. To make the concept of planned variation functional, USOE involved educational specialists, each sponsoring a different educational model in a group of school districts. The strategy was novel in two ways. For the first time, research institutions, institutions of higher learning, and others with theoretical and experimental ideas about the education of children were asked to transfer their ideas from the college classroom, the text books, or the laboratory school setting into the public school classrooms. Second, school districts

which had previously been relatively independent of outside intervention were asked to enter into a partnership with a change agent. Participating school districts were required to select a sponsor (or their own "self-sponsored" education approach) and to work with this sponsor in the implementation of the approach.

As the concept of sponsorship was developing, it became evident that very few well-developed approaches to early education of disadvantaged children were ready to be implemented in the primary grades. To circumvent this problem, USOE officials indicated that the sponsor of each experimental model would be expected to develop and refine the model as experience in the field was acquired. The refinement process included becoming more proficient in implementing the model under a variety of site-specific political, social, and education conditions. In fact, most sponsors were required to develop implementation plans/strategies and instructional plans simultaneously.

Selection of the participants in the Follow Through Planned Variation experiment was a complex process. School districts were selected from those initially nominated by state, school, and OEO officials. The criteria used in selecting the districts indicate that the program administrators were less concerned with the effect of the selection process on the external validity of the results than they were with choosing districts with a high probability of success in the first year of the program. The criteria specified, for example, that candidates were to be capable of mounting a comprehensive social service program in a relatively short time, that they be willing to participate in an experiment not yet fully designed, and that they have a well-established, cooperative relationship with the local community action agency (Elmore, 1975, p. 468). Sponsors, in contrast, were initially identified by USOE during early planning meetings and invited to submit proposals to serve as Follow Through sponsors. The selection process occurred between mid-January, 1968, and the beginning of the academic year 1970-1971. The process of matching the sponsor with the school districts began in late February, 1968, when 14 potential sponsors and "hundreds of representatives of school districts, Head Start Programs, Community Action Agencies, parent groups, and state agencies were brought together" (Egbert, c. 1971). The sponsors at this meeting made presentations on their approaches while the community representatives and school officials

listened, each seeking a sponsor who seemed compatible with local needs and attitudes. At the conclusion of this meeting, districts selected sponsors. Some districts affiliated with their first choice; others, because of the need to distribute sponsors among sites, with their second or third choice. Other districts exercised their option not to affiliate but to become what is know as "self-sponsored;" i.e., the local school district would take responsibility for developing its own model.

Definition of Planned Variation

The Follow Through program, as it was defined by these pairs of sponsors and school districts, consisted of two components: social service and education. Social services and parent and community participation were mandated by the enabling Congressional legislation. All districts were legally required to provide the following:

- medical and dental services;
- nutritional programs;
- social service programs; and
- guidance and psychological services.

In the agreement to participate in the Follow Through program, each school district and sponsor agreed to provide these mandated components. These components were not subject to "planned variation" or evaluation (Elmore, 1975). The remaining component, education, was the object of planned variation. The variety of educational strategies included:

- highly structured projects emphasizing academic skills in reading and arithmetic;
- projects stressing cognitive thinking through asking and answering questions, problem solving, and creative writing;
- projects emphasizing social-emotional development and encouraging exploration and discovery in academic areas; and
- projects focusing on preparing parents to improve the education and development of their children (GAO, 1975, pp. 3-4).

To participate in the implementation of one of these education strategies school districts agreed to:

- affiliate with a program sponsor (some were allowed to remain self-sponsored) and cooperate in implementing the approach;
- establish coordination between primary programs and preschool programs, by selecting children with Head Start or similar preschool experience into the program;
- contribute an amount of Title I money equal to 15 percent of the combined Follow Through and Title I monies or 10 percent of the Title I grant, whichever was less;
- involve parents and community participants in the program planning; and
- engage in teacher and staff training and development.

According to Egbert (1973), sponsors were to serve several critical functions:

- provide the community with a well defined, theoretically consistent and coherent approach that could be adapted to local conditions;
- provide the continuous technical assistance, training, and guidance necessary for local implementation of the approach;
- exercise a "quality control" function by constantly monitoring the progress of program implementation;
- serve as an agent for change as well as a source of program constancy by assisting the community in retaining a consistent focus on the objectives and requirements of the approach rather than responding in an ad hoc manner to the daily pressures of project operations;
- insure implementation of a total program, rather than a small fragment, such as reading, with a resulting possibility for a major impact on the child's life; and
- provide a foundation for comprehending and describing results of evaluation efforts. (p. 16)

From the beginning the Follow Through Planned Variation experimental program was highly complex, defined only in terms of the intent to "find out what works," and exceedingly dependent upon the sponsor's ability to transform preschool strategies into elementary school programs and simultaneously to work out the implementation issues.

Evaluation of Planned Variation

The Follow Through planners did not fully appreciate at the outset the difficulty of alleviating the complex problems of lower achievement among disadvantaged children. The general assumption was that the program impact would be so great that the evaluation design, no matter what its level of sophistication, would easily demonstrate the Follow Through effect. As Egbert (1973) says:

> [i]ts design stemmed from the conviction that sufficient improvement could be affected in the institutions serving children that children's development would be so markedly superior as to be readily demonstrated on measures of achievement, cognition, self-concept, social maturation, and capacity to function independently. Follow Through's design was born also from the conviction that unless such substantial differences were manifest, the really massive increases in spending that would be required could not be justified. In view of the results reported by Miller, Engelmann, Gordon and others in the January, 1968, meetings of prospective sponsors, this conviction did not seem unrealistic, assuming that programs developed in small scale settings could be implemented on a larger scale in a number of communities. (p. 25)

The national evaluation was designed to address the following questions:

- Does Follow Through have a greater impact on disadvantaged children than do regular school programs?*
- Do the various education strategies being tested in Follow Through have different impacts?

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* This early objective was later eliminated, reflecting the intention to examine the impacts of each of the planned variation strategies rather than the impact of Follow Through as a program.

- Do differences in impact have any relationship to the characteristics of children, e.g., socioeconomic status and preschool experience?
- Do differences in implementation of an educational strategy bear any relationship to the differences in impact?
- Do some educational strategies consistently show better results than others over time, or does the impact vary from year to year?

The early evaluation planners foresaw the advantages of collecting vast amounts of longitudinal information about the Follow Through (FT) children and non-Follow Through (NFT) comparison children, their families, and their teachers, for the research. As shown on Table 1-1, the massive data base encompasses three cohorts of children.* These cohorts are divided

Table 1-1

GRADE LEVEL OF FOLLOW THROUGH CHILDREN IN EACH COHORT AND STREAM, BY YEAR

	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76
Cohort I							
K†	K	1	2	3			
EF††	1	2	3				
Cohort II							
K		K	1	2	3		
EF		1	2	3			
Cohort III							
K			K	1	2	3	
EF			1	2	3		

† Entering kindergarten stream.
†† Entering first grade stream.

* There is a fourth cohort consisting of children in three big cities: New York, Philadelphia, and Chicago. These data were used peripherally in the Head Start Planned Variation evaluation reported in Volume IIB of Education as Experimentation: A Planned Variation Model, pp. IV-3, IV-6.

into six specific groups, otherwise known as streams (three streams entering kindergarten [K] and three streams entering first grade [EF]). This table shows the progression of children in each of the cohorts and streams through the grade levels during each successive school year, beginning in 1969. Although some sponsors implemented programs in certain sites in 1968, very little of the data collected during that year was ever evaluated.*

From the beginning, a number of research projects have investigated the impacts of Follow Through. Some projects described programs; others investigated parent attitudes and characteristics; still others studied institutional change and instrument development. This report contributes to the total evaluation by concentrating on assessments of the child, parent, and teacher data.

Beginning with the Cohort I group and continuing through Cohort III, each cohort was to be subjected to more or less intensive evaluation. In 1969, Stanford Research Institute (SRI) was the contractor responsible for designing both the data collection and evaluation, in conjunction with the USOE program staff. Change in the national evaluation strategy, however, was recommended by various reviewers. To accomplish this change, the data collection and data analysis functions were separated, and

> USOE, assisted by a consulting group, assumed full responsibility for specifying the experimental design, tests, and projects where testing would be done. (GAO, 1975, p. 9).

In 1972, competitive procurements were issued. SRI was awarded the contract for data collection and Abt Associates Inc. was awarded the contract for data analysis.

Research Issues

By this time, we were intensely aware that the evaluation of the Follow Through Planned Variation Experiment would require us to address the research questions indirectly. No single and direct analytic strategy would suffice because of several evaluation problems inadequately taken into account in the initial design:

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* See Haney, 1976 for details of other Follow Through evaluations.

- lack of specificity of treatment;
- limitations of the measurement battery; and
- weakness in the design of the evaluation.

Lack of Specificity of Treatment

Changing the Follow Through program from a major social service program to a planned variation experiment brought the difficulty of specification and stabilization of treatment into focus.

> [A]dministrative decisions were never fully rationalized with the authorizing legislation, that is, the legislation authorized a social action program; administration decreed that the program should be experimental. Legislators, community action agencies, OEO regional offices, and others were never apprised of this decree except by Follow Through program personnel. (Egbert, 1973, p. 27)

In effect, the Follow Through program retained all social service components and varied the education component only. The field effort was mounted very rapidly, with only seven months elapsing between the time sponsors were "matched" with communities and the time school began. Most sponsors, therefore, were not provided sufficient time to define their educational treatments in a manner entirely suitable for evaluation. The programs, as they existed, were defined in a manner more suited to a service program where even educational treatments could be continually adjusted as needed. Recognizing that the educational treatments developed in small scale, laboratory-type settings would require adjustments in the "real life" situations, USOE required the sponsors to continue to refine their educational treatments. This situation had several consequences for the evaluation:

- Over time, the specific sponsor goals and objectives have shifted with the exigencies of field operation, and to this day they remain in a state of flux. This makes evaluation of the attainment of sponsor goals and objectives extremely difficult.

- For purposes of evaluation, treatment was defined as the planned variation of the educational program. Yet each actual treatment includes two components: social services and education. Our evaluation addresses only one component of the complete treatment.
- There has been no adequate assessment of whether the sponsors' evolving programs were implemented. We have, therefore, had no way to address the research issue, "Do differences of implementation of an educational strategy have any relationship to differences in impact?" (Parent and teacher data related to implementation are used as descriptive material only.)
- In some instances, educational aspects of the Follow Through treatment may have diffused from Follow Through into non-Follow Through classrooms, thus contaminating the comparison groups with unknown portions of the treatment. However, it must be noted that even where this may have occurred, comparison classrooms still differ from Follow Through classrooms because they do not have the extensive support available to the Follow Through Program.

Even though these problems in the specification of treatment exist, sponsors have changed neither their basic philosophical orientations nor the thrust of their educational strategies; it is in terms of these broad strategies that we can appropriately evaluate sponsor performance.

Limitations of the Measurement Battery

Although the USOE and others expended considerable effort on the selection of an adequate battery of measures, it was soon realized that no common battery could be developed that would encompass all the various sponsors' goals and objectives. As an alternative, in July 1972,

> ...the OE official in charge of the evaluation requested the sponsors to make their objectives explicit and to devise evaluation plans for those objectives not covered in the national evaluation. OE followed up on this request with a memorandum to the sponsors in November 1972. (GAO, 1975, p. 11)

While many sponsors have conducted their own evaluations using their own selection of instruments, the national Follow Through evaluation does not include in its scope the individual sponsors' evaluations.

The battery of measures administered for the national evaluation was, therefore, limited to previously published instruments which had been standardized for the middle class population. The adequacy of these measures of growth and development was unknown for children from low socioeconomic status families.

The battery, however, provides a common set of measures for evaluating the performance of Follow Through children associated with the planned variation models. The instruments were selected to measure children's performance in three domains of learning: basic skills, cognitive conceptual skills, and affective development. The selected measures of basic skills are representative of the kinds of outcomes commonly expected in that domain, e.g., simple arithmetic and reading words. That is, if one is interested in the children's performance in the basic skills domain, the measures in the Follow Through battery are representative of the kinds of outcomes one might expect. The cognitive conceptual and affective domains, however, are not readily defined. Consequently, the measures of performance in these domains do not appear to be based upon any common expectation. Although the Follow Through measures of cognitive conceptual and affective development each provide one set of outcomes for every planned variation model, these measures may only partially match the models' desired outcomes in those domains.

Weakness of the Design

Because of the commitment to deliver a service program to those most in need and because the founders of Follow Through initially assumed it would have a powerful and highly visible impact, they did not give high priority to aspects of the evaluation design that could have made the experiment more sensitive to the measurement of treatment effects. In particular, no attempt was made to assign children randomly to treatment and comparison groups.

In most cases the Follow Through participants were selected from among the most disadvantaged children in the community. As documented by GAO (1975):

> The May 1969 memorandum of understanding [between OEO and OE] required that, with rare exceptions, at least 50% of the children participating in each Follow Through grade have preschool experience, preferably a full year, and come from families whose incomes meet Head Start income eligibility criteria at the time of enrollment in Head Start. However, OE's draft program manual, dated February 1969, provided that, with rare exceptions, at least one-half of the children from low income families in each Follow Through project have a full year of Head Start or comparable preschool experience. According to OE officials, the projects received the manual criteria but not the memorandum criteria. (p. 41-42)

These same criteria did not exclude children with special education needs. Using the OE program manual, some communities chose to include the mentally handicapped and/or emotionally disturbed. Other communities chose to exclude these children. However, some communities met only the minimal criterion of 50 percent low income children and allowed higher income children to make up the remaining 50 percent. The data indicate that there were considerable variations in the range of children served, and the distibution of disadvantage by sponsor and by site does not appear to be random.

The problem of selecting appropriate comparison groups was complicated by a number of considerations. According to Emrick, Sorenson, and Stearns (1973), SRI attempted to obtain comparison groups which were as similar as possible to the treatment groups within each district or proximal district.

> That is, to the extent possible, comparison schools [were] selected because of similarity with the FT school characteristics, such as ethnic composition, general level of poverty of pupil families and type of neighborhood. The purpose of obtaining these matched comparison groups was to provide a basis for validly assessing the Follow Through program impacts by contrasting measures obtained from the comparison groups with those obtained from the FT groups. Thus, if matching [was] successful, the only relevant variable on which the two groups differ [was] Follow Through and differences on measures would be valid indicators of FT's effects. But the comparison school participated on a voluntary basis and since these comparison groups [were] constituted after a Follow Through

> project [was] implemented and designated for inclusion in the evaluation, such matching was accomplished with a highly variable degree of success. (p.21)

Further complicating the non-Follow Through (NFT) comparison is that, with the growth of federal funding for compensatory education efforts over the past ten years, many of the regular school programs serving the NFT comparison children have come to encompass other compensatory programs such as Title I. Thus the NFT category includes both traditional programs which do not receive any additional funds and heavily supported, specially developed compensatory programs.

Another problem arising from the design is the imbalance of sponsor site distribution by region and city size that arose from the self-selection of sites to treatment. Although this problem was foreseen during the selection process and some attempts were made to correct the situation, each sponsor has worked under a set of unique site conditions. Even careful selection for evaluation from among the sites associated with particular sponsors has not alleviated the difficulties of making cross-sponsor comparisons.

In summary, the national Follow Through evaluation is subject to many of the problems inherent in field social research (i.e., nonrandom assignment, unclear definition of treatment, problems of assessing implementation, less than ideal instrumentation) and careful judgment must be used in drawing conclusions. Evaluation of these planned variations provides us with an opportunity to examine the educational strategies under real life conditions as opposed to contrived and tightly controlled laboratory conditions. This evaluation, which has been structured to alleviate the problems likely to be found in evaluation of large-scale, innovative, education programs, reveals some meaningful patterns and provides empirical information on program impacts.

History of the Abt Associates Inc. Evaluation

Our national evaluation contract was specifically limited to the data analysis of the student achievement, parent, and teacher data. We began by first organizing the vast amounts of year-by-year data into a longitudinal data base from which we could readily retrieve all the

information associated with each particular child: all test scores from kindergarten through third grade, the pre- and post-parent interviews, and the kindergarten through third grade teacher questionnaires.

Once this task had been accomplished we began defining the analytic samples for the first year's evaluation. The rationale was simple: we selected children with complete data from the two cohort streams of interest. From the beginning, the Cohort III-K children were the primary sample for intensive evaluation. This stream was selected because most models had at least two years of prior experience with Follow Through implementation. The data collection plans were more extensive for this cohort in terms of the number of children tested, the number of communities included, and the number of time points sampled. By late 1972, their fall and spring kindergarten test scores were added to the data base for retrieval in the form of analytic files. The Cohort I-EF children had just completed third grade and were therefore available for our first evaluation of entry-exit effects.*

The third preliminary task was to begin a continuing investigation of the most appropriate analytic strategy or combination of strategies that could be applied to the research issues embedded in the Follow Through design. (These issues were discussed in the previous section.) Each year since 1972, we have repeated the process: updating the data base, selecting samples from the cohort stream(s) of interest, continuing the development of our analytic strategies, performing the evaluation, and producing a yearly report.

The evaluations discussed in Volumes I through IV, as suggested above, report on different cohort streams evaluated by different analytic strategies. Table 1-2 indicates the cohort streams included in each volume of the report series. The different analysis strategies have resulted in reports whose contents vary as follows.**

Volume I presents a series of cross-sectional studies of the kindergarten year for the Cohort III-K Follow Through and non-Follow

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* See Chapter Four, Volume IV-A for a complete explanation of how the entry-exit effects are calculated.

** The reader is referred to the specific volumes of Education as Experimentation: A Planned Variation Model for more detail.

Table 1-2

COHORTS AND STREAMS INCLUDED IN EACH VOLUME (I-IV) OF EDUCATION AS EXPERIMENTATION: A PLANNED VARIATION MODEL*

GRADE LEVEL OF FOLLOW THROUGH CHILDREN IN EACH COHORT AND STREAM, BY YEAR

Volume I

	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76
Cohort I							
K†	K	1	2	3			
EF††	1	2	3				
Cohort II							
K		K	1	2	3		
EF		1	2	3			
Cohort III							
K			K	1	2	3	
EF			1	2	3		

Volume II

	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76
Cohort I							
K†	K	1	2	3			
EF††	1	2	3				
Cohort II							
K		K	1	2	3		
EF		1	2	3			
Cohort III							
K			K	1	2	3	
EF			1	2	3		

Volume III

	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76
Cohort I							
K†	K	1	2	3			
EF††	1	2	3				
Cohort II							
K		K	1	2	3		
EF		1	2	3			
Cohort III							
K			K	1	2	3	
EF			1	2	3		

Volume IV

	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76
Cohort I							
K†	K	1	2	3			
EF††	1	2	3				
Cohort II							
K		K	1	2	3		
EF		1	2	3			
Cohort III							
K			K	1	2	3	
EF			1	2	3		

† Entering kindergarten stream.
†† Entering first grade stream.

* Cells in white show cohorts, streams, and number of years of Follow Through experience evaluated.

Through comparison children. These studies were carried out using three units of analysis (school, class, and child) for the data from ten sponsors' models. We reported that the sponsors' kindergarten programs produced a wide variety of effects. Analyses of parent and teacher data also showed varying patterns of Follow Through/non-Follow Through differences across the ten sponsor programs. In addition to the studies conducted on the Cohort III-K children, a brief substudy was conducted of the Cohort I children who entered Follow Through in the fall of 1969 as first graders. We conducted our first entry-exit study on six planned variation models and concluded that the three years of Follow Through experience had not homogenized the effects of different sponsors' programs: children associated with the different programs still had widely varying performance levels.

Volume II again dealt with Cohort III-K. This volume differed from the first in two respects. First, it focused on a group of children who could be traced from kindergarten through the end of first grade. Second, site level analyses were added to the previous sponsor level analyses. (The question of overall Follow Through effect was dropped.) This important addition was included because the first report had indicated that many of the models' effects were strongly influenced by site-specific conditions. Follow Through/non-Follow Through comparisons for ten models working with Cohort III-K children were made. We replicated the one-year, cross-sectional study of the kindergarten effects (reported in Volume I) on the Volume II subsample of traced children, and also studied two-year longitudinal effects for ten sponsors. The results indicated that Follow Through children associated with three models showed significantly higher performance levels than non-Follow Through children at the end of first grade. Follow Through children in three other models also showed important effects which varied considerably across sites. The parent and teacher data continued to show the same varying pattern reported in Volume I.

Volume III contained interim findings on the Cohort III-K children through the end of second grade and the full evaluation of the Cohort II-K data through the end of third grade.

This report was both a continuation of and a departure from our previous reports. Once again, we examined Follow Through effects at site-level. The departures were more numerous. The Cohort II-K data provided our first opportunity to look at the results of a full four-year sequence

of Follow Through involvement. We also incorporated, for the first time, information from the parent and teacher questionnaires as indicators of implementation of the various curriculum models. Whereas in the two previous reports we had examined the parent and teacher data in separate monographs, in this report we discussed similarities and differences between the model's stated goals and objectives and the observed learning environment reported by the parents and teachers. The third departure concerned the analytic approaches. Whereas we had previously analyzed the data using one statistical model which compared the Follow Through and non-Follow Through children within each site in turn, Volume III contained three parallel analyses. These analyses included comparisons of Follow Through children with non-Follow Through children at the same site, at a "best matched" site (which might or might not be the local site), and pooled across all sites. In addition we provided standard scores and grade equivalent scores for the Follow Through and non-Follow Through groups of children. This multiple analysis approach was applied to the data from thirteen different models. The results for all sponsors' models indicated that the effects varied widely across outcomes and sites. We presented few conclusions, since the Cohort II-K entry-exit evaluation was intended to serve as a replication of the Cohort III-K entry-exit evaluation.

Volume IV presents the four-year entry-exit effects for the Cohort III-K children, as well as the three-year effects for Cohorts II-and III-EF children, and repeats the summaries of effects for Cohort II-K children. In addition, we present a longitudinal analysis of the Cohort III-K children who were tested at the end of first grade as well as at entry and exit. This year we have once again amended our analysis strategies, and have also employed those strategies found in Volume III (see Chapter Four). The most important change in analyses reported in Volume IV is our development of a method to account for differences among children with varying kinds of preschool background: Head Start, Some Preschool, or No Preschool experiences. The Volume IV report is divided into four major sections. IV-A, An Evaluation of Follow Through, contains a brief discussion of the Follow Through Planned Variation Experiment, a description of the samples, a discussion of the analysis strategies, and a summary of the pattern of effects across all sponsor's models. IV-B, Effects of

Follow Through Models, contains more detailed discussions of the effects for each model included in the evaluation. IV-C Appendices, is an appendix to IV-B. IV-D, Part I: A Longitudinal Study of Follow Through; and Part II: Academic Risk Study, contains a rationale for the longitudinal evaluation, a discussion of the analysis strategies, a presentation of the patterns of relative progress of the Follow Through and non-Follow Through children, and a special study of children deemed academically "high-risk." Although it is not formally included in the Volume IV series, there is also a volume, Non-Follow Through Study, devoted to special study of the non-Follow Through children. As in previous reports, we continue to find that some sponsor's models are more effective than others. The patterns of effects are, however, complicated. In Chapter Five, we present a summary of the findings and compare the effectiveness of various models.

CHAPTER TWO

EDUCATIONAL STRATEGIES AND MEASURES OF EFFECTIVENESS

Linda B. Stebbins

The Follow Through sponsors espouse a wide range of approaches to the education of children from low socioeconomic background, as the research strategy of planned variations requires. The objectives of the sponsor approaches vary accordingly, as do the suggested measures of goal attainment. Some sponsor goals relate directly to the dimensions that standardized tests aim to measure; others do not lend themselves to any well-developed or economical means of assessment. To evaluate each model's performance on every measure of interest to any sponsor would impose unreasonable costs and burdens on the evaluation and on the people involved; the measures actually administered therefore represent a compromise between the demands of diversity and the practical constraints of resources and available instruments. Unfortunately, we have no data on the adequacy or costs of this compromise so it remains a topic of conjecture and controversy.

Educational Strategies

At one time Follow Through program embraced 22 sponsors working with 178 sites. These sponsors represented the spectrum of approaches to early childhood education existing in 1968-1971. This evaluation report includes evidence on the progress of children served by the 17 models listed in Table 2-1 (counting the five Self-Sponsored sites as a single model or group).* These sponsors share the perception that some children in our society, particularly those from families with low socioeconomic status, have special educational needs.

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* A few models are not included in this evaluation because we do not have data. See sample selection criteria in Chapter Three.

Table 2-1

FOLLOW THROUGH MODELS INCLUDED IN THE ANALYSES

Full Model Name	Name Used in Report	Sponsoring Institution or Agency
Bank Street College of Education Approach	Bank Street	Bank Street College of Education
Behavior Analysis Approach	BA	Support and Development Center for Follow Through - University of Kansas
California Process Model	Cal Process	California State Department of Education - Division of Compensatory Education
Cognitively Oriented Curriculum Model	Cognitive Curriculum	High/Scope Educational Research Foundation
Cultural Linguistic Approach	CLA	Northeastern Illinois State College
Direct Instruction Model	Direct Instruction	University of Oregon - College of Education
EDC Open Education Follow Through Program	EDC	Education Development Center
Florida Parent Education Model	Parent Education	University of Florida
Home-School Partnership Model	Home-School Partnership	Clark College
Individualized Early Learning Program	IELP	University of Pittsburgh - Learning Research and Development Center
Interdependent Learning Model	ILM	City University of New York - Institute for Developmental Studies
Language Development (Bilingual) Education Approach	SEDL	Southwest Educational Development Laboratory
Mathemagenic Activities Program	MAP	University of Georgia
The New School Approach to Follow Through	NSA	University of North Dakota
Responsive Education Model	Responsive Education	Far West Laboratory for Educational Research and Development
Self-Sponsored	Self-Sponsored	---
Tucson Early Education Model	TEEM	Arizona Center for Early Childhood Education

Each of the diverse approaches to compensatory education during the 1960's was based on one or both of two hypotheses: "cultural deprivation" and "the failure of schooling." According to the first hypothesis, the academic failure of certain "disadvantaged" children is based on the lack of adequate cognitive and affective development, which middle class children usually obtain from formal or informal preschool experiences. To make up for this deprivation in preschool experiences, special programs of compensatory education were designed to alleviate socially induced handicaps.

The second hypothesis, an alternative to the "cultural deprivation" theory, embodies the premise that academic failure among disadvantaged children is directly attributable to inept practices, low expectations, and negative attitudes on the part of the school staff. Proponents of this theory felt that "early socialization under conditions of poverty and discrimination, although hardly conducive to optimal development by no means precluded effective learning in schools" (Wilkerson, 1970). In short, what was needed was not compensatory education but "good teaching."

The hypotheses underlying the sponsors' educational strategies are not here at issue. The Follow Through program, by virtue of its overall strategy and implementation, is designed to alleviate either of these conditions if they exist. Furthermore, all Follow Through sponsors share the expectation that these conditions can be alleviated: that improvement of the children's opportunities for emotional and intellectual development will enhance their chances for advancement in our society. Although the instructional approaches vary, each sponsor considers the following elements essential to compensatory education (USOE, 1973):

- Development of children's learning abilities;
- Individual and small group instruction and frequent exchange between children and concerned adults;
- Commitment to making learning interesting and relevant to the child's background; and
- Belief that the child's success in learning is inseparable from his self-esteem, motivation, autonomy, and environmental support. (p. 11)

The Follow Through programs reflect a broad spectrum of strategies for implementing these goals. Examination of each sponsor's goals and objectives reveals that the philosophical bases underlying the sponsor approaches vary widely. Some are more oriented toward basic skills achievement, while others are more concerned with developing a desire to learn and yet still others are oriented to learning how to learn.

Classification of Models by Goals and Objectives*

For the purpose of this evaluation, we judgmentally classify models along two dimensions according to their stated goals and objectives for classroom learning environments; emphasis on the learning domain and degree of structure.** Three major classifications in the learning domain are found in the sponsors' descriptions: emphasis on basic skills, emphasis on cognitive conceptual skills and emphasis on self-esteem and sense-of-control (affective measures). These learning domain emphases are based, to some degree, on the philosophical orientation of the model. In Volume III-A we classified sponsors' models according to their major philosophical basis: reinforcement learning theory, cognitive conceptual theory, and psychodynamic theory. Some models did not fit into this scheme, and so we have used another classification in this volume. Based on the sponsors' statements of goals and objectives, we have tried to identify the emphasis of each model on one or two domains of learning. The classification of models by philosophical orientation is not totally congruent with the classification of models by learning domain; we find that both are useful in understanding the intent and approach of each model.

White et al. (1973) have defined the three major theoretical orientations of Follow Through as follows:

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* Many researchers have attempted to categorize the Follow Through models according to various dimensions specified in the models. The programs are usually classified along two dimensions: the theoretical orientation and educational philosophy underlying the programs (Maccoby and Zellner, 1970; White et al., (1973), or the curriculum or educational goals (Bissell, 1973; Cline et al., 1974; Egbert, 1973).

** Sponsor's goals and objectives are stated in several sources, i.e., USOE (1973), Judd and Wood (1973), and sponsor descriptions from 1975 proposals.

> The behavioristic approach maintains that all behaviors are learned, it implies that educational disadvantage exists because specific pre-academic and/or social skills necessary to success in school have not been acquired. These skills must be taught to the child using appropriate instructional techniques to attain specified behavioral objectives. The contingencies between environmental stimulus and child response are carefully planned in advance, with reinforcement (or reward) being used to encourage the desired behaviors.
>
> The cognitive development approach emphasizes the process of cognitive growth more than the learning of specific content. It is assumed that the disadvantaged child has not had sufficient experience with his world in a manner that is conducive to cognitive growth. He needs appropriate interactions with people and materials to learn how to process information and solve problems in a logical and efficient manner. Often, in addition, his verbal skills as they relate to thought processes are inadequate. Instructional techniques vary, but the child's self-guided activity and experimentation with various aspects of the environment are seen as important. Learning is facilitated when there is a "match" between the child's level of cognitive development and the experiences encountered.
>
> The psychodynamic approach considers socioemotional goals to be essential for optimal development of the "whole" child. Learning presupposes the development of a "healthy" individual. A positive self-image, trust, emotional stability, constructive peer relationships, etc., are essential to successful learning. Instructional technique emphasizes the quality of interpersonal relationships and an environment which supports self-actualization. Free choice and self-determination are important. It is usually assumed that the child "knows what is best" for his personal growth. (pp.121-122)

The trichotomy of philosophical orientations defined by White et al. (1973) is based on the sponsors' preschool programs. The psychodynamic orientation has been modified for the Follow Through program in kindergarten through third grade. The educational strategies used by the Follow Through sponsors who emphasize this approach also include a cognitive component of encouragement of exploration and discovery in academic areas.

The second dimension which is useful in our classification is the degree of structure of the model. White et al. (1973) also classified the structure dimension, as follows:

> High structure involves the predetermination of both teacher and child behaviors by the curriculum. In this case the teacher follows a specifically defined role prescription developed by the project planners. The child's behavior is directly dependent upon the teacher's and also fits the prescribed role. Neither teacher nor child behavior should vary greatly among classrooms implementing the same curriculum. (p. 123)
>
> The middle of the structure continuum included both projects with a mixture of high and low structure situations which offer broad guidelines for teacher and child. Many projects use highly structured instructional periods and periods of free play. Also, many projects delineate long-term goals that do not provide step-by-step curriculum for obtaining behavioral objectives. For example, it may be specified that every child should learn math, reading, and spelling without specifying how the child is to be taught. (p. 124)
>
> In low structure models...teachers are free to act on the basis of their own feelings, intuitions, educational philosophy, etc., as long as they are congruent with the overall goals of the project. Both teacher and child are free to choose curricular activities and to act spontaneously according to their needs. Individual behaviors vary widely from classroom to classroom since there are not specified behavioral objectives. (p. 123)

The low structure models are highly dependent upon the teachers' ability to "plan structure" which moves the individual student toward program goals.

Table 2-2 shows our classification of the Follow Through models based upon stated goals and objectives for the classroom learning environment, particularly in terms of the learning skills the model desires to instill. A detailed description of each model is included in Volume IV-B.

The models unclassified on the degree of structure (Self-Sponsored, California Process, Parent Education, and Home-School Partnership) place greater emphasis on parent/community involvement than on the classroom environment in improving the education of children. Although we know very little about the classroom learning environment for these models, the sponsors' stated goals and objectives do permit a classification on the model's emphasis on the learning domain.

Table 2-2

TYPOLOGY OF MODELS WITH RESPECT TO THE CLASSROOM LEARNING ENVIRONMENT

Degree of Structure	Emphasis on Learning Domain		
	Basic Skills	Cognitive/ Conceptual	Cognitive/ Affective
High	Behavior Analysis Direct Instruction IELP		
Medium	CLA SEDL	Cognitive Curriculum TEEM	Responsive Education ILM MAP
Low			Bank Street EDC
Unknown	Self Sponsored California Process Home-School Partnership	NSA Parent Education	

Two of the models expressing a specific basic skills emphasis (Behavior Analysis and Direct Instruction) have adopted a highly structured approach which is compatible with their behaviorist educational strategy. Two other models

(Self Sponsored and California Process) also appear to place primary emphasis on the development of basic skills, particularly reading and math. Most of the models emphasizing cognitive conceptual skills (Cognitive Curriculum and TEEM) use a moderately structured approach. Other models with a cognitive emphasis (NSA and Parent Education) use an unknown degree of structure. Four model descriptions (IELP, CLA, SEDL and Home-School Partnership) suggest varying degrees of structure to develop both basic and cognitive skills. The psychodynamic approaches (Responsive Education, Bank Street, EDC, ILM, and MAP) tend to have medium to low structure and place emphasis on both the acquisition of self-esteem and cognitive thinking processes.

Sponsors differ, not only in their approaches to instruction but also in their approaches to parental involvement. In their stated goals and philosophies, sponsors vary along two parental involvement dimensions: the degree to which the sponsor systematically uses parents as teaching agents and the degree to which the sponsor emphasizes the home environment as a mediating force in the child's education.

The first dimension reflects sponsor emphasis on defining a pedagogical role for the parents and on providing the training and materials necessary to fulfill this role. For this dimension we specify three levels. The first indicates a low level of sponsor involvement in training parents to teach their children; the second a moderate level; and the third a high level of effort in training parents to use appropriate methods and materials in teaching their children either at home or in the classroom.

The second dimension reflects sponsor emphasis on the importance of the home environment as an influence on the child's education and the degree to which the sponsor attempts to affect that environment. This dimension also is divided into three levels which indicate low, moderate, and high emphasis, respectively. Using these two dimensions, models can be classified as shown in Table 2-3.

The models in the first cell of the matrix (EDC, California Process, SEDL, CLA, and MAP) make little mention of parental involvement in their stated goals and objectives. Those models which place high emphasis on the home environment (Home-School Partnership, Cognitive Curriculum, Direct Instruction and Parent Education) differ more in the

Table 2-3

TYPOLOGY OF MODELS WITH RESPECT TO HOME LEARNING ENVIRONMENT

Utilization of Parents as Teaching Agents	Emphasis on the Home Environment		
	Low	Moderate	High
Low	EDC California Process SEDL CLA MAP	Bank Street	Home-School Partnership
Moderate	Behavior Analysis TEEM NSA	ILM	Cognitive Curriculum Direct Instruction
High	IELP	Responsive Education	Parent Education

techniques by which they try to affect the home environment than they do in the degree of emphasis they place upon the home environment as a mediator in the child's education. Three other models (Bank Street, ILM, Responsive Education) place a moderate emphasis on the home environment. These models stress the need to involve parents, they pursue their goals through varying programs and training strategies. Finally, another group of models (Behavior Analysis, TEEM, NSA, and IELP) place a relatively high emphasis on training parents to effectively help their children, especially through participation in the classroom activities.

Indications of Acceptance of the Model Tenets

To evaluate the effectiveness of a particular planned variation strategy requires both a clear description of the essential elements of the educational strategy treatment, and some indication of whether or not the strategy has been implemented. The educational strategies and intended outcomes, introduced in the preceding section and discussed more fully in the model chapters (Volume IV-B), describe how elements of the learning environment, both in the classroom and/or the home, should operate. Although numerous conditions (e.g., community and school support) could influence the acceptance of the sponsor's models, it seems reasonable to expect that after six years (1969-1975) there should be some indications of acceptance of the intended principles of classroom and home learning environments which could be measured. In fact, we have found some, as indicated in the Volume IV-B chapters.

Two sources of data are available on the Follow Through and non-Follow Through classrooms: (1) classroom observation data collected in a small subsample of sites associated with some sponsors in the analytic sample and (2) Teachers Questionnaires administered to all Follow Through and non-Follow Through teachers during the spring term each year. Of these two data sources on classroom behavior, we chose the Teacher Questionnaire for use in this report because it provides some information on all sites in the analytic sample and because the domains of questions are similar to those derived from the classroom observation data.*

The only source of data on the home learning environment is the Parent Interview, administered in the fall of the kindergarten year and again in the spring of the third grade year. (Cohort II entry Parent Interviews were collected in the spring.) We have used only the exit interview in the analysis of the home learning environment.**

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* The Teacher Questionnaire was redesigned in 1973 to collect data on many of the domains which emerged from the classroom observation studies.

** Certain items from the entry Parent Interview are used as covariates in the analyses of the data on children.

Classroom Learning Environment

Various items from the Teacher Questionnaire administered to third grade teachers have been empirically selected and grouped into five clusters.* These clusters, shown in Table 2-4, include:

- Teacher-Centeredness -- the degree to which the classroom is controlled and structured by adults;
- Classroom Flexibility -- the degree to which children work independently and exercise freedom of choice;
- Individualization of Instruction -- emphasis on small group instruction;
- Academic vs. Emotional Emphasis -- the degree to which teachers emphasize basic skills rather than social-emotional development; and
- Satisfaction with Sponsor -- teacher's assessment of the attractiveness of Follow Through and of the sponsor's approach.

These clusters provide indications of the types of programs implemented in the Follow Through classroom.** For example, the teacher-centeredness and classroom flexibility clusters provide empirical estimates of the structure dimension. A high degree of structure is reflected by an above-average degree of teacher-centeredness and a below average degree of classroom flexibility. In contrast, a low degree of structure is reflected

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* These constructed variables have been developed from a Pearson correlation matrix of the teacher variables. The correlations were submitted to a cluster analysis. The method of reciprocal averages was employed to develop item weights for each item response in each of the cluster variables. Finally, the cluster scores were standardized across the Follow Through and non-Follow Through teachers. For a more detailed discussion of this procedure, see Volume I-B of Education as Experimentation: A Planned Variation Model.

** We emphasize the term "indications," since we have no way of knowing what comparisons the teachers were making when they reported their own practices in response to the forced choice and Likert scale items. Moreover, our clustering of these items is based on simultaneous analysis of all Follow Through and non-Follow Through teachers. That the constructed clusters may not be equally appropriate for each model is indicated by the low overall cluster reliabilities (calculated using coefficient alpha) and the variability of the reliabilities among models. (Appendix Tables A2-1 to A2-3.)

Table 2-4

SELECTED CLUSTER VARIABLES DEVELOPED FROM
THE THIRD GRADE TEACHER QUESTIONNAIRE

Teacher-Centeredness

Child gathers vs. teacher imparts information.

Child initiates vs. adults initiate interactions.

Lesson plan is flexible vs. lesson plan is followed closely.

Work and play are not distinguished vs. are distinguished.

Classroom Flexibility

Children work independently vs. under adult supervision.

Children choose activities and materials vs. teacher determines activities and materials.

Children interact freely vs. do not interact freely.

Children change places freely vs. children assigned seats.

Individualization of Instruction

Various activities occur simultaneously vs. whole class engages in one activity.

Individual needs dominant vs. group needs dominant

Teacher rarely/never works with whole class vs. often/always works with whole class.

Academic vs. Emotional Emphasis

Teacher places relatively little value on helping child feel important as a person vs. relatively great value.

Teacher places relatively great value on developing basic skills vs. relatively little value.

Teacher places relatively great emphasis on developing problem solving/critical thinking skills vs. relatively little value.

Satisfaction with Sponsor

Teacher would not choose to teach in FT next year vs. would.

Teacher would not recommend FT to parents vs. would.

Teacher would not advise friend to teach in FT vs. would.

Teacher would not continue with sponsor approach vs. would.

Sponsor's approach does not suit teacher's style vs. does.

Sponsor's approach does not meet pupils' learning needs vs. does.

by a below average degree of teacher centeredness and an above-average degree of flexibility.

The academic emphasis cluster provides an empirical estimate of the theoretical orientation dimension. Models with a behavioristic approach place a higher emphasis on academic skills development while those with a social-emotional viewpoint minimize academic skills development, per se. models with a cognitive approach tend to place greater emphasis on academic skills than do models which endorse a social-emotional emphasis; however, cognitively-oriented models do not emphasize academic skills to the degree that behaviorist models do. Thus, behaviorist models might be expected to show greater than average academic emphasis, cognitive models, average and social-emotional models, below average. While the individualization of instruction and satisfaction with sponsor clusters do not correspond to model typology dimensions, they nevertheless provide interesting and important information about the classroom learning environment.

Home Learning Environment

Certain items from the Parent Interview administered at the end of third grade have also been empirically combined into thirteen factors.* These factors have been empirically combined into four second order factors. The first- and second-order factors shown in Table 2-5 include:**

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* The parent factors were developed from a Pearson correlation matrix which was adjusted for missing pairs of variables. A multiple R^2 was inserted in the diagonal as the commonality estimate. The matrix was subjected to a principal axis extraction and varimax rotation. Factors with eigenvalues greater than 1.0 were selected. Incomplete factor scores, scores using those variables which loaded at an absolute value of 0.30, or higher, were calculated by a unit-weighting procedure. Finally, the factor scores were standardized across the Follow Through and non-Follow Through parents. Factor reliabilities (calculated using coefficient alpha) are reported in Appendix Tables A2-4 to A2-6.

** There are some minor differences between the first-order factors reported in Volume IV and those reported in Volume III. In general, the meaning of the factors with similar names has not changed.

Table 2-5

SELECTED FACTORS DEVELOPED FROM THE SPRING, 1975 PARENT INTERVIEWS

I. SCHOOL IMPACT ON CHILD

School Helped Child

How much has school helped child in the following areas?
- Has made child feel sure of himself.
- Has helped child to get along with others.
- Has helped child to like to do school work.
- Has taught child to think and understand.
- Has taught child reading.
- Has taught child music, arts, and crafts.
- Has taught child numbers and arithmetic.
- Has taught child about his community through field trips and other activities.
- Has helped child make choices on his own.

In general, how helpful has school been to child?

Parent Satisfied with Child's Progress in School

Child's ability compared to most children his age?
How well is child doing in school work?
In general, how satisfied are you with child's progress in school?
How well will child do in school when he is older?
How far do you think child will go in school?

Child's Emotional Adjustment

How does child behave with the family these days?
Degree of sample child's feeling of confidence now, compared with a couple of years ago?
How well does he get along with children his age now, compared to a couple of years ago?
How cheerful is child now, compared to a couple of years ago?

School Helped Parent with Child

How helpful has school been to you personally?
- Helped me to learn about my child's teaching program.
- Helped me to get to know the teacher and other people at school.
- Helped me to help my child with his school work.
- Helped me to understand how children learn.
- Helped to give me the chance to help plan my child's school program.
- Helped me to meet other parents like myself.
- Helped me to find medical, dental, and other services when my child needed them.

In general, how helpful has school been to you personally?

School's Receptivity

Here are some ideas people have. There isn't a right or wrong answer. We just want your opinion. Do you agree or disagree:
- The parents in child's school have a say about how the school is run.
- People in his/her school really know what the parents want.
- People in child's school really care about what parents think.

II. PARENT ACTIVITY

PAC Involvement

Have you ever heard of a group called the Policy Advisory Committee, sometimes called the Parent Advisory Committee, PAC, P.C., or P.A.C.?
Have you or child's father ever gone to the PAC general meetings?
Have you or child's father ever voted in a PAC election?
Have you or child's father ever been a member of PAC?

Parent Visits to School

Since the beginning of the school year have you and/or the child's father gone to watch child's class while class was going on?**
How did you happen to go to watch child's classroom the last time?
How many different times this year did you go to talk with the child's teacher?
- Principal, nurse, and/or social worker?**
- Teacher's aide, PT director, and/or parent coordinator?**

PARENT ACTIVITY (cont.)

School Helped Parent Personally

How often do you work (in school)?

How helpful has school been to you personally?
- Helped me to find a job.
- Helped me to take courses in school or college.

Talks with Teacher

How did you happen to go to school to talk with the teacher this year?

In general, what did you and child's teacher talk about the last time you went to school to talk with her?
- Discuss any problems child may have had with school.
- Talk about what child is learning in school.
- Talk about child's behavior in school.
- Talk about books or teaching materials.
- Talk about teacher's method of teaching.

III. PARENT CHILD INTERACTION

Child Reads at Home

Does child ever read out loud to someone at home?
How often does he do that?
Does someone usually ask him to read or does he volunteer?
To whom does child usually read: parents or other adults, older or younger children, and/or someone else?**

Child Read to at Home

How often does someone at home read to child?
Does child usually ask someone to read to him, or does someone usually offer?
Who usually read to sample child: mother, father, other adults, and/or older or younger children?**

Parent Child Interaction

How often does child come to you for help on school work?
How often does child talk about what is happening in class?
Not counting reading he has to do for school, how often does child look at a book or magazine at home?
How often do you talk with child about things she/he has seen on TV?

IV. PARENT LOCUS

Parent Locus

Here are some ideas people have. There isn't a right or wrong answer. We just want your opinion. Do you agree or disagree:
- No matter how hard a person tries, he can't do much about what happens to him.
- A person shouldn't plan ahead because things don't work out.
- If parents do not agree with the people in his/her schools, there's not much parents can do.

School Impact on Child

- School Helped Child -- parents' perception that school enhanced child's development in a variety of social, cognitive, and academic areas;
- Parent Satisfied with Child's Progress in School -- parents' perception that child is progressing satisfactorily and will continue to do so;
- Child's Emotional Adjustment -- parents' perception of children's social emotional adjustment;
- School Helped Parent with Child -- parents' perception that school helped them to participate in child's education; and
- School Receptivity -- parents' perception of school's responsiveness to their inputs.

Parent Activity

- Parent Advisory Council (PAC) Involvement -- parent is or has been participating member;
- Parent Visits to School -- number of visits to school and program personnel;
- School Helped Parent Personally -- degree of help parent has received from child's school; and
- Talks with Teachers -- parent discusses child's education with teacher.

Parent Child Interaction

- Child Reads at Home -- amount of time child reads at home and to whom;
- Child Read to at Home -- number of times child read to and by whom; and
- Parent-Child Interaction -- amount of parent-child discussion of school-related topics and time spent reading together.

Parent Locus

- Parent Locus -- parents' perception of control over their own environment.

Models which place greater emphasis on parental involvement, whether through emphasis on the home environment alone, emphasis on parents as teaching agents, or some combination of both, should score higher on the Parent Child Interaction factors. The Parent Education, California Process and EDC models, for example, should score comparatively high. However, the Parent Activities factor may be affected to an unknown degree by special approaches used by models and by implementation of their particular parental involvement approach. For example, given its placement in the parental involvement matrix, Bank Street might be expected to score about average on this factor. However, Bank Street uses the school as a center for parent activities. Resource rooms in the schools are maintained for parents to pursue social, vocational, and avocational interests. This may lead Bank Street parents to feel that their contacts with principals, nurses, teachers, and other school and program personnel occur in a less formal context than the "parent visit." Therefore, the Bank Street model might score higher on the Parent Activity than its placement in the parental involvement matrix would indicate.

The School Impact on Child factors are more sensitive to individual model's approach. For example, it appears that School Receptivity should be especially high for those models which place heavy emphasis on the home environment. Yet one must look at the type of approach the model uses in order to make this determination. Those models which focus on enhancing the parent/child relationship alone may show a low degree of School Receptivity. In contrast, models which concentrate more on institutional change might be expected to show a high degree of School Receptivity. This factor, however, may reflect, to some degree, the parents' perception of school personnel in general; the model may not have been able to alter the parents' perception of district administrative personnel. Those models stressing development of appropriate Parent Child Interaction in the home should rank higher on the Parent Child Interaction factor than those models which place greater emphasis on other aspects of parental involvement.

The Parent Locus factor, an estimate of parents' perceptions of their ability to affect change, is independent of any particular sponsor's goals. Improvement of parents' locus of control is a goal of Follow Through, however.

Measures of Effects on Children

As mentioned in Chapter One, a battery of existing standardized tests was chosen to comprise national evaluation outcome measures.* This battery was selected, after careful consideration, as a "best compromise" between the need for accountability and the difficulty of measuring sponsors' diverse goals and objectives. The measures selected provide a basis for comparisons between a model's Follow Through groups and comparison non-Follow Through groups in attainment of basic skills, cognitive and conceptual skills, and affective outcomes including both self-esteem and attitude toward school and learning.

We agree with those who urge that caution be exercised in drawing conclusions from the matching of a model's goals with the measures included in battery of tests for children. Whereas the basic skills measures are probably a reasonable battery for examining achievement which might be expected in that learning domain, the measures on the cognitive and affective domains are much less appropriate. We describe the measures thoroughly so that the reader may judge their adequacy for evaluating Follow Through success. Needless to say, we report results only with respect to the outcomes that were measured. We estimate affects for each model in all domains, emphasizing in each case the domain where the greatest impact might be expected. And we caution the reader that outcome measures other than the ones available might have been able to demonstrate effectiveness in the domains which go untapped in this evaluation.

Table 2-6 shows the specific instruments (and subtests) used in the analysis of the Follow Through and non-Follow Through children at the various grade levels. We have grouped the instruments/subtests according to our interpretation of the model's goals (see Table 2-2). For example, models which advocate a behaviorist educational strategy and place the greatest emphasis on basic skills might be expected to demonstrate success on the measures we have labelled "basic skills." Some Metropolitan Achievement Test (MAT) subtests measure acquisition of basic skills which are taught directly. Other MAT subtests* and the Raven's

* Certain instruments (the PPVT, the WRAT, the IARS and the Raven's described in this section) were modified to make their administration more appropriate for the Follow Through and non-Follow Through children.

Table 2-6

INSTRUMENTS USED IN EVALUATION,
BY TIME OF ADMINISTRATION AND TYPE OF MEASURE *

When Administered	Type of Measure		
	Basic Skills	Cognitive-Conceptual Skills	Affective Skills
Entering Kindergarten or Entering First	Wide Range Achievement Test (WRAT) Peabody Picture Vocabulary Test (PPVT) Caldwell Preschool Inventory (PSI)		
Leaving Kindergarten**	PPVT Metropolitan Achievement Test (MAT) - Primer • Listening for Sounds	MAT - Primer • Reading • Mathematics Concepts	Intellectual Achievement Responsibility Scale (IARS) • Locus of Control-positive • Locus of Control-negative Absence from School
Leaving First Grade**	MAT-- Primary I • Word Knowledge • Word Analysis • Mathematics Computation	Mat - Primary I • Reading • Mathematics Concepts	Absence from School
Leaving Second Grade**	MAT - Primary II • Word Knowledge • Spelling • Mathematics Computation	MAT - Primary II • Reading • Mathematics Concepts • Mathematics Problem Solving	
Leaving Third Grade	MAT - Elementary • Word Knowledge • Spelling • Language (Parts A & B) • Mathematics Computation	MAT - Elementary • Reading • Mathematics Concepts • Mathematics Problem Solving Raven's Coloured Progressive Matrics (Raven's)	IARS • Locus of Control-positive • Locus of Control-negative Coopersmith Self-Esteem Inventory (Coopersmith)

* Table includes only measures used in evaluation. For example, the WRAT was also administered at the end of kindergarten.

** Measures used in evaluation of Cohort III K only.

Coloured Progressive Matrices measure acquisition of cognitive skills and processes which may or may not be directly taught, but which the child may apprehend indirectly through various experiences. Models which advocate cognitive and psychodynamic educational strategies include these kinds of outcomes in their stated goals and objectives for children and might be expected to demonstrate success on these measures. Affective measures include the Coopersmith, a measure of self-esteem; the Intellectual Achievement Responsibility Scale positive (IARS (+)), a measure of the child's tendency to accept personal responsibility for positive happenings; and the IARS (-), a measure of the child's tendency to accept personal responsibility for negative happenings. Psychodynamic models might be expected to demonstrate success on these measures. Each measure, in the order of first appearance on Table 2-6, is described briefly below.

Wide Range Achievement Test (WRAT)

This test is an individually administered measure of letter and number recognition, word reading, spelling, and oral and written arithmetic problems. Although national norms are available for the complete WRAT, the spelling, reading, and arithmetic subtests were abbreviated for administration in the Follow Through evaluation, and so the published norms are not applicable to this modified version.

Peabody Picture Vocabulary Test (PPVT)

The PPVT is an individually administered measure of picture recognition vocabulary. The child is required to point to the picture corresponding to the word spoken by the examiner. The test was administered according to standard procedures; however, a number of pictures were modified to reflect Black rather than White ethnic characteristics. The test scores are therefore not directly parallel to those derived from the standard version.

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* The MAT subtests included in the cognitive conceptual domain are those which require at least some knowledge of basic skills and the application of problem solving skills.

Caldwell Preschool Inventory (PSI)

The PSI is a readiness test for children entering school. The child is to answer questions which require knowledge of certain key words, e.g., "How many wheels does a car have?" or to follow a set of instructions, e.g., "Point to the middle checker."

Metropolitan Achievement Test (MAT) - Primer

The MAT - Primer was administered at the end of kindergarten.* Subtests include:

- Listening for Sounds. The Listening for Sounds Test...provides measurement of pupils' ability to deal with sound-symbol relationships critical for the development of reading ability. The Primer Listening for Sounds Test uses a number of different item formats in order to provide for the very elementary coverage needed at this level. Items are provided on beginning and ending sounds in both a picture-sound format and in a letter-sound format.
- Reading. The Reading Test...is intended as a measure of comprehension of connected discourse presented in a printed medium. This test measures the fundamental objective of the reading curriculum. Vocabulary and word analysis skills are important parts of the reading curriculum; but they are important mainly because they contribute to the development of reading comprehension. [At this level, "reading" is measured by identifying letters and matching pictures and words.]
- Numbers. [The Numbers Test is a measure of basic math concepts, vocabulary, and addition and subtraction skills.]

Gumpgookies

This test, developed by Adkins and Ballif, is designed to measure the child's motivation to achieve in school. The hypothetical constructs underlying this measure are theorized to be a dynamic interaction of learned responses unrelated to intellectual ability, including: the child's knowing and performing activities directed toward achievement; enjoyment

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* Except where bracketed, all descriptions of the content in these MAT subtests are quoted from the Metropolitan Achievement Tests Special Report 1970 Edition (Report No. 1, June, 1971, Harcourt Brace Jovanovich, Inc., 1971, pp. 9-11).

of the school situation; self-evaluation; self-confidence in physical activities; and the child's purposive behavior toward accomplishing future goals. As an individually administered picture test, the child is required to point to one of two semiprojective "Gumpgookie" figures which presumably reflects the orientation of the child either toward or away from one of the five dimensions outlined above. The Gumpgookies are vague figures with the outline of a head, arms, and legs, resembling "Casper the ghost."

Intellectual Achievement Responsibility Scale (IARS)

The IARS (Crandall, Katkovsky, and Crandall, 1965) is a group-administered, noncognitive measure designed to assess the extent to which children take responsibility to themselves or attribute their successes or failures to the operation of internal or external forces. Because the original 34 items IARS was designed for older children, the Stanford Research Institute rewrote the items in simpler terms to make the test more appropriate for Follow Through third graders. Each item describes a positive or negative achievement experience and two alternative explanations of the event, one of which denotes internal control while the other denotes external control. The children are asked to select a response that describes whether they or someone else (e.g., the teacher) would be responsible for the event, e.g., "If a teacher says to you, 'Your work is fine,' it is because -- teachers usually say that to encourage pupils, or you did a good job."

Two subscores are derived: one for those items related to a child's feelings of success (IARS positive), the other for those items related to a child's feelings of failure (IARS negative). For both subscores, the higher the score, the greater the indication of a child's attributing his success and failures to internal forces (Stallings and Kaskowitz, 1974).

Absence

The number of days a child missed school throughout the kindergarten year was analyzed as an indirect measure of a general capacity for a sponsor to attract pupils consistently. While children who enjoy school are more apt to attend, this interpretation cannot be fully accepted without qualifications concerning other reasonable determinants of absence such as sickness, parental factors, or environmental phenomena operating within the community.

Metropolitan Achievement Test (MAT)- Primary I

The MAT - Primary was administered at the end of first grade.*

Subtests include:

- Word Knowledge. [In] the Word Knowledge Test, items are cast in a picture word association format. At [the Primary level], the objective of the test is to measure the extent to which pupils can read words whose meanings they already know: words which they have in their listening or speaking vocabulary. However, the items are not necessarily restricted to words which pupils have already learned to read. A substantial number of the words require word analysis skills. Provided that the pupil correctly decodes the word, the meaning should be relatively clear and familiar to him.

- Word Analysis. The Metropolitan Word Analysis Test allows for measurement of the essential word analysis skills in the framework of a single item format. This format demands of pupils the identification of a word spoken, in context, by the teacher, with distractors being similar to the correct word in configuration and sound patterns.

- Mathematics Computation. The computation items are designed to give straightforward assessment of the pupils' ability to work with numbers. At the lowest levels, coverage is provided for simple number facts in the basic operation. . . .

- Reading. The Reading Test items begin with simple sentences. The pupil looks at a picture, then identifies one of three possible sentences which best tells about the picture. . . . In the later parts of the Primary 1...Reading test pupils read a paragraph, then answer questions based on the paragraphs. At the lowest levels, the paragraphs are composed mainly of simple sentences and elementary vocabulary.

- Mathematics Concepts. The Mathematics Concepts Test evaluates the pupil's knowledge of fundamental principles and relationships in mathematics. The contents of this test are based on the evaluation of what are generally considered to be "modern" textbooks.

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* All descriptions of the contents in these MAT subtests is quoted from the Metropolitan Achievement Tests Special Report, 1970 Edition (Report No. 1, June, 1971, Harcourt Brace Jovanovich, Inc., 1971, pp. 9-11).

The Metropolitan Achievement Test (MAT) - Primary II and Elementary

The MAT - Primary II was administered at the end of the second and Elementary at the third grades.* Subtests include:

- Word Knowledge. The Word Knowledge Test is intended as a measure of vocabulary. The "vocabulary" of interest is that which pupils encounter in their ordinary school . . . knowledge of words becomes less exclusively the province of reading instruction as one moves up the grade scale. One begins to want to know how varied the pupil's vocabulary is -- not just whether or not he can read words that are in his speaking or listening vocabulary. Thus, the Word Knowledge items give a broad sampling of words from various content areas (science, general experience, travel, etc.) and parts of speech.

- Reading. The Reading Test . . . is intended as a measure of comprehension of connected discourse presented in a printed medium . . . There are four main types of questions which pupils must answer. (1) Pupils must be able to identify the main thought in the selection or select the best title for it. (2) Pupils must be able to identify specific information in the selection or identify the literal meaning of the statements. (3) Pupils must be able to determine from the context the meaning of an unfamiliar word or select the one of several known meanings of a word that is most appropriate in a given context. (4) Pupils must be able to draw inferences from the selection, to identify unstated intentions and moods, and to see relationships between different points in the selection. These inferential-type items receive the greatest emphasis in the test.

- Spelling. Close attention was given to the appearance of words in spelling textbooks in selecting words for the Spelling Tests . . . Words were included in the test to represent a variety of spelling errors . . . Words are presented in dictated form.

- Language. . . . Coverage is given to punctuation, capitalization, and usage of words. A series of sentences are underlined. Each underlined part may have one and only one type of error. The error may be word usage, inadequate punctuation, improper capitalization, or there may be no error at all . . . The Elementary Language Test also includes a test

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* All descriptions of the content in these MAT subtests is quoted from the Metropolitan Achievement Tests Special Reprot, 1970 Edition (Report No. 1 June, 1971, Harcourt Brace Jovanovich, Inc., 1971, pp. 9-11).

Sentence Sense . . . The test of sentence sense is designed to assess the pupil's ability to recognize "telling sentences, asking sentences," and incomplete sentences.

- Mathematics Computation. . . . Coverage is provided for simple number facts in the basic operation. The test includes horizontal and vertical notation, with more emphasis on the latter.
- Mathematics Concepts. The Mathematics Concepts Test Test evaluates the pupil's knowledge of fundamental principles and relationships in mathematics.
- Mathematical Problem Solving. The Problem Solving Test attempts to evaluate the pupils's total developed ability in mathematics. It demands reasoning with numbers and operations. It presents the pupils with everyday problems in consumer economics, practical measurement . . . and other typical situations requiring numerical ability . . . [It] includes problems demanding use of all four fundamental operations and some multiple-step problems. An attempt has been made to keep the vocabulary load and computational load easy.

Raven's Coloured Progessive Matrices (Raven's)

The shortened version of this test used in the Follow Through evaluation is a measure of a child's problem-solving ability in visual and perceptual tasks. Each item presents the children with a pattern from which a piece is missing and the children are asked to select the appropriate piece from several alternatives.

Coopersmith Self-Esteem Inventory (Coopersmith)

The Coopersmith is a noncognitive instrument designed by Stanley Coopersmith (1967) to assess a child's feelings of self-esteem. The test measures children's feelings about themselves, the way they think other people feel about them, and their feelings about school. The test contains 58 items, each of which consists of a set of statements. The children are asked to select which of the statements is "like me" or "not like me".

Quality of Data

The reliability of WRAT and MAT Follow Through data collected with the battery of instruments administered to the children is as high

as the publisher's estimates. As shown in Table 2-7, reliability coefficients (coefficients of internal consistency) calculated on the responses of the local analytic sample, range from the high 80's through middle 90's (except the IARS(+) and IARS(-)). Since the reliabilities are approximately equal to the publisher's estimates, the data associated with these outcomes are measured with an acceptable degree of internal consistency. This high degree of reliability prevails in the coefficients calculated for the FT and NFT samples within each model as well. (See Appendix Tables 2-7 to 2-9.)

The validity of the instrument battery is more difficult to assess. Due to the diversity of models' goals and objectives, selecting a valid set of measures of effectiveness required some "best compromise" choices from among instruments which were fully developed and commonly used as of 1971-72. Probably no choice of a single instrument battery could ever be acceptable to all sponsors, and certainly this one was not. No instrument has escaped criticism, especially the MAT and the Coopersmith. Whatever the criticism, however, the battery does provide a wide range of measures of achievement in basic skills, cognitive conceptual skills, and affective development.

Table 2-7

MEANS, STANDARD DEVIATIONS AND RELIABILITIES OF PRETEST AND OUTCOME SCORES FOR THE COHORT III-K ANALYTIC SAMPLE

SUBTEST	Number of Items	Mean	S.D.	Rel. Coeff.[a]	Publisher's Sample	
					Rel. Coeff.[b]	S.E.
Fall Kindergarten WRAT Total	74	29.52	12.64	.88	NA	NA
Metropolitan Achievement Test						
Word Knowledge	50	24.26	11.52	.94	.94	2.5
Reading	45	18.58	8.14	.88	.92	2.5
Language	50	17.45	9.05	.89	.93	2.8
Spelling	40	18.77	12.66	.97	.96	2.0
Total Reading	95	42.84	18.82	.95	.96	3.5
Math Computation	40	18.12	7.58	.88	.88	2.2
Math Concepts	40	17.11	7.80	.88	.90	2.4
Math Problem Solving	35	13.57	6.89	.87	.91	2.0
Total Math	115	48.79	20.47	.95	.96	4.0
Coopersmith's Self-Esteem Inventory	58	36.06	7.40	.78	NA	NA
Raven's Coloured Progressive Matrices	27	18.37	4.89	.85	NA	NA
Intellectual Achievement Responsibility Scale - Negative	17	9.97	2.72	.55	NA	NA
Intellectual Achievement Responsibility Scale - Positive	18	12.91	2.46	.56	NA	NA

[a] These reliability coefficients were computed using the formula $r_{22} = 1 - \frac{s_1^2}{s_2^2}(1 - r_{11})$ where subscripts 1 and 11 reference Volume III sample data and subscripts 2 and 22 reference Volume IV data. r_{11} was a coefficient alpha.

[b] These reliability coefficients were computed using Saupe's Estimate of Kuder-Richardsen Formula 20.

CHAPTER THREE

THE SAMPLE

Linda B. Stebbins

As previously discussed in Chapter One over 352,000 children (divided among the seven groups of children shown in Table 1-1) have been considered eligible for Follow Through evaluation. These groups are identified specifically by sponsorship, cohort, and stream (entering kindergarten or entering first grade). For various reasons, which we discuss in this section, our analytic samples of children are much smaller. In Cohort III-K, for example, our largest analytic sample is 7331 children, the analytic sample for our Preschool studies is 6439 children, and our analytic sample for the longitudinal analysis is 2825 children. These samples include every child in the data base who meets our case selection criteria.

Table 3-1 indicates the effects of the successive restrictions we applied to all children (FT and NFT) in each analytic sample. In Cohort III-K (for example) we can identify (by a coded number only) 20,169 children who were registered in FT and NFT kindergartens. Fewer than half of these children (N=9,567), however, meet our first three criteria: (1) the child was present in third grade; (2) the child took either the WRAT* or any posttest (MAT, Raven's Coopersmith, or IARS); and, (3) the child did not change treatment group. Our next criterion required that (4) the child have valid** scores on all subtests of the MAT. This reduced

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* Chapter Four discusses the way in which we dealt with the problem of missing WRAT pretest scores.

** That is, no extenuating circumstance, such as a fire drill, occurred during the administration of the test.

Table 3-1

SUCCESSIVE RESTRICTION ON ENTRY-EXIT ANALYTIC SAMPLES

Restriction	Number Present on File After Restriction was Applied			
	Kindergarten Cohort III	Kindergarten Cohort II	Entering First Cohort III	Entering First Cohort II
Total Registration in Entering Year*	20169	15825	--	--
1. Child present in kindergarten 2. and third grade, tested in at least one of those years, 3. and did not change treatment group.	9567	7334	2518	2968
4. All exit MAT subtests present.	7669	5773	2208	1636
5. All other exit tests present.	7402	5504	2197	1629
6. Minimum of five sample children present in each third grade FT school.	7339	5476	2196	1626
7. Minimum of twelve children present in each FT and NFT group by site.	7331	5436	2196	1626
8. Valid preschool indicator and pretest score.**	6439	--	--	--

*Available only for cohort streams where attrition studies have been performed.

**For Cohort III-K Preschool Adjusted studies only.

the number of Cohort III-K children to 7,669. By requiring that (5) the child have valid scores on all other exit tests (Raven's, Coopersmith, and IARS), we excluded 267 more children and reduced the number of 7,402. The next restriction required that (6) there must be a minimum sample size of five FT children within each school. Because non-Follow Through "treatment" is defined as "school exposure without FT treatment" and therefore NFT children are traced as they move from one school to another within the local site, this restriction was not imposed upon NFT. The school-related restriction removed 65 children from the sample, reducing the sample of 7,339. Another restriction required that (7) a minimum of 12 children must be present in each treatment group within a site. This restriction resulted in a loss of 8 children, and an analytic sample of 7,331 for those of the Cohort III-K entry-exit studies. (As indicated in Table 3-1, this seventh restriction was the final one for all cohort streams except Cohort III-K). An additional restriction was applied to the Cohort III-K analytic sample which required that (8) the child must have a valid preschool indicator and a valid pretest score. There were 6,439 children who met this final criterion.

The number of analytic sample children in the FT and NFT groups in each site for each cohort stream is displayed in Table 3-2. These numbers are based on restrictions one through seven for all cohort streams except Cohort III-K which is based on one through eight. The analytic samples for each preschool category (Cohort III-K restriction (8)) are shown in Appendix Tables C(2-17) - 27 and C(2-17) - 28, Volume IV-C.

Sample Description*

When the analytic sample for each cohort stream is subdivided on the basis of sponsorship, the similarities and differences among the sponsors' samples begin to emerge. Tables 3-3 through 3-6 present descriptive characteristics of each analytic sample focusing on variables used in

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* Additional information about distribution of household income, mother's education, father's education, mother's occupation, and father's occupation for all cohorts is located in Volume IV-C, Appendix Tables C1-1 through C1-24.

Table 3-2

NUMBER OF ANALYTIC SAMPLE CHILDREN BY FOLLOW THROUGH STATUS, COHORT STREAM, MODEL AND SITE

	Region	City Size	KINDERGARTEN				ENTERING FIRST			
			Cohort III		Cohort II		Cohort III		Cohort II	
			FT	NFT	FT	NFT	FT	NFT	FT	NFT
RESPONSIVE EDUCATION										
Buffalo, NY	NE	Large	51	29	77	27				
Duluth, MN	NC	Medium	53	77	77	79				
Fresno, CA	W	Medium	39	52	48	54				
St. Louis, MO	NC	Large	29	33						
Salt Lake City, UT	W	Medium	21	45	36	55				
Tacoma, WA	W	Medium	48	42	51	62				
Berkeley, CA	W	Medium			99	71				
Lebanon, NH	NE	Rural			14	21				
Goldsboro, NC	S	Small					133	57		
Sumter, SC	S	Small					59	29		
Owensboro, KY	S	Medium					112	13		
TOTAL			241	278	402	369	304	99		
TREE										
Chicasha, OK	S	Small	34	63						
Des Moines, IA	NC	Large	24	32						
Lakewood, NJ	NE	Small	70	36	80	54				
Newark, NJ	NE	Large	42	32						
Lincoln, NB	NC	Medium	110	90	98	97				
Wichita, KS	NC	Large	51	41	84	27				
Baltimore, MD	S	Large			99	42				
Vermillion Par., LA[a]	S	Rural					125	46		
Durham Co., NC[b]	S	Medium					70	104		
Ft. Worth, TX	S	Large					120	143		
Walker Co., GA[c]	S	Medium					47	67		
Pike Co., KY[d]	S	Medium					72	71		
TOTAL			331	294	361	220	434	431		
BANK STREET										
New York, NY	NE	Large	80	155*	72	245*				
Philadelphia, PA	NE	Large	98	354*	80	124*				
Brattleboro, VT	NE	Small	17	24	20	27				
Fall River, MA	NE	Medium	49	42	39	38				
New Haven, CT	NE	Medium	20	14						
Rochester, NY	NE	Large			26	35				
Wilmington, DE	S	Medium			109	107				
Macon Co., AL[e]	S	Small							84	24
TOTAL			264	589	346	576			84	24
DIRECT INSTRUCTION										
New York, NY	NE	Large	28	155*	31	245*				
Grand Rapids, MI	NC	Medium	143	47	103	52				
W. Iron Co., MI[f]	NC	Rural	17	42						
Flint, MI	NC	Medium	35	39	77	42				
Providence, RI	NE	Medium	93	36						
E. St. Louis, IL	NC	Large			56	21			96	45
Racine, WI	NC	Medium			62	38				
Dayton, OH	NC	Large					131	59		
Tupelo, MS	S	Small					61	73	59	47
Williamsburg Co., SC[g]	S	Small					73	18	96	96
TOTAL			316	319	329	398	265	150	251	188

*Pooled citywide NFT (New York, NY; Philadelphia, PA; Chicago, IL).

Note. -- Source of population figures is city in which site is located:

[a] Abbeville, LA
[b] Durham, NC
[c] LaFayette, GA
[d] Pikeville, KY
[e] Tuskegee, AL
[f] Iron River, MI
[g] Lane, SC

Table 3-2 (cont.)

	Region	City Size	KINDERGARTEN Cohort III FT	KINDERGARTEN Cohort III NFT	KINDERGARTEN Cohort II FT	KINDERGARTEN Cohort II NFT	ENTERING FIRST Cohort III FT	ENTERING FIRST Cohort III NFT	ENTERING FIRST Cohort II FT	ENTERING FIRST Cohort II NFT
BEHAVIOR ANALYSIS										
New York, NY	NE	Large	49	155*	43	245*				
Philadelphia, PA	NE	Large	146	354*	108	124*				
Portageville, MO	NC	Rural	44	40	47	36				
Trenton, NJ	NE	Medium	101	45						
Kansas City, MO	NC	Large	79	21	61	27				
Louisville, KY	S	Large	108	105	90	93				
Waukegan, IL	NC	Medium	58	46						
Meridian, IL[h]	NC	Rural			68	--				
TOTAL			585	766	417	525				
COGNITIVE CURRICULUM										
New York, NY	NE	Large	44	155*	52	245*				
Okaloosa Co., FL[i]	S	Small	37	54	48	37				
Greeley, CO	W	Small	20	18						
Seattle, WA	W	Large	45	26						
Chicago, IL	NC	Large	31	89*	18	19*				
Leflore Co., MS[j]	S	Small							79	54
TOTAL			177	342	118	301			79	54
PARENT EDUCATION										
Philadelphia, PA	NE	Large	55	354*	46	124*				
Richmond, VA	S	Large	39	24	111	69				
Yakima, WA	W	Small	51	24						
Houston, TX	S	Large	75	39	95	78				
Lawrenceburg, IN	NC	Rural	35	40						
Jacksonville, FL	S	Large			15	53				
Jonesboro, AR	S	Small							89	93
Chattanooga, TN	S	Medium							102	103
Hillsborough, FL[k]	S	Large							19	107
TOTAL			255	481	267	324			210	303
EDC										
Philadelphia, PA	NE	Large	131	354*	112	124*				
Burlington, VT	NE	Small	20	35						
Lackawanna Co., PA[l]	NE	Medium	49	62						
Morgan Comm. Sch., DC[m]	S	Large	15	15						
Paterson, NJ	NE	Medium	33	21	42	38				
Chicago, IL	NC	Large			14	19*				
Laurel, DE	S	Rural							113	117
Johnston Co., NC[n]	S	Medium							101	62
TOTAL			248	487	168	181			214	179
SELF-SPONSORED										
Detroit, MI	NC	Large			43	37				
New York, NY	NE	Large			20	245*				
Philadelphia, PA	NE	Large			86	124*				
Portland, OR	W	Large			45	46				
San Diego, CA	W	Large			71	42				
TOTAL					265	494				

*Pooled citywide NFT (New York, NY; Philadelphia, PA; Chicago, IL).

Note. -- Source of population figures is city in which site is located:

[h] Mounds, IL
[i] Ft. Walton Beach, FL
[j] Greenwood, MS
[k] Tampa, FL
[l] Scranton, PA
[m] Washington, DC
[n] Smithfield, NC

Table 3-2 (cont.)

	Region	City Size	KINDERGARTEN				ENTERING FIRST			
			Cohort III		Cohort II		Cohort III		Cohort II	
			FT	NFT	FT	NFT	FT	NFT	FT	NFT
IELP										
Lock Haven, PA	NE	Small	44	61						
Montevideo, MN	NC	Rural	110	139						
Akron, OH	NC	Large	73	41						
TOTAL			227	241						
ILM										
New York, NY	NE	Large	36	155*	53	245*				
Atlanta, GA	S	Large	101	63						
TOTAL			137	218	53	245				
SEDL										
Philadelphia, PA	NE	Large	48	354*	86	124*				
Los Angeles, CA	W	Large	121	26						
Tulare, CA	W	Small	134	74	173	51				
St. Martin Parish, LA[o]	S	Rural	113	73	115	87				
San Diego, TX	S	Rural	76	41						
TOTAL			492	568	374	262				
CLA										
Chicago, IL	NC	Large	91	89*						
Topeka, KS	NC	Medium	26	13						
TOTAL			117	102						
HOME-SCHOOL PARTNERSHIP										
New York, NY	NE	Large	29	155*	26	245*				
TOTAL			29	155	26	245				
CAL PROCESS										
Los Angeles, CA	W	Large	94	33	98	66				
Ravenswood, CA[p]	W	Small	34	12	74	18				
Oakland, CA	W	Large	47	--						
San Jose, CA	W	Large	33	12	42	14				
Lamont, CA	W	Rural			27	24				
TOTAL			208	57	241	122				
MSA										
Great Falls, MT	W	Medium	38	57						
Clear Lake, WA	W	Rural	40	60						
TOTAL			78	117						
MATHEMAGENIC										
Gulfport, MS	S	Small					97	71		
Pickens Co., GA[q]	S	Rural					68	21		
Lee Co., VA[r]	S	Small					178	78		
TOTAL							343	170		
TOTAL**			3705	2734	3367	2153	1346	850	838	748

*Pooled citywide NFT (New York, NY; Philadelphia, PA; Chicago, IL).

**Pooled citywide NFT included in sponsor totals, but only once in cohort total.

Note. -- Source of population figures is city in which site is located:

[o] Breaux Bridge, LA
[p] Menlo Park, CA
[q] Jasper, GA
[r] Jonesville, VA

Table 3-3

DESCRIPTIVE CHARACTERISTICS OF COHORT III-K ANALYTIC SAMPLE

IN COMPARISON TO NATIONAL POPULATION

	Analytic Sample		National Population 1970 Census	Responsive Education		TEEM		Bank Street		Direct Instruction		Behavior Analysis		Cognitive Curriculum		Parent Education		EDC	
	FT	NFT		FT	NFT	FT	NFT	FT	NFT	FT	NFT	FT	NFT	FT	NFT	FT	NFT	FT	NFT
Number of Children	3705	2734		241	278	331	294	264	589	316	319	585	766	177	342	255	481	248	487
Number of Sites	63			6		6		5		5		7		5		5		5	
Fall Kindergarten WRAT Mean Score	30.2	30.4		28.9	32.3	30.6	35.2	31.3	28.3	29.6	30.9	28.2	26.2	28.1	29.4	27.8	27.2	28.7	29.1
Percent with Preschool	72	45	9[a]	81	46	65	45	64	37	89	53	71	39	83	52	65	29	74	33
Number Responding	3705	2734		241	278	331	294	264	589	316	319	585	766	177	342	255	481	248	487
Children's Ethnicity																			
Percent Black	65	63	11[b]	57	33	44	28	72	82	81	70	90	87	79	74	58	78	70	77
Percent White	24	28	87[b]	36	53	48	70	27	13	17	23	6	5	9	17	29	17	30	21
Percent Other	11	9	2[b]	7	14	8	2	1	5	2	7	4	8	12	9	13	5	0	2
Median Family Income	4792	5899	9590	4400	6828	5147	8037	5156	6236	4123	6285	4340	4180	4150	4939	4500	6146	5250	6136
Number Responding	2331	1927		166	245	207	221	155	159	156	175	343	270	150	211	175	167	207	178
Mother's Education																			
Percent HS Graduates	51	49	51[c]	53	62	50	68	53	38	46	50	41	35	48	39	48	43	46	55
Number Responding	2303	2013		163	241	202	220	153	166	158	189	329	266	144	206	176	170	209	178
Female Heads of Household Percent	39	31	9[d]	39	24	33	25	36	33	56	30	45	33	42	34	36	28	39	29

[a] U.S. Bureau of the Census. Percent preschool figure is the percentage of all children enrolled in preschool in 1970.

[b] U.S. Bureau of the Census.

[c] Figures for National Population represent all Females (20 years old and over) rather than specifically Mothers.

[d] Hayghe, Howard. Marital and family characteristics of the labor force in March 1973. Monthly Labor Review, April 1974, pp. 21-27.

Table 3-3 (continued)

	Analytic Sample		National Population 1970 Census	IELP		ILM		SEDL		CIA		Home-School Partnership		Cal Process		New School Approach	
	FT	NFT		FT	NFT	FT	NFT	FT	NFT	FT	NFT	FT	NFT	FT	NFT	FT	NFT
Number of Children	3705	2734		227	241	137	218	492	568	117	102	29	155	208	57	78	117
Number of Sites	63			3		2		5		2		1		4		2	
Fall Kindergarten WRAT Mean Score	30.2	30.4		33.3	33.2	25.7	28.5	26.1	26.6	32.1	29.7	36.1	30.1	35.8	31.3	31.3	38.5
Percent with Preschool	72	45	9[a]	64	45	49	57	67	33	84	54	71	52	87	54	65	38
Number Responding	3705	2734		227	241	137	218	492	568	117	102	29	155	208	57	78	117
Children's Ethnicity																	
Percent Black	65	63	11[b]	31	14	95	89	21	68	92	94	100	86	84	64	4	0
Percent White	24	28	87[b]	68	85	5	2	15	14	2	4	0	2	1	7	64	94
Percent Other	11	9	2[b]	1	1	0	9	64	18	6	2	0	12	15	29	32	6
Median Family Income	4792	5899	9590	6218	7913	3850	4400	4150	4675	4200	5300	6500	4400	4240	4250	5650	8762
Number Responding	2331	1927		181	208	58	71	251	250	100	93	20	35	101	53	61	109
Mother's Education																	
Percent HS Graduates	51	49	51[c]	80	76	57	39	29	34	40	32	47	31	61	50	63	83
Number Responding	2303	2013		183	213	53	78	258	250	99	89	19	42	98	50	59	110
Female Heads of Household																	
Percent	39	31	9[d]	21	10	49	51	16	19	56	60	48	31	40	44	26	14

[a] U.S. Bureau of the Census. Percent preschool figure is the percentage of all children enrolled in preschool in 1970.

[b] U.S. Bureau of the Census.

[c] Figures for National Population represent all Females (20 years old and over) rather than specifically Mothers.

[d] Haygue, Howard. Marital and family characteristics of the labor force in March 1973. Monthly Labor Review, April 1974, pp. 21-27.

Table 3-4

DESCRIPTIVE CHARACTERISTICS OF COHORT II-K ANALYTIC SAMPLE IN COMPARISON TO NATIONAL POPULATION

	Analytic Sample		National Population 1970 Census	Responsive Education		TEEM		BANK STREET		Direct Instruction		Behavior Analysis		Cognitive Curriculum	
	FT	NFT		FT	NFT	FT	NFT	FT	NFT	FT	NFT	FT	NFT	FT	NFT
Number of Children	3367	2172		402	369	361	220	346	576	329	398	417	525	118	301
Number of Sites	52			7		4		6		5		6	(5)	3	
Fall Kindergarten WRAT Mean Score	29.7	29.4	NA	34.1	35.3	30.8	31.0	28.1	27.3	33.2	32.8	31.7	27.1	25.2	27.7
Percent with Preschool	81	57	9[a]	79	48	75	51	76	47	89	47	76	59	85	61
Number Responding	2931	1674		385	320	273	171	308	400	305	293	374	346	116	200
Children's Ethnicity															
Percent Black	75	66	11[b]	38	29	56	55	64	59	88	80	80	78	98	64
Percent White	14	21	87[b]	46	61	40	38	34	34	9	12	17	14	2	29
Percent Other	11	13	2[b]	16	10	4	7	3	7	3	8	4	8	0	7
Median Family Income	4660	5470	9590	5760	7680	5050	6030	5220	6300	5200	5310	3890	4890	3700	5600
Number Responding	2066	1466		306	307	208	141	241	291	161	196	274	246	106	129
Mother's Education															
Percent HS Graduates	44.6	46.9	51[d]	59.0	65.0	47.6	52.4	41.0	39.4	51.4	39.4	41.2	47.0	43.4	44.6
Number Responding	2021	1432		306	308	205	133	240	290	158	194	255	237	101	128
Female Heads of Household															
Percent	45	38	9[c]	35	24	47	32	41	36	47	43	43	41	51	41

[a] U.S. Bureau of the Census. Percent preschool figure is the percentage of all children enrolled in preschool in 1970.

[b] U.S. Bureau of the Census.

[c] Hayghe, Howard. Marital and family characteristics of the labor force in March 1973. Monthly Labor Review, April 1974, pp. 21-27.

[d] Figures for National Population represent all Females (20 years old and over) rather than specifically Mothers.

Table 3-4 (continued)

	Analytic Sample		National Population 1970 Census	Parent Education		EDC		Self-Sponsored: Detroit, MI		New York, NY		Philadelphia, PA		Portland, OR		San Diego, CA	
	FT	NFT		FT	NFT	FT	NFT	FT	NFT	FT	NFT	FT	NFT	FT	NFT	FT	NFT
Number of Children	3367	2172		267	324	168	181	43	37	20	245	86	124	45	46	71	42
Number of Sites	52			4		3		1		1		1		1		1	
Fall Kindergarten WRAT Mean Score	29.7	29.4	NA	26.3	26.8	26.8	23.6	27.4	25.5	39.6	33.3	22.6	26.8	36.5	26.2	34.1	32.7
Percent with Preschool	81	57	9[a]	75	41	91	63	100	76	90	88	54	45	100	50	96	82
Number Responding	2931	1674		207	197	146	116	43	37	20	163	70	64	44	36	68	22
Children's Ethnicity																	
Percent Black	75	66	11[b]	91	82	100	88	100	100	10	78	99	83	91	69	62	63
Percent White	14	21	87[b]	1	4	0	1	0	0	50	0	0	1	9	31	1	2
Percent Other	11	13	2[b]	8	14	0	11	0	0	40	22	1	16	0	0	37	34
Median Family Income	4660	5470	9590	3530	3880	5230	4240	4120	4500	8750	5250	4380	4790	4750	6170	3670	6750
Number Responding	2066	1466		135	173	100	92	38	32	16	92	43	43	34	34	29	22
Mother's Education																	
Percent HS Graduates	44.6	46.9	51[d]	41.6	36.0	58.4	36.9	44.7	44.1	56.3	57.2	40.5	44.7	79.4	61.8	42.8	71.4
Number Responding	2021	1432		132	168	100	94	38	34	16	91	37	47	34	34	28	21
Female Heads of Household																	
Percent	45	38	9[c]	42	42	41	53	69	62	28	41	49	48	44	29	60	32

[a] U.S. Bureau of the Census. Percent preschool figure is the percentage of all children enrolled in preschool in 1970.

[b] U.S. Bureau of the Census.

[c] Hayghe, Howard. Marital and family characteristics of the labor force in March 1973. Monthly Labor Review, April 1974, pp. 21-27.

[d] Figures for National Population represent all Females (20 years old and over) rather than specifically Mothers.

Table 3-4 (continued)

	Analytic Sample		National Population 1970 Census	ILM		SEDL		Home-School Partnership		Cal Process	
	FT	NFT		FT	NFT	FT	NFT	FT	NFT	FT	NFT
Number of Children	3367	2172		53	245	374	262	26	245	241	122
Number of Sites	52			1		3		1		4	
Fall Kindergarten WRAT Mean Score	29.7	29.4	NA	27.2	33.3	21.5	24.6	40.8	33.3	27.9	31.2
Percent with Preschool	81	57	9[a]	78	88	80	39	78	88	85	47
Number Responding	2931	1674		50	136	279	189	25	136	218	92
Children's Ethnicity											
Percent Black	75	66	11[b]	100	78	42	42	96	78	52	45
Percent White	14	21	87[b]	0	0	22	46	0	0	5	30
Percent Other	11	13	2[b]	0	2	37	12	4	22	43	25
Median Family Income	4660	5470	9590	4830	5250	4100	4900	4880	5250	4090	6270
Number Responding	2066	1466		43	92	163	164	22	92	147	87
Mother's Education											
Percent HS Graduates	44.6	46.9	51[d]	47.5	57.2	28.2	38.7	31.8	57.2	35.6	40.0
Number Responding	2021	1432		40	91	168	167	22	91	141	85
Female Heads of Household											
Percent	45	38	9[c]	59	41	33	26	62	41	29	30

[a] U.S. Bureau of the Census. Percent preschool figure is the percentage of all children enrolled in preschool in 1970.

[b] U.S. Bureau of the Census.

[c] Haygue, Howard. Marital and family characteristics of the labor force in March 1973. Monthly Labor Review, April 1974, pp. 21-27.

[d] Figures for National Population represent all Females (20 years old and over) rather than specifically Mothers.

Table 3-5

DESCRIPTIVE CHARACTERISTICS OF COHORT III-EF ANALYTIC SAMPLE
IN COMPARISON TO NATIONAL POPULATION

	Analytic Sample		National Population 1970 Census	Responsive Education		TEEM		Direct Instruction		Mathemagenic	
	FT	NFT		FT	NFT	FT	NFT	FT	NFT	FT	NFT
Number of Children	1346	850		304	99	434	431	265	150	343	170
Number of Sites	14			3		5		3		3	
Fall Kindergarten WRAT Mean Score	42.5	47.3		41.5	46.6	42.0	45.1	38.8	46.9	47.7	50.5
Percent with Preschool	83	67	9[a]	80	55	76	63	92	82	82	69
Number Responding	1329	832		302	99	425	431	261	132	341	170
Children's Ethnicity											
Percent Black	55	34	11[b]	60	37	40	20	95	68	24	9
Percent White	44	66	87[b]	40	63	53	77	5	32	76	91
Percent Other	2	1	2[b]	0	0	7	3	0	0	1	0
Median Family Income	3836	6101	9590	3830	6039	4260	5405	2533	6044	4720	6917
Number Responding	789	580		179	73	259	266	165	107	186	134
Mother's Education											
Percent HS Graduates	40	45	51[c]	47	47	29	39	39	45	44	48
Number Responding	755	562		177	69	246	257	145	100	187	136
Female Heads of Household											
Percent	31	14	9[d]	41	18	24	15	47	17	11	7

[a] U.S. Bureau of the Census. Percent preschool figure is the percentage of all children enrolled in preschool in 1970.

[b] U.S. Bureau of the Census.

[c] Figures for National Population represent all Females (20 years old and over) rather than specifically Mothers.

[d] Hayghe, Howard. Marital and family characteristics of the labor force in March 1973. Monthly Labor Review, April 1974, pp. 21-27.

Table 3-6

DESCRIPTIVE CHARACTERISTICS OF COHORT II-EF ANALYTIC SAMPLE
IN COMPARISON TO NATIONAL POPULATION

	Analytic Sample		National Population 1970 Census	Bank Street		Direct Instruction		Cognitive Curriculum		Parent Education		EDC	
	FT	NFT		FT	NFT	FT	NFT	FT	NFT	FT	NFT	FT	NFT
Number of Children	837	746		84	24	251	188	78	52	210	303	214	179
Number of Sites	10			1		3		1		3		2	
Fall Kindergarten WRAT Mean Score	31.9	36.7		30.0	36.4	32.6	38.5	28.2	31.0	33.5	35.7	35.1	42.0
Percent with Preschool	71	54	9[a]	63	0	80	64	42	77	85	65	84	66
Number Responding	745	591		68	10	221	157	66	47	187	200	203	177
Children's Ethnicity													
Percent Black	75	67	11[b]	99	100	97	66	94	100	46	55	39	16
Percent White	25	31	87[b]	1	0	3	33	6	0	54	41	60	83
Percent Other	0	1	2[b]	0	0	0	0	0	0	0	4	1	1
Median Family Income	3671	4667	9590	3125	2000	2597	5077	2107	2500	4845	5633	5682	8125
Number Responding	510	496		35	10	139	129	48	39	131	155	157	163
Mother's Education													
Percent HS Graduates	30	39	51[c]	32	20	35	52	7	26	36	43	38	54
Number Responding	485	481		31	10	128	120	42	35	127	149	157	167
Female Heads of Household													
Percent	30	29	9[d]	35	36	47	30	21	30	24	35	24	14

[a] U.S. Bureau of the Census. Percent preschool figure is the percentage of all children enrolled in preschool in 1970.

[b] U.S. Bureau of the Census.

[c] Figures for National Population represent all Females (20 years old and over) rather than specifically Mothers.

[d] Hayghe, Howard. Marital and family characteristics of the labor force in March 1973. Monthly Labor Review, April 1974, pp. 21-27.

norming the Metropolitan Achievement Test (MAT). The descriptive variables include geographic, racial, and socioeconomic status (SES) characteristics and permit comparison with certain national population averages. The FT and NFT sample statistics contained in these tables are taken from the entry information available for the analytic samples.

The analytic samples in general are substantially below the national population in median family income. While the median income of the national population is $9,590 (1970 Census data), median family income (for each analytic sample) ranges from $3,671 to $4,792 for the FT samples and from $4,667 to $6,101 for the NFT samples. These large income differences between the national population and the FT and NFT analytic samples indicate that the Follow Through program was successful in recruiting children from low income families. The income figures also highlight that the FT children generally come from lower income families than the NFT comparison children.

Another major difference between the analytic samples and the national population is minority representation. Between 57 and 86 percent of the FT samples and between 35 and 79 percent of the NFT samples consist of minority (Black or other) pupils. These figures are in contrast to the national population which is only 13 percent non-White. The large proportion of minority children in the analytic sample reflects the character of the socioeconomically disadvantaged population on which Follow Through focuses. Minority representation varies from region to region, however. For example, programs operating in large metropolitan cities in the Northeast tend to enroll Black and Puerto Rican pupils, programs in the West -- Mexican American pupils -- and programs in the Northcentral region -- White pupils. As can be seen in ethnic distribution tables (Appendix Tables C(2-18) - 1, Volume IV-C), these racial and ethnic compositions are generally similar for the FT and NFT samples within particular sites.

Tables 3-3 through 3-6 also present data on other descriptors such as pretest achievement (WRAT), percentage of children with Head Start or Other Preschool experience, percentage of female-headed households, and mother's education. The percentage of FT and NFT children with preschool experience is considerably above the national average of nine percent. With the exception of the Cohort III-K NFT and III-EF

groups, at least half of the children in all FT and NFT analytic samples have some preschool experience. This is probably due to two circumstances: the prior participation of many FT and NFT children in Head Start and other preschool programs designed especially for low-income children, and the large numbers of children who have been enrolled in some kind of day-care program while their mothers worked.

There are differences between the analytic samples and the national population on other SES indicators as well. While the difference in level of mother's education for the analytic samples is not considerable, there is a strong tendency for pupils in the analytic samples to come from relatively larger families, and ones where the mother is the only parent present. While income and occupation have traditionally been used as indicators of socioeconomic status, more recently family composition has been considered a variable that not only affects the psychodynamics of the family but also has significant influence on family income. This is especially true for poor and minority families, where women in the family often work primarily to augment the husband's income. Therefore, the presence of both mother and father in the household may contribute significantly to a higher family income relative to a one-parent household. The comparatively higher proportions of female-headed households in the FT and NFT samples suggests that the low-income levels may be partially caused by the large proportion of one-parent (particularly female) households.

The differences between FT and NFT samples are considerably smaller than those between the analytic samples and the national population. The FT and NFT samples are fairly evenly matched on all SES indicators except income. Since there is a slightly greater percentage of FT pupils from female-headed families, the income differences appear to be a function of the number of wage earners in the family rather than other SES differences between FT and NFT families.

On the average, the FT and NFT samples have comparable entry level test scores. The FT/NFT similarity is better than expected given the relative disadvantage in income. This pattern, however, seems to be related to a larger proportion of the FT sample than the NFT sample having attended preschool.

In general, the overall characteristics of the analytic samples indicate that the Follow Through program is being applied to disadvantaged children, the group for whom it was intended. However, we do not know whether these samples are suitable for generalization to the population of all low income children. The sampling design was not constructed to address this question. On the other hand, we have compared the NFT samples (cf. Non-Follow Through Study, 1976) with the census data and have found that, in almost all sites, the NFT median is below the census median on SES indicators such as median income, percentage below poverty level, percentage of female heads of households, and percentage of mothers who are high school graduates. Since the FT sample generally has a lower socioeconomic status than the NFT sample, we assume they are representative of low income children in the Follow Through sites.

CHAPTER FOUR

ANALYSIS STRATEGY

Robert G. St.Pierre and Elizabeth C. Proper with Thomas Cerva

Assessing Follow Through impact is not as simple or straightforward as might appear at first glance. It is an axiom of evaluation that in order to attribute differences in observed outcomes to a program, children who participate in the program must be compared to similar children who do not. In a traditional research paradigm, "similarity" is achieved by random assignment of children to treatment and control groups, with such assignment occurring before treatment begins. As discussed in Chapter One, the circumstances surrounding the inception of Follow Through did not permit such random assignment. In fact, systematic attempts were made to attract into the treatment groups those children most in need of the program; i.e., the most disadvantaged children in the community. This has meant that the comparison groups are often less disadvantaged than the treatment groups (Egbert, 1973).

The problem of nonrandom subject assignment to treatment and comparison groups has plagued the evaluation of compensatory programs from the beginning and has weakened many attempts at assessment. This might suggest that "true experiments" are the only appropriate vehicle for measuring the impact of social programs. Evans and Schiller (1970) point out the practical unacceptability and danger of such a choice. As Evans and Schiller state,

> [This is] a position which is untenable practically . . . . [We] must arrive at some judgment using the best information we have at hand . . . . The problem is that in the absence of formal, objective studies, programs will be evaluated [and decisions made by

> Congress] by the most arbitrary, anecdotal, partisan, and subjective means . . . . Compared with the weakness of this method for making decisions, the problems of [the lack of a true experiment] pale to a most minor flaw indeed. (pp. 219-220)

Given the need to provide information to decision makers, the essential problem becomes the development of an evaluation approach that will provide the most valid and comprehensive information possible. To this end, the Follow Through evaluation planners (United States Office of Education and Stanford Research Institute) adopted a quasi-experimental design, judgmentally selecting at each site a comparison group as similar to the treatment group as possible. Since this design does not suggest a single "appropriate" analysis, we have subjected the data to a variety of analytic procedures, so as to compensate for the drawbacks of the quasi-experimental design. The multiple strategies approach anticipates the common and valuable practice of performing secondary analyses such as those performed on the Equality of Educational Opportunity data.* Any single analytic treatment of quasi-experimental data is inevitably subject to well-founded methodological criticism, especially when the data are being used to assess the impact of major educational programs. Subsequent reanalyses using other techniques and approaches help to assess the validity of the original results. Ideally, after several reanalyses have been accomplished and a body of literature accumulated, all available information is integrated to refine and clarify understanding of the problem (or program). Our analytic cross-validation anticipates some of the more obvious alternative analyses and should provide other researchers with a broader basis for designing further thoughtful approaches to the Follow Through data.

The remainder of this chapter is divided into four sections. In the first section (CONSTRAINTS ON THE DEVELOPMENT OF ANALYTIC STRATEGIES), we discuss issues which constrained the development of the analyses in order to make clear why we chose certain strategies. The outcomes of these discussions are that we have chosen three different types of comparisons: local, pooled, and norm referenced. In both local and pooled

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* A multiple strategies approach was also used in the analysis of the Head Start Planned Variation data (Smith, 1973).

comparisons, we have contrasted the performance of the sample of FT children within a given site with the performance of the sample of NFT children within the same site. We base these comparisons on our predictions of children's performance, given what we know about their background characteristics and how those background characteristics relate to performance in a larger group of children.

In local comparisons, we base our predictions on all FT and NFT sample children within a given sponsor.* This means that our predictions are based on children from a varying number of sites for each sponsor. It also means that our predictions are based on a different set of children for each sponsor. In pooled comparisons, we base our predictions on the performance of all sample NFT children across all sponsors. This means that our predictions are based on the performance of the same set of children for each sponsor. Thus, in a sense, pooled comparisons provide a common yardstick against which we compare the performance of each and every site's FT and NFT children across all sponsors. On the other hand, local comparisons provide a series of sponsor-specific yardsticks. By using both common and model-specific yardsticks, we hope to provide two different but appropriate ways to examine sponsor performance. In norm referenced comparisons we have provided the reader with a third yardstick. This one is probably the most difficult to be measured against. Here we compare the performance of a given site's FT children with the performance of children in the MAT publisher's norm sample; children who, on the average, were not disadvantaged. Thus, with this comparison, we are asking if FT children are performing as well as nondisadvantaged children.

In the second section of this chapter (ANALYTIC STRATEGIES) we specify the analytic strategies we selected. All of our analyses (except norm referenced) make statistical adjustments to outcome scores of FT and NFT children based on background variables. Most of the analyses are based on data collected about children at entry to kindergarten and exit from third grade and are thus termed the "Entry-Exit" analyses. A subset of children included in the Entry-Exit analyses were also tested at an interim time point and thus are included in the "Longitudinal Analysis."

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* Within this chapter "sponsor" refers to the program implemented by a sponsor while "model" refers to a type of analysis, i.e., "analytic model."

In this analysis we compute results at the sponsor level for two separate time periods--fall kindergarten to spring first grade and fall second grade to spring third grade.

While each of our analyses adjusts for children's background characteristics, one background characteristic needing special attention is preschool experience. Children who have attended some form of preschool before entering the public school system may perform differently at entry to school from children who have not been previously exposed to some form of schooling. However, preschool experience may vary widely. Some children have had fairly formalized instruction at the nursery level while others have had a more informal child care experience.

Trying to categorize type of preschool experience from the data available has been particularly troublesome. However, this year we have developed working definitions and applied them to the set of children where the most complete information about preschool is available--Cohort III-K. Analyses of Cohort III-EF, Cohort II-K, and Cohort II-EF children do not take preschool experience into account.

As part of the Entry-Exit analyses we have developed three methods to assess differences between FT groups and the local and pooled NFT comparisons while taking preschool into account. Each method adjusts for a common set of background variables but handles preschool experience in a different manner. The first ignores the potential for preschool differences in deriving two sets of results at the site level (Local and Pooled Analyses). We have performed these analyses with each of the four cohort streams (Cohort III-K, Cohort III-EF, Cohort II-K, Cohort II-EF). The second method statistically adjusts for preschool differences at the site level (Preschool Adjusted Local and Preschool Adjusted Pooled Analyses). Finally, the third method examines effects separately for each preschool group (blocks on preschool experience) at the sponsor level (Preschool Blocked Local and Preschool Blocked Pooled Analyses). The last two methods have been performed on only the Cohort III-K stream. The Longitudinal Analysis mentioned above also blocks on preschool experience (Longitudinal Analysis.)

In the third section of this chapter (SUPPLEMENTARY ANALYSES AND THEIR CONSEQUENCES) we present a series of auxiliary analyses which add to, qualify, and help us interpret our primary and secondary analyses. Included in this section are discussions of attrition, the adequacy of

our set of background variables for the statistical adjustment of outcome scores, the degree to which our data meet the assumptions required by our analyses, and the comparability between and relationships among effects which are derived from different types of analyses. In general, these auxiliary analyses uphold our confidence in the appropriateness of our primary and secondary analyses.

In the final section of the chapter (DEFINITION AND CONSEQUENCES OF INITIAL MISMATCH) we discuss the degree to which the various groups we compare are poorly matched on background variables. Those results which are based on groups which are poorly matched have been displayed in Summary of Effects* tables along with all other results. However, in an effort to inform the reader as to the existence of this "mismatch" problem we have pointed out those effects which are questionable due to mismatch by "shading" the appropriate sections of relevant tables. By shading we mean that a grey mask has been placed over the section of each table containing the effects that we consider to be possibly misleading. The mask allows the reader to see the effects and interpret them if desired, but serves as an effective warning that something may be amiss. We do not discuss any shaded effects, nor do these effects enter into any aggregations presented in Chapter Five. Thus, the sponsor and site discussions are based solely on effect estimates which we believe to be valid.

In the preceeding paragraphs we have provided an overview of material which is discussed in greater detail in the remainder of this chapter. Those who are not interested in more extensive presentations should turn to Chapter Five.

CONSTRAINTS ON THE DEVELOPMENT OF ANALYTIC STRATEGIES

The founders of Follow Through chose to implement the program in the existing structure of the public schools: children clustered in classroom groups that generally change from year to year; classes grouped within schools; and schools grouped within school districts (sites). To this hierarchical structure Follow Through added yet another level of clustering: sponsors, serving and advising site groups comprising varying numbers of children.

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* See Chapter One, Volume IV-B for an explanation of Summary of Effects tables.

Comparison entry-level classrooms were selected so that FT and NFT children would be as socioeconomically similar as possible. After the entry year, children from those comparison kindergarten classrooms were traced as long as they remained within geographic proximity.

A child generally participates in Follow Through for up to four years, from kindergarten through third grade. While major data collection efforts were conducted at these two time points, interim tests were administered to subsets of students at the end of kindergarten and first and second grades. Thus, the set of children (FT and NFT) participating in the present FT evaluation all have pretest and posttest data, while subsets of these students have additional interim data.

In this section we discuss a variety of issues pertaining to the Follow Through design and evaluation data which were taken into account during the development of our analytic strategies. These include:

- levels of analysis;
- units of analysis;
- noncomparability of groups; and
- the influence of preschool on pretest.

Levels of Analysis

The hierarchical structuring of the Follow Through design mentioned above provided us with an opportunity to perform analyses at several different levels. When Follow Through was first implemented, one major concern was whether or not Follow Through would prove effective across all sponsors. Some of our early analyses* addressed this question. However, as we examined sponsor emphases, we recognized that effects might be differential: thus, almost immediately, the concern for determining whether or not Follow Through as a whole worked was restructured to a concern for determining whether sponsors were differentially effective. To this end, sponsor-level analyses also played a major part in early reports.**

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* See Volume I: Experimentation as Education: A Planned Variation Model.

** See Volumes I and II: Experimentation as Education: A Planned Variation Model.

As we became more familiar with the data, we noted not only that sponsors appeared to perform differentially but also that there was great variability in the site-to-site performance of sponsors. Thus, in our later efforts we have conducted site-level analyses; that is, our main estimates of the effects of Follow Through have been derived from adjusted comparisons of a sponsor's FT children in each site with the NFT children in the same site.*

Units of Analysis

Within each site, the Follow Through data present the opportunity for selection from among three units of analysis; school, class, and child. Arguments can be made for the selection of each unit. For example, one can argue that the appropriate unit is schools because this is the unit at which programs are administered. Alternatively, one can argue that classrooms should be the unit of analysis since this is where the children receive the treatment. The results of analyses of classes and schools have been reported at earlier stages of the project.**

But these units have disadvantages, both conceptually and practically. Classroom groups seldom stay intact from kindergarten through third grade. Therefore, the class is not a useful unit beyond single-year studies. Although more schools remain intact than classroom groups, there are fewer of them. Coupling these considerations with the need to develop an analysis that can respond to the large variability among sites, it becomes evident that few, if any, sites have enough schools or classrooms to support a site-level analysis. It is on this practical consideration that any attempt at analyzing aggregates of children flounders. Consequently, the unit of analysis selected in this evaluation is the child.

There are arguments against using the child as the unit of analysis, the primary issue being the effect of other children on each child's performance. Stated briefly, standard regression analysis procedures

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* See Volumes II and III: Experimentation as Education: A Planned Variation Model.

** See Volume I: Education as Experimentation: A Planned Variation Model.

compute "theoretical" standard errors of adjusted differences on the assumption that the children in each sample were selected and treated individually, whereas in fact they were selected and treated in classroom groups nested within schools. Children in a given classroom tend to resemble each other in most relevant respects, more than they would if the classroom were filled at random. This tendency of similar children to cluster in classes (and in schools) implies a certain amount of redundancy in the information available for the analyses: fifty scores do not contain fifty independent pieces of information. Clustering causes the "theoretical" standard errors to underestimate to some degree the true standard errors of our reported differences. The reported "significance" judgments may be somewhat too liberal, so that some differences that we have reported as "real" could vanish had clustering been taken into account.

The computations required to arrive at exact clustering effect coefficients are so complex as to be impractical. Exact formulas will probably never be derived for the specific configuration of the Follow Through data. For the Cohort II-K evaluation* we addressed the issue by means of the "jackknife" technique proposed by Mosteller and Tukey (1968) and further elaborated by Finifter (1972). The results of the jackknife analysis suggested that many of the theoretical standard errors we reported were somewhat too small, as suspected. We assume that the data for Cohort III-K have the same properties with respect to clustering as the Cohort II-K data and thus that the reported standard errors in the present study may also be somewhat too small.

The value of the jackknife analysis, however, lies in its indication that clustering has not been so severe as to force us to discard all the adjusted differences that we declare "significant." If, as seems plausible, the average standard error reported in most analyses really ought to be 25 to 30 percent larger, those differences which we have identified as "significant beyond the .01 level" would be more conservatively labeled at the $p < .05$ level. Although we have not taken

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* See Volume III: Experimentation as Education: A Planned Variation Model.

clustering effects into account in our presentation of the results, some readers may wish to do so.*

As a check on the jackknife results in the Cohort II-K evaluation we also computed approximate cluster effect coefficients, using formulas derived by Mood (1975). These coefficients estimate the effects of clustering on the estimation of means, not the adjusted differences with which we are concerned, and so they are less to the point. However, in magnitude, and also in site variability, they agreed reasonably well with their jackknife analogues.

Noncomparability of Groups

By far, the major concern in the selection of our analysis strategies is the presence of noncomparable groups. This issue is not new: recognition of the presence of noncomparable FT site-level groups within and across the various sponsors occurred early in the evaluation of Project Follow Through (Emrick, Sorenson and Stearns, 1973). The strategy of planned variations required both diverse programs and a variety of situations in which to try them out. But the more diverse the settings, the more difficult it was to make direct comparisons. Since direct comparisons among the FT site groups were not possible, local NFT comparison groups were sought instead.** Unfortunately, previous evaluations of

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* In Volume III: Education as Experimentation: A Planned Variation Model we suggest that the reader be cautious in the interpretation of possible clustering effects because of site variability. For example, for the MAT Total Reading comparison in 29 sites the ratio between the jackknife and theoretical standard error estimates ranges between .293 (the theoretical estimate was more than three times too large) and 1.938 (the theoretical estimate was only half large enough), averaging 1.040 (the theoretical estimate was too small by four percent). For Total Math, the ratios range from .029 to 2.398, with a mean of 1.285. The jackknife estimates are somewhat unstable at the site level, mainly because sites are comprised of small numbers of schools. It would therefore make no sense to use the jackknife standard error estimates as significance criteria in reporting our adjusted difference.

** See Chapter One, Weakness of Design, for a discussion of this procedure.

the FT and NFT site-level groups* have suggested that even the local FT and NFT groups are not comparable in all cases. For this reason a variety of site-level comparisons were selected for last year's analyses** and for this year's work: local comparison, pooled comparisons, and norm referenced comparisons.***

Local comparisons reflect the original intentions of the FT/NFT evaluation design: comparison of FT children with selected local NFT children within each site. The advantage of these comparisons is that the FT and NFT children have been subject to most of the same set of productive and counterproductive educational circumstances, such as local commitment to the needs of "special children," natural disasters, and teacher strikes. Local comparisons also have disadvantages. In some sites, there are compelling reasons to believe that the comparison children are also receiving a "treatment" which is very similar to the FT program, particularly in terms of classroom instruction. Hence the comparison may be between FT children and "quasi-FT" children rather than children receiving no compensatory services. A second problem with local comparisons derives from the selection of NFT groups. In many sites, the majority of the children eligible for Follow Through were assigned to FT classrooms and schools. Thus, in some sites comparable NFT children could not be found.

Pooled NFT comparisons provide a different approach to the issue of noncomparable groups. The outcomes in each FT site are judged on the basis of expected trends of performance as observed in the pooled sample of NFT children across all sponsors and sites. In the case of some outlying FT groups, this comparison may be less than adequate.

Norm referenced comparisons provide an opportunity for comparing some of the outcomes for each FT and NFT site-level sample with an external

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* See Volumes I and II: Experimentation as Education: A Planned Variation Model.

** See Volume III: Experimentation as Education: A Planned Variation Model.

*** Another comparison strategy, one that involved the matching of each FT site-level group with an NFT site-level group on the basis of several background characteristics was implemented but is not presented in the body of this report. A detailed explanation of the technique and the reasons for its exclusion are presented in Exhibit A4-1.

criterion, the MAT national norms for children at the end of third grade. Since the MAT was standardized on a sample representative of the nation as a whole, the MAT norms provide information about the expected performance of children from average socioeconomic backgrounds. Given that FT and NFT children are disadvantaged, we expect these children to perform below the norm sample. If the compensatory educational services are effective, however, the FT children's performance may begin to approach that of the national norm group.

The advantage of these comparisons is the perspective they add. For example, in some sites where our primary analyses show no difference between FT and NFT children, the MAT norm comparisons may reveal that FT children are nevertheless performing well with respect to national norms. One disadvantage is that national norms are not available for the pretest nor for outcomes other than the MAT. Without such pretest information it is not possible to estimate the national norm level we might expect of the FT children in the absence of treatment.

The Influence of Preschool on Pretest

Because this evaluation is concerned with school performance as measured by achievement tests, we use a test administered at kindergarten or first grade entry as an adjusting variable. A child who has attended a formal preschool program is likely to attain a higher score on such an entry test (pretest) than a similar child who has had no preschool experience. This potential influence of preschool experience on pretest scores has been a particularly troublesome factor throughout our evaluation of Follow Through--in part because of the difficulty in precisely classifying each child's preschool experience.

The problem of developing a precise definition coupled with resource constraints resulted in the exclusion of preschool as an adjusting variable in our first three years of analytic work. As we began our fourth year, the need to take account of preschool became increasingly apparent and resources were made available to develop a method for handling the issue. The specific analytic techniques which were developed are presented in the section on ANALYTIC STRATEGIES in this chapter.

ANALYTIC STRATEGIES

In the previous section of this chapter we discussed a variety of considerations affecting the development of our analytic strategies. Most of these strategies make statistical adjustments to the outcomes based on background variables. In the present section we first discuss the general set of adjusting variables which have been used. Then we present nontechnical explanations of the models developed in which we assume that the reader is familiar with such statistical techniques as analysis of covariance and multiple regression analysis.

Adjusting Variables

The selection of adjusting variables (covariates) is based on a number of considerations. First, we are limited to the variables on which we have data. Second, some variables do not correlate with outcome measures and consequently are not used. (See Appendix Table A4-1 for correlations of outcomes with covariates.) Finally we are limited by the degrees of freedom* available in the various analyses.

The covariates selected which are common to the analyses developed for the local and pooled comparisons are:

Fall kindergarten WRAT pretest;

First language (English vs. nonEnglish);

Family income (in dollars);

Highest occupation in household (ten-point scale);

Ethnic membership (two vectors defining White/Black/Other comparisons);

Sex;

Entry age (in months);

Missing data code for WRAT;**

Missing data code for income;** and

Missing data code for occupation.**

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* As we indicated in Chapter Three, a minimum of twelve children in each within-site treatment group must be present in order for that within-site group to be retained in the site-level analysis of child data. This relatively low number was set in order to retain as many sites as possible.

** See Exhibit A4-2 for an explanation of how missing data were treated.

In addition to these eleven core background variables we have also included site specific (between-site) covariates coded to adjust for differences among sites. These between-site covariates attempt to control for all nontreatment differences among children related to differences in the sites where the Follow Through experiment is implemented. The number and types of these between-site terms depend on which type of comparison is being made. (See Exhibit A4-3 for details.)

In one set of analyses designed to take the effects of preschool experience into account we treat type of preschool experience and the interaction of preschool experience with the pretest as another set of adjusting variables. Preschool experience is defined as a three category variable (Head Start, Some Preschool, No Preschool.)*

Finally, in an analysis which explores the timing of effects (Longitudinal Analysis) we use not only the core set of background covariates but also add mother's education and fall kindergarten Preschool Inventory. In the longitudinal model which predicts third grade scores we use first grade MAT Reading, and first grade MAT Total Math scores as covariates. The model handles missing SES data in a slightly different manner and does not contain the between-sites covariates. The model blocks by preschool category and estimates effects at the sponsor level.

We have examined the adequacy of these covariates and present the results of these analyses in the section Adequacy of Covariate Set. A discussion of the longitudinal covariate set can be found in Volume IV-D of the present study.

Analytic Models for the Entry-Exit Analyses

The primary technique for isolating and strengthening the signal of the Follow Through effect from the overall noise in the data is a statistical adjustment of outcome scores based on preexisting conditions. As mentioned above there is a common set of covariates which is used to adjust outcomes in all analyses. Preschool experience has been employed as an additional adjusting variable in selected analyses.**

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* See Exhibit A4-4 for an explanation of how our preschool definition was developed.

** Preschool adjusting analyses have been performed only for Cohort III-K because of resource constraints. Similar analyses will be performed for Cohort II-K and presented in a later supplementary report.

In the previous section we discussed local and pooled comparisons. We have developed three analytic models to assess differences between FT groups and then associated local and pooled NFT comparison groups. Each of these analytic models adjusts for a common set of background variables but handles preschool experience in a different manner. The first ignores the potential for preschool differences in deriving results at the site level. The second statistically adjusts for preschool differences at the site level.* Finally, the third analytic model examines effects separately for each preschool group (blocks on preschool experience) at the sponsor level. (The specific regression models for these analyses are shown in Exhibit A4-3.)

Analysis of Local Comparisons

Three models have been developed for the analysis of local comparisons. These are:

- the Local Analysis;
- the Preschool Adjusted Local Analysis; and
- the Preschool Blocked Local Analysis.

These models are summarized in Figure 4-1 and are explained below.

Local Analysis. In the Local Analysis we perform an analysis of covariance within each Follow Through sponsor for each of the fifteen outcome measures. Differences among children related to the eleven core covariates are adjusted out of each outcome measure with differences related to variations among sites within a particular sponsor being simultaneously controlled. The treatment condition is considered to be nested within each site so that one can estimate an adjusted treatment difference for each site. To be judged as either a positive or negative effect, a treatment difference for a particular test must be both statistically significant at the 95 percent level of confidence and material (i.e larger in absolute magnitude than one-fourth of a standard deviation of all FT and NFT scores

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* The analyses which take preschool experience into account use a somewhat smaller sample then the nonpreschool analyses. We do not include those children on whom we have no information as to prior preschool experience. Also, we eliminate those children who do not have valid pretest information.

adjusted for between-site variation.)* This two part criterion for significance of an effect has been employed previously in the analysis of Follow Through data.** We have summarized these effects in tables where a "+" indicates a FT-favoring effect that is both statistically significant and material, while a "-" indicates an NFT-favoring significant and material effect. All other effects (nonsignificant and/or not material) are shown as blanks (see Table 1-3 in the introduction to Volume IV-B.)

Preschool Adjusted Local Analysis. The Preschool Adjusted Local Analysis is identical to the Local Analysis with two exceptions. First, as was mentioned earlier, the sample is somewhat smaller. Second, four additional covariates are included. Two of these terms are codes representing differences among the three preschool groups (Head Start, Some Preschool, No Preschool); the remaining two terms represent the interaction of preschool classification with the kindergarten WRAT pretest. The analysis is run within each sponsor, covarying the augmented set of background variables and the between-site vectors. Estimates of Follow Through effect are obtained for each site and tested for statistical significance and materiality.

Preschool Blocked Local Analysis. In the Preschool Blocked Local Analysis we perform an analysis of covariance at the sponsor level blocked by preschool experience. For each sponsor preschool group we use the core set of covariates, covary site within sponsor, and produce a sponsor effect for each outcome measure.***

Analysis of Pooled Comparisons

Three models have been developed for the analysis of pooled comparisons. These are:

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* The grade equivalents of .25 SD range from 2.1 months to 2.6 months. Figures illustrating the relationship for several dependent variables are included in Appendix Figure A4-1.

** See Volume III: Education as Experimentation: A Planned Variation Model.

*** As another sponsor-level analysis we performed a Preschool Blocked Extreme Groups Analysis using only those children in Follow Through who have Head Start experience and those children in non-Follow Through who have no prior preschool experience. This produces one "extreme groups" effect for each sponsor. This last analysis perhaps puts the greatest strain on the analysis of covariance adjustment procedure because the groups being compared are very different in terms of background characteristics. The rationale for performing the analysis and the reasons for its exclusion are presented in Exhibit A4-5.

Figure 4-1

SUMMARY OF ANALYSES OF LOCAL COMPARISONS

ANALYSIS	FORM OF EQUATION	DISCUSSION OF RESULTS
Local Analysis (one equation per sponsor)	Third Grade measure = {background covariate set} + {between-site covariates} + {FT/NFT within site codes}	Site level (preschool grouping ignored)
Preschool Adjusted Local Analysis (one equation per sponsor)	Third Grade measure = {background covariate set} + {preschool} + {preschool X WRAT interactions} + {between-site covariates} + {FT/NFT within site codes}	Site level (preschool grouping covaried)
Preschool Blocked Local Analysis (three separate equations per sponsor: Head Start, Some Preschool, (No Preschool)	Third Grade measure (Head Start) = {background covariate set} + {between-site covariates} + {FT/NFT}	Sponsor level (Head Start)
	Third Grade measure (Some Preschool) = {background covariate set} + {between-site covariates} + {FT/NFT}	Sponsor level (Some Preschool)
	Third Grade measure (No Preschool) = {background covariate set} + {between-site covariates} + {FT/NFT}	Sponsor level (No Preschool)

- the Pooled Analysis;
- the Preschool Adjusted Pooled Analysis; and
- the Preschool Blocked Pooled Analysis.

These analytic models are summarized in Figure 4-2 and are explained below.

Pooled Analysis. In the Pooled Analysis we build a regression model using all non-Follow Through children for each outcome measure. This model includes the eleven core adjusting variables and also includes fifty-one between-sites adjusting variables to eliminate all between-site variation in test scores for the fifty-two NFT sites.* The resulting equation is applied to each Follow Through child to predict his score "in the absence of Follow Through treatment." The mathematical effect is to give each Follow Through child a predicted score based on the child's values for the background variables and the between-site vectors. The difference between a child's actual score on an outcome test and the child's predicted score based on the NFT model is our measure of the Follow Through effect. These difference scores are averaged for each site to produce an estimate of the effect of Follow Through at the site level. This estimate is then tested for statistical and material significance in the same manner as were the effects estimates in the Local Analysis.

The major difference between this analysis and the Local Analysis is the value to which the dependent variable is adjusted. In the Local Analysis, all FT and NFT sites for a given sponsor are entered into a single regression equation; in that case, the dependent variable is adjusted to the value for all FT and NFT children within the sponsor at the covariate centroid. In the Pooled Analysis, all (across sponsors) NFT sites are entered into a single regression equation; in this case, the dependent variable is adjusted to the value for all NFT children at the covariate centroid.

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* This analysis strategy is a replication of that reported in Volume III and so we also entered nine two-way interactions as additional adjusting variables. The large number of degrees of freedom in the pooled model permitted such entry; however, the interactions added little explanatory power to the model. The nine interaction terms were: Fall Kindergarten WRAT by first language and by the two ethnicity vectors; entry age by first language and by the two ethnicity vectors; and sex by first language and by the two ethnicity vectors.

FIGURE 4-2

SUMMARY OF ANALYSIS OF POOLED COMPARISONS

ANALYSIS	FORM OF EQUATION	APPLICATION	EFFECT	RESULTS
Pooled Analysis (one equation for all NFT children)	Third Grade measure = [background covariate set] + [between site covariates]	Apply NFT equation to FT	Effect = FT observed - FT predicted	Site level (preschool grouping ignored)
Preschool Adjusted Pooled Analysis (three separate equations for NFT children; Head Start, Some Preschool, No Preschool	Third Grade measure (Head Start) = [background covariate set] + [between site covariates]	Apply appropriate NFT equation to Head Start FT within site	Effect = FT observed - FT predicted	
	Third Grade measure (Some Preschool) = [background covariate set] + [between site covariates]	Apply appropriate NFT equation to Some Preschool FT within site	Effect = FT observed - FT predicted	Site level (preschool groups collapsed)
	Third Grade measure (No Preschool) = [background covariate set] + [between site covariates]	Apply appropriate NFT equation to No Preschool FT within site	Effect = FT observed - FT predicted	
Preschool Blocked Pooled Analysis (three separate equations for NFT children: Head Start, Some Preschool, No Preschool)	Third Grade measure (Head Start) = [background covariate set] + [between site covariates]	Apply appropriate NFT equation to Head Start FT within site	Effect = FT observed - FT predicted	Sponsor level (Head Start)
	Third Grade measure (Some Preschool) = [background covariate set] + [between site covariates]	Apply appropriate NFT to Some Preschool FT within site	Effect = FT observed - FT predicted	Sponsor level (Some Preschool)
	Third Grade measure (No Preschool) = [background covariate set] + [between site covariates]	Apply appropriate NFT to No Preschool FT within site	Effect = FT observed - FT predicted	Sponsor level (No Preschool)

* Nine interaction terms were included in the Pooled Analysis to make it comparable to the Cohort II-K Pooled Analysis

Preschool Adjusted Pooled Analysis. The Preschool Adjusted Pooled Analysis is identical to the Pooled Analysis with four exceptions. First, as was mentioned earlier, the sample is somewhat smaller. Second, the two-way interaction terms are not included in this analysis thus making the set of adjusting variables comparable to the set in the Local Analysis. Third, three separate NFT models are produced for each outcome measure and the appropriate one (depending on the preschool classification) is applied as described above to each Follow Through child. Fourth, the effect of computing three separate regression equations is to allow for interactions of each covariate with preschool experience. The effect of Follow Through for each site is obtained by averaging the child effects across the preschool categories for the site. In this way a Follow Through site effect is a composite of three separate types of effects weighted by the proportions of children in the three preschool conditions in the site.

Preschool Blocked Pooled Analysis. In the Preschool Blocked Pooled Analysis we aggregrate the child effects obtained from the Preschool Adjusted Pooled Analysis. This is done separately for each preschool group and creates three FT effects for each sponsor.

Analysis of Norm Referenced Comparisons

Our analysis of norm referenced data is descriptive rather than bias adjusting. We have computed the prcportion of children in each sites' FT group who score one or more years below grade level on each of four outcomes (Total Reading, Total Math, Language, Spelling.) These proportions are presented in our Summary of Effects* tables and are compared with similar proportions from the MAT norms sample. These comparisons allow us to qualify results from our primary analyses.

Analytic Model for the Longitudinal Analysis

All of the analyses described up to this point employ an Entry-Exit design. For each Follow Through site we calculate local and pooled effects ignoring the influence of preschool experience. We also calculate local and pooled effects for each site after controlling for prior preschool

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* See Chapter One of Volume IV-B for an explanation of Summary of Effects tables.

experience. Finally, at the sponsor level we obtain local and pooled effects for each of the three preschool groups.

We were able to obtain sufficient data on a subset of children included in the Entry-Exit sample to investigate the timing of effects at the sponsor level. This Longitudinal Analysis of somewhat different from the Entry-Exit analyses in terms of sample, covariate set, and method.

The sample differs from the Entry-Exit sample by demanding that a child have first grade test information; also we exclude those children who are not White, Black, or Spanish-surnamed. The covariate set is altered as follows: (1) we combine the first language and ethnic membership contrasts; (2) we add mother's education and fall kindergarten Preschool Inventory to the core set of covariates; (3) we eliminate the two missing data covariates for income and occupation and substitute one covariate which measures the number of times a child is missing information on these two covariates and on mother's education; (4) we add to the covariate set which was used in predicting first grade test scores the child's scores on the first grade MAT Reading and Total Math tests when we predict third grade test scores; and (5) we do not adjust between-site differences. The motivation for these changes can be found in the Longitudinal Analysis volume (Volume IV-D).*

First and third grade regression models are created for non-Follow Through children within the three preschool categories (see Tables D3-2 through D3-9 in Volume IV-D). We then apply the models to the same children to create predicted NFT test scores, subtract the predicted score from the actual score obtained by each non-Follow Through child, and examine the residual differences. For each preschool group and each outcome measure we locate the two residual difference scores which divide the group at the 35th and 65th percentiles. Children at or above the 65th percentile are judged to be doing better than expected; children in the middle 30 percent are doing as well as expected; and children below the 35th percentile are performing worse than expected. The first grade and the third grade NFT results are crossed to create a nine-fold typology in which a child's residual difference scores are uniquely placed. Approximately

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* Volume IV-D also contains an Academic Risk Study. See that volume for a discussion of the analytic techniques employed in this special substudy.

one-ninth of the non-Follow Through children in each preschool group for each of the four content areas fall into each category.

The cutoff points as determined on NFT children are applied to each FT child's residual difference scores and the FT child is placed into the nine-fold typology. We obtain the distribution of FT children across the nine categories for each content area for each preschool group and overall for a sponsor. In this way we characterize a Follow Through sponsor in terms of its positive, null, or negative effects on children between kindergarten and first grade and between first grade and third grade. This is done separately for each of the three preschool groups.

SUPPLEMENTARY ANALYSES AND THEIR CONSEQUENCES

Now that we have described the conditions that restricted the development of our analytic strategies and have outlined the methods which we did develop, we will present a series of supplementary analyses that shed light on the quality of the primary analyses.

The results of our analyses imply a number of conclusions about the performance of Follow Through children. Since Project Follow Through is a quasi-experiment, these results are subject to alternative interpretations, some deriving from our analytic methods and others from broader insights on the complicated reality that a wide-ranging yet incomplete set of measures cannot help oversimplifying. Questions that could legitimately be raised include:

1. Might differential attrition of pupils from FT and NFT groups over the four years of treatment bias the evaluation results?
2. Are we using the best possible model to assess the effectiveness of Follow Through? How adequate is our covariate set, and are the results we find dependent upon the particular covariates we selected?
3. Can we meet the assumptions our analyses make about how the data are distributed?
4. How comparable are the results from different analyses?
5. What relationships exist among effects from different analyses?

With respect to each question above, we present results of some auxiliary analyses performed on Cohort III-K that should enhance the plausibility of our analytic procedures. These results are neither complete nor exhaustive. In this quasi-experimental context, we cannot hope to lay all doubts and objections to rest, but we have expended considerable effort to check our conclusions, with the effect of reinforcing our confidence in the results.

In this section we compare the results of many different analyses at the aggregate level. The major vehicle for such comparisons is a three-by-three table which has, as each of its two dimensions, the three possible conclusions which we draw about the effectiveness of each site's FT group on each outcome for a given analysis: positive (+), null (0), or negative (-). (See Table 4-1 as an example.) Cross-tabulating the results of any two analyses (combining all sites and outcomes) yields a three-by-three table which, to the extent that the analyses yield identical results, will only contain elements on the diagonal. More likely, the analyses will yield somewhat different results and some off-diagonal entries will exist. These tables are presented only at the aggregate level (usually for a total of 930 effects--62 sites by 15 outcomes) for the purpose of comparing results among analyses. Although we have made no attempt to examine differences in effects resulting from the application of alternative analyses at a lower level of aggregation (sponsor, site, outcome) we believe this is a fruitful avenue for further study.

Attrition

The issue of attrition is particularly relevant to the Follow Through evaluation: approximately 70 percent of the FT and NFT children who were tested in the kindergarten year of Cohort III-K are <u>not</u> present in the analytic sample. (The analogous attrition rate for Cohort II-K was about 50 percent).* This loss of children is attributable to two

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* An additional consideration related to attrition is the addition of children into the program. For example, if all replacement children were low achievers, they might place an additional strain on improving the performance level of the children retained. Because these replacement children entered FT and NFT classrooms after the collection of pretest and demographic data, there is no way to accurately assess their impact on the FT and NFT classrooms.

factors: program attrition and sample attrition. Program attrition takes place in most instances when children's families move during the four years of their involvement in the program.* In fewer instances children may have been dropped out of the program because of improved academic performance or because for some other reason the treatment was no longer appropriate.

Sample attrition occurs when either the evaluator and/or data collector deem the data to be suspect. Included in this category are children who are omitted from the analytic sample for any number of reasons, including an invalid test, a large amount of missing data, or lack of enough children within school or site for analysis. This type of attrition is reflected in the successive restrictions on the analytic sample (Table 3-1). Attrition is discussed in this report in two ways: overall attrition (both program and sample attrition simultaneously) and attrition due to testing problems (a subset of sample attrition).

The occurrence of attrition does not imply that the data cannot or should not be analyzed. Rather, results of attrition analyses provide useful information to assist in understanding and perhaps qualifying the results of the primary analysis. In the case of this evaluation, we have examined the potential impact of attrition in two ways.

Overall Attrition

We have performed a hierarchical regression analysis to determine whether or not the FT/NFT within-site difference in rate of attrition was different across levels of pretest and income. (A technical presentation of the procedure appears in Exhibit A4-6). For example, one of the questions this study addressed is, in a given site; did both low-achieving FT children and high-achieving NFT children drop out? If this was the case we would want to qualify the results of our primary analyses. Our analysis of attrition indicates that in no Cohort III-K site is the interaction of treatment with pretest or income demonstrably related to attrition. There is not a statistically significant relationship and neither the interaction of pretest nor of income with treatment explains

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* Whereas NFT children are traced within a given school district and remain part of the sample, FT children are dropped from further testing (and from the sample) when they leave the FT classroom at any grade level.

more than one percent of the variance in rate of attrition. Thus, neither pretest nor income relates differentially to attrition in FT vs. NFT groups.

In general, the examination of attrition leads to the conclusion that children in the Cohort III-K analytic sample are representative of children who started in the Follow Through program, at least in terms of pretest score and income. This suggests that the results of the present evaluation are generalizable to the Follow Through population to the extent that the original FT and NFT samples are representative of that population. Similar conclusions were drawn in a study of the effects of attrition on Cohort II-K children.*

Attrition Due to Testing Problems

In addition to investigating the effects of attrition in general, we identified those subjects who became part of the attrition group due to invalid tests, missing data, insufficient school or site level sample size, etc. This was referred to earlier as sample attrition. The distribution of students with invalid tests is of particular interest. If test problems tend to be concentrated in certain sites we may conclude that there were problems with the testing situation in those sites. Appendix Table A4-2 presents the number of children with testing problems as a percentage of total registration (number of entry to kindergarten) in each site for Cohort III-K. The percentage of children with testing problems ranges from zero to forty-one, the single group in the latter category being the NFT group for Oakland, California--a clear outlier. We would consider questioning the trustworthiness of the Oakland, California NFT data due to the high degree of testing problems; however, the number of NFT children with adequate data for analysis dropped below 12, and so the NFT site group could not be included.

Adequacy of Covariate Set

The covariates employed in the Local and Pooled Analyses were presented earlier in this chapter. We have explored several concerns that we had regarding the adequacy of the covariate set. These include:

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* See Volume I: Education as Experimentation: A Planned Variation Model.

- percentage of outcome variance explained;
- other potential covariates;
- combined use of preschool experience and pretest; and
- adequacy of pretest for low-scoring children.

Percentage of Variance Explained

The main criterion for a good covariate (or covariate set) is that it be correlated with the dependent variable (Keppel, 1973). Thus, one indicator of the adequacy of a covariate set is the amount of outcome variance (multiple R^2) that it explains. The combination of demographic and between-site covariates accounts for a substantial proportion of variance in most outcomes for the Local and Pooled Analyses of Cohort III-K children as can be seen in Appendix Tables A4-3 and A4-4. In addition, the pooled model is better than the local model in explaining outcome variance, although, in both, it is much more difficult to account for differences in affective than in academic measures.

Exploration of the amount of outcome variance "explained by site level variation in the Local Analysis for Cohort III-K" (see Appendix Tables A4-3 and A4-4) reveals that the amount of variance explained by the inclusion of a set of between-sites vectors after the inclusion of the demographic covariate set fluctuates from sponsor to sponsor and outcome to outcome, but often comprises about four percent of the outcome variance. This means that, in many cases, sites account for about ten or twenty percent of the predictable outcome variance. Similar conclusions hold for the pooled model. It should be noted that, on the average, sites (between-site vectors) account for somewhat more outcome variance than does treatment.

Other Potential Covariates

As another investigation into the adequacy of our covariate set, we recomputed the Local Analysis on Cohort III-K, using an alternative set, one which we believed had the potential to be more efficient that the set as stated in the earlier section on analytic models. Figure 4-3 contrasts the two sets of covariates.

The alternative set differs from the actual covariate set in that a variable indicating the ceiling value on income was added (allowing for

Figure 4-3

COMPARISON OF ACTUAL AND ALTERNATIVE COVARIATE SETS

ACTUAL COVARIATE SET	ALTERNATIVE COVARIATE SET
Fall Kindergarten WRAT	Fall Kindergarten WRAT
Family income	Family income
---	Income $\geq$ \$9999*
Highest occupation in household	Highest occupation in household
Sex	Sex
Entry Age	Entry Age
Ethnic membership (White vs. Black) (White vs. Other)	Ethnic membership/first language (four vectors)
First language	---
---	Mother's education
Missing data code for WRAT	Missing data code for WRAT
Missing data code for income	Tendency to missing data (values from zero to three depending on whether income, occupation, and education are missing)
Missing data code for occupation	---
---	Fall Kindergarten WRAT (quadratic)

*The ceiling on the income scale was \$9,999. Approximately one-quarter of the families in Cohort III-K had reported incomes of \$9,999 or more.

a change in slope for these less disadvantaged children); ethnic membership and first language were combined into a four-vector variable; mother's education was added; the missing data codes for income, occupation, and education were combined into a single variable; and a term providing for the effects of a quadratic relationship between the pretest and each outcome was added. Appendix Figure A4-2 presents the results of this reanalysis.

Comparing the results of the analyses using the two covariate sets, we see that out of 930 estimated effects (62 sites x 15 outcomes), only three percent were changed enough to be reflected on a Summary of Effects* table. Table 4-1 summarizes the changes in results which occurred by changing covariate sets. Note that most changes were from negative to positive or to null, not from null to positive or negative. No effects changed sign (from positive to negative, or from negative to positive.)

Table 4-1

SUMMARY OF CHANGES IN EFFECTS[a] BETWEEN THE LOCAL ANALYSIS AND THE LOCAL ANALYSIS WHICH USED AN ALTERNATIVE COVARIATE SET FOR COHORT III-K

Actual Set	Alternative Set +	Alternative Set 0	Alternative Set -	
+	43	2	0	45
0	2	742	6	750
-	0	14	121	135
	45	758	127	930

Percent Agreement = 97

Correlation = .93

[a]Effects for Oakland, CA were not estimated.

Not only were the changes in effects few, but the changes in the treatment effect estimates were very small. From the data presented in

* A discussion of the Summary of Effects tables appears in Chapter One of Volume IV-B and defines which FT/NFT comparisons are negative (-), null (0), or positive (+).

Table 4-2

EFFECT ESTIMATES AND ASSOCIATED STATISTICS FOR EFFECTS WHICH CHANGED WHEN AN ALTERNATIVE COVARIATE SET WAS USED IN THE LOCAL ANALYSIS FOR COHORT III-K

Covariate Set	Treatment Effect Estimate	Standard Error of Treatment Effect	T Value	Effect
Actual	2.48	1.25	.048	+
Alternative	2.28	1.26	.072	0
Actual	-3.27	1.98	.100	0
Alternative	-3.97	1.98	.046	-
Actual	-3.21	1.71	.062	0
Alternative	-4.08	1.68	.016	-
Actual	-3.03	1.39	.030	-
Alternative	-2.63	1.38	.057	0
Actual	-4.62	2.10	.028	-
Alternative	-4.02	2.10	.057	0
Actual	-4.20	1.91	.028	-
Alternative	-3.71	1.91	.053	0
Actual	-3.45	1.69	.042	-
Alternative	-2.95	1.69	.082	0
Actual	-3.43	1.65	.038	-
Alternative	-3.15	1.70	.065	0
Actual	-4.90	2.40	.042	-
Alternative	-4.60	2.51	.068	0
Actual	-7.59	3.69	.040	-
Alternative	-7.09	3.82	.064	0
Actual	-1.45	.71	.041	-
Alternative	-1.37	.73	.063	0
Actual	-1.20	.60	.046	-
Alternative	-1.19	.63	.058	0
Actual	1.66	.88	.058	0
Alternative	1.88	.91	.040	+
Actual	-3.45	1.93	.075	0
Alternative	-3.94	1.96	.046	-
Actual	5.05	2.67	.060	0
Alternative	5.44	2.73	.047	+
Actual	-4.30	2.11	.042	-
Alternative	-4.14	2.18	.058	0
Actual	-3.88	1.93	.045	-
Alternative	-3.54	2.01	.079	0
Actual	-2.21	1.04	.035	-
Alternative	-2.06	1.06	.052	0
Actual	-4.62	2.19	.037	-
Alternative	-4.47	2.30	.054	0
Actual	-3.77	1.82	.039	-
Alternative	-3.36	1.89	.075	0
Actual	-4.75	2.44	.052	0
Alternative	-5.29	2.50	.035	-
Actual	-6.10	3.17	.055	0
Alternative	-6.56	3.25	.044	-
Actual	3.00	1.49	.044	+
Alternative	2.84	1.51	.060	0
Actual	-2.59	1.34	.056	0
Alternative	-2.77	1.37	.045	-

Table 4-2, it is clear that the 24 changes in effects occurred because the treatment effect estimates were near the boundary between significance and nonsignificance. Thus, it appears that the effect estimates are quite stable across covariate sets.

Combined Use of Preschool Experience and Pretest

One of the problems arising from the inclusion of covariates which account for preschool differences among children is that preschool experience may effect a child's pretest score. The child who has attended Head Start and scores at a given level on the WRAT may be quite different from a child who has not attended Head Start but still achieves the same pretest score. In order to account for this possibility in our preschool adjusted analyses, we introduced pretest by preschool interaction terms in addition to pretest and preschool terms. There may be some, however, who believe that it does not make conceptual sense to include both preschool and pretest as covariates. We therefore ran an auxiliary analysis in which we included preschool as a covariate but excluded the pretest. Appendix Figure A4-2 presents the results of this analysis. Table 4-3 below shows the changes in effects between the Preschool Adjusted Local Analysis (which includes both the pretest and preschool experience as well

Table 4-3

SUMMARY OF CHANGES IN EFFECTS[a]
BETWEEN THE PRESCHOOL ADJUSTED LOCAL ANALYSIS
AND THE PRESCHOOL ADJUSTED LOCAL ANALYSIS
WHICH OMITTED THE PRETEST AS A COVARIATE FOR COHORT III-K

Preschool Adjusted Local Analysis		Preschool Adjusted Local Analysis (Omitting Pretest) +	0	-	
	+	43	18	0	61
	0	21	691	36	748
	-	0	35	86	121
		64	744	122	930

Percent Agreement = 88
Correlation = .69

[a]Effects for Oakland, CA were not estimated.

as their interaction as covariates) and the same analysis with the pretest omitted. Although some twelve percent of the observed effects change from one analysis to the other, in the aggregate we find little difference between the overall results of the two strategies. This suggests that the observed differences may be due to a reduction in precision which occurs when the pretest is omitted.*

The results at the site level presented in Appendix Figure A4-2 suggest that many of the changes in effects are site-specific. For example, about one third of the changes which go from null to positive when we remove the pretest are in one site, and over three quarters of those which change from positive to null are in two sites. In those sites where a large number of changes occurred, the changes were in a predictable direction; e.g., if FT scored lower than NFT on pretest, the inclusion of pretest as a covariate resulted in more FT favorable results. In summary, preliminary explorations suggest that using pretest and its interactions with preschool as covariates make site-specific and predictable contributions to the results.

Adequacy of Pretest for Low-Scoring Children

Some have expressed concern that scores which are close to zero on the pretest may not accurately reflect entering achievement level and may prevent the pretest from functioning adequately as a covariate. We needed to determine how many low-scoring students we had, and if our results would have been different had we excluded these children from the analysis.

Deciding what score is too low to be an adequate representation of a student's achievement is not simple. The pretest, as its name implies, is a wide-range test which has few items at any given achievement level. Therefore, a fairly low score may be occurring simply because there are few items at the student's achievement level. In Cohort III-K, the pretest has a mean of 29.5 and a standard deviation of 12.6 (calculated across all participating students); thus, a score of five is approximately two standard deviations below the mean. This suggests that a score below six not only is close to zero but also is in the lower tail of our distribution

* Depending on the outcome measure, the pretest accounts for up to 20 percent of the outcome variance beyond what is explained by other covariates.

and might be considered as not adequately reflecting a child's entry performance capability. Therefore, we reran the Cohort III-K Local Analysis excluding children who scored below six. Appendix Table A4-5 presents the proportion of children in each site who scored below six; Appendix Figure A4-2 presents the site-level effects resulting from the analysis; and Table 4-4 presents changes in effects between the Cohort III-K Local Analysis on the entire sample and the reanalysis of the sample as reduced by eliminating students who scored below six on the pretest.

Table 4-4

SUMMARY OF CHANGES IN EFFECTS[a] BETWEEN THE LOCAL ANALYSIS AND THE LOCAL ANALYSIS ON THE SUBSET OF STUDENTS WITH PRETEST SCORES OF SIX OR GREATER FOR COHORT III-K

		Local Analysis (Pretest ≥ 6)			
		+	0	-	
Local Analysis	+	43	2	0	45
	0	3	741	6	750
	-	0	10	125	135
		46	753	131	930

Percent Agreement = 98

Correlation = .94

[a]Effects for Oakland, CA were not estimated.

Although this exploration shows that some results are different when we exclude the children who scored below six on the pretest, we do not suggest that the major findings be qualified or that all analyses should have been run excluding these children. First, only two percent of the results have been changed, suggesting that we are perhaps observing random fluctuations. Second, as discussed above, we have arbitrarily selected the cutoff point; we might as easily have selected cutoff scores of zero, three, five or ten. Likely, in each of these cases, the results

would have been somewhat different. In any case, the paucity of changes in effects suggests that the effects are quite stable and that, while the reader may wish to note those sites which have a large proportion of low-scoring children on the pretest, there is no reason to be concerned about the overall pattern of results.

In review, we have made the following points about the covariate set used in this study:

- the covariate set accounts for a reasonable amount of variance in each outcome;
- the addition of some other traditional covariates (mother's education, for example) did not change the results of the analysis;
- the inclusion of the pretest and its interactions with preschool make site-specific and predictable contributions to the results; and
- the inclusion of low-scoring children in our analyses makes little difference to the results.

These findings suggest that the covariate set is working as intended. On the other hand, we cannot be certain that all relevant variables have been specified; that is, there may be important data which were never gathered and which may vary from site to site. Such data are not available and hence we must assume that the included covariates adequately represent the basic background of the students.

Assumptions of Analyses

Four conditions that should be met prior to the application of covariance techniques are that:

1. the multivariate distribution of the covariates is not grossly different across groups,
2. the covariates are perfectly reliable,
3. the relationships among covariates and criteria are the same (homogeneous) within FT and NFT groups, and that
4. the covariates are uninfluenced by treatment.

Distribution of Covariates

An examination of the site-level data presented in the Covariate and Background Tables of Volume IV-C for each sponsor reveals that there are no variables for which a site's FT and NFT groups have nonoverlapping distributions. That is, no FT/NFT site-level covariate means are separated by two or more standard deviations. On the other hand, there are sites in which the degree of covariate mismatch is considerable. This problem is addressed in the section of this chapter which deals with the Definition and Consequences of Initial Mismatch.

Reliability of Covariates

Among the many problems prevalent in the evaluation of educational programs are those concerned with the adjustment of outcome scores based on one or more covariates. Typically, such programs are implemented in a quasi-experimental fashion, and some version of the analysis of covariance is employed in an attempt to statistically equate treatment and comparison groups on one or more pretreatment conditions. However, the application of ANCOVA to quasi-experimental data has been widely criticized because violation of the assumption that subjects should be randomly assigned to treatment and comparison groups leads to systematic bias (usually under-adjustment when the treatment group is initially disadvantaged with respect to the control group) of outcome scores unless the measurement of covariates is error-free (Campbell and Boruch, 1975). Achievement tests are commonly used as outcome measures for educational programs. Also, they are often employed as premeasures and serve as covariates in subsequent analyses. Since such tests are known to contain error, it has been argued that they should be corrected for unreliability prior to entry into a covariance analysis (Lord, 1960).

Perfect reliability is assumed for all of the covariates in this study. Variables such as sex, ethnicity, income, occupation, education, language and age are all presumably measured with minimal error. The pretest poses the most serious problem. The reliability of the pretest was estimated on various Follow Through samples by a measure of internal consistency (coefficient alpha) and is on the order of .90.

Although there are several methods for dealing with a single fallible covariate (Porter and Chibucos, 1974), the solution to the problem

in the multiple covariate case (even if only one of the covariates is unreliable) is not clear. Cohen and Cohen (1975) offer a method that has not been mathematically proven which "rests on no more than the judgment of the present authors and some of our colleagues" (Cohen and Cohen, 1975, p. 373). Applying their method to the present case, we desire to correct only for the effects of unreliability in the pretest. The procedure involves correcting the correlations of the unreliable covariate(s) with each other covariate and the outcome for attenuation due to unreliability by dividing each correlation by the square root of the estimated reliability of the covariate. In addition, the covariate standard deviation is corrected by multiplying the observed standard deviation by the square root of the covariate reliability.

Although the internal consistency (a statistic recommended as the appropriate measure of reliability by some methodologists) of the pretest was high (.9), Campbell and Boruch (1975) suggest that, as the time lapse between pretest and posttest increases, the correlation between them decreases. Consequently, they recommend the pre-post correlation be used as the appropriate measure of reliability.

Given the disagreement in the literature as to the most appropriate reliability estimate and the fact that we do not have a direct measure of the pre-post correlation for the fall kindergarten WRAT, the Local Analysis was run for Cohort III-K (on the subsample of pupils having preschool information) using three separate values spanning the range of potential estimates. The values selected were .6, .8, and 1.0, the latter being the equivalent of not correcting the pretest. Our interest is in determining whether the analytic results obtained by correcting for pretest unreliability (.6 or .8) differ from results obtained from an uncorrected analysis (1.0). Summaries of the results of the three analyses are presented in Tables 4-5 and 4-6 and indicate that lower reliability estimates lead to movement of effects from the null category. Correction for unreliability tends, furthermore, to make the results less favorable to Follow Through: without correction, 791 (85 percent) of the results are either positive or null; this number drops to 696 (75 percent) when corrected for a .80 reliability estimate and to 647 (70 percent) when corrected for a .60 reliability estimate. Those who are concerned with these changes in aggregate effects may examine the results corrected for

Table 4-5

SUMMARY OF CHANGES IN EFFECTS[a]
BETWEEN THE LOCAL ANALYSIS ON THE PRESCHOOL SAMPLE
AND THE SAME ANALYSIS
WHEN THE PRETEST IS CORRECTED
USING A RELIABILITY ESTIMATE OF .8 FOR COHORT III-K

Uncorrected Analysis (r=1.0)	Corrected Pretest Analysis (r=.8) +	0	-	
+	55	3	0	58
0	24	614	95	733
-	0	0	139	139
	79	617	234	930

Percent Agreement = 87
Correlation = .75

[a]Effects for Oakland, CA were not estimated.

Table 4-6

SUMMARY OF CHANGES IN EFFECTS[a]
BETWEEN THE LOCAL ANALYSIS ON THE PRESCHOOL SAMPLE
AND THE SAME ANALYSIS
WHEN THE PRETEST IS CORRECTED
USING A RELIABILITY ESTIMATE OF .6 FOR COHORT III-K

Uncorrected Analysis (r=1.0)	Corrected Pretest Analysis (r=.6) +	0	-	
+	48	10	0	58
0	40	538	155	733
-	0	11	128	139
	88	559	283	930

Percent Agreement = 75
Correlation = .61

[a]Effects for Oakland, CA were not estimated.

unreliability in Appendix Figure A4-2. Because work in this area is still exploratory, because we do not know the test/retest correlation for the WRAT, and because we believe that the internal consistency reliability coefficient of .90 is high enough to obviate the need for application of these techniques, we prefer to accept the results of the uncorrected analysis.

Homogeneity of Regression

Another assumption of ANCOVA deals with the relationships between covariates and outcomes in the treatment and comparison groups. The question to be addressed is whether the FT/NFT within-site difference on a given outcome measure differs across the multidimensional space defined by our covariate set. The most appropriate technique for answering this question is to examine the set of two-way interaction terms for each sponsor: treatment within-site by covariate. For example, the analysis would contain the following terms for a sponsor with seven sites:

	Number of Terms
Covariates	11
Sites	6
Treatment (within-site)	7
Covariates x sites	66
Covariates x treatment	77
TOTAL	167

However, such an analysis would require entering 167 variables into a multiple regression analysis for each sponsor having five or more sites. This poses insurmountable problems, given limited sample sizes within sponsors and sites. Thus, as a first attempt to assess the problem of homogeneity of regression for each sponsor, we performed a regression analysis which predicted a given posttest as a function of a single given covariate, a set of orthogonal between-sites contrasts, a set of orthogonal within-sites contrasts, the interactions of the covariate with the between-sites contrasts, and the interactions of the covariates with the within-site contrasts. That is, the analysis contained the following terms for a sponsor with seven sites:

	Number of Terms
Covariate	1
Sites	6
Treatment (within-site)	7
Covariate x sites	6
Covariate x treatment	7
TOTAL	27

We then determined whether the last set of interaction terms (covariate by treatment within-site) explained a significant amount of variance in the dependent variable ($p < .01$).

There were some sites in which the FT and NFT regression lines of some outcome on a given covariate were nonparallel when assessed via this method, a result which may have occurred because the technique is not wholly satisfactory since it only assesses the effects of one covariate at a time. A second method was therefore developed with the advantage of examining all covariates at once; however, it is restricted in that it only contrasts a given site with all others of the same sponsor. That is, the analysis contained the following terms for any sponsor.

	Number of Terms
Covariates	11
Site	1
Treatment (within-site)	2
Covariates x site	11
Covariates x treatment	22
TOTAL	47

In the second method, we partially obscure between-site variance in order to gain a clearer understanding of the FT/NFT outcome-covariate relationship when <u>all</u> covariates are operating. Selective application of this technique to those covariate by treatment within-site interactions found

to be significant earlier* did not confirm the results of the first method and, in fact, showed that in no cases (for Cohort III-K, Cohort III-EF, and Cohort II-EF) were FT and NFT regression surfaces nonparallel. We interpret this as enabling us to proceed with the Local Analysis, unencumbered by the problems of heterogeneous regression for treatment and control groups. We see no reason to suppose that notably different results would have been found had the second method been applied to the Cohort II-K data.

Covariate/Treatment Correlation

With the exception of the fall kindergarten WRAT, the covariates used in the present analyses are demographic variables not susceptible to direct influence by treatment. The WRAT was administered by SRI early in the kindergarten year, usually within the first six weeks of school. Although the WRAT is sensitive to early learning, it does not seem likely that the instruction received during these first weeks (which are generally spent "getting settled") would substantially affect WRAT scores for all children. On the other hand, we have no evidence to suggest that early learning which could be measured by the WRAT did not take place for some children. The reader especially concerned that such a phenomenon did occur may wish to pay special attention to our analyses that omit the WRAT. (See the section in this chapter on Combined Use of Preschool Experience and Pretest.)

Comparability of Analyses

We have performed many different analyses, all of which are aimed at assessing the effectiveness of a given sponsor's model as implemented in a set of sites. Dimensions along which our analyses vary include the sample of children, the covariate set, and timing of effects. For example, the preschool analyses have been performed on the subset of Entry-Exit children who have valid preschool information (sample difference). The Longitudinal Analysis not only uses a different covariate set (covariate

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* The application of this technique was restricted because with our data set and analyses the computer cost of full application would have been prohibitive.

set difference) but also examines the data at three timepoints rather than two as in the Entry-Exit studies (timing of effects difference).

In this section we first examine alternative explanations such as those cited above for differences among the results of our analyses. This is done through a set of linking analyses. Second, we determine the degree to which the analyses yield the same results.

Linking Analyses

As mentioned above, we have analyzed our data in several ways. We are concerned with the comparability of results between:

- the Preschool Adjusted Local Analysis and the Local Analysis;
- the Preschool Adjusted Pooled Analysis and the Pooled Analysis;
- the Preschool Adjusted Local Analysis and the Preschool Adjusted Pooled Analysis; and
- the Preschool Blocked Pooled Analysis and the Longitudinal Analysis.

Some of our analyses differ on more than one dimension. For example, two analyses may differ in terms of sample and analytic technique. In such a case we have performed a linking analysis which differs from each of the two other analyses on only one dimension. Using the above example, the linking analysis would differ from one analysis only in terms of sample and from the other only in terms of technique. We then compare the results of each of the three analyses and ascertain the types of changes in results which occur when we change samples and when we change techniques.

Comparison of the Preschool Adjusted Local Analysis and the Local Analysis. The Preschool Adjusted Local Analysis and the Local Analysis differ in two ways--preschool information is covaried in the preschool adjusted analysis and the sample for the preschool adjusted analysis (N = 6439) is a subset of the Entry-Exit sample (N = 7331).* Ideally dropping certain students from the preschool analysis should not affect the results.

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* Students omitted from the Preschool Adjusted Local Analysis include those with missing preschool information or missing pretest information.

If it does not, we can attribute any discrepancies in effects to the inclusion of preschool information. Table 4-7 shows that when results are collapsed across all outcomes, sites and sponsors, about six percent of the effects differ from the Local to the Preschool Adjusted Local Analysis with the latter showing more positive and fewer negative effects than the former.

Table 4-7

SUMMARY OF CHANGES IN EFFECTS[a] BETWEEN THE LOCAL ANALYSIS AND PRESCHOOL ADJUSTED LOCAL ANALYSIS FOR COHORT III-K

Preschool Adjusted Local Analysis	Local Analysis: +	0	-	
+	41	20	0	61
0	4	721	23	748
-	0	9	112	121
	45	750	135	930

Percent Agreement = 94

Correlation = .84

[a]Effects for Oakland, CA were not estimated.

To assess the effect of changing the sample independent of the inclusion of preschool information we computed the Local Analysis on the "preschool reduced" sample and compared the results with those of the Local Analysis. Table 4-8 presents the results of this comparison and shows the extent to which the sample modification changes the results of the Local Analysis.

Table 4-8

SUMMARY OF CHANGES IN EFFECTS[a] BETWEEN THE LOCAL ANALYSIS AND THE LOCAL ANALYSIS ON THE PRESCHOOL SAMPLE FOR COHORT III-K

Local Analysis (Preschool Sample)	Local Analysis +	Local Analysis 0	Local Analysis -	
+	41	15	2	58
0	4	714	15	733
-	0	21	118	139
	45	750	135	930

Percent Agreement = 94

Correlation = .88

[a]Effects for Oakland, CA were not estimated.

From this table we can see that the reduction in sample size leads to about a thirty percent (from forty-five to fifty-eight) increase in positive effects. Likewise, Table 4-9 compares the results of the Local Analysis on the preschool sample with the preschool adjusted results. This table shows that the addition of preschool covariates when the sample is held constant

Table 4-9

SUMMARY OF CHANGES IN EFFECTS[a] BETWEEN THE PRESCHOOL ADJUSTED LOCAL ANALYSIS AND THE LOCAL ANALYSIS ON THE PRESCHOOL SAMPLE FOR COHORT III-K

Preschool Adjusted Local Analysis	Local Analysis (Preschool Sample) +	Local Analysis (Preschool Sample) 0	Local Analysis (Preschool Sample) -	
+	54	7	0	61
0	3	720	25	748
-	1	6	114	121
	58	733	139	930

Percent Agreement = 95

Correlation = .88

[a]Effects for Oakland, CA were not estimated.

leads to about fifteen percent fewer negative effects than when those covariates are omitted. In summary, the increase in positive effects as noted in Table 4-7 appears to be associated with the shift of samples. The decrease in negative effects appears to be associated with the addition of preschool covariates, supporting the contention that the exclusion of preschool information biases comparisons against Follow Through.

Comparison of the Preschool Adjusted Pooled Analysis and the Pooled Analysis. Table 4-10 presents the simple changes between the Pooled and Preschool Adjusted Pooled Analyses. There are a relatively large number of changes in effects (twenty-eight percent); however, the marginals of the table are similar. As was the case for the Local Analysis, the Preschool Adjusted Pooled Analysis yields slightly more positive effects than the Pooled Analysis. However, it also yields more negative effects. We have not run analyses to link the Pooled with the Preschool Adjusted Pooled Analysis through the sample modification as we did with the Local Analysis, and therefore cannot associate specific changes in effects with either the change in sample or the introduction of the preschool information.

Table 4-10

SUMMARY OF CHANGES IN EFFECTS[a] BETWEEN THE POOLED ANALYSIS AND PRESCHOOL ADJUSTED POOLED ANALYSIS FOR COHORT III-K

Preschool Adjusted Pooled Analysis	Pooled Analysis +	Pooled Analysis 0	Pooled Analysis -	
+	81	64	2	147
0	54	407	64	525
-	2	77	179	258
	137	548	245	930

Percent Agreement = 72

Correlation = .64

[a]Effects for Oakland, CA were not estimated.

Comparison of the Preschool Adjusted Local Analysis and the Preschool Adjusted Pooled Analysis. The major difference between these two analyses is the covariate centroid at which the adjusted effects are computed. That is, for the Local Analysis the effects are computed at the value of the covariate centroid for all FT and NFT children within a given sponsor; for the Pooled Analysis the effects are computed at the value of the covariate centroid for all NFT children across all sponsors. Table 4-11 presents changes between effects resulting from these analyses and shows that the Preschool Adjusted Pooled Analysis has fewer null effects and about twice as many positive and negative effects as the Preschool Adjusted Local Analysis. There were, however, no changes from positive to negative or negative to positive.

Table 4-11

SUMMARY OF CHANGES IN EFFECTS[a] BETWEEN THE PRESCHOOL ADJUSTED POOLED ANALYSIS AND THE PRESCHOOL ADJUSTED LOCAL ANALYSIS FOR COHORT III-K

Preschool Adjusted Local Analysis	Preschool Adjusted Pooled Analysis: +	0	-	
+	54	7	0	61
0	93	511	144	748
-	0	7	114	121
	147	525	258	930

Percent Agreement = 73

Correlation = .59

[a]Effects for Oakland, CA were not estimated.

Comparison of the Preschool Blocked Pooled Analysis and the Longitudinal Analysis. The Preschool Blocked Pooled Analysis is an examination of sponsor-level Entry-Exit effects for each of the three preschool groups on the Entry-Exit preschool sample. The Longitudinal Analysis is an examination of sponsor-level effects at first and third grade separately for each of the three preschool groups on the longitudinal sample. The

major differences between these two analyses are the timing of effects, the covariate set, the sample, and the use of between-site codes as discussed in the section on ANALYTIC STRATEGIES.

In order to make these two analyses comparable, the Longitudinal Analysis was performed in the Entry-Exit mode of the Preschool Blocked Pooled Analysis. That is, regression equations were developed separately for the three preschool NFT groups and applied separately to the appropriate preschool FT groups within each sponsor (See Figure 4-2). This new analysis on the longitudinal sample in the Entry-Exit mode used the longitudinal covariate set, but not the between-site covariates. It was performed for the four third grade tests (Total Reading, Total Math, Math Computations, Math Concepts) used in the Longitudinal Analysis. The results of this new analysis were compared with those from the Preschool Blocked Pooled Analysis. Table 4-12 shows the summary of changes which occurred. The Longitudinal Analysis in Entry-Exit mode produced fewer positive effects and concomitantly more null and negative effects. In an attempt to ascertain whether these shifts were associated with the shifts in covariate set or sample or the dropping of between-site covariates, two linking analyses were performed. A Summary of Effects table for these linking analyses, the Longitudinal Analysis in Entry-Exit Mode and the Preschool Blocked Pooled Analysis is presented as in Appendix Figure A4-3.

Table 4-12

SUMMARY OF CHANGES IN EFFECTS BETWEEN THE PRESCHOOL BLOCKED POOLED ANALYSIS (PBPA) AND THE LONGITUDINAL ANALYSIS IN ENTRY-EXIT MODE

		Longitudinal Analysis in Entry-Exit Mode			
		+	0	-	
Preschool Blocked Pooled Analysis	+	7	9	0	16
	0	3	69	19	91
	-	0	16	9	25
		10	94	28	132

Percent Agreement = 64

Correlation = .39

First, the Preschool Blocked Pooled Analysis (the Entry-Exit analysis with which we are comparing the longitudinal results) was again performed except that the between-site covariates were dropped. (This modified analysis is called the Preschool Blocked Pooled Analysis Without Between-Site Covariates.) The summary of changes which occurred between the Preschool Blocked Pooled Analysis and this new analysis without between-site covariates is displayed in Table 4-13. As expected, the percentage of variance explained by the prediction equations decreased when the between-site covariates were dropped (See Table 4-14). The dropping of these covariates resulted primarily in an increase in negative effects. These changes from null to negative were associated with changes in the size of the treatment coefficients since the standard errors for the two analyses were usually similar (see Appendix Table A4-6).

Table 4-13

SUMMARY OF CHANGES IN EFFECTS BETWEEN THE PRESCHOOL BOLCKED POOLED ANALYSIS (PBPA) AND THE PRESCHOOL BLOCKED POOLED ANALYSIS WITHOUT BETWEEN-SITE COVARIATES

Preschool Blocked Pooled Analysis	Preschool Blocked Pooled Analysis Without Between-Site Covariates: +	0	-	
+	7	9	0	16
0	8	66	17	91
-	1	12	12	25
	16	87	29	132

Percent Agreement = 64

Correlation = .41

Table 4-14

PERCENTAGE OF VARIANCE EXPLAINED IN EACH OUTCOME
FOR THE ANALYSES LINKING THE ENTRY-EXIT AND LONGITUDINAL STUDIES

Analysis / Outcome / Preschool Group	Preschool Blocked Pooled Analysis (PBPA)			PBPA without Between-Site-Covariates			PBPA without Between-Site Covariates on the Longitudinal Sample			Longitudinal Analysis in Entry-Exit Mode		
	Head Start	Some Preschool	No Preschool	Head Start	Some Preschool	No Preschool	Head Start	Some Preschool	No Preschool	Head Start	Some Preschool	No Preschool
Total Reading	.55	.62	.56	.41	.57	.48	.46	.56	.47	.45	.59	.48
Total Math	.53	.58	.52	.42	.50	.43	.44	.48	.42	.43	.58	.42
Math Computations	.43	.48	.43	.30	.36	.31	.30	.33	.33	.26	.35	.22
Math Concepts	.54	.56	.50	.44	.49	.43	.43	.47	.40	.44	.49	.41

The second check we made involved performing the Preschool Blocked Pooled Analysis Without Between-Site Covariates on the longitudinal sample. (This modification of the analysis is called the Preschool Blocked Pooled Analysis Without Between-Site Covariates on the Longitudinal Sample.) This permitted the comparison of two analyses which differ only in terms of sample. The summary of changes associated with the shift in sample is presented in Table 4-15. The analysis on the longitudinal sample produced more positive effects and fewer negative effects. Often associated with the

Table 4-15

SUMMARY OF CHANGES IN EFFECTS BETWEEN THE
PRESCHOOL BLOCKED POOLED ANALYSIS (PBPA) WITHOUT
BETWEEN-SITE COVARIATES AND THE PBPA WITHOUT
BETWEEN-SITE COVARIATES ON THE LONGITUDINAL SAMPLE

Preschool Blocked Pooled Analysis
Without Between-Site Covariates
on the Longitudinal Sample

Preschool Blocked Pooled Analysis Without Between-Site Covariates	+	0	-	
+	14	2	0	16
0	5	76	6	87
-	0	12	17	29
	19	90	23	132

Percent Agreement = 81

Correlation = .72

sample change was an increase in the size of the standard error, however, changes in effects were also associated with changes in the size of the treatment coefficients.

The last check we made compared two analyses which differed only in terms of the covariate set. The two analyses contrasted were the Preschool Blocked Pooled Analysis Without Between-Site Covariates on the Longitudinal Sample (which used the Entry-Exit covariate set) and the Longitudinal Analysis in Entry-Exit Mode. (This last analysis was mentioned above and compared with the Preschool Blocked Pooled Analysis.) The summary of changes which occurred when the covariate shift was made is shown in Table 4-16. The change in covariate set resulted in fewer positive effects and more negative effects. Although the standard errors are often similar in these two analyses, the treatment coefficients changed (See Appendix Table A4-6).

Table 4-16

SUMMARY OF CHANGES IN EFFECTS BETWEEN THE PRESCHOOL BLOCKED POOLED ANALYSIS WITHOUT BETWEEN-SITE COVARIATES ON THE LONGITUDINAL SAMPLE AND THE LONGITUDINAL ANALYSIS IN ENTRY-EXIT MODE

		Longitudinal Analysis in Entry-Exit Mode			
		+	0	-	
Preschool Blocked Pooled Analysis Without Between-Site Covariates on the Longitudinal Sample	+	10	9	0	19
	0	0	84	6	90
	-	0	1	22	23
		10	94	28	132

Percent Agreement = 88

Correlation = .82

In summary, in order to compare the results of the Entry-Exit and Longitudinal Analysis, we performed the Longitudinal Analysis in Entry-Exit mode. We compared this with our Preschool Blocked Pooled Analysis and found fewer positive, and more negative effects. In order to ascertain which of these changes in effects were associated with the sample or covariate change or the dropping of the between-site covariates, we ran additional

analyses. We found that the dropping of between-site covariates was associated with an increase in negative effects. The change in sample was associated with an increase in positive effects and a decrease in negative effects. Finally, the change in covariate set was associated with a decrease in positive effects and an increase in negative effects.

Relationships Among Effects

In the above section we examined changes in effects between many different analyses which were performed across all cohort streams. We now explore the relationships among effects yielded by selected primary and secondary analyses of Cohort III-K (the Preschool Adjusted Local Analysis, the Preschool Adjusted Pooled Analysis, the Local Analysis and the Pooled Analysis).

Table 4-17 presents site-level correlations among effects yielded by the primary and secondary analyses of Cohort III-K overall and for each sponsor. These correlations are based not on treatment effect estimates but on the grosser measures of positive, null, or negative effects as given in our Summary of Effects tables. This was done because our evaluative decisions about sites and sponsors are based on the positive, null, and negative information. We are thus correlating variables each of which has three ordinal values. The correlations have a wide range across sponsors and analyses. All the coefficients are positive, and about half are greater than .60, but some are fairly low. Certain sponsors tend to have higher than average correlations among analyses (Direct Instruction, IELP, New School Approach), while others have lower than average correlations (Bank Street, Cognitive Curriculum, Parent Education, EDC, and Interdependent Learning). To the extent that agreement among analyses reinforces confidence in our sponsor evaluations, conclusions as to the relative effectiveness of sponsors in the former group listed above are somewhat more trusted than for the latter.

Parallel conclusions may be drawn about our confidence in the analyses of each outcome by examining the correlations presented in Table 4-18. The correlations tend to be relatively low for the affective measures (Coopersmith, IARS(-), IARS(+)) as well as for Language Part A and, to a

Table 4-17

CORRELATIONS AMONG EFFECTS FROM SELECTED PRIMARY AND SECONDARY ANALYSES OF COHORT III-K: OVERALL AND BY SPONSOR

	PALA[1] with PAPA[2]	PALA with LOCAL[3]	PALA with POOLED[4]	PAPA with LOCAL	PAPA with POOLED	LOCAL with POOLED	N
Overall	.61	.84	.59	.59	.64	.60	930
Responsive Education	.65	.74	.76	.48	.72	.68	90
TEEM	.64	.86	.57	.70	.68	.62	90
Bank Street	.51	.70	.30	.55	.62	.47	75
Direct Instruction	.59	.87	.66	.62	.85	.67	75
Behavior Analysis	.66	.94	.50	.61	.47	.50	105
Cognitive Curriculum	.53	.77	.42	.67	.42	.55	75
Parent Education	.43	.75	.62	.38	.55	.52	75
EDC	.43	.67	.28	.28	.34	.33	75
IELP	.79	.94	.91	.85	.77	.91	45
Interdependent Learning	.39	.80	.63	.31	.70	.51	30
SEDL	.62	.92	.71	.62	.68	.69	75
Cultural Linguistic	.58	.79	.61	.58	.67	.60	30
Home-School Partnership	--	--	--	--	.53	--	15
California Process	.21	--	.07	--	.69	--	45
New School Approach	.93	.87	.57	.80	.61	.65	30

[1]Preschool Adjusted Local Analysis
[2]Preschool Adjusted Pooled Analysis
[3]Local Analysis
[4]Pooled Analysis

Table 4-18

CORRELATIONS AMONG EFFECTS FROM SELECTED PRIMARY AND SECONDARY ANALYSES OF COHORT III-K: OVERALL AND BY OUTCOME

	PALA[1] with PAPA[2]	PALA with LOCAL[3]	PALA with POOLED[4]	PAPA with LOCAL	PAPA with POOLED	LOCAL with POOLED	N
Overall	.61	.84	.59	.59	.64	.60	930
Word Knowledge	.56	.89	.57	.59	.54	.60	62
Spelling	.63	.90	.61	.65	.63	.57	62
Language	.72	.85	.70	.70	.74	.77	62
Math Computations	.69	.88	.68	.66	.76	.70	62
Raven's	.60	.87	.39	.68	.41	.39	62
Reading	.65	.82	.53	.73	.71	.66	62
Math Concepts	.71	.83	.62	.66	.75	.62	62
Math Problem Solving	.56	.68	.54	.43	.67	.58	62
Coopersmith	.44	.69	.43	.23	.47	.14	62
IARS(-)	.52	.84	.50	.42	.58	.52	62
IARS(+)	.30	.68	.50	.35	.55	.55	62
Total Reading	.50	.82	.58	.49	.54	.57	62
Total Math	.67	.87	.67	.62	.76	.67	62
Language Part A	.38	.72	.36	.43	.54	.32	62
Language Part B	.80	.89	.71	.76	.72	.71	62

[1] Preschool Adjusted Local Analysis
[2] Preschool Adjusted Pooled Analysis
[3] Local Analysis
[4] Pooled Analysis

lesser extent, for the Raven's. This suggests that we trust conclusions based on these measures somewhat less than conclusions based on other measures.

Finally, Table 4-19 presents site-level correlations for each outcome between the primary analyses of Cohort III-K and a nonparametric "ranking" analysis which does not make the assumptions that our primary and secondary analyses make.* These correlations are computed between numerical changes in ranks (for the ranking analysis) and the trichotomous effect variables (for the primary analyses) and, in general, are lower than the correlations among our primary and secondary analyses. This suggests that an analysis of ranks captures only part of the same information that our primary analyses yield.

Summary of Analyses

This volume reports the results of many different analyses, all of which have been performed on the Cohort III-K stream with selected methodologies being applied to the other Cohort streams. Figures 4-4 and 4-5 depict the various applications of these techniques. Five types of analyses are presented in these figures: primary, secondary, shaded, auxiliary and linking.

The primary analyses for Cohort III-K are

- Preschool Adjusted Local Analysis;
- Preschool Adjusted Pooled Analysis;
- Preschool Blocked Local Analysis;

---

* We transformed to ranks the pretest and each of the posttest mean scores for each site's FT and local NFT groups combining the 62 FT groups and the 52 NFT groups into a single list for ranking purposes. We then computed the following statistic for each site on each outcome:

Rank difference = (FT posttest rank - NFT posttest rank)

- (FT pretest rank - NFT pretest rank)

Low ranks were assigned to high scores and high ranks to low scores. The rank difference is then a measure of posttest FT/NFT difference "adjusted" for pretest differences. Positive rank differences thus mean FT-favoring changes in ranks. The rank differences by site and outcome are reported in Appendix Table A4-7.

Table 4-19

CORRELATIONS AMONG EFFECTS FROM PRIMARY AND RANKING ANALYSES OF COHORT III-K

	PALA* with Ranking	PAPA** with Ranking
Word Knowledge	.53	.50
Spelling	.56	.62
Language	.50	.59
Math Computations	.49	.51
Raven's	.47	.77
Reading	.47	.52
Math Concepts	.43	.51
Math Problem Solving	.29	.40
Coopersmith	.54	.64
IARS (-)	.52	.59
IARS (+)	.27	.67
Total Reading	.63	.47
Total Math	.44	.51
Language (Part A)	.31	.47
Language (Part B)	.45	.58

* Preschool Adjusted Local Analysis

** Preschool Adjusted Pooled Analysis

FIGURE 4–4

SUMMARY OF ANALYSES FOR COHORT III-K

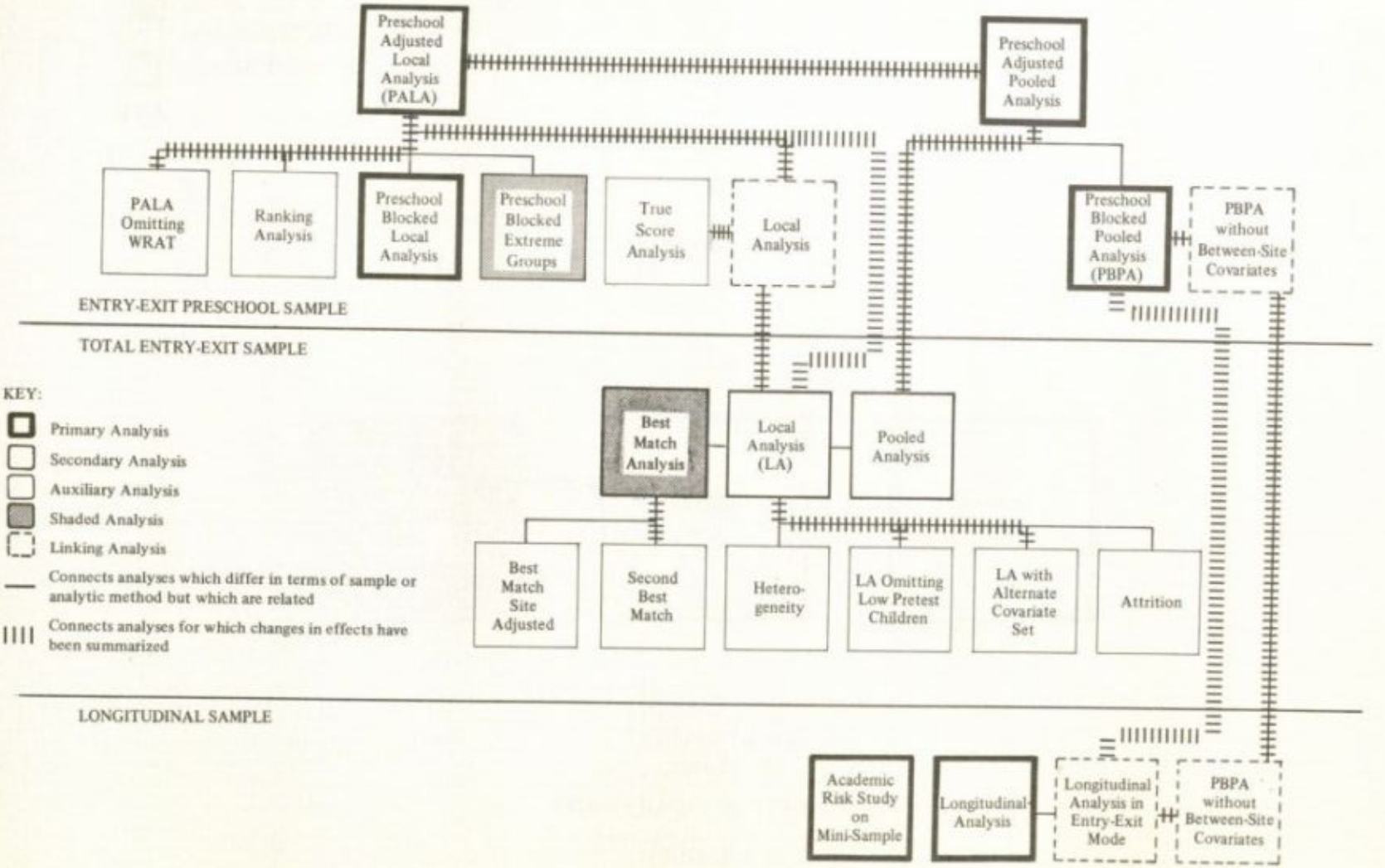
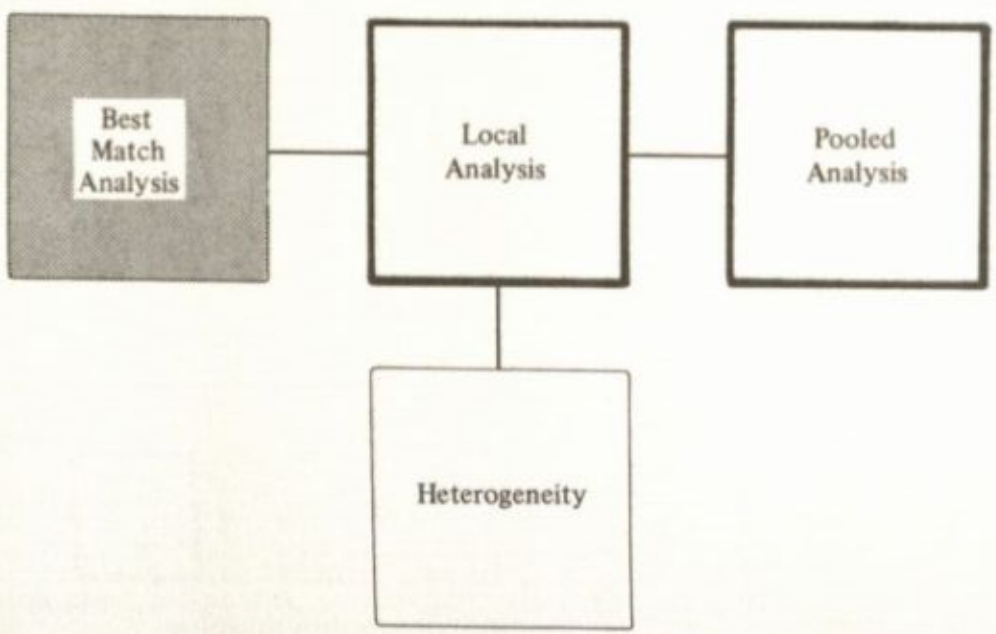


FIGURE 4–5

SUMMARY OF ANALYSES FOR

Cohort II–K
Cohort III–EF
Cohort II–EF



KEY

Primary Analysis

Auxiliary Analysis

Shaded Analysis

—— Connects analyses which differ in terms of sample or analytic method but which are related

- Longitudinal Analysis; and
- Academic Risk Study.

The primary analyses for Cohort III-EF, Cohort II-K, and Cohort II-EF are

- Local Analysis and
- Pooled Analysis.

All of the primary analyses, with the exception of the Academic Risk Study, are discussed in the ANALYTIC STRATEGIES section above. Their results are discussed in Chapters Two through Eighteen of Volume IV-B and are synthesized in Chapter Five of this volume. Volume IV-D presents the Academic Risk Study and a more detailed discussion of the Longitudinal Analysis.

The secondary analyses (for Cohort III-K only) are

- Local Analysis and
- Pooled Analysis.

These analyses are discussed in the ANALYTIC STRATEGIES section above. Their results are presented in Appendix Figure A4-1.

The shaded analyses are

- Preschool Blocked Extreme Groups Analysis, and
- Best Match Analysis.

These analyses were run but for various reasons were deemed inappropriate for inclusion in the body of this report. We discuss our reasons for performing these analyses, the problems which arose in their application, and some of their results in Exhibit A4-1 and Exhibit A4-5.

The auxiliary analyses are

- Preschool Adjusted Local Analysis Omitting WRAT;
- Preschool Adjusted Local Analysis with True Score Adjustments;
- Ranking Analysis;
- Heterogeneity;

- Local Analysis Omitting Low Pretest Children;
- Local Analysis with Alternate Covariate Set;
- Attrition;
- Best Match Analysis Site Adjusted; and
- Second Best Match Analysis.

These analyses were performed in order to address specific concerns which either we or others had expressed. All but the last two have been discussed above in the preceding sections. The last two are presented and discussed in Exhibit A4-1.

Finally, the linking analyses are

- Local Analysis on the Entry-Exit preschool sample;
- Preschool Blocked Pooled Analysis without Between-Site Covariates;
- Preschool Blocked Pooled Analysis without Between-Site Covariates on the Longitudinal Sample; and
- Longitudinal Analysis in Entry-Exit Mode.

These analyses were performed to examine potential reasons for alternative analyses yielding different results. They are discussed above in the section titled Comparability of Analyses.

The solid lines in Figures 4-4 and 4-5 connect analyses which differ in terms of sample or analytic method but which are related. The feathered lines connect analyses for which changes in effects have been summarized to help us assess the extent to which the analyses have shown different results.

We have reported results from multiple primary analyses and have performed several secondary, auxiliary, and linking analyses. We have begun to reconcile differences among these different analyses at the aggregate level through our summary of change tables; however, a complete treatment of these differences is beyond our resources at this time. For example, we realize that relationships among the effects from the different analyses might vary for different sponsors, sites, or preschool groups. We hope that others may join us as time permits to further explore such phenomena.

DEFINITION AND CONSEQUENCES OF INITIAL MISMATCH

As noted earlier in this chapter, the noncomparability of FT children across sponsors led to the selection of local comparison children early in the Follow Through evaluation. It has become clear in the course of our evaluation that FT children in some sites are not comparable with these local NFT children. In an attempt to counteract this noncomparability, we devised a set of analytic techniques designed to compensate to the fullest possible extent for treatment/comparison group initial differences.

The analysis of covariance, in several forms, has been our main vehicle for comparing FT and NFT performance. We have argued that the data are distributed approximately as this analysis assumes they should be. We are aware that many believe that adjusting procedures are effective only to take care of chance differences that arise among randomly constituted groups. However, others believe that adjusting procedures are also appropriate if the covariate set accounts for the differences between nonrandomly constituted groups. To apply such procedures to the comparison of the judgmentally formed FT and NFT groups is, in the view of those who believe in the necessity of random assignment, to stretch them beyond their range of strict applicability. Faced with the "black box" of adjustment, we have looked at its performance from a number of perspectives in the hope of satisfying ourselves that it is not clouding our results with errors and artifacts.

Although FT and NFT sites were judgmentally selected, many are well matched on background characteristics such as those contained in our covariate set. For such groups we feel that the application of adjusting procedures as a means for removing preexisting differences is justified. On the other hand, as the initial mismatch between groups to be compared becomes larger, we tend to lose confidence in the ability of adjusting procedures on background characteristics to properly control for those differences. Gross FT/NFT mismatch suggests that the treatment and control groups may really be from different populations and therefore we are not justified in comparing them. The issue, then, is to define the magnitude of mismatch between an FT and NFT group which makes us uncomfortable about comparing the two.

Magnitude of Adjustment

The difference between FT and NFT raw outcome site means is a measure of unadjusted "effect." We adjust the raw effects because the FT and NFT groups were not initially equal. The more different they are, the larger is the adjustment, as long as the group differences are relevant to (i.e., correlate with) the outcome measure. The (signed) magnitude of the local adjustment is thus a convenient composite index of local mismatch--or at least the component of mismatch that is relevant to the outcomes and for which we have data. For the Local Analysis we compute the "local adjustment" for outcome_i in site_j as:

$$\text{LOCAL ADJ}_{ij} = (\text{Local adjusted treatment effect for outcome}_i \text{ in site}_j) - (\text{Raw FT mean}_{ij} - \text{Raw NFT mean}_{ij})$$

In the case of the Pooled Analysis, we subtract the same local unadjusted effect as in the local case, creating the "pooled adjustment":

$$\text{POOLED ADJ}_{ij} = (\text{Pooled adjusted treatment effect for outcome}_i \text{ in site}_j) - (\text{Raw FT mean}_{ij} - \text{Raw NFT mean}_{ij})$$

Extreme values of either of these adjustment statistics might lead us to distrust the adjusted effects estimates in which they take part. If the adjustment is too large, the various terms in the prediction equation may be having to make excessive contributions to the prediction of the particular outcome. Such an adjustment may be unstable.

We acknowledge the existence of other opinions on this subject. At one end of the continuum is the viewpoint that the covariate set is an adequate model of a student's background and therefore all adjusted effects should be trusted. At the opposite end is the assumption that the covariate set is not adequate and therefore that we should mistrust all adjusted effects. We have taken a course between these two extremes. Even though we believe in the adequacy of our covariate set, we question very large adjustments, and so we have decided to mistrust:

- any local effect estimate whose adjustment exceeds half a standard deviation of the outcome measure, where the standard deviation is the same one that

we used in judging the materiality of the adjusted effects (that is, the pooled within-site standard deviation of the FT and NFT children combined); and

- any pooled effect estimate whose pooled adjustment exceeds the same criterion.

The criterion of a half standard deviation was selected after we ascertained that such a figure separated those sites which had what we considered to be large initial mismatch (e.g., an FT/NFT difference of five to seven points on the pretest or an FT/NFT difference of about $2000 in income) from the other sites.

Appendix Tables A4-8 through A4-17 present adjustments for the Cohort III-K Preschool Adjusted Local and Pooled Analyses, and for the Cohort III-K, Cohort II-K, Cohort III-EF, and Cohort II-EF Local and Pooled Analyses. The data from which these adjustments may be caluclated is presented on tables in Volume IV-C tables entitled Means and Standard Deviations for the Outcomes, Differences Between FT and NFT Adjusted Third Grade Outcomes, and Treatment Regression Coefficients and Standard Errors by Outcome for Head Start Studies.

Table 4-20 shows the proportion of adjustments considered to be large for each site-level analysis of each outcome for all cohort streams. In general, Pooled Analyses (across all cohort streams) contain a greater proportion of large adjustments than Local Analyses (across all cohort streams.) Also, the Cohort II-EF stream tends to contain a greater proportion of large adjustments than other cohort streams.

Preschool Mismatch

We have so far discussed mismatch in terms of the size of adjustment which an analysis makes. Mismatch as thus defined applies to all analyses, outcomes and cohort streams, and is based on the covariates included in each analysis. However, the type of preschool experience for each child is an important pretreatment variable which we have not integrated completely into our analyses. We believe that "large" differences in type of preschool experience between FT and NFT children should be controlled. To date we have only been able to do this for the Cohort III-K stream. Preschool Adjusted Local and Pooled Analyses for Cohort III-K

Table 4-20

PERCENTAGE OF ADJUSTMENTS WHICH EXCEED THE SPECIFIED CRITERION FOR EACH SITE-ANALYSIS BY COHORT STREAM

	Cohort and Analysis									
	Cohort III-K Preschool Adjusted		Cohort III-K		Cohort II-EF		Cohort III-EF		Cohort II-K	
Outcome	Local	Pooled	Local	Pooled	Local	Pooled	Local	Pooled	Local	Pooled
Word Knowledge	14	18	13	12	25	40	7	14	6	14
Spelling	5	19	3	2	0	30	7	14	6	62
Language	8	18	5	10	13	50	15	21	6	11
Math Computations	5	11	2	4	13	20	8	14	15	32
Ravens	3	18	5	5	25	20	23	21	9	8
Reading	13	19	8	9	13	50	8	21	6	14
Math Concepts	8	18	7	11	25	40	8	14	21	43
Math Problem Solving	6	14	6	10	13	40	8	21	6	16
Coopersmith	0	5	0	3	0	0	0	0	3	24
IARS(-)	0	6	0	3	0	10	0	0	15	5
IARS(+)	0	8	0	4	0	0	8	0	9	16
Total Reading	14	18	13	14	38	50	8	14	12	16
Total Math	11	16	6	10	25	50	8	14	9	16
Language Part A	5	13	2	2	0	10	15	14	6	22
Language Part B	5	14	3	7	13	40	15	21	9	8
	Number of Sites = 62		Number of Sites = 62		Number of Sites = 8		Number of Sites = 14		Number of Sites = 34	

have been performed and were discussed earlier in this chapter. The Local and Pooled Analyses in Cohort III-K and all other cohort streams do not consider preschool experience and may be criticized when the preschool experience of FT and NFT children differs.

We have approached this problem in two ways. First, we compared the Cohort III-K site-level effects of the Local and Pooled Analyses with the corresponding effects derived from the Preschool Adjusted Local and Pooled Analyses. Where the results agree (in about 85 percent of the cases) we assume that preschool mismatch has not influenced the Local and Pooled Analyses. Where results disagree we assume the Preschool Adjusted Analyses to be correct and apply the criteria described below to the Local and Pooled Analyses.

We needed a different and simpler approach to the problem of preschool mismatch when analyzing the other cohort streams. Analyses which control for the effects of preschool were not performed for these streams. Therefore, we used the rule that an effect would not be trusted if it was derived from groups which were mismatched by 50 percent or more in terms of preschool attendance.* That is, if 80 percent of the FT children and 20 percent of the NFT children, or zero percent of the FT children and 52 percent of the NFT children in a given site attended some form of preschool we did not trust the effects produced by our analyses in that site. On the other hand, if 33 percent of FT children and 47 percent of NFT children attended preschool, we believed the mismatch to be of relatively little consequence and therefore trust the analysis of that site.

Consequences of Mismatch

Our conclusions from the above discussion are as follows:

1. As a result of initial covariate mismatch (large adjustment) we do not trust any of the effects which are indicated by an "A" on Appendix Tables A4-18 through A4-27.
2. Due to initial preschool mismatch, we do not trust any of the effects for the sites which are indicated by a "P" on Appendix Tables A4-18 through A4-27.

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* For Cohort II-K, II-EF, and III-EF no differentiation was made between types of preschool attendance.

Table 4-21 presents site-level correlations of adjustments with adjusted effects for "all" effects and "trusted" effects. That is, we include all sites in the calculations for the "all effects" columns, but only include the sites with trustworthy effects in the calculations for the "trusted effects" columns. Although the correlations were small for all effects, they tend to be closer to zero for the trusted effects. This suggests that the trustworthy effects are not artifacts of the adjustment procedures.

Those effects which we do not trust have been displayed in Summary of Effects tables along with trusted effects. However, in an effort to inform the reader as to the existence of these problems we have pointed out questionable effects by shading the appropriate sections of Summary of Effects tables. (By shading we mean that a gray mask has been placed over the section of each table containing the effects we consider to be possibly misleading. The mask allows the reader to see the effects and interpret them if desired, but serves as an effective warning that something may be amiss.) We do not discuss any shaded effects, nor do these effects enter into any aggregations presented in Chapter Five. Thus, the sponsor and site discussions are based solely on effect estimates which we believe to be valid.

In addition to mistrusting certain effects, we were concerned that different analyses sometimes yielded different results and felt that the selection of the "more appropriate" of the Local and Pooled Analyses would help to clarify our interpretations in Chapter Five of this volume. A two-step procedure was employed to select the More Appropriate Analysis (MAA), either the Local or Pooled, for each of the sites included in the four cohort streams of the evaluation.

The first step was to reject as the MAA any analysis which was greyed-out as a result of preschool mismatch. This step applied only to Cohort II-K and the entering first streams, since preschool differences were taken into account for Cohort III-K.

The second step was more complicated and involved comparisons of FT site covariate means with sponsor and pooled NFT covariate means. The general approach was to calculate a distance measure between each FT site's sponsor (including both FT and NFT children), and the pooled

Table 4-21

CORRELATIONS OF ADJUSTMENTS WITH ADJUSTED EFFECTS FOR THE PRESCHOOL ADJUSTED LOCAL AND POOLED ANALYSES OF COHORT III-K

	Preschool Adjusted Lotal Analysis'		Preschool Adjusted Pooled Analysis	
Outcome	All Effects	Trusted Effects	All Effects	Trusted Effects
Word Knowledge	-.21	.01	.22	.19
Spelling	-.01	-.04	.32	.31
Language	-.24	-.18	.15	.10
Math Computations	-.01	.03	.31	.14
Ravens	.24	.27	.38	.27
Reading	-.11	.05	.25	.18
Math Concepts	-.17	-.19	.12	.14
Math Problem Solving	-.20	-.27	.14	.07
Coopersmith	.26	.26	.49	.33
IARS(-)	.08	.08	.46	.40
IARS(+)	.19	.19	.40	.56
Total Reading	-.20	.00	.22	.20
Total Math	-.14	-.18	.15	.09
Language Part A	-.06	-.04	.41	.21
Language Part B	-.23	-.21	.13	.17

NFT group. Since the Local Analysis computes treatment effects at the sponsor covariate centroid, and the Pooled Analysis computes treatment effects at the pooled NFT covariate centroid, the distance between those centroids and the covariate centroid of the FT site in question is a measure of the appropriateness of the comparison: the smaller the distance, the better the comparison. This assumes that the covariates adequately represent the important differences between groups, and that groups which "look alike" in terms of covariates are "more comparable" than groups which look "less alike."

For Cohort III-K, a set of ten covariates was used including the WRAT, income, occupation, first language, two vectors accounting for differences in ethnicity, two vectors accounting for preschool differences, sex, and age at entry. The same set excluding the preschool vectors was used for the other cohort streams (since preschool adjusted analyses were not computed for these cohort streams for Volume IV). The distance measure was calculated separately within each cohort stream (since analyses were blocked on cohort stream) in the following manner:

1. Standardize each pupil's covariate scores ($\bar{X} = 50$, SD = 10) using means and standard deviations computed on all children (FT and NFT) in the evaluation sample.
2. Calculate the distance between each FT site's covariate centroid and the appropriate sponsor's covariate centroid as: $\Sigma\ (FT_{\bar{X}i} - SP_{\bar{X}i})^2$ where $FT_{\bar{X}i}$ is the FT site's mean on covariate i and $SP_{\bar{X}i}$ is the sponsor's mean on covariate i.
3. Calculate the distance between each FT site's covariate centroid and the pooled NFT covariate centroid in the same manner: $\Sigma\ (FT_{\bar{X}i} - NFT_{\bar{X}i})^2$ where $FT_{\bar{X}i}$ is the FT site's mean on covariate i and $NFT_{\bar{X}i}$ is the pooled NFT mean on covariate i.
4. Finally, if $\Sigma\ (FT_{\bar{X}i} - SP_{\bar{X}i})^2 - \Sigma\ (FT_{\bar{X}i} - NFT_{\bar{X}i})^2 > 0$ then we selected the Pooled Analysis as the MAA, while if $\Sigma\ (FT_{\bar{X}i} - SP_{\bar{X}i})^2 - \Sigma\ (FT_{\bar{X}i} - NFT_{\bar{X}i})^2 < 0$ we selected the Local Analysis as the MAA.

Note that the missing data at the pupil level was handled by computing site, sponsor, and pooled NFT covariate means based on the number of pupils with valid data, and then making comparisons among means.

A discussion of the results when examined only in terms of the MAA (see Table 4-22) is included in Chapter Five along with discussions which aggregate results from the two analyses.

Table 4-22

MORE APPROPRIATE ANALYSIS

SPONSOR/Site	MAA			
	CIII-K	CII-K	CIII-E	CII-E
RESPONSIVE EDUCATION				
Buffalo, NY	2	3		
Duluth, MN	1	1		
Fresno, CA	1	2		
St. Louis, MO	1			
Salt Lake City, UT	1	2		
Tacoma, WA	1	5		
Berkeley, CA		1		
Lebanon, NH		1		
Goldsboro, NC			1	
Sumter, SC			4	
Owensboro, KY			1	
TEEM				
Chicasha, OK	1			
Des Moines, IA	2			
Lakewood, NJ	2	5		
Newark, NJ	2			
Lincoln, NB	1	1		
Wichita, KS	1	4		
Baltimore, MD		2		
Vermilion Par., LA			1	
Durham CO., NC			2	
Ft. Worth, TX			1	
Walker Co., GA			2	
Pike Co., KY			2	
BANK STREET				
New York, NY	1	1		
Philadelphia, PA	1	1		
Brattleboro, VT	2	2		
Fall River, MA	2	2		
New Haven CT	2			
Rochester, NY		5		
Wilmington, DE		5		
Macon Co., AL				4
DIRECT INSTRUCTION				
New York, NY	1	1		
Grand Rapids, MI	1	4		
W. Iron Co., MI	2			
Flint, MI	1	1		
Providence, RI	1			
E. St. Louis, IL		4	4	
Racine, WI		2		
Dayton, OH			1	
Tupelo, MS			1	1
Williamsburg Co., SC			1	1

KEY

1 = Local
2 = Pooled
3 = Local (Pooled shaded due to preschool)
4 = Pooled (Local shaded due to preschool)
5 = Neither (Both shaded due to preschool or size of adjustment)

Table 4-22 (cont.)

SPONSOR/Site	MAA			
	CIII-K	CII-K	CIII-E	CII-E
BEHAVIOR ANALYSIS				
New York, NY	1	1		
Philadelphia, PA	1	1		
Portageville, MO	2	1		
Trenton, NJ	1			
Kansas City, MO	1	1		
Louisville, KY	1	5		
Waukegan, IL	1			
Meridan, IL		2		
COGNITIVE CURRICULUM				
New York, NY	1	1		
Okaloosa Co., FL	1	5		
Greeley, CO	1			
Seattle, WA	1			
Chicago, IL	1	5		
Leflore Co., MS				1
PARENT EDUCATION				
Philadelphia, PA	1	1		
Richmond, VA	1	1		
Yakima, WA	2			
Houston, TX	1	1		
Lawrenceburg, IN	2			
Jacksonville, FL		5		
Jonesboro, AR				1
Chattanooga, TN				1
Hillsborough, FL				1
EDC				
Philadelphia, PA	1	1		
Burlington, VT	2			
Lackawanno Co., PA	2			
Morgan Comm. Sch., DC	1			
Paterson, NJ	1	1		
Chicago, IL		5		
Laurel, DE				1
Johnston Co., NC				2
SELF-SPONSORED				
Detroit, MI		5		
New York, NY		3		
Philadelphia, PA		1		
Portland, OR		5		
San Diego, CA		5		

KEY

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5 = Neither (Both shaded due to preschool or size of adjustment)

Table 4-22 (cont.)

	MAA			
	CIII-K	CII-K	CIII-E	CII-E
IELP				
Lock Haven, PA	1			
Montevideo, MN	1			
Akron, OH	2			
ILM				
New York, NY	1	1		
Atlanta, GA	1			
SEDL				
Philadelphia, PA	1	1		
Los Angeles, CA	1			
Tulare, CA	1	1		
St. Martin Parish, LA	2	4		
San Diego, TX	1			
CLA				
Chicago, IL	1			
Topeka, KS	1			
HOME-SCHOOL PARTNERSHIP				
New York, NY	1	1		
CAL PROCESS				
Los Angeles, CA	1	1		
Ravenswood, CA	1	1		
Oakland, CA	1			
San Jose, CA	1	1		
Lemont, CA		4		
NSA				
Great Falls, MT	1			
Clear Lake, WA	1			
MAP				
Gulfport, MS			2	
Pickens Co., GA			1	
Lee Co., VA			1	

KEY

1 = Local
2 = Pooled
3 = Local (Pooled shaded due to preschool)
4 = Pooled (Local shaded due to preschool)
5 = Neither (Both shaded due to preschool or size of adjustment)

CHAPTER FIVE

PATTERNS OF EFFECTS

Richard B. Anderson, Linda B. Stebbins,
Elizabeth C. Proper, and Robert G. St. Pierre

Recent evaluations of Project Follow Through emanate from a variety of sources and perspectives. Reports from the model sponsors, the participating communities, the national evaluation contractors, and the U.S. Office of Education suggest that the pattern of effects is a complicated mixture of success and failure with respect to the educational and social service objectives of the program.

By design, one portion of the national evaluation of Follow Through Planned Variation models focused on the results of tests administered to Follow Through (FT) and non-Follow Through (NFT) comparison children, questionnaires administered to their teachers, and interview data collected from their parents. These data are the basis of our evaluation. The patterns of effects which are reported provide one perspective on the effectiveness of the various alternative instructional strategies with respect to one set of objectives: improving the school performance of low-income children in kindergarten through grade three. In pursuit of its general purpose, the improvement of children's life chances, Follow Through has provided a broad range of services. We report here only on the instructional component of Follow Through, and within that only on a restricted set of educational outcomes.

We have addressed three essential questions with the national evaluation data:

- Do the various education strategies being tested in Follow Through have different impacts?
- Do differences in impact have any relationship to such characteristics of the children as socioeconomic status and preschool experience?
- Do some educational strategies consistently show better results from others over time, or does the impact vary from year to year?

We present our responses to these questions in varying detail throughout Volumes IV-A through D. Volumes IV-B and D, for example, devote discrete sections to detailed presentations of each model's patterns of effects. In this chapter, however, we have attempted to average the data in meaningful ways which permit us to demonstrate the consistencies that we have discerned in the patterns of effects.

Our evaluation of Follow Through Planned Variation models focuses on the progress of FT children relative to NFT comparison children in three learning domains as measured by the Follow Through test battery.* For convenience in summarizing the results, we have grouped the eleven outcome tests as indicated in Figure 5-1 and as discussed more fully in Chapter Two. The "basic skills" are the simplest objectives of traditional elementary schooling: vocabulary, spelling, the conventions of written language, and simple arithmetic computation. "Cognitive conceptual skills" --comprehension, reading, mathematical concepts, mathematical problems, and abstract problem solving--are also traditional academic goals, but are more complex and tend to require application of some basic skills. "Affective outcomes," finally, are approximate measures of the children's self-concept and of their tendency to attribute success or failure to themselves rather than to others.

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*We point out in Chapter Two that tests of basic skills achievement provide a more appropriate estimate of the children's performance in that domain than do tests of cognitive conceptual and affective development in their respective domains. The relative performance of FT and NFT children on each of the tests in Figure 5-1 is discussed in Volume IV-B along with detailed descriptions of the samples of children, the perceptions of the parents and teachers, and a description of each planned variation model. The tests leave much to be desired as indices of performance in the outcome domains, but they were the best available at the time of selection and they do provide insights we would not otherwise have. It behooves the reader to keep in mind precisely which tests generated the evidence we present.

FIGURE 5–1

DOMAINS OF THIRD GRADE TESTING IN FOLLOW THROUGH

Outcome Domains	Tests	
BASIC SKILLS	Word Knowledge Spelling Language Math Computations	Metropolitan Achievement Test (MAT)
COGNITIVE CONCEPTUAL SKILLS	Reading Math Concepts Math Problems	Metropolitan Achievement Test (MAT)
	Raven's Progressive Matrices	
AFFECTIVE OUTCOMES	Coopersmith Self-Esteem	
	Achievement Responsibility, Positive Achievement Responsibility, Negative	Intellectual Achievement Responsibility Scale (IARS)

In order to capture some of the important apsects of model diversity and to permit us to draw conclusions about types of models, we have divided the models into three broad categories, according to their areas of primary emphasis:*

- Basic Skills Models — These models focus first on the elementary skills of vocabulary, arithmetic computation, spelling, and language.
- Cognitive Conceptual Skills Models — These models emphasize the more complex "learning-to-learn" and problem solving skills.

*As indicated in Chapter Two, we arrived at this classification judgmentally, based on the stated goals and objectives of the models. Other classifications are possible, and the reader may wish to examine the patterns of effects achieved by other grouping of models; the necessary detailed information is presented in Volumes IV-B and IV-C. We follow this scheme because it yields some revealing and relatively stable patterns that illuminate the performance of Follow Through.

• Affective/Cognitive Models	These models focus primarily on self concept and attitudes toward learning, and secondarily on "learning-to-learn" skills.

The patterns that we have discerned are based on data gathered on children in Follow Through Cohorts II and III, entering-kindergarten (K) and entering-first (EF) streams. The children in Cohorts II and III entered Follow Through in 1970 and 1971, respectively. For each Follow Through group* in each project, and with respect to each of eleven test scores, our analyses asked, in effect, the question:

> "How much better did the Follow Through group perform than it would have performed if it had been outside Follow Through?"

Where it seems to have performed substantially better, we have indicated a positive effect; where less well, a negative effect. Where the difference was too small to seem educationally important, or where it was statistically insignificant and thus could easily be explained by differences among children within the group, we declared it to be a null effect.** Where

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*A "group" in these discussions comprises all the FT children in a model's local project in one of the four cohort streams (Cohorts II and III, each with entering kindergarten (K) and entering first (EF) streams). Responsive Education's Cohort III-K children in Duluth, for example, constitute a "group." The groups are the units of the effect averages reported in this chapter.

**Our criterion of "educational importance" or "material significance" was set at one-fourth of a standard deviation of the outcome variable. For those outcomes that possess national grade-equivalent norms, in the ranges of scores actually achieved by Follow Through children, this criterion corresponds to a difference on the order of two months of achievement. We also required "statistical significance" at the $p < .05$ level, in order to ensure that we did not draw undue conclusions from groups of inadequate size. In general, and most particularly in the entering kindergarten streams, the statistical criterion turned out to be the more stringent of the two; fully 25% of the null effects were "material" but not "significant," whereas only 5% were "significant" but not "material." We surmise that an extra year's attrition in the kindergarten streams may have diminished the numbers of children in the various groups sufficiently to reduce the power of our statistical tests in some cases and to create some tendency toward Type II error.

the character of the Follow Through group cast serious doubt on the validity of an estimate of untreated performance, we omitted the associated comparison from the summaries.*

As Chapter Four explains, we have estimated the performance of similarly-disadvantaged groups outside Follow Through by combining in several ways the available information on the NFT comparison groups. The averages that make up these summaries include two estimates of each effect: The "adjusted local effect," which in essence compares the Follow Through group with its own local comparison group, and the "adjusted pooled effect," which compares it against the total NFT sample. We performed similar analyses on all four cohort streams (with one important exception, the local and pooled adjusted effects for the Cohort III kindergarten stream are adjusted for preschool experience), taking the fullest possible account in each case of all the measured characteristics of both the Follow Through and comparison populations.** Except as noted all model averages and model type averages combine the local and pooled estimates of effects across all four cohort streams.

The patterns of effects are complex. Almost every model has at least one site in which the FT children performed better on some test than did the NFT children. The evidence indicates that some models have improved the test performance of children in some sites to national norm levels, but none has managed to achieve this high level of success consistently in all sites. In this chapter, we summarize the patterns of effects in several ways that make evaluative sense, but we do not pretend

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*We have omitted from these summaries all effects whose covariance adjustment was larger than one-half an outcome standard deviation.

**Average effects are computed by assigning a value of +1 to each positive effect estimate, -1 to each negative, and zero to each null, and then computing the simple mean of these values. The average effect is thus the number of positive effects, less the number of negative effects, divided by the total number of effects; in other words, it is the proportion of net positive effects. Average effects in the basic skills and cognitive conceptual skills domains are computed on a maximum of eight effect estimates per site/cohort stream group: two estimates of the effect on each of four test scores in each group. In the affective domain, we have only three scores, and so the averages are computed on a maximum of six estimates per group.

to have exhausted the information to be found in our results. The reader who wishes to impose other criteria of successful performance will find in Volume IIV-B all detailed information necessary to any further summaries.

We should not be surprised, of course, to discern variable results in a planned variation experiment: the model sponsors differ widely in their educational goals and emphases. Some believe, for example, that affective progress must precede academic progresss: that until children come to feel good about themselves and to accept responsibility for what happens to them, it is unreasonable to expect them to learn the basic and cognitive conceptual skills that school success requires. Under these models children are expected to make better academic progress after they develop a positive self-image. Other models -- the more behavioristic and/or academically-oriented ones -- hold that acquisition of basic and conceptual skills will provide success experiences which will improve the child's self-image and sense of control.

Although no model explicitly ignores any of the three outcome domains, each places primary emphasis on improving performance in one or two of them, as we have discussed in Chapter Two. When Follow Through began, each model confidently expected to have laid by third grade, in its own way, the foundation for continuing balanced progress in school performance. We now have the means to assess how well these diverse paths actually have led to the kinds of successes that the tests measure. We are in no position, of course, to extrapolate our findings to the children's future performance, particularly in terms of increased "life's chances."

The next section of this chapter discusses the answers to the questions raised at the beginning of this chapter and presents the various patterns of "effects" that the Follow Through models have achieved in their respective sites; the details of these effects are set forth model by model in Volume IV-B.

Do the Various Educational Strategies Being Tested in Follow Through Have Different Impacts?

Overall, Follow Through intervention has succeeded in raising some scores for some children, while apparently not doing so for others: merely to intervene is not to guarantee that test scores will rise. But nobody today seriously expects disadvantage, in all its variety, to yield

tamely to any know panacea or set of panaceas. One important motivation for the planned variation approach was the hope that by trying many kinds of intervention in many settings we might be able to learn what works under what circumstances. Do some models or types of models have importantly better effects than others? Five major findings bear on the answer to this questions.

Finding 1: The effectiveness of each Follow Through model varied substantially from site group to site group; overall model averages varied little in comparison.

No model has shown itself to be powerful enough to succeed everywhere it has been tried. Figure 5-2 indicates that eleven models had at least one group with a positive average effect on basic skills. That is, all but two models appear to provide a net benefit to some groups of disadvantaged children relative to other similarly disadvantaged groups. The same finding obtains in the other domains. Every model, on the other hand, had groups with negative average effects. In each model with more than three groups, the range of group average effects was wider than the total range of the thirteen model averages. Each model might have performed very differently in other sites: if each had been judged by its results in one site only, and that site had been diabolically chosen, the rank order of model averages could have been almost reversed. For this reason, we have taken care not to overinterpret small differences in averages or rankings among models. It is well that the Follow Through planned variation design called for each model to be implemented in a wide variety of places; without this diversity, we would not have been able to demonstrate so clearly the importance of local conditions.

Since each model discussed in this chapter has only a few groups (from 3 to 16), and since group averages vary widely within each model, each model's average depends heavily on the precise set of groups considered. Since, furthermore, most of the model averages for all groups are very close to zero and to each other, especially for the affective outcomes and, to a lesser extent, for the cognitive conceptual, one would expect the rank order of model averages to be substantially different in the total set of groups and in various subsets of it. Table 5-1

FIGURE 5–2
SITE AND MODEL AVERAGE EFFECTS IN THREE OUTCOME DOMAINS FOR THIRTEEN FOLLOW THROUGH MODELS ACROSS ALL COHORT STREAMS

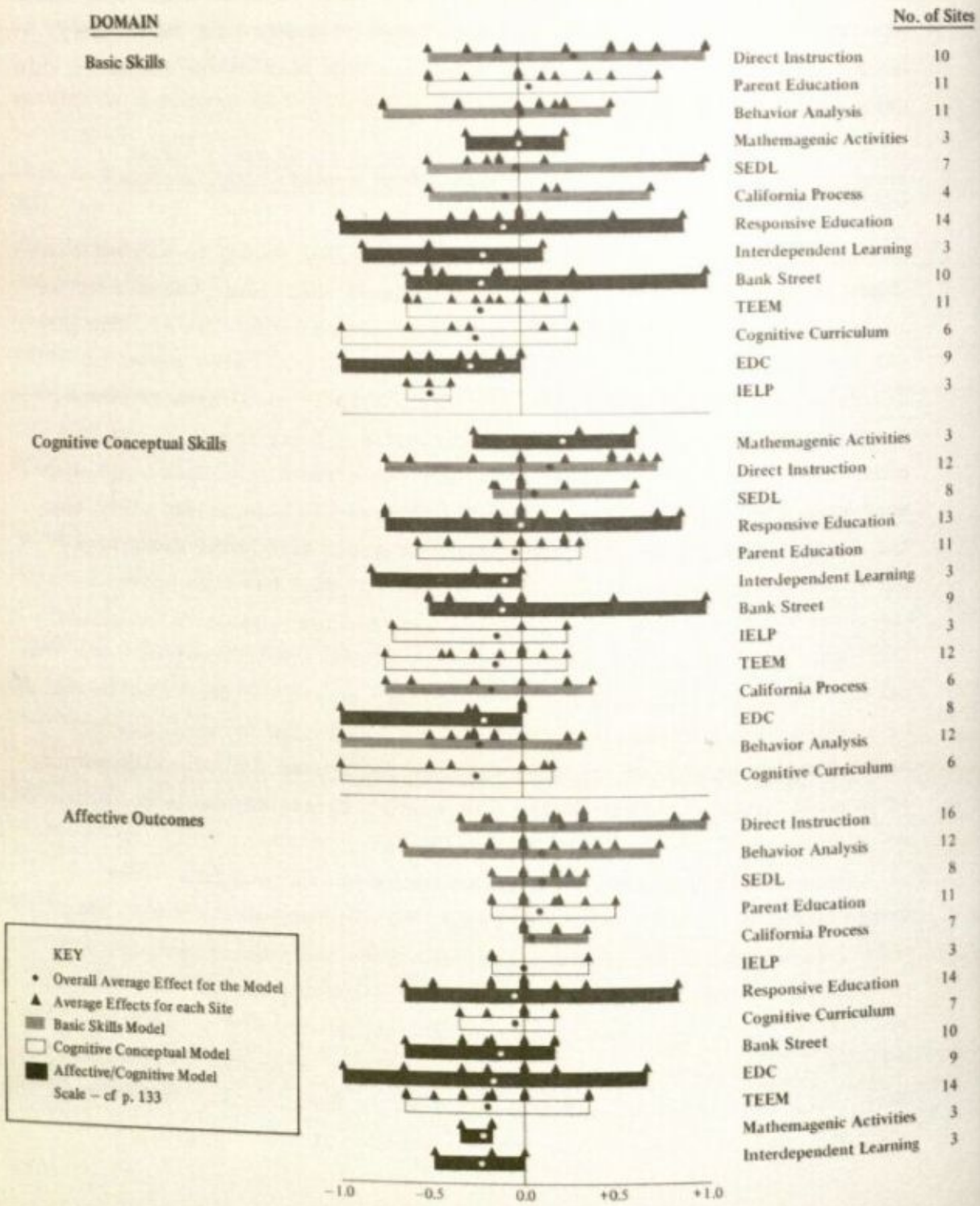


Table 5-1

RANKS OF MEAN SCORES IN THREE OUTCOME DOMAINS
FOR ELEVEN MODELS, FOR ALL GROUPS, AND
FOR COHORT III-K GROUPS ONLY

Model	Domain of Primary Emphasis	Outcome Domain: Basic Skills		Cognitive Conceptual Skills		Affective Outcomes		Number of Groups	
		All Groups	C3K Groups	All Groups	C3K Groups	All Groups	C3K Groups	All	C3K
Direct Instruction	Basic Skills	1	1	1	3	1	5	16	5
Behavior Analysis		3	2	10	8	2	4	13	7
SEDL		4	3	2	2	3	3	8	5
California Process		5	6	8	10	5	7	8	4
TEEM	Cognitive Conceptual Skills	8	9	7	7	11	11	15	6
Cognitive Curriculum		9	8	11	9	8	8	9	5
Parent Education		2	4	4	6	4	2	12	5
IELP		11	11	6	5	6	6	3	3
Responsive Education	Affective Outcomes	6	5	3	1	7	10	16	6
Bank Street		7	10	5	11	9	9	12	5
EDC		10	7	9	4	10	1	10	5
Group totals, Means of ranks by domain of primary emphasis	Basic Skills	3.3	3.0	5.2	5.8	2.8	4.8	45	21
	Cognitive Conceptual Skills	7.5	8.0	7.0	6.8	7.2	6.8	39	19
	Affective Outcomes	7.7	7.3	5.7	5.3	8.7	6.7	38	16
Spearman's ρ			.87		.61		.46		

shows the rank order of the mean scores of eleven models* in each domain as computed for all groups, and separately, for the groups in Cohort III-K only.**

To single out this subset of groups for special attention is, in an important sense, to give the models the best possible legitimate chance to show a positive effect, since Cohort III-K was the largest and best-documented cohort stream and also the latest, so that the sponsors had had the greatest opportunity to develop their models and implementation strategies.

With a few notable exceptions, the rankings for the Cohort III-K sites are fairly similar to those for all sites, but their similarity varies by model type and outcome domain. The basic skills rankings are substantially more similar (Spearman's $\rho = .87$) than those for cognitive conceptual skills ($\rho = .61$), which in turn are more similar than those for affective outcomes ($\rho = .46$). Much of the instability arises among the models that give primary emphasis to the affective outcomes, as Table 5-1 indicates. It is clear from Table 5-1 that EDC's effects, especially in the affective domain, were much more favorable in Cohort III-K than in the other cohort streams. On the other hand, Bank Street, another affective/cognitive model, had less favorable effects in Cohort III-K, especially in the cognitive domain.

Across all outcome domains and model types, the average model's rank in Cohort III-K differed from that in all groups by slightly less than two ranks, as Table 5-2 shows. As will be evident from more detailed summaries later in this chapter, the absolute values of the model averages are also very sensitive to changes in the set of groups being averaged. It would therefore be inappropriate to set a criterion level for model averages and to declare all models "successful" whose average effect over all groups exceeds the criterion: adding or subtracting very few groups could create whole new lists of "successful" models.

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*These eleven models are the ones that had at least three groups in Cohort III-K.

**These are, more precisely, those Cohort III-K groups on which we had the information necessary to carry out the preschool-adjusted analyses reported in detail in Volumes IV-B and IV-C and discussed from a methodological point of view in Chapter Four.

TABLE 5-2

INSTABILITY OF MODEL OUTCOME RANKINGS,*
BY MODEL TYPE AND OUTCOME DOMAIN

Model Type (Domain of Primary Emphasis)	Outcome Domain			All Outcomes
	Basic Skills	Cognitive Conceptual Skills	Affective Outcomes	
Basic Skills	0.75	1.50	2.00	1.42
Cognitive Conceptual Skills	1.00	1.25	0.50	0.92
Affective/Cognitive Outcomes	2.33	4.33	4.00	3.56
All Models	1.27	2.18	2.00	1.82

*The tabulated index of ranking instability is the mean absolute rank difference per model between the rankings in all groups and those in Cohort III-K groups only (cf Table 5-1).

Somewhat more stable comparative patterns emerge at a more aggregated level:

- Direct Instruction and SEDL are consistently in the top half (five ranks) of the rankings in all domains, both overall and in Cohort III-K. TEEM and Cognitive Curriculum consistently fall in the bottom half.
- Behavior Analysis and Parent Education are always in the top half in basic skills and affective outcomes, and Responsive Education in cognitive conceptual skills.
- California Process, Bank Street, and IELP vary near and below the middle of the rankings.
- EDC, as noted above, ranges from the top to near the bottom of the rankings, depending mainly on the cohort.
- Mathemagenic Activities and ILM, with only three site groups each, are inadequately represented for this sort of comparison.

But the main lesson of site variability is that the models are not powerful enough to countervail unmeasured site-specific determinants of outcomes. Any model can "fail" by having a group perform lower on a test than it would have without Follow Through. Nearly every model has shown that it can "succeed" in the sense of showing more positive than negative effects in some group.

Community size also appears to be a factor in the site variability we observe. As shown in Table 5-3, the Cohort III-K site groups are pretty well distributed over the matrix. But since there are only 58 sites in the Cohort III-K, hardly any cell of the model by community size (12 x 5) portion of the matrix has enough replications to lend any generalizability to the average effect by model. The only empty cell in the model type by community size breakdown, however, is in rural areas for affective sponsors. In general, there are few rural sites in this cohort stream. Each of the other 14 cells in the model type section of Table 5-3 has from one to seven sites. Figure 5-3 displays what there seems to be in the way of a community size effect. We have selected the model type by community size and all models by community size average effects for this display, combining the medium and small cities. There is a fairly strong tendency for the middle-sized communities to have better Follow Through performance from that experienced by either the very large or very small ones. The

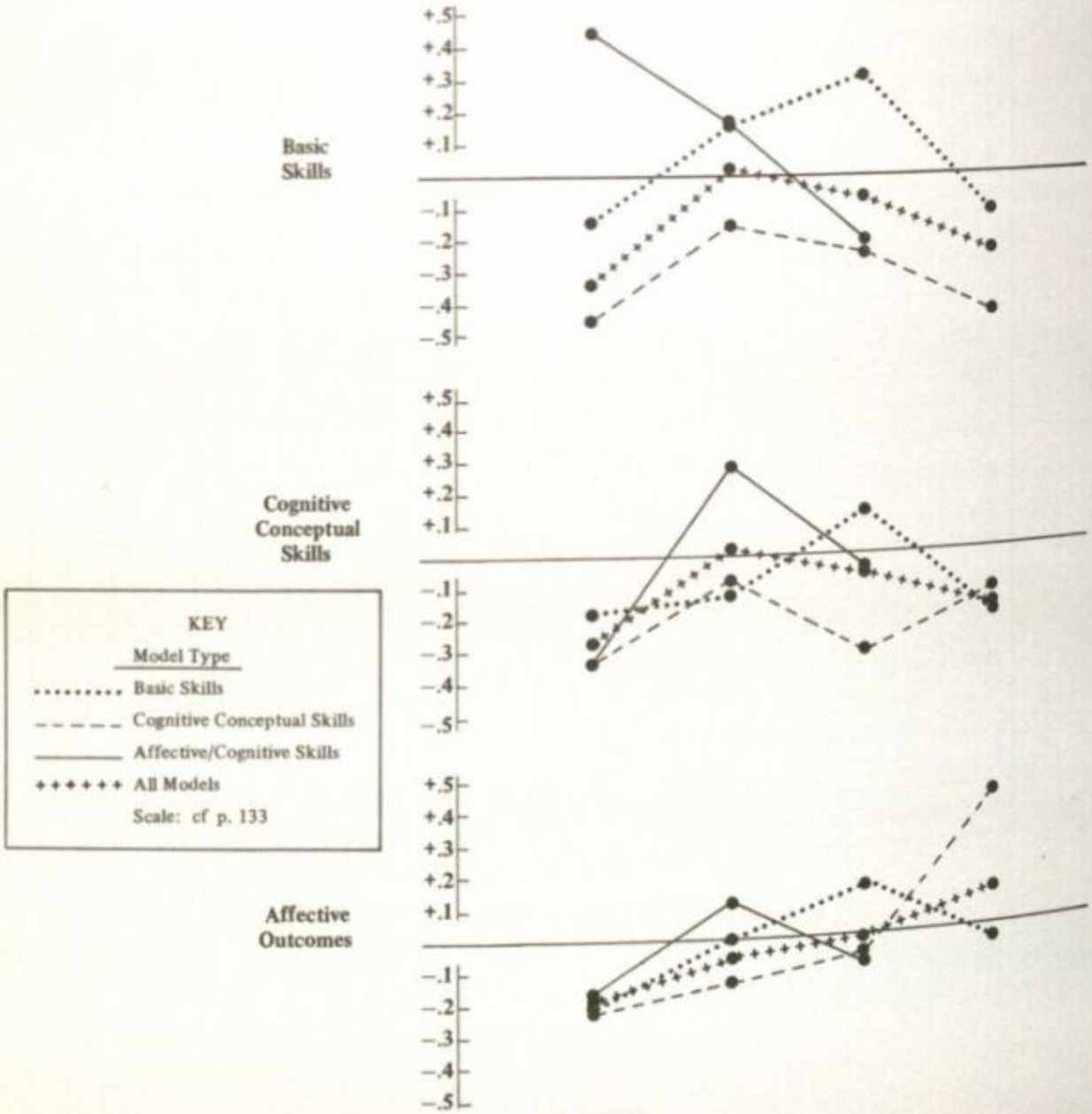
Table 5-3

NUMBER OF GROUPS FOR EACH COMMUNITY SIZE
IN THE COHORT III KINDERGARTEN STREAM

Model	Domain of Primary Emphasis	Community Size: New York & Philadelphia	Other Big Cities	Medium Cities	Small Cities	Rural Areas	All Sites
Direct Instruction	Basic Skills	1		3		1	5
Behavior Analysis	Basic Skills	2	2	2		1	7
SEDL	Basic Skills	1	1		1	2	5
California Process	Basic Skills		3		1		4
TEEM	Cognitive Conceptual Skills		3	1	2		6
Cognitive Curriculum	Cognitive Conceptual Skills	1	2		2		5
Parent Education	Cognitive Conceptual Skills	1	2		1	1	5
IELP	Cognitive Conceptual Skills		1		1	1	3
ILM	Cognitive Conceptual Skills	1	1				2
Responsive Education	Affective/ Cognitive Skills		2	4			6
Bank Street	Affective/ Cognitive Skills	2		2	1		5
EDC	Affective/ Cognitive Skills	1	1	2	1		5
Model Type	Basic Skills	4	6	5	2	4	21
Model Type	Cognitive Skills	3	9	1	6	2	21
Model Type	Affective/ Cognitive Outcomes	3	3	8	2		16
All Models		10	18	14	10	6	58

FIGURE 5–3
AVERAGE EFFECTS FOR COMMUNITY SIZE BY MODEL TYPE
AND FOR COMMUNITY SIZE BY ALL MODELS
FOR THE COHORT III KINDERGARTEN GROUPS

Domain	Average Effect	COMMUNITY SIZE			
		New York & Philadelphia	Other Big Cities	Medium & Small Cities	Rural



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strongest exception to that pattern appears in the affective performance of cognitive sponsors, but that cell includes only two sites.

This pattern is probably real, although hardly commanding. And given the reasonable distribution of community size across model types, even a much stronger pattern would not have much impact on the overall evaluation. A model that specialized in New York, Philadelphia, and the rural areas might indeed suffer relatively to other models that hewed to the middle ground. SEDL, for example, approaches such a distribution, and indeed its middle-sized sites generally had positive results whereas its big and little ones had negative results.

These examples strongly suggest that it is only when we aggregate even beyond the model level to that of the model type that really consistent patterns appear. Table 5-1 displays these patterns as means of ranks by domain of primary emphasis; they are more qualitatively apparent in Figure 5-2 as groupings of model types. We rest our principal conclusions, Findings 2 through 5 below, upon these patterns; Figure 5-4 displays them graphically.

The stability of the model type patterns is even more apparent in Table 5-4. Here we contrast the rankings shown in Figure 5-2 (which are based on our broadest set of results, incorporating two estimates of the Follow Through effect on each outcome in each group) with those which appear when we consider only the "more appropriate" of the two estimates of each effect.* The "more appropriate" rankings, although based on only half as many estimates and therefore presumably subject to more instability, correlate very highly with the overall rankings and actually sharpen somewhat the contrasts among the model types.

Finding 2: Models that emphasize basic skills succeeded better than other models in helping children gain these skills.

The four basic skills models ranked, on the average, substantially higher than did those of either of the other types with respect to their effects on basic skills test scores, as Figure 5-4 indicates. The groups of disadvantaged children served by these models have tended, moreover, to perform better on the basic skills tests than have similarly disad-

*Chapter Four discusses the criteria by which we selected the "more appropriate" analysis for the estimation of each effect.

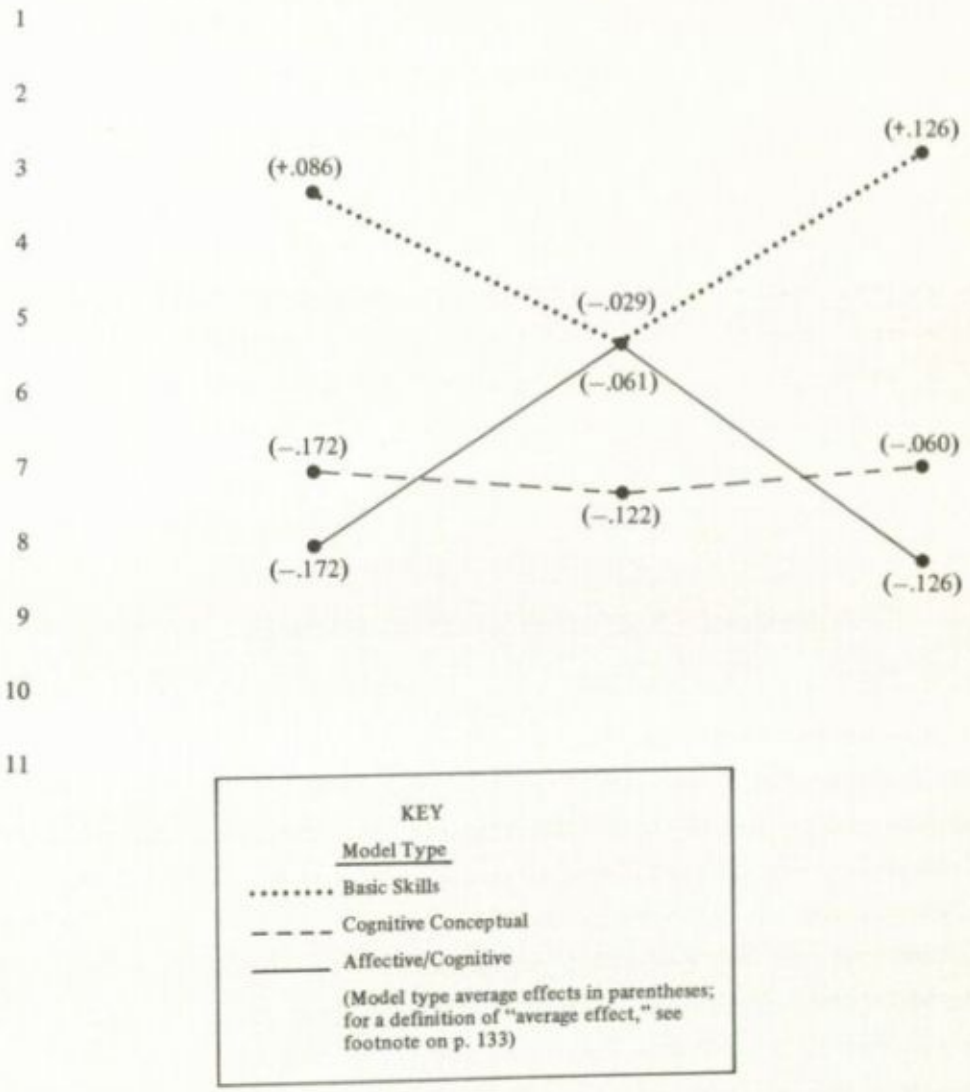
Table 5-4

RANKS OF MEAN SCORES IN THREE OUTCOME DOMAINS FOR ELEVEN MODELS: ALL ESTIMATES, AND THE "MORE APPROPRIATE" ESTIMATE FOR EACH GROUP

Model	Domain of Primary Emphasis	Basic Skills		Cognitive Conceptual Skills		Affective Outcomes	
		All Estimates	"More Appropriate"	All Estimates	"More Appropriate"	All Estimates	"More Appropriate"
Direct Instruction	Basic Skills	1	1	1	2	1	1
Behavior Analysis		3	4	10	10	2	3
SEDL		4	3	2	1	3	5.5
California Process		5	5	8	4	5	5.5
TEEM	Cognitive Conceptual Skills	8	8	7	8	11	11
Cognitive Curriculum		9	10	11	11	8	5.5
Parent Education		2	2	4	7	4	2
IELP		11	11	6	6	6	5.5
Responsive Education	Affective Outcomes	6	6.5	3	5	7	8
Bank Street		7	6.5	5	3	9	9
EDC		10	9	9	10	10	10
Means of ranks by domain of primary emphasis	Basic Skills	3.3	3.2	5.2	4.2	2.8	3.2
	Cognitive Conceptual Skills	7.5	7.8	7.0	8.0	7.2	6.0
	Affective Outcomes	7.7	7.3	5.7	5.7	8.7	9.0
Spearman's ρ		.98		.84		.91	

FIGURE 5–4
AVERAGE EFFECTS AND PROFILES OF MEAN RANKS
FOR THOSE EFFECTS IN THREE OUTCOME DOMAINS
FOR THREE MODEL TYPES IN COHORT III KINDERGARTEN

Mean of Model Ranks	DOMAIN		
	Basic Skills	Cognitive Conceptual Skills	Affective Outcomes



vantaged groups outside Follow Through, as evidenced by the positive overall average effect for this model type: the excess of positive over negative effects amounted to 9.2% of all trustworthy effects estimates for these models. Figure 5-2 indicates also that the Direct Instruction Model of the University of Oregon, a basic skills emphasis model, had a distinctly higher average effect on basic skills scores than did any other model, of whatever type.

On the other hand, only two of the four basic skills models achieved a positive balance of basic skills effects, although all four were among the top six in the ranking. Also in the top six were one cognitive conceptual model, Parent Education, with a positive average effect, and one affective/cognitive model, Mathemagenic Activities, whose positive and negative effects just balanced each other out.

It is reasonably clear from these results that if an educator is aiming primarily at enhancing spelling, vocabulary, and arithmetic computation skills, one of the basic skills models would be a better bet than the others. Our earlier finding of wide site variability still holds, however: even the model with the best track record had more than one site in which the Follow Through children did less well, on the average, than we estimate they would have done if they had been outside Follow Through. Unmeasured local circumstances, including those associated with implementation, still have had more influence on results than have the philosophies of the models' sponsors.

Finding 3: Where models have put their primary emphasis elsewhere than on the basic skills, the children they served have tended to score lower on tests of these skills than they would have done without Follow Through.

Except for Parent Education and Mathemagenic Activities, mentioned above, all models other than the basic skills models showed more negative than positive effects on basic skills scores. For the cognitive conceptual models, the excess of negative over positive effects was 17.2% of all trustworthy effects; for the affective/cognitive models, it was 19.0%. It appears that the NFT children are receiving educational experiences that teach them the basic skills by third grade more effectively than would the compensatory programs offered by Follow Through. The educational theories of some of the Follow Through sponsors predict, to be sure, that the traditional

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academic benefits of their interventions should become evident over the long term, not necessarily by third grade; some, indeed, doubt that the kinds of educational outcomes measured by the basic skills tests will ever be important to the "life chances" of children. Be that as it may, instruction in the cognitive conceptual and affective domains does not seem to have transferred to improved basic skills test scores; the reader's value system will govern his judgment of the seriousness of this finding.

Finding 4: No type of model was notably more successful than the others in raising scores on cognitive conceptual skills.

As Figure 5-2 shows, each of the three model types is well distributed over the range of model average effects on cognitive conceptual scores; if any of the three is less effective than the others, it is the type that aims primarily at enhancing these skills. Only three models (two basic skills and one affective/cognitive) show more positive than negative effects in this domain. The basic skills models, relatively successful in their "own" domain, cluster near both extremes of the cognitive conceptual ranking. No model type has an overall average positive effect. Since our measures of this domain include tests of such important and complex skills as reading comprehension and problem solving, the relative infrequency of positive results is a serious matter. Direct Instruction's basic skills emphasis, and that of SEDL as well, seem to have transferred to a relatively respectable showing on the more advanced cognitive conceptual outcomes, as has the affective/cognitive approach of Mathemagenic Activities. If the cognitive conceptual models are to enhance test scores in their domain of principal emphasis, the results have not shown up by the end of third grade.

Finding 5: Models that emphasize basic skills produced better results on tests of self-concept than did other models.

On the average, children served by basic skills models have performed substantially better on the Follow Through tests of self-esteem and achievement responsibility than have the children in the models that aim directly to develop these outcomes, as Figure 5-4 indicates. Improved basic skills scores, where they have been achieved, do not seem to have been bought at the price of reduced scores in the domain of feelings and

motivation. It appears that those models which provide children with success and non-threatening failure experiences in the course of achieving small, "bite-sized" goals have demonstrated that, consistently with the theory espoused by some of these models, the success experience transfers into a demonstrably improved self-concept, in terms of the measures in the Follow Through outcome battery.

The foregoing findings reflect very clear general patterns in the Follow Through data. An additional observation of some substantive interest also bears on the question of site variability and permits us to control for much of that variability. This observation, and the rest which follow in answer to the two remaining questions, seem to hold, but with less certainty and generality.

Finding 6: Model comparisons in New York and Philadelphia yield results which are similar to those found in overall comparisons.

The performance of models in "big cities" (New York and Philadelphia) permits us to compare models with less concern with the confounding of site variability. Our data on children in the Cohort II-K and III-K streams of the Follow Through evaluation permit us to study model effectiveness in two big cities--New York and Philadelphia. Figure 5-5 presents model average effects (designated by a •) and big city average effects * (designated by a o) for basic skills, cognitive-conceptual skills, and affective measures.

From these figures we see that the patterns of effects in New York and Philadelphia are similar to the overall patterns. That is, Direct Instruction performs better than other models in basic and cognitive conceptual skills, in its big cities and (with the exception of SEDL) overall. While the patterns of model effects in big cities are similar to overall model effects, the absolute level of effectiveness differs. Most models were less effective in New York and Philadelphia than in other sites. This holds for basic and cognitive-conceptual skills, but not as strongly for affective outcomes.

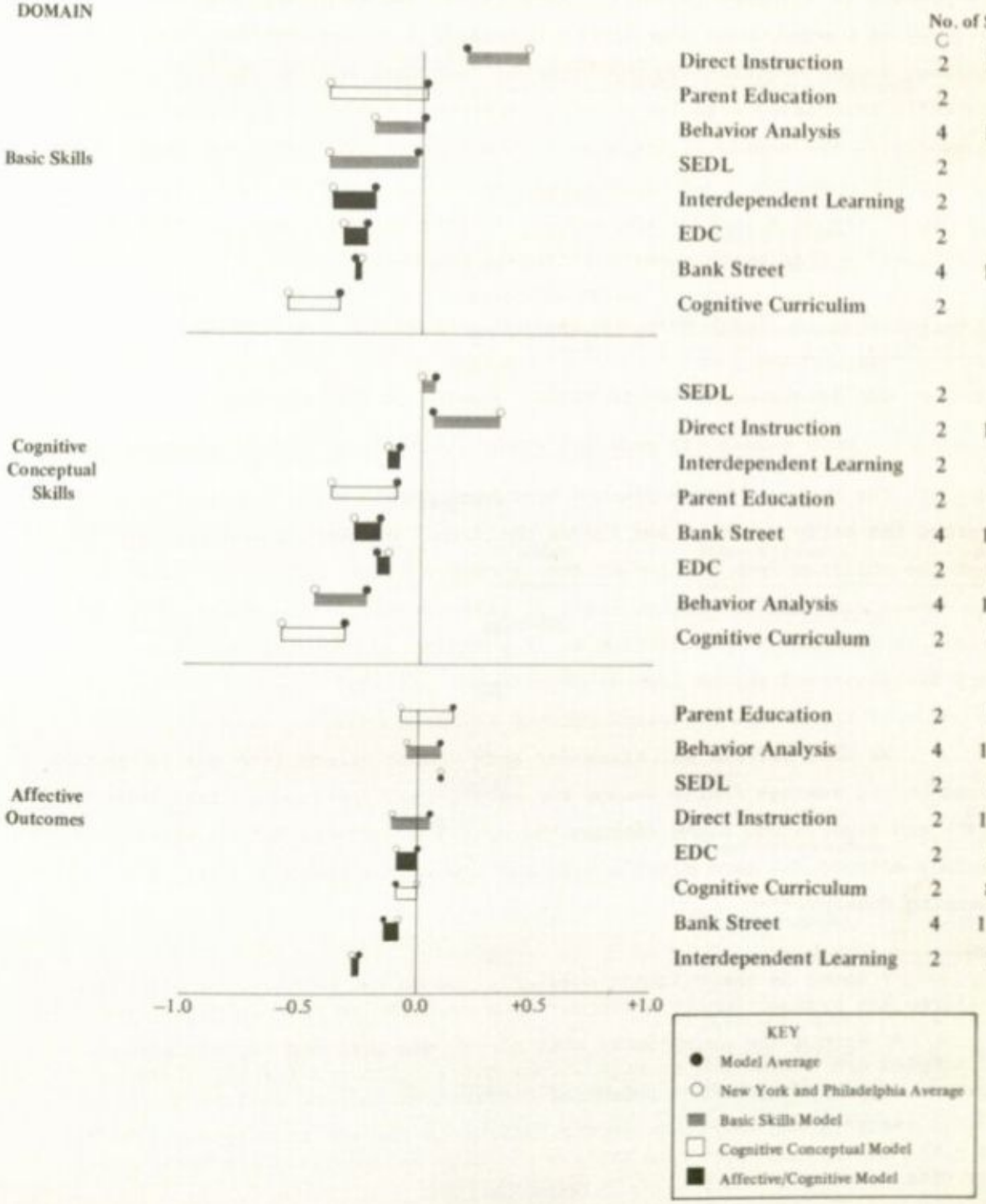
These findings suggest that there may be characteristics of large cities that make it particularly difficult for the models of compensatory education included in Follow Through to be as effective as they might be.

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* Model average effects are aggregated across Cohorts II and III kindergarten streams; big city average effects are aggregated across New York and Philadelphia for Cohorts II-K and III-K.

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FIGURE 5–5
NEW YORK AND PHILADELPHIA AVERAGE EFFECTS
AND MODEL AVERAGE EFFECTS IN THREE OUTCOME DOMAINS
FOR COHORTS II AND III KINDERGARTEN



The organization and operation of a big city school system may pose a major problem for the implementation of new educational approaches. Characteristics of large city systems which are either not present or are present to a lesser extent in other cities and which may make the delivery of a model's program difficult include high teacher turnover, teacher strikes, formal negotiations over teacher contracts and the bureaucracy generally associated with large school systems. A model must be organized to deal with the continual training of teachers and the problems of operating its program under the conditions cited above. We might therefore view the big cities as a test of the model's ability to adapt to often adverse conditions, a test which appears difficult to pass.*

Do Differences in Impact Have Any Relationship to the Characteristics of Children, e.g., Socioeconomic Status and Preschool Experience?

Our data suggest two tentative answers to this question.

Finding 7: Some models are more successful in their most disadvantaged sites.**

The Follow Through planned variation models were designed to improve the performance of low income children. However, one might expect that the children from the lowest socioeconomic backgrounds would present the models with their severest tests of effectiveness. Our analyses do not permit us to address the question as it pertains to types of children; i.e., very disadvantaged versus less disadvantaged. We can, however, address it in terms of the groups of Follow Through children found in each site.

We have divided all sites for each cohort stream into two categories based on the average family income for each site: low-income (designated by a ↓) and high-income sites (designated by a ↑). Figure 5-6 shows the average effects for each model's high and low income sites on the three learning domains.***

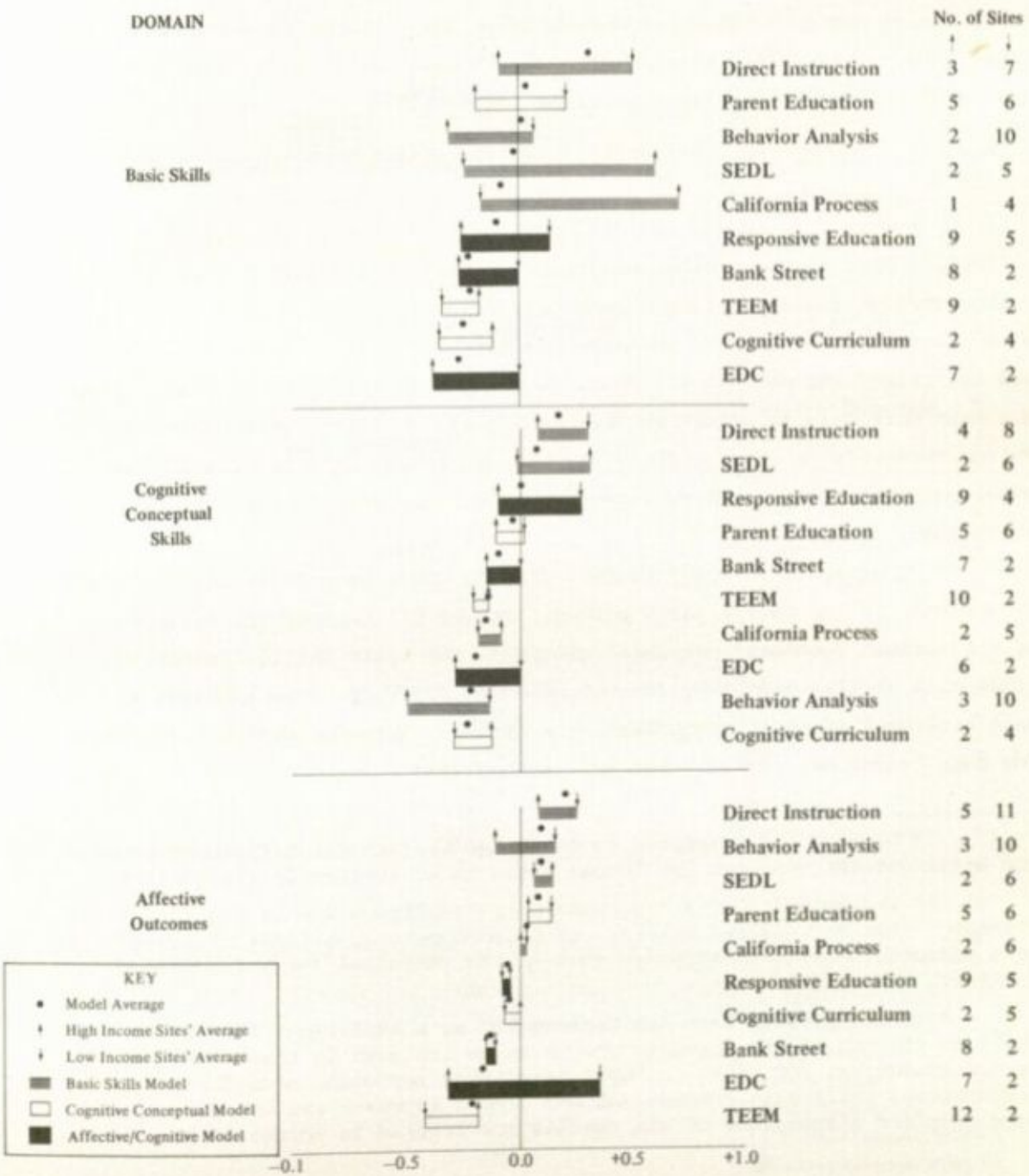
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* Based on the evidence available, we do not believe the big city children are systematically different from children in non-big city sites.

** With a few exceptions, most of the New York and Philadelphia FT samples are classified as high income sites. Incomes for all sites, however, are unadjusted for potential differences in cost of living.

*** With the exception of the California Process high income sites (N = 1), all models' averages for low and high income sites are based upon the site means from two to twelve sites.

FIGURE 5–6
AVERAGE EFFECTS IN THREE OUTCOME DOMAINS FOR MODELS
AND THEIR LOW INCOME AND HIGH INCOME SITES ACROSS ALL COHORT STREAMS



Six models (Direct Instruction, Parent Education, Behavior Analysis, Responsive Education, Bank Street, and EDC) have higher average effects in the low-income sites than in the high-income sites for both the basic skills and cognitive conceptual domains.* On the affective measures, six models (Direct Instruction, Parent Education, Behavior Analysis, California Process, Bank Street) have higher average effects in their most disadvantaged sites. That is, approximately half of the Follow Through models (with more than three sites) are most effective when helping the children in the most disadvantaged communities, demonstrating that some models can be effective with groups of children from very low income families.**

Finding 8: Two models are consistently more effective with Head Start children.

Follow Through was designed originally to follow through on children's Head Start or other comparable preschool experience. In general, Follow Through and non-Follow Through children who attended Head Start are more disadvantaged than the children who attended other preschool or who did not attend any preschool. Thus, we want to ascertain if Follow Through has been particularly effective with Head Start children, both because of Follow Through's original purpose and because it provides us with another opportunity to explore Follow Through's effectiveness with the most disadvantaged.

We explored Follow Through's effectiveness with different preschool groups only in the Cohort III-K stream. Figure 5-7 depicts the performance of the various sponsors' preschool groups in the basic skills, cognitive conceptual skills, and effective outcomes respectively. The location of each preschool group is designated by a letter: (H)--for Head Start, (S)--for Some Preschool, and (N)--for No Preschool.***

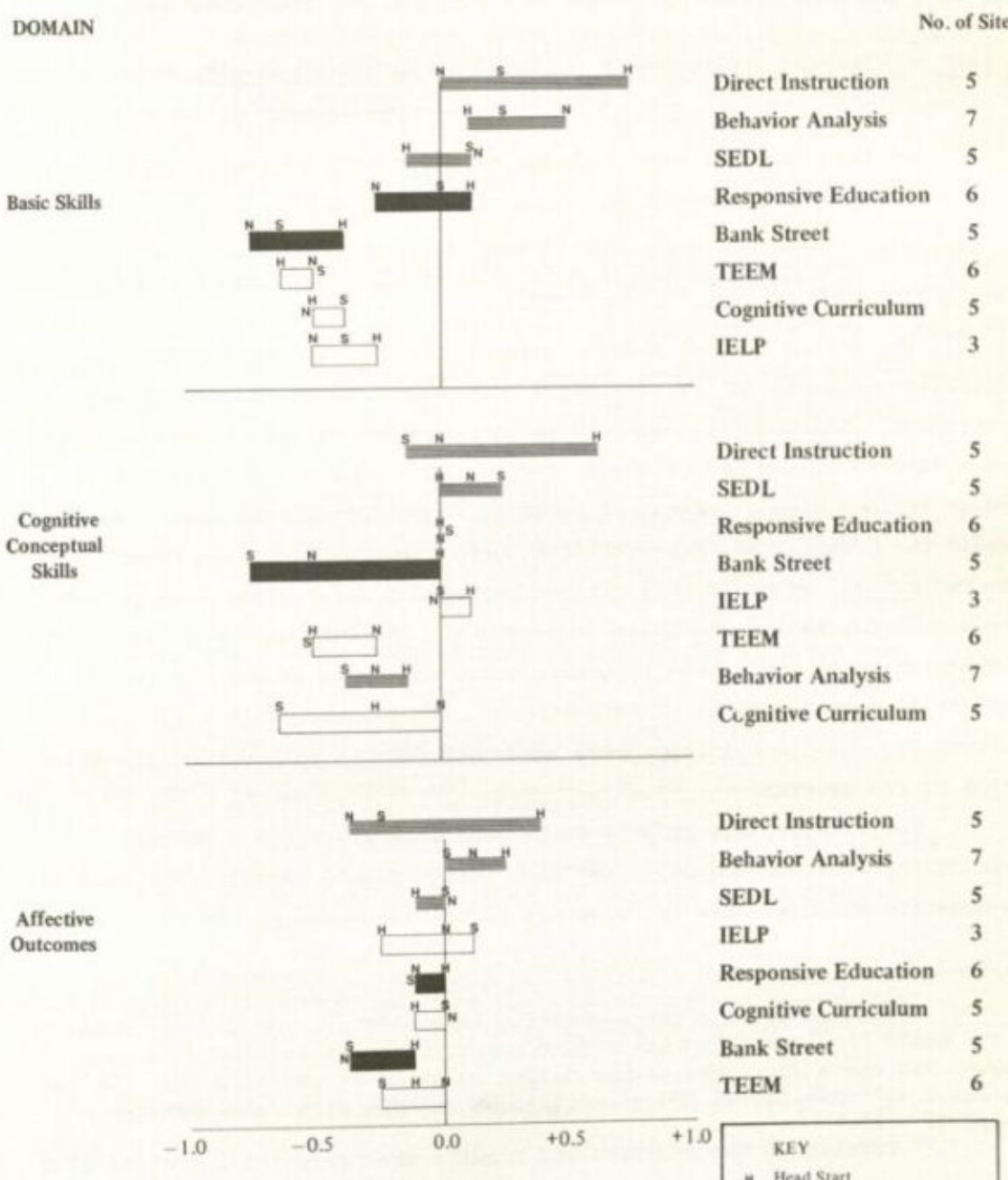
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* We have not attempted to determine whether the difference between the means for the high and low income sites is statistically significant.

** The question of a "regression artifact" applies to the site-level effects. This discussion, however, is based upon aggregations of trustworthy site effects, thereby eliminating most of the potential for a regression artifact.

***Some sponsors were not represented by a sufficient number (30) of children in each of the specific groups to be included in these analyses. Parent Education, EDC, ILM, Cultural Linguistic Approach, Home-School Partnership, California Process and New School Approach are not discussed. More complete discussions of the results are located in Volume IV-B.

FIGURE 5–7
AVERAGE EFFECTS IN THREE DOMAINS FOR MODELS
AND THEIR THREE PRESCHOOL GROUPS FOR COHORT III KINDERGARTEN



Only a few models produced differential effects across preschool groups.* Direct Instruction and Bank Street are consistently more effective with the Head Start children than with other preschool groups across all three domains. Behavior Analysis appears to be more effective with the No Preschool group in basic skills. TEEM and Cognitive Curriculum appear to be more effective with their No Preschool groups in the Cognitive Conceptual domain.

Do Some Educational Strategies Consistently Show Better Results than Others Over Time, or Does the Impact Vary from Year to Year?

We have examined this question from two perspectives, longitudinally and across Cohorts II and III, reaching two conclusions:

Finding 9: Most models are more effective during kindergarten and first grade than during second and third grade.

The Follow Through models place varying degrees of emphasis on the acquisition of basic skills, cognitive conceptual skills, and affective development. Although all sponsors expected to demonstrate effectiveness in all domains by the end of third grade, we can expect the models to produce various time sequences of progress in achieving this goal. We have divided the progress of these children during the course of the program into two parts: progress during kindergarten and first grade (early) and progress during second and third grade (late). A study of the progress of FT children during these two intervals shows that most programs produce substantial progress early on math measures.** However, only a few of the programs are able to maintain these early benefits in math during the later period of the program.

The reading area appears to be much less tractable. Direct Instruction, Behavior Analysis, and Bank Street models produce predominantly non-negative effects, that is, progress in reading which is either greater

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* The number of effects entering into each average is very small (8 for Basic Skills and Cognitive Conceptual, 6 for Affective). We only discuss instances where the groups differ on at least two effects. (On the figures a differential of two effects is shown by a difference between groups of .25.)

** Details of the analysis and results are presented in Volume IV-D.

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than or equal to the progress of comparison children. Only the children associated with the Direct Instruction Model appear to perform above the expectation determined by the progress of the non-Follow Through children. Moreover, the Direct Instruction children are the only group which appears to make more progress in reading, both early and late. In general, most models appear to be more effective during kindergarten and first grade than during second and third grade. The Direct Instruction Model is the only program which consistently produces substantial progress.

Finding 10: Some Follow Through sponsors grew in effectiveness over time.

Although we have not been able to determine the degree of treatment implementation, we might surmise that implementation should improve over time, and that a model's effectiveness should be related to the length of time a sponsor has spent in a site. Models encounter many problems in the development and implementation of an educational approach. These include:

- problems of model development - In order to produce its intended outcomes, an educational approach must be based on a theoretical orientation and must have developed a curriculum which can be used to operationalize that theory in the classroom. According to early planners of Follow Through, many sponsors initially labored under the problem of imprecise program definition and needed time for the formative development of their models.

- model-specific implementation problems - Once a theory and supporting curriculum have been developed, the program must be operationalized in a variety of classroom settings.

  The sponsor must develop precise methods to train teachers in the effective delivery of their model, gain acceptance by the community, and enlist the support of parents and school administration.

- site-specific implementation problems - In addition to model specific difficulties, such external site-specific factors as high teacher turnover (necessitating continual retraining), teacher strikes, busing for desegregation, fires in school buildings, etc., all contribute to a model's implementation problems.

We have the opportunity to study model effects over time by examining data on twelve models which implemented their programs in a total of thirty-six sites in both Cohort II-K and Cohort III-K.* One would expect the adverse effects of model development problems and model-specific implementation problems to diminish from one cohort to the next, as the sponsors gained experience. We therefore expect to find greater model effectiveness in Cohort III-K than in Cohort II-K.

Figure 5-8 presents model average effects for cross-cohort sites in Cohort II-K (designated by a •) and Cohort III-K (designated by a →) for basic skills, cognitive conceptual skills, and affective outcomes. The direction of the arrow specifies whether the model increased or decreased in effectiveness.

We can see a tendency to improve across time for those models which performed differently across the two cohorts on basic and cognitive conceptual skills. On the other hand, most models did not do as well in Cohort III-K as in Cohort II-K on affective outcomes. Two other patterns in the data are apparent. First, the strongest performers on basic skills in Cohort II-K (Direct Instruction, Parent Education, California Process) showed little change in Cohort II-K. This pattern is not evident in the cognitive conceptual and affective areas. Second, the weakest performers in Cohort II-K (EDC, Home-School Partnership, Cognitive Curriculum, and Responsive Education) improved substantially in Cohort III-K on both basic and cognitive conceptual skills.

These findings suggest that the length of time that a model is active in a site was moderately related to its effectiveness as assessed by basic and cognitive conceptual skills measures. Those models which appeared weaker in Cohort II-K were most easily able to improve their effectiveness, while the models which performed relatively well early in Cohort II-K did not improve as much.

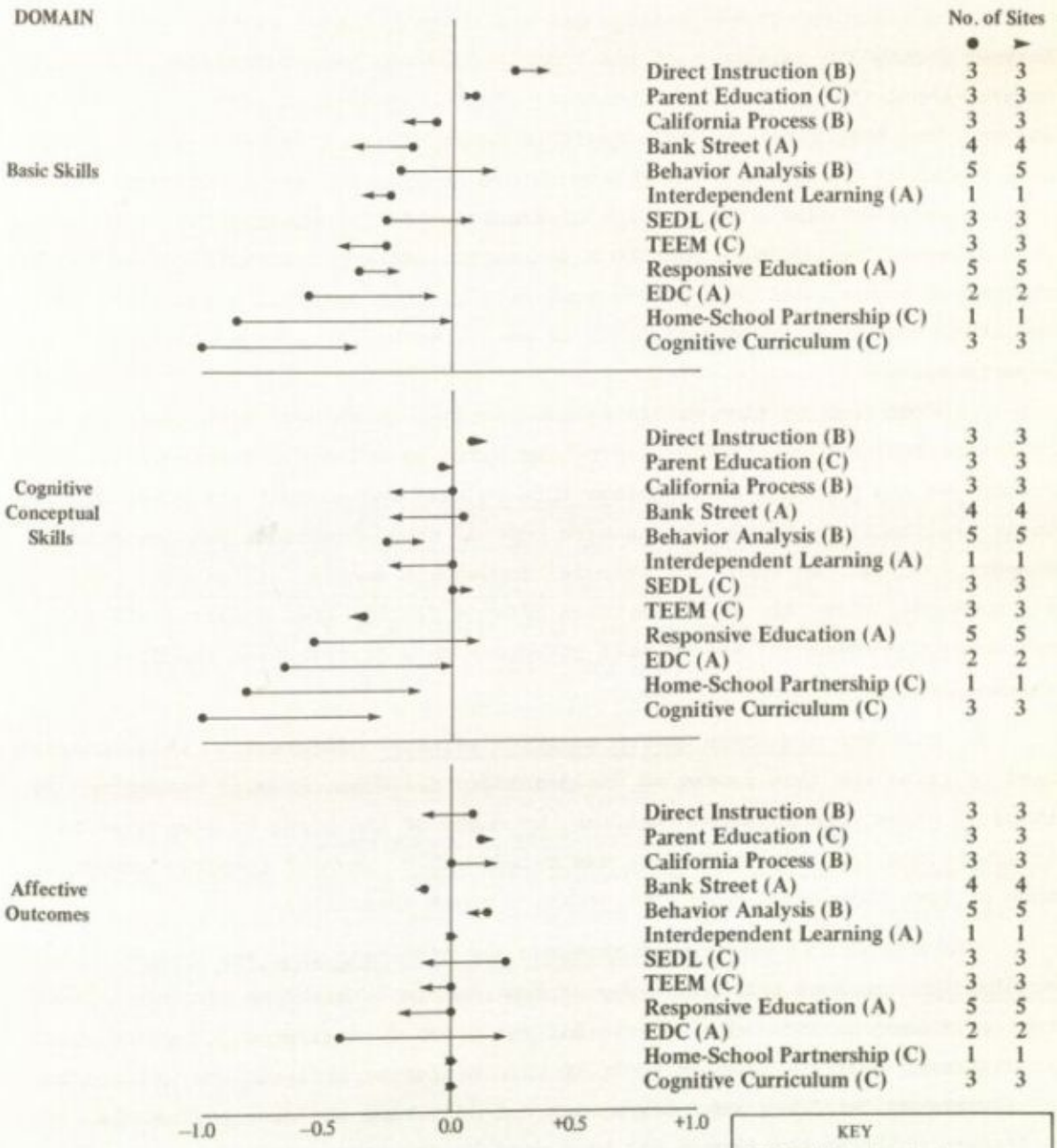
What Follows from These Results?

Let us finally reiterate that this report is by no means a comprehensive evaluation of the national Follow Through endeavor. To be sure, we

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* We have compared the effects from analyses of Cohort II and Cohort III which were not adjusted for preschool.

FIGURE 5–8
AVERAGE EFFECTS IN THREE OUTCOME DOMAINS FOR THE MODELS
IN COHORT II KINDERGARTEN AND COHORT III KINDERGARTEN



have examined a sizable number and variety of outcomes, and we have done just about all that the data and the state of the analytic art allow in order to find out why the results turned out as they did. We should be most surprised if further analysis of these data were to yield qualitatively different conclusions to anybody in the future.

But our report has really more the character of a report card than that of a complete catalogue of all that is good and bad, successful and unsuccessful about Follow Through. Sponsors, project leaders, parents, teachers, and children have other valuable insights to provide. Those who have to make practical decisions about Follow Through would be mistaken to base their actions on only a part of the available evidence, whether our part or another. They would be equally mistaken to ignore our results: seen in the proper context and interpreted judiciously, they embody a unique part of the history from which we must learn if we are to build upon our collective experience.

From time to time we are asked questions which bear upon the believability and generalizability of the patterns we have presented here. Perhaps we can best put our findings into context and delimit the range of their applicability by discussing here some of these questions and our best answers to them. We find, for example, across all models, all groups, and all measures, there are fewer positive effects (12.8%) than negative (19.6%) and a preponderance (67.6%) of null effects. This distribution immediately raises three questions:

1. Why are there so few positive effects? Apparently, it is genuinely hard to raise the test scores of disadvantaged children, even in comparison to those of other disadvantaged children, by means of the kinds of compensatory interventions that Follow Through has tried. Why? Several possible answers, more or less consistent with each other, suggest themselves.

a. Disadvantaged children are different from the general population. Much of the philosophy of some models is based on the proposition that different children should have different educational experiences directed at different objectives which imply in turn different criteria for evaluation. Disadvantaged children, some argue, are not defective children but merely different children who should not be judged by the same standards as other children. In our view, this argument amounts to a concession that compensatory

education might not have the power to enable its clients to compete successfully with their peers in the nation at large. Be that as it may, our evaluation has undertaken to apply a uniform standard to all the diverse manifestations of Follow Through.

b. It is difficult to implement change in the functioning of institutions by means of intervention from the outside. Efforts to innovate in schools, even spearheaded by well-placed insiders, are often frustrated by the overt or covert unwillingness of teachers, parents, pupils, administrators and others to change accustomed ways of carrying out the business of education. Abundant anecdotal evidence attests to the wide variety of problems that the sponsors have faced in trying to implement their models in the sites. Any extensions of Follow Through to other districts, however, would probably encounter analogous circumstances, and so we are confident that our findings reflect the outcomes one might expect from a broader Follow Through program, even though the available evidence on the particular implementation difficulties to date was too unsystematic to contribute directly to the findings.

c. In some Follow Through models, children get very little practice in test-taking. Several models make it a point to shield children from evaluative testing. Other models, however, provide ample opportunities for children to develop test-taking skills and to develop familiarity with items similar to those found on standardized tests. Therefore, one would not be surprised to find many FT children doing less well on the tests in the outcome battery, relative to an NFT standard, than do the FT children more accustomed to test-taking.

d. Disadvantage is resilient. Implicit in much of the early thinking which led to Head Start and Follow Through was the idea that disadvantaged children were like a compressed spring: if an educator could merely remove whatever obstacles prevented children from realizing their potential, then they would in the normal course of events expand and stay expanded, barring further negative intervention from outside. When it was alleged that Head Start gains tended to decrease over time, two possible explanations arose: (a) public schooling destroys the benefits of Head Start, re-compressing the spring, as it were; or (b) disadvantaged children are not like compressed springs, but rather like shorter springs that are already at their equilibrium state: if intervention expands them, they tend

to return to their normal position in the absence of continuing effort to keep them stretched. Follow Through was designed to cover both of these possibilities, by improving the performance of the public schools and by extending the compensatory effort in time. The results of the present Follow Through evaluation effort are consistent with the idea that whatever the forces may be which cause and maintain low test performance among children from families of low socioeconomic status, many of the compensatory interventions that have been tried to date are not strong enough to countervail them. That is, the models appear to be less effective in raising test scores than originally expected.

2. Why are there so many negative effects? The advocates of Follow Through did not enter upon the program with the expectation that compensatory services with firm theoretical foundations, implemented by concerned professionals, over a considerable period of time, at substantial cost, and with the active cooperation of the parents of the children being served, could be detrimental to children. How, then, do we explain the fact that we find half again as many negative effects as positive? The question is worth asking, if only to provide another opportunity to make clear what the results really say.

The outcome tests were designed to assess performance with respect to the traditional objectives of schooling, pursued in the usual ways. They are not necessarily the best possible tests of performance with respect to the more innovative objectives of some Follow Through models. In many cases, the measured objectives do not match the objectives of these models. For example, there are models which place little emphasis on mathematical skills, choosing instead to focus on the development of higher-order conceptual skills and expecting math proficiency to follow later, once the child has "learned to learn." Such a program would tend to divert the child's attention from the basics and thus confer a relative advantage in that field upon the comparison group; our evaluation would detect a "negative effect." To interpret such a negative effect in a positive light, one would have to show that (a) the FT children gain more of the higher-order skills than do the NFT, and (b) the higher skills actually do transfer eventually to the basic proficiencies. Up to third grade, and judging by the measures in the Follow Through battery, we have found little evidence of such a process.

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One's interpretation of our findings will therefore depend on one's educational values and objectives: if one believes that the primary function of schooling is to enhance the kinds of skills that the tests in this outcome battery measure, then the results justify a conclusion that Follow Through has been, in a minority of cases, a less productive experience than traditional schooling would have been. If, on the other hand, one believes that other broader objectives are more appropriate, and that our instruments do not measure those objectives, then one could speculate--or adduce independent evidence--that these negative results may be offset by progess on other unmeasured outcomes. Our results cannot confirm or deny that possibility; they bear only on the evaluation of Follow Through with respect to traditional criteria.

3. Why are there so many null effects? To balance the picture, let us also note that most of the effects are null. That is, as determined by the analyses, most Follow Through groups have performed neither better nor worse than expected of similarly disadvantaged non-Follow Through groups on the tests administered at the end of third grade. There are at least three possible explanations for the null effects:

a. FT and NFT may not be very different in practice:

- NFT children generally receive assistance from Title I and other programs, and so we have clearly not compared Follow Through to "the absence of compensatory education."
- In some locations, there is evidence that NFT classrooms have picked up FT techniques and materials from enthusiastic FT participants, thus muddying the practical distinction between treatment and control.
- Finally, implementation difficulties may have kept the Follow Through models from making as much difference as they would have wished.

To the extent that any of these arguments explain the preponderance of null effects, however, the evaluative implications for Follow Through seem rather negative. If Follow Through is worth what it costs, it should be more productive than other, generally less expensive, compensatory programs. If technology transfer in the teachers' lounge is all it takes to wipe out the difference between FT and NFT, then simpler and less expensive dissemination

procedures than sponsorship ought to suffice to spread the benefits of Follow Through throughout the nation. And if a program cannot be put into practice, what real value does it have?

b. FT and NFT may be very different, but both ineffective.

Our best evidence of the ineffectiveness of NFT is the oft-cited tendency of disadvantaged children to fall farther and farther behind their more advantaged peers. If this pattern holds for the NFT groups--and we have made no direct test of the hypothesis--then our comparative results suggest that it also holds, and slightly more often, for the FT groups. Our best interpretation of the large number of nulls is the same as for the small number of positive effects: it seems to be hard to make a difference.

c. The tests of differences may not have been powerful enough. By reason of small sample sizes within some sites, in fact, our analyses were sometimes not sensitive enough to detect all of the effects which may actually exist; the footnote on page 132 discusses the extent of this problem.

4. Did we study the right outcomes? Our results comprise evidence on the effectiveness of Follow Through intervention of various kinds in helping disadvantaged children to score better on tests of several academic skills, self-concept, and achievement responsibility than they would have done without Follow Through. Some of the models' sponsors place high priority on the skills tested, and some do not. To the extent that the tests overlap the models' objectives, our results provide evidence on the models' success in attaining those objectives. But whether or not we have anything to say about the models' achievement of their own goals, we do have some important findings about their performance with respect to some rather widely-accepted (if controversial) criteria. We have simply laid several uniform measuring sticks up against each member of a very diverse set of educational situations. Our report describes such apparent program effects as we have discerned in each measured domain; the reader must decide whether there was any reason to expect effects and what judgments about the programs properly follow.

We should also point out that, as in all social science--or in any other kind of science, for that matter--the designers of Follow Through had to live with a pervasive trade-off between relevance and measurability. The characteristics one would most like to know can usually be measured only

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indirectly, approximately, and at great cost. Anything the evaluator can actually get at will always find somebody to call it the "wrong measure." In our judgment, the Follow Through design and instrumentation represent as good a resolution of this trade-off as the political and methodological climate of the 1960's would give one any reason to expect. Even with the experience of the intervening decade, it is not obvious that anybody is in a position to do importantly better.

5. Were the outcomes measured adequately? Again, the measures in the Follow Through battery were the best available at the time that instrumentation decisions had to be made. Some mid-stream instrument changes were made, at some cost to the longitudinal integrity of the evaluation. As in any large-scale data collection effort, especially a long-term one in a mobile population beset here and there with serious social unrest, the testing and interviewing process encountered many practical difficulties. Abt Associates was not a party to the data gathering, but the quality of the of the data we have received over the years from the Stanford Research Institute bespeaks a high level of care and ingenuity devoted to overcoming those difficulties.

Here and there throughout the report, we have remarked that the basic skills test scores have tended to correlate more highly with other measured characteristics than have the scores on cognitive conceptual skills, and both more highly than the affective scores. It is not surprising that the simplest and most concrete outcomes, such as spelling, computation, and vocabulary, would be more reliably measured than would more abstract, reactive outcomes such as self-esteem or achievement responsibility. If a child completes several arithmetic computations correctly, he has the skill being measured. If he says he feels good about himself, the response may have any of a number of meanings. Because of such considerations, the prudent reader will place more confidence in the reported effects on the simpler outcomes, but even the patterns in the more complex outcomes are anything but random.

6. Did our analyses set too high a standard of success? Before we would declare an apparent effect "real," whether positive or negative, we required it to be statistically significant (at the conventional $p < .05$ level) and also to exceed a quarter of a standard deviation of the outcome measure. The first requirement merely obliged us to base each finding on a large enough

number of cases that it would be unlikely to result from the differences among members of the groups being compared, rather than from differences among the groups; this criterion has nothing to do with high or low standards of accomplishment. Overall, 30% of the effects were "significant."

The second criterion, which we have called "materiality" or "educational significance," arose from a consensus early in the project that mean test score differences that amounted to less than a quarter of a standard deviation might well be "significant," thanks to large samples, but that they would not be educationally interesting. Figure 5-9 displays a somewhat idealized picture of a difference of this magnitude. We decided, in effect, that if the FT and NFT distributions coincided even more closely than Figure 5-9 shows, we were willing to ignore the differences among them. Overall, 49% of the effects were "material."

As further evidence of the reasonableness of this judgmental standard, we note that a quarter of a standard deviation corresponds roughly to about two months' progress in terms of grade equivalents.* Over a three-year or four-year period of intervention, a program really ought to generate a couple of months' relative progress; if not, it has not made much of a dent in the problem that the outcome measure is intended to document. A year would be too much to ask; a week, too little. In our judgment, two months is a comfortable criterion. The reader who wishes to impose a more or less stringent standard can do so by reference to the detailed results of our computations of effects, presented in Volumes IV-B and IV-C.

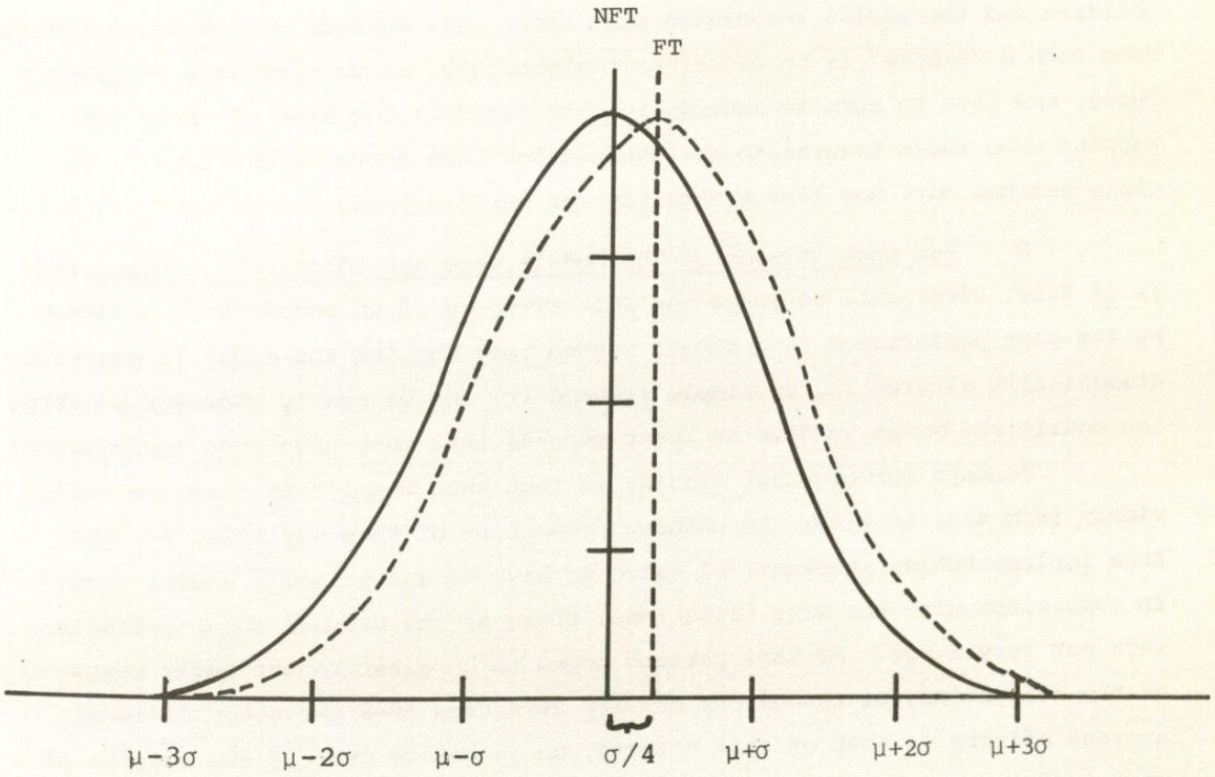
7. Could attrition have led us to mistaken conclusions? As Chapter Four points out in some detail, our analytic sample comprises only a minority of the children who were pretested and to whom the Follow Through "treatments" were applied. What of the others? Did they leave because they were in some relevant sense different from those who stayed? Had they all stayed, how would they have performed on the outcome tests, and would our measure of program effectiveness turned out differently? The pluperfect subjunctive is, unfortunately, notoriously unresearchable. Our closest approach to answers to such questions derives from a series of studies of the attrition question which we performed when the extent of developing attrition become apparent.

* Chapter Four discusses this conversion and its pitfalls; see Appendix Figure 4-1.

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FIGURE 5-9

Two normal distributions with the same variance and means separated by 0.25 standard deviation, illustrating the minimum "educationally-significant" FT/NFT difference.



From the results of these studies, we conclude, to our relief, that the same kinds of children left the FT and NFT groups, site by site, at least with respect to income and pretest scores. We therefore feel reasonably confident that attrition has not done serious damage to our comparisons of FT with NFT. Our results apply less well, it is true, to the more mobile segment of the disadvantaged population than to those who tend to stay in one place. But then the Follow Through world was not sampled probabilistically from any larger population: it is simply an availability sample, clustered by more or less relevant political criteria, of variably disadvantaged children and the adults associated with them. All anybody can do to generalize from such a "sample" is to describe it thoroughly, as we have done in Chapter Three, and then to surmise cautiously that "this is the kind of thing that happens when these treatments are applied to these sorts of children." We claim neither more nor less generality for our findings.

8. But what if some of the models were not adequately implemented? Is it fair, after all, to judge the effectiveness of an educational strategy by its poor performance in a school system that bungled the model in practice, dramatically altered it, or simply ignored it? Do we really know how powerful the models are before we have at least ensured that they have been implemented?

Perhaps our clearest finding is that each model's performance varies widely from site to site. An unknown proportion of this variation results from implementation problems, of which we have no analytically useful record. In comparison with the site variations, those of the overall model averages were not very large. As this pattern began to be clear in the early years of the evaluation, we turned our primary attention from the study of model average effects to that of site effects, so as not to obscure the results of good implementations by averaging them with those of bad ones. Most of the models were tried out in enough sites that one might reasonably expect at least one good implementation: if a model did not make its point in any of its sites, however powerful it might be in principle, one might legitimately wonder about its practical value.

In a practical sense, we can be fairly confident that a model can produce at least as much progress as it showed in its best site. On the other side of the coin, the same model can clearly do at least as badly as it did in its worst site. Lacking information about implementation (what if a model did

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best in a site that had not implemented it well?), we can only give the models the benefit of the doubt in this matter. If future evaluations of externally-guided compensatory interventions wish to be able to attribute outcomes more confidently to the specific kinds of intervention applied, they will have to take steps to find out, systematically, what local people did with the models and other associated program resources. Model labels have turned out to carry only a small fraction of the relevant information.

Appendix Table A2-1

COHORT III-K TEACHER RELIABILITIES BY SPONSOR AND OVERALL

Teacher Factor / SPONSOR	Teacher-Centeredness	Flexibility	Individualization	Academic vs. Emotional Emphasis	Satisfaction with Sponsor
Responsive Education	0.32	0.64	0.56	0.58	0.85
TEEM	0.40	0.58	0.52	0.54	0.80
Bank Street	0.31	0.64	0.27	0.81	0.78
Direct Instruction	0.46	0.58	-0.03	0.56	0.81
Behavior Analysis	0.43	0.25	0.41	0.56	0.87
Cognitive Curriculum	0.48	0.78	0.45	0.53	0.88
Parent Education	0.32	0.19	0.17	0.66	0.81
EDC	0.54	0.40	0.36	0.60	0.82
IELP	0.49	0.23	0.46	0.68	0.83
ILM	0.43	0.68	0.31	0.68	0.84
SEDL	0.46	0.47	0.42	0.43	0.82
CLA	0.16	0.25	0.18	0.64	0.70
Home-School Partnership	--	--	--	--	--
Cal Process	0.53	0.71	0.56	0.56	0.80
NSA	0.70	0.59	0.42	0.12	0.85
OVERALL	0.44	0.54	0.48	0.57	0.83

Appendix Table A2-2

COHORT III-EF TEACHER RELIABILITIES BY SPONSOR AND OVERALL

Teacher Factor / SPONSOR	Teacher-Centeredness	Flexibility	Individualization	Academic vs. Emotional Emphasis	Satisfaction with Sponsor
Bank Street	--	--	--	--	--
Direct Instruction	0.74	0.61	0.57	0.41	0.93
Cognitive Curriculum	--	--	--	--	--
Parent Education	--	--	--	--	--
EDC	--	--	--	--	--
OVERALL	0.53	0.60	0.54	0.61	0.88

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Appendix Table A2-3

COHORT II-EF TEACHER RELIABILITIES BY SPONSOR AND OVERALL

Teacher Factor / SPONSOR	Teacher-Centeredness	Flexibility	Individualization	Academic vs. Emotional Emphasis	Satisfaction with Sponsor
Responsive Education	--	--	--	--	--
TEEM	--	--	--	--	--
Direct Instruction	0.65	0.65	0.52	0.75	0.79
Mathemagenic	--	--	--	--	--
OVERALL	0.48	0.61	0.42	0.52	0.81

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Appendix Table A2-4

COHORT III-K PARENT RELIABILITIES BY SPONSOR

Teacher Factor / SPONSOR	School Helped Child	Parent Satisfied with Child's Progress	Child's Emotional Adjustment	School Helped with Child	School Helped Parent	School Receptivity	Talks with Teacher	PAC Involvement	Parent Visits	School Helped Parent Personally	Child Read to at Home	Child Reads at Home	Parent Child Interaction	Parent Locus
Responsive Education	.77	.77	.68	.83	.60	.88	.83	.63	.58	.81	.68	.25	.56	
TEEM	.80	.75	.76	.84	.55	.87	.78	.39	.39	.82	.72	.30	.50	
Bank Street	.81	.73	.73	.85	.60	.91	.87	.39	.59	.84	.74	.39	.64	
Direct Instruction	.76	.73	.72	.84	.50	.87	.82	.62	.46	.82	.75	.27	.51	
Behavior Analysis	.75	.72	.68	.85	.54	.93	.83	.67	.50	.78	.76	.41	.57	
Cognitive Curriculum	.76	.69	.61	.82	.54	.93	.86	.50	.55	.68	.70	.41	.58	
Parent Education	.81	.77	.66	.88	.67	.91	.80	.61	.57	.77	.73	.36	.55	
EDC	.77	.69	.73	.83	.57	.89	.84	.74	.50	.82	.71	.38	.46	
IELP	.80	.75	.76	.79	.60	.83	.82	.65	.53	.82	.79	.26	.51	
ILM	.81	.75	.79	.85	.54	.94	.86	.71	.52	.65	.63	.52	.14	
SEDL	.80	.73	.74	.85	.55	.87	.86	.79	.49	.81	.79	.22	.47	
CLA	.80	.68	.72	.84	.49	.75	.86	.53	.61	.80	.74	.40	.60	
Home-School Partnership	.85	.86	.87	.89	-.13	.93	.73	.69	.22	.75	.63	.36	.54	
Cal Process	.82	.74	.74	.83	.40	.84	.80	.30	.48	.80	.71	.19	.56	
NSA	.80	.82	.71	.86	.61	.83	.80	.45	.52	.83	.68	.33	.44	
OVERALL	.85	.74	.71	.85	.57	.89	.83	.65	.52	.80	.73	.32	.54	

Appendix Table A2-5

COHORT III-EF PARENT RELIABILITIES BY SPONSOR

Teacher Factor / SPONSOR	School Helped Child	Parent Satisfied with Child's Progress	Child's Emotional Adjustment	School Helped Child with	School Helped Parent	School Receptivity	Talks with Teacher	PAC Involvement	Parent Visits	School Helped Parent Personally	Child Read to at Home	Child Reads at Home	Parent Child Interaction	Parent Locus
Responsive Education	.81	.76	.72	.87	.54	.82	--	.69	.42	.75	.69	.36	.42	
TEEM	.74	.74	.71	.83	.58	.81	--	.65	.53	.77	.75	.40	.49	
Direct Instruction	.72	.63	.68	.80	.59	.87	--	.77	.64	.78	.69	.54	.51	
Mathemagenic	.79	.72	.74	.81	.49	.76	--	.63	.41	.80	.74	.09	.61	
OVERALL	.77	.73	.72	.83	.56	.82	.80	.67	.52	.78	.73	.37	.51	

Appendix Table A2-6

COHORT II-EF PARENT RELIABILITIES BY SPONSOR

Parent Factor / SPONSOR	School Helped Child	Parent Satisfied with Child's Progress	Child's Emotional Adjustment	School Helped Child	School Helped Parent	School Receptivity	Talks with Teacher	PAC Involvement	Parent Visits	School Helped Parent Personally	Child Read to at Home	Child Reads at Home	Parent Child Interaction	Parent Locus
Bank Street	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Direct Instruction	.66	.63	.73	.84	.34	.83	--	.50	.52	.75	.78	.28	.65	
Cognitive Curriculum	.68	.66	.69	.81	.44	.90	--	.61	.59	.71	.80	.46	.49	
Parent Education	.83	.72	.80	.87	.50	.77	--	.73	.54	.76	.71	.43	.50	
EDC	.76	.81	.72	.86	.60	.76	--	.77	.42	.80	.74	.45	.54	
OVERALL	.75	.73	.76	.83	.50	.81	.77	.50	.81	.77	.75	.39	.59	

Appendix Table A2-7

RELIABILITY COEFFICIENTS OF THE OUTCOME SCORES FOR COHORT III-K

		Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS(-)	IARS(+)	Total Reading	Total Math
Responsive Education	FT	.94	.96	.85	.88	.86	.87	.89	.86	.82	.47	.56	.96	.95
	NFT	.95	.97	.89	.87	.84	.88	.90	.89	.79	.53	.42	.96	.95
TEEM	FT	.93	.95	.88	.89	.84	.86	.88	.87	.79	.64	.60	.95	.95
	NFT	.94	.96	.90	.91	.80	.97	.90	.91	.79	.58	.30	.95	.96
Bank Street	FT	.93	.96	.93	.89	.87	.84	.85	.84	.74	.58	.51	.94	.94
	NFT	.93	.97	.89	.88	.85	.88	.87	.88	.81	.50	.62	.96	.96
Direct Instruction	FT	.90	.96	.91	.91	.82	.82	.87	.87	.74	.50	.58	.92	.96
	NFT	.94	.97	.92	.90	.86	.90	.90	.89	.79	.53	.50	.96	.96
Behavior Analysis	FT	.92	.97	.88	.89	.84	.81	.86	.85	.76	.41	.51	.94	.95
	NFT	.93	.97	.86	.85	.83	.84	.87	.85	.76	.61	.63	.94	.94
Cognitive Curriculum	FT	.92	.97	.79	.84	.84	.85	.87	.83	.77	.62	.65	.94	.93
	NFT	.94	.97	.90	.86	.82	.88	.88	.87	.78	.48	.54	.96	.95
Parent Education	FT	.93	.97	.84	.83	.81	.86	.84	.67	.77	.55	.54	.95	.92
	NFT	.94	.97	.91	.86	.86	.88	.87	.87	.83	.59	.64	.96	.95
EDC	FT	.93	.97	.89	.84	.81	.83	.87	.83	.77	.58	.62	.94	.94
	NFT	.94	.97	.92	.90	.81	.90	.90	.90	.77	.57	.52	.96	.96
IELP	FT	.93	.97	.92	.90	.82	.91	.90	.90	.81	.56	.53	.96	.96
	NFT	.93	.95	.93	.87	.81	.89	.88	.89	.74	.56	.25	.96	.96
ILM	FT	.91	.97	.80	.85	.85	.74	.81	.73	.71	.55	.48	.90	.92
	NFT	.91	.97	.78	.79	.81	.78	.79	.78	.76	.46	.59	.93	.91
SEDL	FT	.92	.96	.83	.88	.86	.83	.85	.83	.85	.54	.60	.93	.94
	NFT	.90	.97	.76	.85	.84	.77	.81	.79	.75	.52	.52	.91	.92
CLA	FT	.91	.97	.75	.84	.82	.78	.77	.77	.76	.55	.51	.93	.91
	NFT	.93	.97	.87	.88	.84	.83	.85	.84	.70	.49	.67	.95	.95
Home-School Partnership	FT	.93	.97	.86	.93	.83	.85	.91	.83	.88	.61	.52	.95	.97
	NFT	.91	.94	.88	.89	.86	.86	.90	.90	.79	.64	-.04	.93	.96
Cal Process	FT	.95	.97	.75	.84	.84	.81	.83	.78	.78	.57	.57	.93	.92
	NFT	.94	.97	.79	.85	.81	.84	.87	.84	.80	.62	.46	.94	.96
NSA	FT	.94	.96	.90	.88	.81	.90	.86	.88	.78	.67	.49	.96	.95
	NFT	.90	.94	.91	.80	.70	.85	.84	.88	.79	.54	.26	.94	.94

Appendix Table A2-8

RELIABILITY COEFFICIENTS OF THE OUTCOME SCORES FOR COHORT III-EF

		Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS(-)	IARS(+)	Total Reading	Total Math	
Responsive Education	FT	.93	.96	.89	.88	.87	.88	.88	.87	.78	.70	.66	.95	.95	
	NFT	.95	.97	.90	.88	.86	.85	.88	.88	.68	.53	.39	.95	.95	
TEEM	FT	.93	.96	.86	.89	.86	.83	.87	.85	.81	.67	.67	.95	.95	
	NFT	.95	.97	.90	.87	.85	.90	.88	.88	.78	.60	.39	.99	.95	
Mathemagenic	FT	.93	.97	.91	.90	.87	.88	.90	.90	.73	.62	.55	.96	.96	
	NFT	.92	.96	.87	.83	.83	.84	.87	.90	.71	.44	.40	.95	.95	
Direct Instruction	FT	.90	.96	.92	.90	.81	.80	.86	.86	.77	.47	.60	.92	.95	
	NFT	.95	.97	.93	.91	.84	.91	.91	.90	.78	.49	.69	.97	.97	

Appendix Table A2-9

RELIABILITY COEFFICIENTS OF THE OUTCOME SCORES FOR COHORT II-EF

		Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS(-)	IARS(+)	Total Reading	Total Math
Bank Street	FT	.95	.97	.82	.92	.86	.70	.83	.78	.64	.50	.49	.93	.95
	NFT	.64	.90	.47	.77	.77	.43	.59	.52	.58	.62	.45	.71	.85
Direct Instruction	FT	.86	.96	.91	.86	.82	.73	.85	.84	.70	.57	.60	.89	.94
	NFT	.95	.97	.93	.91	.88	.91	.91	.90	.82	.64	.68	.97	.97
Cognitive Curriculum	FT	.86	.97	.81	.82	.82	.72	.82	.76	.67	.51	.58	.89	.90
	NFT	.92	.96	.82	.77	.84	.74	.74	.70	.80	.53	.71	.94	.88
Parent Education	FT	.94	.97	.90	.88	.85	.89	.90	.76	.76	.68	.57	.96	.96
	NFT	.95	.97	.92	.88	.86	.89	.91	.89	.81	.64	.56	.96	.96
EDC	FT	.92	.97	.88	.87	.83	.84	.86	.85	.76	.58	.66	.93	.95
	NFT	.94	.97	.92	.91	.81	.90	.91	.91	.80	.56	.41	.96	.97

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Appendix Table A4-1

CORRELATIONS OF COVARIATES AND OUTCOMES FOR COHORT III-K FOLLOW THROUGH CHILDREN

	Fall Kindergarten WRAT	Missing WRAT	Family Income	Missing Income	Occupation	Missing Occupation	Entry Age	Ethnicity (White vs. Black)	Ethnicity (White vs. Other)	Sex	First Language	Total Reading	Total Math	Spelling	Language	Raven's	Coopersmith	IARS (-)	IARS (+)	Word Knowledge	Reading	Math Computations	Math Concepts	Math Problem Solving	Language Part A	Language Part B
Fall Kindergarten WRAT	1.00	.00	.20	-.01	.25	-.03	.22	.13	.14	.11	.10	.53	.51	.49	.43	.37	.24	.19	.28	.52	.49	.42	.51	.45	.43	.35
Missing WRAT	.00	1.00	-.03	.18	-.03	.18	-.04	-.02	-.05	.03	-.05	-.06	-.05	-.03	-.04	-.04	-.01	-.04	-.02	-.06	-.06	-.04	-.05	-.03	-.04	-.03
Family Income	.20	-.03	1.00	.00	.35	-.11	.00	.28	.26	.02	.09	.26	.20	.19	.22	.19	.13	.06	.10	.25	.24	.12	.21	.21	.18	.19
Missing Income	-.01	.18	.00	1.00	-.01	.90	-.05	-.08	-.09	.01	-.02	-.09	-.07	-.05	-.06	-.07	-.03	-.03	-.04	-.09	-.09	-.06	-.06	-.07	-.05	-.05
Occupation	.25	-.03	.35	-.01	1.00	.00	.05	.26	.26	.02	.10	.30	.21	.22	.25	.19	.10	.07	.10	.29	.28	.13	.22	.22	.23	.22
Missing Occupation	-.03	.18	-.11	.90	.00	1.00	-.04	-.08	-.11	.01	-.03	-.12	-.09	-.07	-.07	-.07	-.05	-.04	-.06	-.11	-.11	-.08	-.07	-.09	-.07	-.06
Entry Age	.22	-.04	.00	-.05	.05	-.04	1.00	.16	.03	-.04	-.08	.12	.12	.07	.07	.17	.06	.03	.07	.11	.12	.11	.11	.12	.09	.05
Ethnicity (White vs. Black)	.13	-.02	.28	-.08	.26	-.08	.16	1.00	.51	-.02	-.17	.28	.22	.12	.26	.37	.08	.03	.11	.26	.28	.14	.23	.23	.19	.25
Ethnicity (White vs. Other)	.14	-.05	.26	-.09	.26	-.11	.03	.51	1.00	.01	.53	.26	.17	.15	.23	.13	.08	.04	.09	.27	.22	.09	.19	.19	.23	.19
Sex	.11	.03	.02	.01	.02	.01	-.04	-.02	.01	1.00	.04	.11	.10	.17	.11	-.08	.05	.02	.08	.10	.10	.11	.07	.09	.11	.09
First Language	.10	-.05	.09	-.02	.10	-.03	-.08	-.17	.53	.04	1.00	.12	.07	.11	.08	-.06	.04	.02	.03	.14	.07	.02	.09	.08	.13	.04
Total Reading	.53	-.06	.26	-.09	.30	-.12	.12	.28	.26	.11	.12	1.00	.72	.79	.68	.42	.30	.27	.36	.97	.93	.55	.73	.68	.68	.55
Total Math	.51	-.05	.20	-.07	.21	-.09	.12	.22	.17	.10	.07	.72	1.00	.66	.70	.43	.31	.27	.34	.68	.69	.90	.92	.91	.62	.60
Spelling	.49	-.03	.19	-.05	.22	-.07	.07	.12	.15	.17	.11	.79	.66	1.00	.56	.32	.28	.28	.33	.81	.68	.55	.66	.59	.61	.42
Language	.43	-.04	.22	-.06	.25	-.07	.07	.26	.23	.11	.08	.68	.70	.56	1.00	.38	.28	.23	.31	.64	.65	.60	.67	.64	.77	.93
Raven's	.37	-.04	.19	-.07	.19	-.07	.17	.37	.13	-.08	-.06	.42	.43	.32	.38	1.00	.21	.12	.22	.40	.39	.34	.45	.37	.36	.32
Coopersmith	.24	-.01	.13	-.03	.10	-.05	.06	.08	.08	.05	.04	.30	.31	.28	.28	.21	1.00	.13	.25	.29	.27	.27	.32	.27	.28	.22
IARS (-)	.19	-.04	.06	-.03	.07	-.04	.03	.03	.04	.02	.02	.27	.27	.28	.23	.12	.13	1.00	.34	.26	.25	.24	.27	.23	.25	.17
IARS (+)	.28	-.02	.10	-.04	.10	-.06	.07	.11	.09	.08	.03	.36	.34	.33	.31	.22	.25	.34	1.00	.36	.32	.28	.34	.30	.34	.23
Word Knowledge	.52	-.06	.25	-.09	.29	-.11	.11	.26	.27	.10	.14	.97	.68	.81	.64	.40	.29	.26	.36	1.00	.80	.52	.70	.64	.66	.51
Reading	.49	-.06	.24	-.09	.28	-.11	.12	.28	.22	.10	.07	.93	.69	.68	.65	.39	.27	.25	.32	.80	1.00	.52	.69	.67	.62	.53
Math Computations	.42	-.04	.12	-.06	.13	-.08	.11	.14	.09	.11	.02	.55	.90	.55	.60	.34	.27	.24	.28	.52	.52	1.00	.72	.70	.50	.53
Math Concepts	.51	-.05	.21	-.06	.22	-.07	.11	.23	.19	.07	.09	.73	.92	.66	.67	.45	.32	.27	.34	.70	.69	.72	1.00	.79	.63	.56
Math Problem Solving	.45	-.03	.21	-.07	.22	-.09	.12	.23	.19	.09	.08	.68	.91	.59	.64	.37	.27	.23	.30	.64	.67	.70	.79	1.00	.57	.56
Language Part A	.43	-.04	.18	-.05	.23	-.07	.09	.19	.23	.11	.13	.68	.62	.61	.77	.36	.28	.25	.34	.66	.62	.50	.63	.57	1.00	.49
Language Part B	.35	-.03	.19	-.05	.22	-.06	.05	.25	.19	.09	.04	.55	.60	.42	.93	.32	.22	.17	.23	.51	.53	.53	.56	.56	.49	1.00

Appendix Table A4-1 (cont.)

CORRELATIONS OF COVARIATES AND OUTCOMES
FOR COHORT III-K NON-FOLLOW THROUGH CHILDREN

	Fall Kindergarten WRAT	Missing WRAT	Family Income	Missing Income	Occupation	Missing Occupation	Entry Age	Ethnicity (White vs. Black)	Ethnicity (White vs. Other)	Sex	First Language	Total Reading	Total Math	Spelling	Language	Raven's	Coopersmith	IARS (-)	IARS (+)	Word Knowledge	Reading	Math Computations	Math Concepts	Math Problem Solving	Language Part A	Language Part B
Fall Kindergarten WRAT	1.00	.00	.31	-.08	.35	-.10	.22	.31	.26	.09	.09	.62	.61	.52	.56	.49	.29	.20	.27	.61	.59	.52	.61	.56	.51	.50
Missing WRAT	.00	1.00	-.01	.06	-.04	.06	-.01	-.03	-.06	.01	-.03	-.06	-.05	-.04	-.05	-.03	-.03	-.04	-.03	-.07	-.05	-.04	-.06	-.04	-.05	-.04
Family Income	.31	-.01	1.00	.00	.45	-.13	.06	.39	.36	-.04	.09	.39	.34	.31	.32	.28	.18	.11	.16	.40	.35	.28	.33	.33	.30	.29
Missing Income	-.08	.06	.00	1.00	-.02	.92	-.15	-.34	-.23	.02	.08	-.16	-.13	-.08	-.16	-.17	-.04	-.03	-.04	-.16	-.15	-.11	-.13	-.13	-.12	-.16
Occupation	.35	-.04	.45	-.02	1.00	.00	.07	.37	.34	-.01	.14	.40	.35	.27	.37	.30	.17	.09	.16	.39	.37	.28	.36	.34	.31	.35
Missing Occupation	-.10	.06	-.13	.92	.00	1.00	-.14	-.36	-.25	.00	.08	-.17	-.14	-.09	-.18	-.17	-.04	-.03	-.03	-.17	-.16	-.12	-.15	-.13	-.13	-.18
Entry Age	.22	-.01	.06	-.15	.07	-.14	1.00	.21	.08	-.03	-.06	.11	.13	.04	.13	.15	.04	-.00	.02	.10	.11	.12	.13	.13	.09	.13
Ethnicity (White vs. Black)	.31	-.03	.39	-.34	.37	-.36	.21	1.00	.69	-.03	-.06	.47	.44	.29	.44	.45	.16	.10	.18	.46	.45	.37	.43	.42	.37	.41
Ethnicity (White vs. Other)	.26	-.06	.36	-.23	.34	-.25	.08	.69	1.00	-.02	.41	.40	.36	.24	.38	.28	.14	.08	.13	.39	.37	.30	.35	.36	.33	.35
Sex	.09	.01	-.04	.02	-.01	.00	-.03	-.03	-.02	1.00	.00	.04	.02	.13	.08	-.08	.06	.01	.07	.04	.05	.03	.01	.03	.08	.06
First Language	.09	-.03	.09	.08	.14	.08	-.06	-.06	.41	.00	1.00	.06	.05	-.00	.08	-.04	.03	-.02	.03	.06	.05	.02	.07	.04	.08	.07
Total Reading	.62	-.06	.39	-.16	.40	-.17	.11	.47	.40	.04	.06	1.00	.79	.80	.76	.52	.37	.31	.37	.97	.95	.67	.79	.75	.73	.66
Total Math	.61	-.05	.34	-.13	.35	-.14	.13	.44	.36	.02	.05	.79	1.00	.68	.76	.55	.37	.29	.34	.76	.77	.92	.94	.93	.68	.68
Spelling	.52	-.04	.31	-.08	.27	-.09	.04	.29	.24	.13	-.00	.80	.68	1.00	.61	.40	.34	.31	.32	.82	.71	.61	.67	.62	.65	.50
Language	.56	-.05	.32	-.16	.37	-.18	.13	.44	.38	.08	.08	.76	.76	.61	1.00	.50	.34	.24	.32	.72	.74	.65	.74	.72	.78	.96
Raven's	.49	-.03	.28	-.17	.30	-.17	.15	.45	.28	-.08	-.04	.52	.55	.40	.50	1.00	.24	.17	.26	.51	.50	.49	.55	.51	.45	.45
Coopersmith	.29	-.03	.18	-.04	.17	-.04	.04	.16	.14	.06	.03	.37	.37	.34	.34	.24	1.00	.16	.28	.36	.35	.34	.37	.33	.35	.29
IARS (-)	.20	-.04	.11	-.03	.09	-.03	-.00	.10	.08	.01	-.02	.31	.29	.31	.24	.17	.16	1.00	.35	.31	.28	.27	.28	.25	.28	.18
IARS (+)	.27	-.03	.16	-.04	.16	-.03	.02	.18	.13	.07	.03	.37	.34	.32	.32	.26	.28	.35	1.00	.36	.34	.30	.33	.31	.35	.26
Word Knowledge	.61	-.07	.40	-.16	.39	-.17	.10	.46	.39	.04	.06	.97	.76	.82	.72	.51	.36	.31	.36	1.00	.85	.65	.76	.71	.71	.62
Reading	.59	-.05	.35	-.15	.37	-.16	.11	.45	.37	.05	.05	.95	.77	.71	.74	.50	.35	.28	.34	.85	1.00	.65	.75	.74	.67	.65
Math Computations	.52	-.04	.28	-.11	.28	-.12	.12	.37	.30	.03	.02	.67	.92	.61	.65	.49	.34	.27	.30	.65	.65	1.00	.78	.77	.60	.58
Math Concepts	.61	-.06	.33	-.13	.36	-.15	.13	.43	.35	.01	.07	.79	.94	.67	.74	.55	.37	.28	.33	.76	.75	.78	1.00	.84	.68	.66
Math Problem Solving	.56	-.04	.33	-.13	.34	-.13	.13	.42	.36	.03	.04	.75	.93	.62	.72	.51	.33	.25	.31	.71	.74	.77	.84	1.00	.62	.65
Language Part A	.51	-.05	.30	-.12	.31	-.13	.09	.37	.33	.08	.08	.73	.68	.65	.78	.45	.35	.28	.35	.71	.67	.60	.68	.62	1.00	.56
Language Part B	.50	-.04	.29	-.16	.35	-.18	.13	.41	.35	.06	.07	.66	.68	.50	.96	.45	.29	.18	.26	.62	.65	.58	.66	.65	.56	1.00

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Appendix Table A4-1 (cont.)

CORRELATIONS OF COVARIATES AND OUTCOMES
FOR COHORT III-EF FOLLOW THROUGH CHILDREN

	Fall Kindergarten WRAT	Missing WRAT	Family Income	Missing Income	Occupation	Missing Occupation	Entry Age	Ethnicity (White vs. Black)	Ethnicity (White vs. Other)	Sex	First Language	Total Reading	Total Math	Spelling	Language	Raven's	Coopersmith	IARS (-)	IARS (+)	Word Knowledge	Reading	Math Computations	Math Concepts	Math Problem Solving	Language Part A	Language Part B
Fall Kindergarten WRAT	1.00	.00	.33	-.02	.31	-.03	.23	.21	.17	.11	-.00	.59	.58	.57	.48	.50	.29	.26	.33	.58	.53	.52	.56	.53	.47	.41
Missing WRAT	.00	1.00	-.03	.06	-.02	.06	.12	.08	.08	.02	.02	-.04	-.01	-.03	-.03	.01	-.03	-.01	-.04	-.04	-.04	-.02	.00	-.01	-.01	-.04
Family Income	.33	-.03	1.00	.00	.53	-.13	-.01	.39	.36	-.06	-.01	.33	.29	.23	.23	.39	.18	.14	.16	.31	.31	.22	.30	.29	.24	.20
Missing Income	-.02	.06	.00	1.00	.07	.93	.08	-.03	-.08	-.07	-.08	-.07	-.04	-.07	-.05	.01	-.04	-.05	-.00	-.07	-.06	-.03	-.05	-.03	-.04	-.05
Occupation	.31	-.02	.53	.07	1.00	.00	-.00	.29	.29	-.02	.03	.35	.29	.27	.26	.35	.15	.15	.20	.33	.34	.23	.30	.29	.23	.24
Missing Occupation	-.03	.06	-.13	.93	.00	1.00	.09	-.02	-.07	-.06	-.08	-.09	-.06	-.08	-.07	.00	-.04	-.03	.02	-.09	-.08	-.05	-.06	-.05	-.06	-.07
Entry Age	.23	.12	-.01	.08	-.00	.09	1.00	.03	-.03	-.03	-.10	.03	.07	-.01	.03	.08	.03	.03	.03	.00	.05	.05	.08	.08	.05	.02
Ethnicity (White vs. Black)	.21	.08	.39	-.03	.29	-.02	.03	1.00	.88	.00	-.01	.29	.21	.24	.11	.37	.10	.03	.06	.29	.25	.13	.24	.24	.16	.07
Ethnicity (White vs. Other)	.17	.08	.36	-.08	.29	-.07	-.03	.88	1.00	-.02	.37	.28	.22	.23	.14	.32	.08	.02	.05	.29	.23	.14	.24	.23	.18	.10
Sex	.11	.02	-.06	-.07	-.02	-.06	-.03	.00	-.02	1.00	-.02	.11	.10	.18	.11	-.06	.10	.02	.05	.12	.10	.10	.09	.09	.10	.10
First Language	-.00	.02	-.01	-.08	.03	-.08	-.10	-.01	.37	-.02	1.00	.06	.08	.06	.09	-.01	-.01	.00	.02	.08	.03	.08	.07	.06	.09	.08
Total Reading	.59	-.04	.33	-.07	.35	-.09	.03	.29	.28	.11	.06	1.00	.78	.83	.74	.47	.31	.34	.35	.97	.94	.66	.78	.75	.70	.66
Total Math	.58	-.01	.29	-.04	.29	-.06	.07	.21	.22	.10	.08	.78	1.00	.73	.78	.50	.35	.36	.38	.75	.74	.92	.95	.93	.70	.71
Spelling	.57	-.03	.23	-.07	.27	-.08	-.01	.24	.23	.18	.06	.83	.73	1.00	.65	.41	.30	.34	.34	.84	.73	.66	.72	.67	.64	.55
Language	.48	-.03	.23	-.05	.26	-.07	.03	.11	.14	.11	.09	.74	.78	.65	1.00	.39	.27	.33	.36	.70	.72	.72	.74	.73	.81	.95
Raven's	.50	.01	.39	.01	.35	.00	.08	.37	.32	-.06	-.01	.47	.50	.41	.39	1.00	.29	.20	.27	.45	.45	.43	.50	.47	.40	.33
Coopersmith	.29	-.03	.18	-.04	.15	-.04	.03	.10	.08	.10	-.01	.31	.35	.30	.27	.29	1.00	.16	.31	.30	.29	.34	.32	.31	.29	.22
IARS (-)	.26	-.01	.14	-.05	.15	-.03	.03	.03	.02	.02	.00	.34	.36	.34	.33	.20	.16	1.00	.32	.34	.31	.34	.35	.32	.32	.29
IARS (+)	.33	-.04	.16	-.00	.20	.02	.03	.06	.05	.05	.02	.35	.38	.34	.36	.27	.31	.32	1.00	.34	.33	.37	.36	.34	.39	.29
Word Knowledge	.58	-.04	.31	-.07	.33	-.09	.00	.29	.29	.12	.08	.97	.75	.84	.70	.45	.30	.34	.34	1.00	.82	.63	.75	.71	.68	.62
Reading	.53	-.04	.31	-.06	.34	-.08	.05	.25	.23	.10	.03	.94	.74	.73	.72	.45	.29	.31	.33	.82	1.00	.62	.73	.71	.66	.65
Math Computations	.52	-.02	.22	-.03	.23	-.05	.05	.13	.14	.10	.08	.66	.92	.66	.72	.43	.34	.34	.37	.63	.62	1.00	.80	.77	.64	.65
Math Concepts	.56	.00	.30	-.05	.30	-.06	.08	.24	.24	.09	.07	.78	.95	.72	.74	.50	.32	.35	.36	.75	.73	.80	1.00	.84	.68	.67
Math Problem Solving	.53	-.01	.29	-.03	.29	-.05	.08	.24	.23	.09	.06	.75	.93	.67	.73	.47	.31	.32	.34	.71	.71	.77	.84	1.00	.64	.67
Language Part A	.47	-.01	.24	-.04	.23	-.06	.05	.16	.18	.10	.09	.70	.70	.64	.81	.40	.29	.32	.39	.68	.66	.64	.68	.64	1.00	.60
Language Part B	.41	-.04	.20	-.05	.24	-.07	.02	.07	.10	.10	.08	.66	.71	.55	.95	.33	.22	.29	.29	.62	.65	.65	.67	.67	.60	1.00

Appendix Table A4-1 (cont.)

CORRELATIONS OF COVARIATES AND OUTCOMES
FOR COHORT III-EF NON-FOLLOW THROUGH CHILDREN

	Fall Kindergarten WRAT	Missing WRAT	Family Income	Missing Income	Occupation	Missing Occupation	Entry Age	Ethnicity (White vs. Black)	Ethnicity (White vs. Other)	Sex	First Language	Total Reading	Total Math	Spelling	Language	Raven's	Coopersmith	IARS (-)	IARS (+)	Word Knowledge	Reading	Math Computations	Math Concepts	Math Problem Solving	Language Part A	Language Part B
Fall Kindergarten WRAT	1.00	.00	.29	.05	.32	.05	.24	.15	.13	.10	.08	.53	.53	.48	.49	.42	.25	.21	.26	.52	.49	.45	.53	.47	.43	.44
Missing WRAT	.00	1.00	-.02	.01	-.01	.01	.04	-.02	-.01	.05	.01	-.01	.01	.01	.00	.02	-.03	.04	-.00	-.01	-.01	.01	.01	.01	-.01	.01
Family Income	.29	-.02	1.00	.00	.46	-.15	-.13	.33	.33	-.01	.00	.38	.35	.26	.34	.35	.15	.14	.21	.36	.37	.29	.36	.32	.33	.29
Missing Income	.05	.01	.00	1.00	.03	.93	.12	-.17	-.22	-.04	-.04	-.05	-.06	-.03	-.09	.02	.05	.02	.03	-.05	-.05	-.06	-.05	-.07	-.04	-.10
Occupation	.32	-.01	.46	.03	1.00	.00	-.11	.28	.28	.02	.08	.40	.35	.30	.39	.30	.11	.11	.18	.39	.38	.29	.36	.32	.34	.36
Missing Occupation	.05	.01	-.15	.93	.00	1.00	.12	-.18	-.22	-.04	-.04	-.06	-.06	-.03	-.09	-.02	.05	.02	.03	-.05	-.06	-.07	-.05	-.07	-.05	-.09
Entry Age	.24	.04	-.13	.12	-.11	.12	1.00	-.11	-.12	-.04	.01	-.12	-.06	-.11	-.08	-.02	-.02	-.03	-.02	-.12	-.10	-.04	-.07	-.06	-.11	-.06
Ethnicity (White vs. Black)	.15	-.02	.33	-.17	.28	-.18	-.11	1.00	.89	.02	.00	.37	.33	.25	.33	.32	.10	.20	.18	.36	.34	.26	.33	.32	.34	.27
Ethnicity (White vs. Other)	.13	-.01	.33	-.22	.28	-.22	-.12	.89	1.00	.00	.21	.32	.29	.21	.31	.25	.08	.20	.14	.33	.29	.23	.29	.29	.32	.26
Sex	.10	.05	-.01	-.04	.02	-.04	-.04	.02	.00	1.00	-.01	.10	.10	.19	.14	-.09	.10	-.01	.09	.11	.08	.11	.08	.09	.15	.11
First Language	.08	.01	.00	-.04	.08	-.04	.01	.00	.21	-.01	1.00	.09	.06	.07	.06	.02	.01	.06	-.01	.09	.09	.03	.06	.08	.09	.04
Total Reading	.53	-.01	.38	-.05	.40	-.06	-.12	.37	.32	.10	.09	1.00	.79	.83	.77	.46	.31	.33	.39	.97	.95	.64	.80	.75	.74	.68
Total Math	.53	.01	.35	-.06	.35	-.06	-.06	.33	.29	.10	.06	.79	1.00	.73	.76	.49	.33	.30	.40	.76	.77	.91	.94	.93	.68	.70
Spelling	.48	.01	.26	-.03	.30	-.03	-.11	.25	.21	.19	.07	.83	.73	1.00	.67	.36	.31	.27	.37	.85	.75	.63	.71	.68	.66	.57
Language	.49	.00	.34	-.09	.39	-.09	-.08	.33	.31	.14	.06	.77	.76	.67	1.00	.44	.31	.29	.37	.74	.75	.64	.75	.72	.81	.95
Raven's	.42	.02	.35	.02	.30	-.02	-.02	.32	.25	-.09	.02	.46	.49	.36	.44	1.00	.16	.17	.22	.44	.45	.43	.49	.43	.42	.39
Coopersmith	.25	-.03	.15	.05	.11	.05	-.02	.10	.08	.10	.01	.31	.33	.31	.31	.16	1.00	.15	.27	.29	.30	.31	.30	.31	.31	.27
IARS (-)	.21	.04	.14	.02	.11	.02	-.03	.20	.20	-.01	.06	.33	.30	.27	.29	.17	.15	1.00	.39	.32	.31	.24	.31	.27	.32	.23
IARS (+)	.26	-.00	.21	.03	.18	.03	-.02	.18	.14	.09	-.01	.39	.40	.37	.37	.22	.27	.39	1.00	.37	.38	.35	.40	.36	.37	.31
Word Knowledge	.52	-.01	.36	-.05	.39	-.05	-.12	.36	.33	.11	.09	.97	.76	.85	.74	.44	.29	.32	.37	1.00	.86	.61	.76	.72	.73	.64
Reading	.49	-.01	.37	-.05	.38	-.06	-.10	.34	.29	.08	.09	.95	.77	.75	.75	.45	.30	.31	.38	.86	1.00	.63	.77	.73	.69	.67
Math Computations	.45	.01	.29	-.06	.29	-.07	-.04	.26	.23	.11	.03	.64	.91	.63	.64	.43	.31	.24	.35	.61	.63	1.00	.77	.75	.57	.59
Math Concepts	.53	.01	.36	-.05	.36	-.05	-.07	.33	.29	.08	.06	.80	.94	.71	.75	.49	.30	.31	.40	.76	.77	.77	1.00	.84	.69	.68
Math Problem Solving	.47	.01	.32	-.07	.32	-.07	-.06	.32	.29	.09	.08	.75	.93	.68	.72	.43	.31	.27	.36	.72	.73	.75	.84	1.00	.63	.67
Language Part A	.43	-.01	.33	-.04	.34	-.05	-.11	.34	.32	.15	.09	.74	.68	.66	.81	.42	.31	.32	.37	.73	.69	.57	.69	.63	1.00	.59
Language Part B	.44	.01	.29	-.10	.36	-.09	-.06	.27	.26	.11	.04	.68	.70	.57	.95	.39	.27	.23	.31	.64	.67	.59	.68	.67	.59	1.00

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Appendix Table A4-1 (cont.)

CORRELATIONS OF COVARIATES AND OUTCOMES FOR COHORT II-EF FOLLOW THROUGH CHILDREN

	Fall Kindergarten WRAT	Missing WRAT	Family Income	Missing Income	Occupation	Missing Occupation	Entry Age	Ethnicity (White vs. Black)	Ethnicity (White vs. Other)	Sex	First Language	Total Reading	Total Math	Spelling	Language	Raven's	Coopersmith	IARS (-)	IARS (+)	Word Knowledge	Reading	Math Computations	Math Concepts	Math Problem Solving	Language Part A	Language Part B
Fall Kindergarten WRAT	1.00	.00	.26	.07	.32	.08	.20	.18	.17	.14	.00	.49	.55	.47	.50	.40	.31	.23	.30	.45	.48	.48	.53	.50	.49	.42
Missing WRAT	.00	1.00	-.27	.25	.08	.28	.04	-.24	-.23	.01	.00	-.15	-.16	-.08	.03	-.17	-.01	.04	-.07	-.14	-.14	-.12	-.19	-.12	-.06	.07
Family Income	.26	-.27	1.00	.00	.39	-.09	-.02	.54	.54	-.03	.00	.24	.26	.18	.10	.37	.12	.14	.16	.23	.23	.20	.28	.23	.16	.06
Missing Income	.07	.25	.00	1.00	.03	.95	.04	-.13	-.14	-.03	.00	-.02	-.00	.01	.03	-.05	.03	.02	-.03	-.02	-.01	-.01	.01	-.01	.01	.03
Occupation	.32	.08	.39	.03	1.00	.00	.08	.36	.34	-.00	.00	.28	.26	.17	.22	.23	.15	.09	.15	.26	.26	.22	.25	.27	.16	.21
Missing Occupation	.08	.28	-.09	.95	.00	1.00	.06	-.14	-.14	-.02	.00	-.04	-.01	-.01	.02	-.06	.01	-.00	-.04	-.04	-.03	-.02	-.00	-.01	-.01	.03
Entry Age	.20	.04	-.02	.04	.08	.06	1.00	.01	.02	.03	.00	.09	.09	.01	.10	.08	.04	-.00	.03	.08	.08	.06	.11	.09	.09	.10
Ethnicity (White vs. Black)	.18	-.24	.54	-.13	.36	-.14	.01	1.00	.99	-.03	.00	.28	.20	.14	.03	.41	.09	.10	.18	.26	.27	.10	.25	.21	.18	-.05
Ethnicity (White vs. Other)	.17	-.23	.54	-.14	.34	-.14	.02	.99	1.00	-.04	.00	.27	.20	.13	.02	.40	.10	.10	.18	.24	.26	.09	.24	.21	.17	-.05
Sex	.14	.01	-.03	-.03	-.00	-.02	.03	-.03	-.04	1.00	.00	.12	.07	.16	.12	-.10	.06	.01	.08	.11	.11	.10	.02	.07	.10	.11
First Language	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Total Reading	.49	-.15	.24	-.02	.28	-.04	.09	.28	.27	.12	.00	1.00	.75	.79	.60	.42	.37	.30	.29	.96	.90	.64	.72	.70	.65	.48
Total Math	.55	-.16	.26	-.00	.26	-.01	.09	.20	.20	.07	.00	.75	1.00	.71	.68	.46	.43	.32	.36	.71	.68	.90	.93	.91	.68	.57
Spelling	.47	-.08	.18	.01	.17	-.01	.01	.14	.13	.16	.00	.79	.71	1.00	.57	.34	.35	.29	.31	.80	.65	.65	.68	.62	.63	.46
Language	.50	.03	.10	.03	.22	.02	.10	.03	.02	.12	.00	.60	.68	.57	1.00	.30	.40	.26	.32	.55	.56	.60	.63	.63	.78	.95
Raven's	.40	-.17	.37	-.05	.23	-.06	.08	.41	.40	-.10	.00	.42	.46	.34	.30	1.00	.28	.24	.26	.38	.40	.38	.48	.41	.37	.22
Coopersmith	.31	-.01	.12	.03	.15	.01	.04	.09	.10	.06	.00	.37	.43	.35	.40	.28	1.00	.22	.32	.34	.35	.42	.39	.36	.37	.35
IARS (-)	.23	.04	.14	.02	.09	-.00	-.00	.10	.10	.01	.00	.30	.32	.29	.26	.24	.22	1.00	.32	.28	.28	.29	.30	.27	.28	.21
IARS (+)	.30	-.07	.16	-.03	.15	-.04	.03	.18	.18	.08	.00	.29	.36	.31	.32	.26	.32	.32	1.00	.29	.26	.33	.35	.30	.35	.26
Word Knowledge	.45	-.14	.23	-.02	.26	-.04	.08	.26	.24	.11	.00	.96	.71	.80	.55	.38	.34	.28	.29	1.00	.74	.63	.68	.65	.62	.44
Reading	.48	-.14	.23	-.01	.26	-.03	.08	.27	.26	.11	.00	.90	.68	.65	.56	.40	.35	.28	.26	.74	1.00	.55	.66	.66	.60	.46
Math Computations	.48	-.12	.20	-.01	.22	-.02	.06	.10	.09	.10	.00	.64	.90	.65	.60	.38	.42	.29	.33	.63	.55	1.00	.75	.72	.58	.52
Math Concepts	.53	-.19	.28	.01	.25	-.00	.11	.25	.24	.02	.00	.72	.93	.68	.63	.48	.39	.30	.35	.68	.66	.75	1.00	.79	.67	.51
Math Problem Solving	.50	-.12	.23	-.01	.27	-.01	.09	.21	.21	.07	.00	.70	.91	.62	.63	.41	.36	.27	.30	.65	.66	.72	.79	1.00	.62	.54
Language Part A	.49	-.06	.16	.01	.16	-.01	.09	.18	.17	.10	.00	.65	.68	.63	.78	.37	.37	.28	.35	.62	.60	.58	.67	.62	1.00	.56
Language Part B	.42	.07	.06	.03	.21	.03	.10	-.05	-.05	.11	.00	.48	.57	.46	.95	.22	.35	.21	.26	.44	.46	.52	.51	.54	.56	1.00

Appendix Table A4-1 (cont.)

CORRELATIONS OF COVARIATES AND OUTCOMES
FOR COHORT II-EF NON-FOLLOW THROUGH CHILDREN

	Fall Kindergarten WRAT	Missing WRAT	Family Income	Missing Income	Occupation	Missing Occupation	Entry Age	Ethnicity (White vs. Black)	Ethnicity (White vs. Other)	Sex	First Language	Total Reading	Total Math	Spelling	Language	Raven's	Coopersmith	IARS (-)	IARS (+)	Word Knowledge	Reading	Math Computations	Math Concepts	Math Problem Solving	Language Part A	Language Part B
Fall Kindergarten WRAT	1.00	.00	.39	-.04	.38	-.08	.19	.37	.33	-.03	-.05	.60	.55	.62	.52	.49	.31	.22	.34	.59	.58	.49	.57	.50	.53	.43
Missing WRAT	.00	1.00	-.43	.01	.01	.04	.19	-.28	-.28	.00	-.01	-.31	-.27	-.27	-.28	-.23	-.21	-.20	-.26	-.31	-.29	-.27	-.26	-.22	-.29	-.24
Family Income	.39	-.43	1.00	.00	.43	-.04	-.16	.62	.56	.00	-.01	.56	.50	.49	.47	.44	.26	.32	.40	.56	.52	.47	.50	.44	.48	.40
Missing Income	-.04	.01	.00	1.00	.02	.94	.04	-.20	-.20	-.01	-.08	-.13	-.14	-.10	-.12	-.16	-.03	-.09	-.05	-.13	-.11	-.12	-.13	-.14	-.12	-.10
Occupation	.38	.01	.43	.02	1.00	.00	-.04	.37	.33	-.02	.02	.35	.31	.33	.32	.28	.12	.18	.09	.35	.34	.28	.32	.29	.25	.32
Missing Occupation	-.08	.04	-.04	.94	.00	1.00	.05	-.23	-.23	-.02	-.08	-.15	-.17	-.12	-.14	-.19	-.06	-.11	-.07	-.16	-.14	-.15	-.15	-.17	-.15	-.12
Entry Age	.19	.19	-.16	.04	-.04	.05	1.00	-.01	-.01	-.00	-.05	-.04	-.04	-.02	-.03	-.02	-.03	-.03	-.07	-.04	-.04	-.03	-.03	-.04	-.05	-.02
Ethnicity (White vs. Black)	.37	-.28	.62	-.20	.37	-.23	-.01	1.00	.91	-.04	-.03	.63	.61	.52	.57	.56	.26	.35	.42	.62	.60	.56	.60	.55	.53	.51
Ethnicity (White vs. Other)	.33	-.28	.56	-.20	.33	-.23	-.01	.91	1.00	-.04	.28	.59	.56	.49	.53	.49	.20	.30	.36	.58	.56	.52	.55	.50	.49	.47
Sex	-.03	.00	.00	-.01	-.02	-.02	-.00	-.04	-.04	1.00	.03	.04	.01	.11	.02	-.16	-.01	.09	.09	.05	.04	-.01	.00	.03	.07	-.01
First Language	-.05	-.01	-.01	-.08	.02	-.08	-.05	-.03	.28	.03	1.00	.03	.01	.04	.00	-.03	-.09	-.03	-.04	.03	.03	.03	-.01	.00	-.00	.01
Total Reading	.60	-.31	.56	-.13	.35	-.15	-.04	.63	.59	.04	.03	1.00	.85	.86	.80	.60	.43	.45	.49	.98	.96	.74	.84	.82	.78	.69
Total Math	.55	-.27	.50	-.14	.31	-.17	-.04	.61	.56	.01	.01	.85	1.00	.75	.81	.60	.41	.44	.48	.83	.82	.93	.95	.94	.74	.74
Spelling	.62	-.27	.49	-.10	.33	-.12	-.02	.52	.49	.11	.04	.86	.75	1.00	.69	.52	.44	.41	.47	.87	.80	.68	.75	.70	.73	.57
Language	.52	-.28	.47	-.12	.32	-.14	-.03	.57	.53	.02	.00	.80	.81	.69	1.00	.53	.37	.40	.45	.77	.78	.73	.79	.78	.82	.95
Raven's	.49	-.23	.44	-.16	.28	-.19	-.02	.56	.49	-.16	-.03	.60	.60	.52	.53	1.00	.36	.32	.37	.58	.58	.54	.60	.55	.51	.47
Coopersmith	.31	-.21	.26	-.03	.12	-.06	-.03	.26	.20	-.01	-.09	.43	.41	.44	.37	.36	1.00	.29	.40	.43	.40	.38	.40	.39	.38	.31
IARS (-)	.22	-.20	.32	-.09	.18	-.11	-.03	.35	.30	.09	-.03	.45	.44	.41	.40	.32	.29	1.00	.39	.45	.44	.42	.42	.40	.42	.34
IARS (+)	.34	-.26	.40	-.05	.09	-.07	-.07	.42	.36	.09	-.04	.49	.48	.47	.45	.37	.40	.39	1.00	.50	.45	.44	.48	.43	.49	.37
Word Knowledge	.59	-.31	.56	-.13	.35	-.16	-.04	.62	.58	.05	.03	.98	.83	.87	.77	.58	.43	.45	.50	1.00	.89	.72	.82	.79	.78	.66
Reading	.58	-.29	.52	-.11	.34	-.14	-.04	.60	.56	.04	.03	.96	.82	.80	.78	.58	.40	.44	.45	.89	1.00	.72	.81	.81	.73	.69
Math Computations	.49	-.27	.47	-.12	.28	-.15	-.03	.56	.52	-.01	.03	.74	.93	.68	.73	.54	.38	.42	.44	.72	.72	1.00	.82	.81	.67	.66
Math Concepts	.57	-.26	.50	-.13	.32	-.15	-.03	.60	.55	.00	-.01	.84	.95	.75	.79	.60	.40	.42	.48	.82	.81	.82	1.00	.87	.73	.71
Math Problem Solving	.50	-.22	.44	-.14	.29	-.17	-.04	.55	.50	.03	.00	.82	.94	.70	.78	.55	.39	.40	.43	.79	.81	.81	.87	1.00	.69	.72
Language Part A	.53	-.29	.48	-.12	.25	-.15	-.05	.53	.49	.07	-.00	.78	.74	.73	.82	.51	.38	.42	.49	.78	.73	.67	.73	.69	1.00	.60
Language Part B	.43	-.24	.40	-.10	.32	-.12	-.02	.51	.47	-.01	.01	.69	.74	.57	.95	.47	.31	.34	.37	.66	.69	.66	.71	.72	.60	1.00

Appendix Table A4-1 (cont.)

CORRELATIONS OF COVARIATES AND OUTCOMES
FOR COHORT III-K(PS) FOLLOW THROUGH CHILDREN
INCLUDED IN THE PRESCHOOL STUDIES

	Fall Kindergarten WRAT	Family Income	Missing Income	Occupation	Missing Occupation	Entry Age	Ethnicity (White vs. Black)	Ethnicity (White vs. Other)	Sex	First Language	Head Start Membership	Some Preschool Membership	WRAT x Head Start	WRAT x Some Preschool	Total Reading	Total Math	Spelling	Language	Raven's	Coopersmith	IARS(-)	IARS(+)	Word Knowledge	Reading	Math Computations	Math Concepts	Math Problem Solving	Language Part A	Language Part B
Fall Kindergarten WRAT	1.00	.20	-.01	.25	-.03	.22	.12	.14	.11	.10	-.04	.14	.25	.35	.53	.51	.49	.43	.37	.24	.19	.28	.52	.49	.42	.51	.45	.43	.35
Family Income	.20	1.00	0.00	.35	-.11	.01	.28	.26	.02	.10	-.22	.08	-.15	.13	.25	.19	.19	.21	.19	.12	.07	.10	.25	.23	.12	.21	.21	.18	.19
Missing Income	-.01	0.00	1.00	-.01	.89	-.04	-.08	-.09	-.00	-.02	-.08	-.06	-.07	-.05	-.08	-.05	-.04	-.05	-.07	-.03	-.03	-.05	-.07	-.08	-.05	-.04	-.06	-.04	-.04
Occupation	.25	.35	-.01	1.00	0.00	.05	.26	.26	.02	.10	-.14	.05	-.08	.12	.30	.21	.22	.26	.19	.11	.07	.10	.29	.28	.13	.23	.22	.23	.22
Missing Occupation	-.03	-.11	.89	0.00	1.00	-.04	-.09	-.11	.00	-.03	-.07	-.05	-.06	-.05	-.11	-.07	-.07	-.07	-.07	-.04	-.04	-.07	-.10	-.10	-.06	-.06	-.08	-.06	-.06
Entry Age	.22	.01	-.04	.05	-.04	1.00	.17	.02	-.04	-.09	.08	-.06	.13	-.01	.12	.12	.07	.07	.17	.06	.04	.08	.11	.12	.10	.11	.11	.09	.09
Ethnicity (White vs. Black)	.12	.28	-.08	.26	-.09	.17	1.00	.53	-.03	-.16	-.06	-.13	-.03	-.10	.29	.22	.13	.26	.37	.09	.04	.14	.27	.28	.14	.23	.24	.20	.24
Ethnicity (White vs. Other)	.14	.26	-.09	.26	-.11	.02	.53	1.00	.01	.52	-.03	-.10	.00	-.07	.26	.17	.15	.23	.14	.08	.04	.08	.27	.22	.09	.19	.20	.23	.14
Sex	.11	.02	-.00	.02	.00	-.04	-.03	.01	1.00	.05	.02	-.00	.05	.03	.11	.10	.17	.11	-.09	.05	.02	.08	.11	.10	.11	.07	.09	.11	.09
First Language	.10	.10	-.02	.10	-.03	-.09	-.16	.52	.05	1.00	.03	-.03	.06	-.02	.11	.06	.11	.08	-.07	.03	.01	.02	.14	.07	.01	.09	.08	.12	.04
Head Start Membership	-.04	-.22	-.08	-.14	-.07	.08	-.06	-.03	.02	.03	1.00	-.55	.89	-.50	-.07	-.02	-.05	-.06	-.03	-.02	-.01	-.03	-.06	-.07	.03	-.06	-.04	-.05	-.05
Some Preschool Membership	.14	.08	-.06	.05	-.05	-.06	-.13	-.10	-.00	-.03	-.55	1.00	-.49	.91	-.00	-.02	.02	-.02	-.02	-.01	.00	-.00	-.01	.00	-.03	-.00	-.02	-.01	-.03
WRAT x Head Start	.25	-.15	-.07	-.08	-.06	.13	-.03	.00	.05	.06	.88	-.49	1.00	-.44	.08	.12	.09	.06	.07	.04	.05	.05	.09	.07	.15	.09	.09	.07	.04
WRAT x Some Preschool	.35	.13	-.05	.12	-.05	-.01	-.10	-.07	.03	-.02	-.50	.91	-.44	1.00	.12	.10	.14	.09	.06	.05	.05	.07	.12	.12	.06	.11	.08	.10	.05
Total Reading	.53	.25	-.08	.30	-.11	.12	.29	.26	.11	.11	-.07	-.00	.08	.12	1.00	.72	.79	.67	.42	.29	.28	.38	.97	.93	.54	.73	.68	.68	.64
Total Math	.51	.19	-.05	.21	-.07	.12	.22	.17	.10	.06	-.02	-.02	.12	.10	.72	1.00	.66	.70	.42	.31	.28	.34	.68	.68	.90	.92	.91	.82	.81
Spelling	.49	.19	-.04	.22	-.07	.07	.13	.15	.17	.11	-.05	.02	.09	.14	.79	.66	1.00	.56	.32	.28	.28	.33	.81	.68	.56	.66	.59	.61	.43
Language	.43	.21	-.05	.26	-.07	.07	.26	.23	.11	.08	-.06	-.02	.06	.09	.67	.70	.56	1.00	.38	.27	.23	.30	.64	.64	.60	.67	.64	.77	.74
Raven's	.37	.19	-.07	.19	-.07	.17	.37	.14	-.09	-.07	-.03	-.02	.07	.06	.42	.42	.32	.38	1.00	.21	.12	.24	.40	.39	.34	.45	.37	.36	.31
Coopersmith	.24	.12	-.03	.11	-.04	.05	.09	.08	.05	.03	-.02	-.01	.04	.05	.29	.31	.28	.27	.21	1.00	.14	.25	.29	.27	.27	.31	.27	.27	.22
IARS(-)	.19	.07	-.03	.07	-.04	.04	.04	.04	.02	.01	-.01	.00	.05	.05	.28	.28	.28	.23	.12	.14	1.00	.35	.27	.26	.25	.28	.24	.25	.17
IARS(+)	.28	.10	-.05	.10	-.07	.08	.12	.08	.08	.02	-.03	-.00	.05	.07	.36	.34	.33	.30	.22	.25	.35	1.00	.36	.32	.29	.34	.30	.34	.23
Word Knowledge	.52	.25	-.07	.29	-.10	.11	.27	.27	.11	.14	-.06	-.01	.09	.12	.97	.68	.81	.64	.40	.29	.27	.36	1.00	.81	.52	.76	.64	.66	.51
Reading	.49	.23	-.08	.28	-.10	.12	.28	.22	.10	.07	-.07	.00	.07	.12	.93	.68	.68	.64	.39	.27	.26	.32	.81	1.00	.52	.69	.67	.62	.53
Math Computations	.42	.12	-.05	.13	-.06	.10	.14	.09	.11	.01	.03	-.03	.15	.06	.54	.90	.56	.60	.34	.27	.25	.29	.52	.52	1.00	.72	.70	.50	.54
Math Concepts	.51	.21	-.04	.23	-.06	.11	.23	.19	.07	.09	-.06	-.00	.09	.11	.73	.92	.66	.67	.45	.31	.28	.34	.70	.69	.72	1.00	.79	.63	.56
Math Problem Solving	.45	.21	-.06	.22	-.08	.11	.24	.20	.09	.08	-.04	-.02	.09	.08	.68	.91	.59	.64	.37	.27	.24	.30	.64	.67	.70	.79	1.00	.57	.56
Language Part A	.43	.18	-.04	.23	-.06	.09	.20	.23	.11	.12	-.05	-.01	.07	.10	.68	.82	.61	.77	.36	.27	.25	.34	.66	.62	.50	.63	.57	1.00	.49
Language Part B	.35	.19	-.04	.22	-.06	.05	.24	.19	.09	.04	-.05	-.02	.04	.06	.54	.61	.43	.94	.31	.22	.17	.23	.51	.53	.54	.56	.56	.49	1.00

Appendix Table A4-1 (cont.)

CORRELATIONS OF COVARIATES AND OUTCOMES
FOR COHORT III-K(PS) NON-FOLLOW THROUGH CHILDREN
INCLUDED IN THE PRESCHOOL STUDIES

	Fall Kindergarten WRAT	Family Income	Missing Income	Occupation	Missing Occupation	Entry Age	Ethnicity (White vs. Black)	Ethnicity (White vs. Other)	Sex	First Language	Head Start Membership	Some Preschool Membership	WRAT x Head Start	WRAT x Some Preschool	Total Reading	Total Math	Spelling	Language	Raven's	Coopersmith	IARS(-)	IARS(+)	Word Knowledge	Reading	Math Computations	Math Concepts	Math Problem Solving	Language Part A	Language Part B
Fall Kindergarten WRAT	1.00	.31	-.06	.35	-.09	.23	.32	.28	.10	.12	-.04	.15	.12	.34	.61	.60	.51	.55	.48	.29	.19	.27	.60	.58	.51	.60	.56	.49	.50
Family Income	.31	1.00	0.00	.46	-.12	.06	.39	.36	-.04	.09	-.25	.06	-.20	.14	.40	.34	.32	.33	.29	.18	.11	.15	.40	.35	.28	.34	.33	.30	.29
Missing Income	-.06	0.00	1.00	-.02	.89	-.18	-.34	-.19	.02	.08	-.09	-.06	-.09	-.07	-.13	-.13	-.05	-.15	-.15	-.03	-.01	-.02	-.12	-.14	-.11	-.13	-.12	-.11	-.15
Occupation	.35	.46	-.02	1.00	0.00	.08	.37	.35	-.01	.14	-.17	.13	-.13	.21	.40	.36	.27	.37	.30	.17	.09	.16	.39	.38	.29	.36	.34	.31	.35
Missing Occupation	-.09	-.12	.89	0.00	1.00	-.17	-.36	-.21	.01	.08	-.09	-.05	-.09	-.07	-.15	-.14	-.07	-.17	-.16	-.03	-.02	-.01	-.14	-.15	-.12	-.15	-.13	-.12	-.17
Entry Age	.23	.06	-.18	.08	-.17	1.00	.22	.10	-.04	-.06	.01	.01	.05	.06	.11	.14	.05	.13	.16	.04	.01	.02	.11	.11	.12	.13	.14	.09	.13
Ethnicity (White vs. Black)	.32	.39	-.34	.37	-.36	.22	1.00	.73	-.03	-.05	-.15	-.06	-.10	.02	.48	.44	.29	.45	.45	.15	.10	.17	.46	.46	.37	.43	.43	.37	.41
Ethnicity (White vs. Other)	.28	.36	-.19	.35	-.21	.10	.73	1.00	-.02	.43	-.14	-.01	-.10	.05	.41	.38	.25	.39	.30	.15	.08	.14	.40	.39	.31	.37	.37	.34	.36
Sex	.10	-.04	.02	-.01	.01	-.04	-.03	-.02	1.00	.00	-.01	.03	.00	.04	.04	.01	.12	.08	-.08	.07	.02	.07	.03	.05	.02	-.00	.02	.08	.07
First Language	.12	.09	.08	.14	.08	-.06	-.05	-.03	.00	1.00	.04	.06	.03	.07	.08	.06	.01	.09	-.03	.05	-.01	.05	.08	.06	.03	.08	.06	.10	.07
Head Start Membership	-.04	-.25	-.09	-.17	-.09	.01	-.15	-.14	-.01	.04	1.00	-.27	.91	-.24	-.08	-.09	-.08	-.07	-.07	-.07	-.03	-.02	-.09	-.08	-.07	-.09	-.09	-.08	-.05
Some Preschool Membership	.15	.06	-.06	.13	-.05	.01	-.06	-.01	.03	.06	-.27	1.00	-.24	.91	.04	.04	.02	.04	.01	.03	.01	.03	.02	.05	.04	.04	.03	.04	.04
WRAT x Head Start	.12	-.20	-.09	-.13	-.09	.05	-.10	-.10	.00	.03	.91	-.24	1.00	-.22	.02	.01	.01	.01	.02	-.01	.02	.02	.01	.02	.02	.01	.00	.00	.02
WRAT x Some Preschool	.34	.14	-.07	.21	-.07	.06	.02	.05	.04	.07	-.24	.91	-.22	1.00	.16	.17	.12	.17	.12	.09	.03	.09	.15	.17	.15	.17	.15	.14	.16
Total Reading	.61	.40	-.13	.40	-.15	.11	.48	.41	.04	.08	-.08	.04	.02	.16	1.00	.79	.80	.75	.52	.37	.30	.38	.97	.95	.67	.79	.75	.72	.66
Total Math	.60	.34	-.13	.36	-.14	.14	.44	.38	.01	.06	-.09	.04	.01	.17	.79	1.00	.68	.76	.55	.38	.28	.34	.76	.77	.91	.94	.93	.68	.68
Spelling	.51	.32	-.05	.27	-.07	.05	.29	.25	.12	.01	-.08	.02	.01	.12	.80	.68	1.00	.60	.40	.34	.30	.34	.82	.70	.62	.67	.61	.65	.49
Language	.55	.33	-.18	.37	-.17	.13	.45	.39	.08	.09	-.07	.04	.01	.17	.75	.76	.60	1.00	.50	.34	.22	.33	.72	.73	.66	.74	.72	.78	.96
Raven's	.48	.29	-.15	.30	-.16	.16	.45	.30	-.08	-.03	-.07	.01	.02	.12	.52	.55	.40	.50	1.00	.23	.17	.26	.51	.49	.48	.55	.51	.45	.45
Coopersmith	.29	.18	-.03	.17	-.03	.04	.19	.15	.07	.05	-.07	.03	-.01	.09	.37	.38	.34	.34	.23	1.00	.15	.28	.36	.35	.34	.37	.34	.35	.29
IARS(-)	.19	.11	-.01	.09	-.02	.01	.10	.08	.02	-.01	-.03	.01	.02	.03	.30	.28	.30	.22	.17	.15	1.00	.36	.30	.27	.26	.27	.24	.27	.17
IARS(+)	.27	.15	-.02	.16	-.01	.02	.17	.14	.07	.05	-.02	.03	.02	.08	.38	.34	.34	.33	.26	.28	.36	1.00	.37	.35	.31	.33	.32	.36	.26
Word Knowledge	.60	.40	-.12	.39	-.14	.11	.46	.40	.03	.08	-.09	.02	.01	.15	.97	.76	.82	.72	.51	.36	.30	.37	1.00	.84	.65	.76	.71	.71	.61
Reading	.58	.35	-.14	.38	-.15	.11	.46	.39	.05	.06	-.08	.05	.02	.17	.95	.77	.70	.73	.49	.35	.27	.35	.84	1.00	.64	.75	.74	.67	.66
Math Computations	.51	.28	-.11	.29	-.12	.12	.37	.31	.02	.03	-.07	.04	.02	.15	.67	.91	.62	.66	.48	.34	.26	.34	.65	.64	1.00	.78	.77	.60	.59
Math Concepts	.60	.34	-.13	.36	-.15	.13	.43	.37	-.00	.08	-.09	.04	.01	.17	.79	.94	.67	.74	.55	.37	.27	.33	.76	.75	.78	1.00	.84	.68	.66
Math Problem Solving	.56	.33	-.12	.34	-.13	.14	.43	.37	.02	.06	-.09	.03	.00	.15	.75	.93	.61	.72	.51	.34	.24	.32	.71	.74	.77	.84	1.00	.62	.66
Language Part A	.49	.30	-.11	.31	-.12	.09	.37	.34	.08	.10	-.08	.04	.00	.14	.72	.68	.65	.78	.45	.35	.27	.36	.71	.67	.60	.68	.62	1.00	.56
Language Part B	.50	.29	-.15	.35	-.17	.13	.41	.36	.07	.07	-.05	.04	.02	.16	.66	.68	.49	.96	.45	.29	.17	.26	.61	.66	.59	.66	.66	.56	1.00

Appendix Table A4-2

CHILDREN WITH TESTING PROBLEMS AS A PERCENTAGE OF TOTAL REGISTRATION FOR COHORT III-K

		Total Registration	Children with Testing Problems	Percent
RESPONSIVE EDUCATION				
Buffalo, NY	FT	191	7	4
	NFT	176	4	2
Duluth, MN	FT	189	6	3
	NFT	179	7	4
Fresno, CA	FT	163	9	6
	NFT	187	24	13
St. Louis, MO	FT	152	2	1
	NFT	220	18	8
Salt Lake City, UT	FT	121	2	2
	NFT	142	14	10
Tacoma, WA	FT	194	16	8
	NFT	174	13	7
TEEM				
Chicasha, OK	FT	154	7	5
	NFT	157	5	3
Des Moines, IA	FT	141	1	1
	NFT	162	6	4
Lakewood, NJ	FT	137	6	4
	NFT	91	9	10
Newark, NJ	FT	120	1	1
	NFT	142	7	5
Lincoln, NB	FT	278	22	8
	NFT	286	24	9
Wichita, KS	FT	246	6	2
	NFT	150	26	17
BANK STREET				
New York, NY	FT	156	8	5
	NFT	764	90	12
Philadelphia, PA	FT	229	5	2
	NFT	1686	252	15
Brattleboro, VT	FT	57	6	11
	NFT	50	1	2
Fall River, MA	FT	138	1	1
	NFT	138	14	10

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Appendix Table A4-2 (cont.)

		Total Registration	Children with Testing Problems	Percent
BANK STREET (cont.)				
New Haven, CT	FT	60	1	1
	NFT	68	17	25
DIRECT INSTRUCTION				
New York, NY	FT	73	6	8
	NFT	764	90	12
Grand Rapids, MI	FT	316	20	6
	NFT	209	54	26
W. Iron Co., MI	FT	52	3	6
	NFT	62	2	3
Flint, MI	FT	121	13	11
	NFT	142	4	3
Providence, RI	FT	250	20	8
	NFT	180	26	14
BEHAVIOR ANALYSIS				
New York, NY	FT	128	6	5
	NFT	764	90	12
Philadelphia, PA	FT	355	14	4
	NFT	1686	252	15
Portageville, MO	FT	107	2	2
	NFT	93	2	2
Trenton, NJ	FT	237	33	14
	NFT	219	22	10
Kansas City, MO	FT	187	16	9
	NFT	115	16	14
Louisville, KY	FT	213	11	5
	NFT	193	24	12
Waukegan, IL	FT	160	4	3
	NFT	103	13	13
COGNITIVE CURRICULUM				
New York, NY	FT	114	4	4
	NFT	764	90	12
Okaloosa Co., FL	FT	108	5	5
	NFT	110	3	3
Greeley, CO	FT	89	0	0
	NFT	83	8	10
Seattle, WA	FT	167	6	4
	NFT	220	39	18

Appendix Table A4-2 (cont.)

		Total Registration	Children with Testing Problems	Percent
COGNITIVE CURRICULUM (cont.)				
Chicago, IL	FT	93	10	11
	NFT	490	71	14
PARENT EDUCATION				
Philadelphia, PA	FT	154	8	5
	NFT	1686	252	15
Richmond, VA	FT	105	9	9
	NFT	107	12	11
Yakima, WA	FT	276	9	3
	NFT	83	5	6
Houston, TX	FT	261	24	9
	NFT	328	48	15
Lawrenceburg, IN	FT	84	0	0
	NFT	92	4	4
EDC				
Philadelphia, PA	FT	315	19	6
	NFT	1686	252	15
Burlington, VT	FT	85	14	16
	NFT	103	3	3
Lackawanna Co., PA	FT	160	4	3
	NFT	139	16	12
Morgan Comm. Sch., DC	FT	80	8	10
	NFT	63	2	3
Paterson, NJ	FT	103	11	8
	NFT	90	6	7
IELP				
Lock Haven, PA	FT	123	6	5
	NFT	120	7	6
Montevideo, MN	FT	147	1	1
	NFT	206	4	2
Akron, OH	FT	161	15	9
	NFT	219	32	15
ILM				
New York, NY	FT	110	11	10
	NFT	764	90	12
Atlanta, GA	FT	333	11	3
	NFT	334	85	25

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Appendix Table A4-2 (cont.)

		Total Registration	Children with Testing Problems	Percent
SEDL				
Philadelphia, PA	FT	241	14	6
	NFT	1686	252	15
Los Angeles, CA	FT	341	19	6
	NFT	160	7	4
Tulare, CA	FT	284	12	4
	NFT	183	5	3
St. Martin Parish, LA	FT	169	20	12
	NFT	150	7	5
San Diego, TX	FT	108	9	8
	NFT	65	6	9
CLA				
Chicago, IL	FT	293	25	9
	NFT	490	71	14
Topeka, KS	FT	153	3	2
	NFT	58	10	17
HOME-SCHOOL PARTNERSHIP				
New York, NY	FT	96	11	11
	NFT	764	90	12
CAL PROCESS				
Los Angeles, CA	FT	254	17	7
	NFT	140	4	3
Ravenswood, CA	FT	150	21	14
	NFT	166	30	18
Oakland, CA	FT	197	41	21
	NFT	158	65	41
San Jose, CA	FT	229	14	6
	NFT	61	6	10
NSA				
Great Falls, MT	FT	135	3	2
	NFT	158	12	8
Clear Lake, WA	FT	121	4	3
	NFT	137	8	6

Appendix Table A4-3

PERCENTAGE OF VARIANCE*EXPLAINED IN EACH OUTCOME FOR EACH SPONSOR BY DEMOGRAPHIC COVARIATES, BETWEEN-SITE COVARIATES AND TREATMENT FOR THE COHORT III-K LOCAL ANALYSIS

Sponsor \ Outcome	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS(-)	IARS(+)	Total Reading	Total Math	Language Part A	Language Part B
RESPONSIVE EDUCATION															
Demo Covs.	44	32	32	19	34	39	34	27	11	3	13	45	32	25	25
Site Covs.	1	3	2	7	3	3	6	7	5	2	1	2	7	3	2
Treatment	1	2	2	4	2	1	1	1	2	2	3	1	2	2	1
TOTAL	46	37	36	30	39	43	41	35	18	7	17	48	41	30	28
TEEM															
Demo Covs.	39	30	34	29	31	39	47	41	11	5	6	42	44	27	28
Site Covs.	2	3	5	13	1	2	5	4	3	4	1	3	8	3	5
Treatment	8	6	3	2	0	4	1	2	1	0	2	6	1	2	3
TOTAL	49	39	42	44	32	45	53	47	15	9	9	51	53	32	36
BANK STREET															
Demo Covs.	31	24	28	19	27	30	25	23	9	4	10	34	26	23	22
Site Covs.	4	2	1	4	2	6	2	2	0	4	1	5	3	1	1
Treatment	2	4	2	3	3	1	2	2	2	3	1	1	2	0	2
TOTAL	37	30	31	26	32	37	29	27	11	11	12	40	31	24	25
DIRECT INSTRUCTION															
Demo Covs.	37	29	35	26	30	33	35	30	6	3	9	39	35	25	29
Site Covs.	2	2	5	8	1	1	1	1	1	6	2	1	4	1	6
Treatment	0	0	9	10	2	1	3	4	3	1	1	1	6	1	12
TOTAL	39	31	49	44	33	35	39	35	10	10	12	41	45	27	47

* the demographic, site, and treatment variables were entered into regression equations in a hierarchical manner.

Appendix Table A4-3 (cont.)

Sponsor \ Outcome	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS (-)	IARS (+)	Total Reading	Total Math	Language Part A	Language Part B
BEHAVIOR ANALYSIS															
Demo Covs.	28	23	24	21	17	24	26	24	6	5	8	29	28	21	16
Site Covs.	4	2	3	4	3	3	1	2	1	4	2	4	3	2	5
Treatment	0	1	1	3	3	2	2	1	1	3	2	1	2	1	1
TOTAL	32	26	28	28	23	29	29	27	8	12	12	34	33	24	22
COGNITIVE CURRICULUM															
Demo Covs.	34	27	30	20	31	29	30	26	7	8	9	35	30	25	23
Site Covs.	3	6	3	4	2	3	2	1	4	5	2	3	2	2	3
Treatment	4	4	5	1	1	3	2	2	1	1	1	4	2	2	4
TOTAL	41	37	38	25	34	35	34	29	12	14	12	42	34	29	30
PARENT EDUCATION															
Demo Covs.	35	28	31	19	27	32	30	26	8	6	10	37	30	24	23
Site Covs.	4	3	2	5	2	2	2	3	2	1	1	4	4	3	3
Treatment	1	2	2	1	2	2	2	2	1	2	1	1	2	1	1
TOTAL	40	33	35	25	31	36	34	31	11	9	12	42	36	28	27
EDC															
Demo Covs.	40	28	36	30	28	37	34	34	8	7	11	43	38	29	29
Site Covs.	1	1	4	4	0	2	2	2	0	0	2	0	3	1	5
Treatment	0	1	1	2	1	1	1	2	1	2	0	1	1	0	1
TOTAL	41	30	41	36	29	40	37	38	9	9	13	44	42	30	35
IELP															
Demo Covs.	49	37	44	28	34	44	42	36	9	5	3	50	40	30	40
Site Covs.	4	2	5	1	3	4	2	3	1	1	0	5	3	2	5
Treatment	1	2	6	3	2	3	2	0	0	2	2	2	1	2	8
TOTAL	54	41	55	32	39	51	46	39	10	8	5	57	44	34	53

Appendix Table A4-3 (cont.)

Sponsor \ Outcome	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS(-)	IARS(+)	Total Reading	Total Math	Language Part A	Language Part B
ILM															
Demo Covs.	37	25	24	26	24	29	31	25	8	7	10	37	33	21	16
Site Covs.	5	4	0	3	0	3	1	0	1	7	2	5	2	0	0
Treatment	0	1	4	2	0	3	1	1	2	1	1	1	1	3	3
TOTAL	42	30	28	31	24	35	33	26	11	15	13	43	36	24	19
SEDL															
Demo Covs.	20	18	16	17	25	19	22	18	6	3	9	22	22	15	11
Site Covs.	3	4	4	4	2	2	1	1	0	1	0	3	3	4	4
Treatment	4	4	1	2	0	2	1	1	1	1	2	3	1	0	1
TOTAL	27	26	21	23	27	23	24	20	7	5	11	28	26	19	16
CLA															
Demo Covs.	30	28	24	30	27	30	31	28	13	5	18	33	36	22	18
Site Covs.	1	0	2	2	3	2	0	0	0	1	0	1	0	1	3
Treatment	1	3	3	3	1	3	1	0	0	2	1	2	1	1	6
TOTAL	32	31	29	35	31	35	32	28	13	8	19	36	37	24	27
HOME-SCHOOL PARTNERSHIP															
Demo Covs.	32	24	23	22	36	30	30	24	7	8	8	33	29	21	17
Site Covs. *															
Treatment	1	1	2	0	2	1	0	0	2	0	0	2	0	0	3
TOTAL	33	25	25	22	38	31	30	24	9	8	8	35	29	21	20
CAL PROCESS															
Demo Covs.	36	35	23	26	14	41	30	24	9	12	9	42	32	26	10
Site Covs.	6	8	1	2	3	0	2	1	2	0	0	2	1	1	1
Treatment	2	1	1	2	0	1	1	3	1	1	3	2	2	0	3
TOTAL	44	44	25	30	17	42	33	28	12	13	12	46	35	27	14

* Single site sponsor - no between-site terms included in the model.

Appendix Table A4-3 (cont.)

Sponsor \ Outcome	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS(-)	IARS(+)	Total Reading	Total Math	Language Part A	Language Part B
NSA															
Demo Covs.	38	21	39	32	22	38	39	37	10	9	21	41	41	32	33
Site Covs.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Treatment	3	6	4	3	1	3	8	3	2	2	3	4	6	4	3
TOTAL	42	27	43	36	23	42	47	40	12	11	25	45	47	36	37

Appendix Table A4-4

PERCENTAGE OF VARIANCE* EXPLAINED IN EACH OUTCOME
BY DEMOGRAPHIC COVARIATES AND BETWEEN-SITE COVARIATES
IN THE COHORT III-K POOLED ANALYSIS

Outcome	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS (-)	IARS (+)	Total Reading	Total Math	Language Part A	Language Part B
Demo Covs.	46	31	42	32	35	43	43	40	10	5	10	48	44	32	36
Site Covs.	6	6	6	9	4	6	6	5	4	7	4	6	7	6	7
TOTAL	52	37	48	41	39	49	49	45	14	12	14	54	51	38	43

* The demographic and site variables were entered into regression equations in a hierarchical manner.

Appendix Table A4-5

PROPORTION OF STUDENTS IN EACH COHORT III-K SITE
WHO SCORED BELOW SIX ON THE PRETEST

Sponsor/Site		Proportion
RESPONSIVE EDUCATION		
Buffalo, NY	FT	2
	NFT	6
Duluth, MN	FT	0
	NFT	0
Fresno, CA	FT	0
	NFT	0
St. Louis, MO	FT	0
	NFT	0
Salt Lake City, UT	FT	5
	NFT	0
Tacoma, WA	FT	0
	NFT	0
TEEM		
Chicasha, OK	FT	0
	NFT	0
Des Moines, IA	FT	0
	NFT	0
Lakewood, NJ	FT	1
	NFT	0
Newark, NJ	FT	0
	NFT	0
Lincoln, NB	FT	1
	NFT	0
Wichita, KS	FT	0
	NFT	0
BANK STREET		
New York, NY	FT	1
	NFT	0
Philadelphia, PA	FT	0
	NFT	1
Brattleboro, VT	FT	0
	NFT	0

Sponsor/Site		Proportion
BANK STREET (cont.)		
Fall River, MA	FT	0
	NFT	0
New Haven, CT	FT	0
	NFT	7
DIRECT INSTRUCTION		
New York, NY	FT	0
	NFT	0
Grand Rapids, MI	FT	0
	NFT	0
W. Iron Co., MI	FT	0
	NFT	0
Flint, MI	FT	0
	NFT	0
Providence, RI	FT	0
	NFT	0
BEHAVIOR ANALYSIS		
New York, NY	FT	0
	NFT	0
Philadelphia, PA	FT	0
	NFT	1
Portageville, MO	FT	0
	NFT	5
Trenton, NJ	FT	1
	NFT	0
Kansas City, MO	FT	0
	NFT	0
Louisville, KY	FT	1
	NFT	9
Waukegan, IL	FT	0
	NFT	0

Appendix Table A4-5 (cont.)

Sponsor/Site		Proportion
COGNITIVE CURRICULUM		
New York, NY	FT	2
	NFT	0
Okaloosa Co., FL	FT	0
	NFT	0
Greeley, CO	FT	0
	NFT	0
Seattle, WA	FT	0
	NFT	0
Chicago, IL	FT	0
	NFT	3
PARENT EDUCATION		
Philadelphia, PA	FT	2
	NFT	1
Richmond, VA	FT	2
	NFT	0
Yakima, WA	FT	0
	NFT	4
Houston, TX	FT	1
	NFT	4
Lawrenceburg, IN	FT	0
	NFT	0
EDC		
Philadelphia, PA	FT	2
	NFT	1
Burlington, VT	FT	0
	NFT	0
Lackawanna Co., PA	FT	0
	NFT	0
Morgan Comm. Sch., DC	FT	0
	NFT	0
Paterson, NJ	FT	5
	NFT	0
IELP		
Lock Haven, PA	FT	0
	NFT	0
Montevideo, MN	FT	0
	NFT	0
Akron, OH	FT	0
	NFT	3

Sponsor/Site		Proportion
ILM		
New York, NY	FT	0
	NFT	0
Atlanta, GA	FT	4
	NFT	3
SEDL		
Philadelphia, PA	FT	3
	NFT	1
Los Angeles, CA	FT	0
	NFT	0
Tulare, CA	FT	3
	NFT	0
St. Martin Parish, LA	FT	1
	NFT	2
San Diego, TX	FT	16
	NFT	5
CLA		
Chicago, IL	FT	0
	NFT	3
Topeka, KS	FT	0
	NFT	0
HOME-SCHOOL PARTNERSHIP		
New York, NY	FT	0
	NFT	0
CAL PROCESS		
Los Angeles, CA	FT	0
	NFT	0
Ravenswood, CA	FT	0
	NFT	6
Oakland, CA	FT	2
	NFT	0
San Jose, CA	FT	0
	NFT	0
NSA		
Great Falls, MT	FT	0
	NFT	0
Clear Lake, WA	FT	0
	NFT	0

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Appendix Table A4-6

TREATMENT EFFECT ESTIMATES AND STANDARD ERRORS
FOR ANALYSES WHICH LINK THE ENTRY-EXIT
AND LONGITUDINAL STUDIES

Sponsor/ Preschool Category/ Outcome	Analysis / Statistic	Preschool Blocked Pooled Analysis (PBPA)		PBPA without Between-Site Covariates		PBPA without Between-Site Covariates on Longitudinal Sample		Longitudinal Analysis in Entry-Exit Mode	
		Effect Estimate	Standard Error	Effect Estimate	Standard Error	Effect Estimate	Standard Error	Effect Estimate	Standard Error
RESPONSIVE EDUCATION									
HEAD START	Total Reading	-.093	1.474	-3.781	1.409	-5.169	1.844	-6.169	1.876
	Total Math	-.670	.642	-1.975	1.668	-2.044	2.280	-2.925	2.266
	Math Computations	1.788	.668	-.273	.610	-.516	.806	-.771	.780
	Math Concepts	.606	.655	-1.230	.652	-.830	.904	-.566	.920
SOME PRE-SCHOOL	Total Reading	-1.803	1.733	-2.363	1.696	-1.843	2.216	-4.133	2.147
	Total Math	-.055	1.674	1.477	1.813	2.975	2.604	1.329	2.475
	Math Computations	-1.285	.722	.491	.696	.489	1.042	.084	1.015
	Math Concepts	.595	.690	.278	.730	1.030	1.044	.481	1.020
NO PRE-SCHOOL	Total Reading	-1.473	2.326	-3.948	2.343	-.270	3.376	-2.533	3.359
	Total Math	-3.500	2.529	-5.482	2.591	.125	3.583	-1.623	3.606
	Math Computations	-1.133	1.183	-1.569	1.031	.228	1.436	-.116	1.467
	Math Concepts	-1.052	1.039	-1.532	1.032	.521	1.300	-.100	1.273
TEEM									
HEAD START	Total Reading	-8.232	1.103	-4.725	1.041	-5.933	1.599	-7.148	1.605
	Total Math	-4.392	1.121	--	--	-2.755	1.664	-3.301	1.678
	Math Computations	-1.127	.518	-.249	.541	-.728	.732	-.881	.725
	Math Concepts	-1.390	.404	-1.056	.439	-1.382	.604	-.827	.601
SOME PRE-SCHOOL	Total Reading	-10.927	2.448	-3.170	2.415	-.821	4.517	1.036	4.062
	Total Math	-4.443	2.400	.384	2.798	.542	5.566	2.431	5.442
	Math Computations	-1.689	1.013	.985	1.314	2.563	2.387	3.351	2.369
	Math Concepts	-2.647	.882	-.504	.965	-1.404	1.868	-.683	1.748
NO PRE-SCHOOL	Total Reading	-7.480	1.487	-3.449	1.444	-3.459	1.940	-5.722	1.975
	Total Math	-3.774	1.579	-.314	1.538	2.016	1.888	.281	1.886
	Math Computations	-1.075	.591	.295	.584	.597	.763	.254	.761
	Math Concepts	-1.485	.567	-.547	.555	.311	.689	-.248	.677
BANK STREET									
HEAD START	Total Reading	-4.519	2.311	-2.360	2.368	-1.765	3.032	-2.078	3.085
	Total Math	-2.880	2.210	-5.058	2.342	-2.452	2.790	-2.836	2.762
	Math Computations	-1.846	.890	-1.595	.918	-1.032	1.117	-1.297	1.128
	Math Concepts	-1.485	.819	-2.409	.896	- .839	.980	-.282	.971
SOME PRE-SCHOOL	Total Reading	-4.147	1.158	-1.132	1.205	1.032	2.019	-2.460	2.165
	Total Math	-6.251	1.302	-5.337	1.256	-2.602	2.132	-5.025	2.097
	Math Computations	-1.852	.608	-1.466	.553	- .437	1.057	-.845	1.058
	Math Concepts	-2.231	.486	-1.939	.481	-1.787	.798	-2.697	.803
NO PRE-SCHOOL	Total Reading	-4.825	1.350	-4.279	1.457	-2.195	2.351	-3.363	2.496
	Total Math	-5.548	1.686	-5.413	1.624	-4.044	2.714	-4.952	2.852
	Math Computations	-2.170	.693	-1.836	.656	-1.945	.997	-2.107	1.067
	Math Concepts	-2.071	.629	-2.104	.602	-1.649	1.018	-1.652	1.029
DIRECT INSTRUCTION									
HEAD START	Total Reading	5.507	.944	- .056	.937	- .088	1.335	-2.494	1.353
	Total Math	15.414	1.525	10.901	1.341	11.533	1.811	9.381	1.813
	Math Computations	8.821	.638	6.526	.537	6.511	.722	6.019	.716
	Math Concepts	3.038	5.42	2.261	.501	2.404	.652	2.221	.651
SOME PRE-SCHOOL	Total Reading	-1.355	1.438	4.617	1.475	4.683	2.158	.439	2.269
	Total Math	.058	.972	8.307	1.811	8.599	2.343	4.981	2.491
	Math Computations	.496	.845	4.096	.796	3.802	1.032	3.084	1.093
	Math Concepts	-2.450	.730	2.387	.649	2.429	.891	1.096	.931
NO PRE-SCHOOL	Total Reading	- .557	2.084	3.506	2.122	5.777	2.634	3.224	2.915
	Total Math	.147	3.148	6.373	3.288	8.969	4.201	7.217	4.369
	Math Computations	1.562	1.159	3.773	1.338	3.703	1.881	3.356	1.911
	Math Concepts	-1.481	1.215	1.011	1.209	2.071	1.471	1.554	1.530

Appendix Table A4-6 (cont.)

Sponsor/ Preschool Category/ Outcome / Analysis / Statistic	Preschool Blocked Pooled Analysis (PBPA)		PBPA without Between-Site Covariates		PBPA without Between-Site Covariates on Longitudinal Sample		Longitudinal Analysis in Entry-Exit Mode	
	Effect Estimate	Standard Error	Effect Estimate	Standard Error	Effect Estimate	Standard Error	Effect Estimate	Standard Error
BEHAVIOR ANALYSIS								
HEAD START — Total Reading	3.876	.908	1.629	.778	1.235	1.117	- .524	1.126
HEAD START — Total Math	1.609	.964	4.843	.938	5.146	1.317	4.025	1.285
HEAD START — Math Computations	1.994	.402	2.704	.393	2.964	.536	2.770	.535
HEAD START — Math Concepts	.395	.375	1.291	..361	1.166	.512	1.372	.499
SOME PRE-SCHOOL — Total Reading	-3.667	1.298	-1.288	1.152	-1.813	1.510	-4.024	1.638
SOME PRE-SCHOOL — Total Math	5.505	1.348	3.444	1.326	5.521	1.809	3.923	1.894
SOME PRE-SCHOOL — Math Computations	3.730	.615	1.908	.588	2.634	.827	2.382	.850
SOME PRE-SCHOOL — Math Concepts	1.345	.512	1.063	.512	1.901	.746	1.294	.801
NO PRE-SCHOOL — Total Reading	2.050	1.034	3.815	1.124	3.256	1.641	1.732	1.601
NO PRE-SCHOOL — Total Math	5.738	1.211	7.385	1.219	6.436	1.773	5.127	1.768
NO PRE-SCHOOL — Math Computations	3.040	.475	3.350	.475	3.040	.641	2.693	.647
NO PRE-SCHOOL — Math Concepts	1.495	.473	2.206	.460	1.283	.661	1.043	.642
COGNITIVE CURRICULUM								
HEAD START — Total Reading	-3.600	1.424	-5.913	1.561	-7.563	2.069	-8.289	2.052
HEAD START — Total Math	-2.285	1.808	-5.426	1.749	-8.234	2.108	-7.991	2.130
HEAD START — Math Computations	- .932	.697	-1.894	.666	-3.378	.830	-3.373	.860
HEAD START — Math Concepts	-1.762	.710	-2.229	.696	-3.627	.789	-2.844	.784
SOME PRE-SCHOOL — Total Reading	-5.854	2.501	- .112	2.499	-1.378	4.229	-3.540	3.960
SOME PRE-SCHOOL — Total Math	-3.550	2.321	-2.611	2.312	-2.311	3.865	-4.578	3.774
SOME PRE-SCHOOL — Math Computations	- .987	.895	-1.051	.913	-1.063	1.505	-1.670	1.520
SOME PRE-SCHOOL — Math Concepts	-2.072	.913	-1.321	.938	-1.282	1.321	-2.122	1.329
NO PRE-SCHOOL — Total Reading	-7.478	2.846	-1.641	3.074	- .897	4.514	-2.328	4.376
NO PRE-SCHOOL — Total Math	-1.283	4.006	2.914	4.058	1.513	4.617	.324	4.455
NO PRE-SCHOOL — Math Computations	.499	1.535	1.367	1.527	.431	1.922	.062	1.854
NO PRE-SCHOOL — Math Concepts	-1.069	1.541	.820	1.527	- .610	1.678	- .874	1.686
PARENT EDUCATION								
HEAD START — Total Reading	-1.076	1.769	-2.481	1.532	-4.745	2.281	-5.551	2.317
HEAD START — Total Math	-3.330	1.695	-3.585	1.399	-5.700	2.177	-5.478	2.099
HEAD START — Math Computations	-1.709	.631	-1.621	.551	-2.279	.937	-2.018	.878
HEAD START — Math Concepts	- .912	.671	-1.097	.550	-2.065	.911	-1.535	.897
SOME PRE-SCHOOL — Total Reading	1.726	1.794	-1.940	1.703	- .950	2.271	-3.096	2.117
SOME PRE-SCHOOL — Total Math	- .606	1.641	-4.095	1.601	- .371	2.289	-2.013	2.095
SOME PRE-SCHOOL — Math Computations	1.004	.670	-1.607	.571	- .973	.761	-1.368	.699
SOME PRE-SCHOOL — Math Concepts	-1.021	.710	-1.670	.670	- .414	.959	-1.014	.900
NO PRE-SCHOOL — Total Reading	1.328	1.383	- .547	1.416	..013	1.857	-2.380	1.854
NO PRE-SCHOOL — Total Math	.293	1.571	-2.624	1.497	-1.496	2.226	-3.595	2.181
NO PRE-SCHOOL — Math Computations	.492	..674	- .795	.638	- .337	.918	- .938	.900
NO PRE-SCHOOL — Math Concepts	- .085	.615	-1.028	.598	-1.045	.870	-1.44	.850
EDC								
HEAD START — Total Reading	1.345	2.489	-7.409	1.733	-9.010	2.404	-9.411	2.322
HEAD START — Total Math	3.053	2.215	-1.798	2.163	-5.020	2.739	-5.475	2.668
HEAD START — Math Computations	.614	.806	.241	.786	- .988	1.028	-1.296	1.021
HEAD START — Math Concepts	.581	.948	-1.522	.858	-2.942	1.084	-2.363	1.033
SOME PRE-SCHOOL — Total Reading	- .619	1.150	-3.506	1.087	-1.871	1.647	-1.971	1.582
SOME PRE-SCHOOL — Total Math	.700	1.373	-1.661	1.376	- .492	2.000	- .606	1.957
SOME PRE-SCHOOL — Math Computations	.810	.515	- .389	.521	- .412	.768	- 1.87	.770
SOME PRE-SCHOOL — Math Concepts	.248	.567	- .467	.564	- .043	.816	- .202	.798
NO PRE-SCHOOL — Total Reading	-3.185	1.838	-5.280	1.813	-4.204	2.684	-6.228	2.765
NO PRE-SCHOOL — Total Math	-3.928	1.866	-2.962	1.706	-2.229	2.920	-4.144	3.024
NO PRE-SCHOOL — Math Computations	- .932	.742	- .431	.615	- .490	.958	-1.050	1.000
NO PRE-SCHOOL — Math Concepts	-1.414	.744	- .259	.736	- .751	1.349	-1.139	1.376

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Appendix Table A4-6 (cont.)

Sponsor/ Preschool Category/ Outcome	Analysis / Statistic	Preschool Blocked Pooled Analysis (PBPA)		PBPA without Between-Site Covariates		PBPA without Between-Site Covariates on Longitudinal Sample		Longitudinal Analysis in Entry-Exit Mode	
		Effect Estimate	Standard Error	Effect Estimate	Standard Error	Effect Estimate	Standard Error	Effect Estimate	Standard Error
IELP									
HEAD START	Total Reading	-4.390	1.099	-1.804	1.268	-3.043	2.335	-3.827	2.380
	Total Math	-2.751	1.538	-2.034	1.661	-5.151	3.431	-6.065	3.487
	Math Computations	-1.070	.613	- .817	.637	-1.978	1.290	-2.112	1.329
	Math Concepts	- .964	.589	- .567	.644	-1.344	1.262	- .912	1.280
SOME PRE-SCHOOL	Total Reading	4.052	1.796	2.837	1.786	3.631	2.156	2.925	1.946
	Total Math	-6.211	3.232	-5.376	3.320	-4.049	4.488	-4.648	4.687
	Math Computations	-4.143	1.197	-3.940	1.224	-3.925	1.612	-4.120	1.678
	Math Concepts	-1.430	1.085	- .789	1.113	.075	1.505	- .178	1.586
NO PRE-SCHOOL	Total Reading	1.607	1.432	5.085	1.503	9.961	1.770	9.065	1.642
	Total Math	-1.908	2.033	1.766	2.051	2.608	3.315	1.800	3.269
	Math Computations	-2.329	.787	-1.012	.793	-1.649	1.323	-1.796	1.313
	Math Concepts	.237	.677	- .732	.684	2.428	1.037	2.147	1.023
SEDL									
HEAD START	Total Reading	-3.823	1.144	-5.075	1.056	-2.935	1.449	-2.268	1.490
	Total Math	.633	1.215	.511	1.164	- .045	1.525	3.878	1.535
	Math Computations	1.863	.547	1.122	.478	.308	.654	1.742	.668
	Math Concepts	- .609	.458	- .320	.453	- .736	.575	1.262	.565
SOME PRE-SCHOOL	Total Reading	4.583	1.402	-2.094	1.373	.757	1.795	-3.592	1.684
	Total Math	- .009	1.434	-1.925	1.321	- .828	1.565	-4.742	1.584
	Math Computations	-1.412	.607	- .434	.514	.035	.591	-1.088	.610
	Math Concepts	- .620	.550	-1.244	.514	-1.411	.673	-2.640	.643
NO PRE-SCHOOL	Total Reading	- .027	1.015	-4.542	1.046	-2.190	1.589	-3.936	1.623
	Total Math	5.381	1.284	1.213	1.345	3.066	2.070	1.418	2.126
	Math Computations	2.706	.533	1.352	.556	2.322	.818	1.640	.821
	Math Concepts	1.921	.485	- 1.60	.493	.067	.761	- .105	.783
CAL PROCESS									
HEAD START	Total Reading	-6.907	2.121	-11.893	1.921	-13.677	2.934	-16.248	3.050
	Total Math	-5.459	1.882	-11.297	1.762	-13.039	3.149	-15.364	3.139
	Math Computations	.196	.731	-2.643	.661	-4.131	1.061	-4.627	1.056
	Math Concepts	-3.698	.751	-4.932	.727	-5.794	1.213	-6.104	1.228
SOME PRE-SCHOOL	Total Reading	- .597	1.391	- .525	1.092	-4.033	1.915	-8.243	1.710
	Total Math	1.807	1.370	- 3.87	1.273	-2.402	1.919	-5.457	1.938
	Math Computations	.373	.557	- .596	.565	- .049	.804	- .857	.807
	Math Concepts	1.294	.582	-1.897	.491	-2.178	.824	-3.237	.833
NO PRE-SCHOOL	Total Reading	-2.159	3.246	-9.024	2.819	-6.628	2.656	-9.047	2.922
	Total Math	-2.124	2.926	-9.511	2.564	-7.010	2.996	-8.611	2.839
	Math Computations	- .080	1.083	-2.782	.959	-2.288	1.066	-2.575	1.039
	Math Concepts	- .327	1.251	-3.516	1.122	-2.649	1.358	-3.171	1.318

Appendix Table A4-7

RESULTS OF RANKING ANALYSES FOR COHORT III-K (PS) SAMPLE:
POSTTEST FT/NFT RANK DIFFERENCE ADJUSTED FOR PRETEST FT/NFT RANK DIFFERENCE

	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS(-)	IARS(+)	Total Reading	Total Math	Language Part A	Language Part B
RESPONSIVE EDUCATION															
Buffalo, NY	-9.	-18.	-20.	-63.	0	-17.	-1.	-15.	-33.	-95.	-80.	-12.	-38.	-23.	-22.
Duluth, MN	7.	-16.	8.	24.	30.	13.	7.	5.	12.	-10.	32.	6.	12.	5.	10.
Fresno, CA	19.	12.	22.	44.	20.	10.	36.	41.	34.	61.	38.	19.	41.	21.	19.
St. Louis, MO	95.	97.	65.	112.	81.	103.	99.	120.	60.	57.	87.	100.	107.	106.	43.
Salt Lake City, UT	-27.	-4.	-50.	-4.	-24.	12.	-41.	-16.	-50.	24.	-93.	-8.	-18.	-63.	-40.
Tacoma, WA	-39.	-69.	-27.	-50.	-13.	-37.	-44.	-40.	-11.	3.	-19.	-40.	-46.	-22.	-23.
TEEM															
Chicasha, OK	28.	1.	62.	70.	29.	27.	44.	46.	52.	56.	62.	27.	55.	55.	61.
Des Moines, IA	12.	18.	20.	67.	14.	20.	19.	30.	-45.	-15.	-8.	14.	36.	34.	19.
Lakewood, NJ	-5.	-21.	-27.	0	25.	9.	-9.	-1.	41.	18.	8.	0	-1.	-17.	-34.
Newark, NJ	-112.	-95.	-50.	-29.	-26.	-54.	-25.	-11.	-35.	-78.	-103.	-94.	-22.	-47.	-71.
Lincoln, NB	-9.	-22.	11.	0	-5.	-6.	4.	5.	-10.	1.	23.	-10.	2.	8.	15.
Wichita, KS	0	-13.	-21.	-16.	21.	4.	-18.	-12.	-39.	39.	-12.	3.	-22.	3.	-29.
BANK STREET															
New York, NY	-25.	-49.	-62.	-63.	-75.	-19.	-55.	-51.	-98.	-52.	-50.	-23.	-55.	-20.	-85.
Philadelphia, PA	-60.	-73.	-32.	-32.	-68.	-47.	-56.	-54.	-68.	-49.	-67.	-55.	-50.	-31.	-41.
Brattleboro, VT	-1.	-35.	-22.	-90.	5.	-10.	-55.	-42.	-6.	-104.	-35.	-2.	-69.	1.	-38.
Fall River, MA	-39.	-61.	25.	-10.	-2.	-23.	-2.	5.	5.	9.	3.	-32.	-7.	-1.	24.
New Haven, CT	-45.	-62.	-24.	-98.	-33.	-34.	-57.	-38.	-55.	-154.	-15.	-38.	-63.	-46.	5.
DIRECT INSTRUCTION															
New York, NY	-17.	-11.	18.	16.	-50.	-17.	9.	12.	-98.	-19.	-82.	-18.	18.	7.	23.
Grand Rapids, MI	-29.	-23.	-61.	-29.	7.	-10.	-64.	-40.	-76.	9.	-45.	-24.	-40.	-24.	-74.
W. Iron Co., MI	1.	-15.	16.	21.	0	0	2.	-7.	-10.	1.	28.	2.	9.	2.	17.
Flint, MI	-32.	-22.	-19.	-32.	-107.	-15.	-31.	-8.	-144.	-45.	-75.	-28.	-27.	-29.	-3.
Providence, RI	11.	17.	54.	79.	26.	21.	44.	60.	28.	68.	57.	13.	63.	43.	53.
BEHAVIOR ANALYSIS															
New York, NY	-51.	-62.	-54.	-22.	-81.	-62.	-73.	-77.	-110.	-56.	-62.	-57.	-54.	-65.	-45.
Philadelphia, PA	-29.	-14.	-1.	14.	-51.	-10.	13.	3.	-31.	11.	-40.	-21.	4.	10.	-13.
Portageville, MO	-50.	-64.	-73.	-60.	-101.	-80.	-74.	-78.	-54.	-81.	-116.	-64.	-73.	-79.	-67.
Trenton, NJ	-10.	-5.	-38.	17.	-35.	-14.	27.	-4.	-67.	64.	39.	-14.	6.	-40.	-24.
Kansas City, MO	15.	48.	2.	2.	-27.	-2.	8.	-15.	61.	16.	-26.	10.	3.	6.	2.
Louisville, KY	14.	12.	11.	66.	-20.	20.	42.	30.	-32.	62.	8.	16.	46.	19.	6.
Waukegan, IL	11.	-25.	31.	27.	-26.	-4.	-27.	-7.	-12.	11.	26.	4.	0	20.	29.
COGNITIVE CURRICULUM															
New York, NY	-36.	-22.	-79.	-45.	-59.	-43.	-52.	-43.	-22.	-27.	-40.	-40.	-44.	-61.	-85.
Okaloosa Co., FL	-45.	-20.	-69.	-47.	-37.	-57.	-65.	-68.	-9.	-29.	-55.	-47.	-62.	-58.	-64.
Greeley, CO	23.	49.	51.	10.	21.	44.	31.	56.	29.	20.	21.	20.	37.	53.	49.
Seattle, WA	2.	9.	1.	58.	54.	2.	22.	13.	2.	-9.	71.	-1.	35.	33.	-7.
Chicago, IL	-56.	-60.	-50.	-58.	-5.	-58.	-56.	-50.	-60.	-55.	17.	-57.	-55.	-42.	-58.
PARENT EDUCATION															
Philadelphia, PA	-8.	-20.	9.	-3.	-13.	5.	-15.	-4.	-8.	-9.	-27.	-2.	-10.	0	15.
Richmond, VA	-1.	-11.	-39.	-5.	-12.	1.	-18.	22.	-46.	54.	37.	-4.	-3.	-18.	-49.
Yakima, WA	3.	10.	-22.	4.	-42.	-12.	-9.	-40.	-22.	-7.	-6.	-11.	-16.	5.	-43.
Houston, TX	-32.	-35.	-36.	-10.	-28.	-30.	-32.	-23.	-38.	1.	6.	-37.	-20.	-29.	-56.
Lawrenceburg, IN	54.	55.	40.	13.	38.	24.	45.	42.	47.	113.	86.	46.	36.	40.	43.
EDC															
Philadelphia, PA	-24.	-45.	3.	-2.	0	-17.	-20.	-25.	-1.	19.	0	-10.	-17.	10.	-4.
Burlington, VT	-11.	-15.	-45.	55.	-8.	-10.	22.	37.	-18.	-11.	-3.	-13.	45.	-14.	-54.
Lackawanna Co., PA	6.	0	5.	-3.	6.	3.	1.	-2.	0	14.	14.	5.	-2.	10.	5.
Morgan Comm. Sch., DC	28.	39.	18.	57.	26.	34.	28.	50.	149.	103.	100.	30.	41.	31.	6.
Paterson, NJ	12.	19.	14.	24.	39.	22.	25.	33.	64.	-75.	3.	14.	28.	23.	10.

Appendix Table A4-7 (cont.)

	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS(-)	IARS(+)	Total Reading	Total Math	Language Part A	Language Part B
IELP															
Lock Haven, PA	-16.	-13.	-19.	-39.	-1.	-24.	-25.	-22.	-25.	-35.	-49.	-18.	-39.	-4.	-24.
Montevideo, MN	5.	5.	-13.	-12.	-2.	2.	1.	-2.	1.	49.	9.	0	0	-2.	-13.
Akron, OH	-13.	-42.	-64.	-26.	16.	-51.	-23.	-21.	-32.	-30.	-40.	-36.	-23.	-75.	-94.
ILM															
New York, NY	-43.	-63.	-88.	-60.	-40.	-79.	-56.	-68.	-78.	-79.	-91.	-59.	-69.	-67.	-90.
Atlanta, GA	13.	24.	33.	17.	4.	18.	11.	13.	-37.	1.	3.	18.	19.	29.	40.
SEDL															
Philadelphia, PA	-5.	-17.	11.	14.	23.	8.	9.	19.	30.	41.	-10.	2.	15.	12.	11.
Los Angeles, CA	-50.	-45.	-16.	-29.	-8.	-24.	-20.	-14.	-58.	-52.	-30.	-38.	-14.	-32.	4.
Tulare, CA	53.	53.	49.	83.	30.	54.	59.	42.	74.	50.	69.	54.	63.	24.	58.
St. Martin Parish, LA	-12.	-24.	-15.	4.	2.	-25.	-6.	-19.	-18.	0	-38.	-17.	-6.	-5.	-18.
San Diego, TX	-42.	-72.	12.	33.	2.	-12.	-8.	0	-9.	6.	8.	-35.	20.	10.	21.
CLA															
Chicago, IL	-10.	20.	-37.	6.	0	-26.	-6.	-6.	-24.	10.	-30.	-17.	1.	-18.	-60.
Topeka, KS	-9.	26.	-30.	52.	-1.	-19.	-8.	-3.	-33.	-23.	-20.	-18.	18.	-14.	-12.
HOME-SCHOOL PARTNERSHIP															
New York, NY	-43.	-43.	-55.	-12.	-73.	-46.	-37.	-13.	-87.	-41.	-63.	-43.	-13.	-43.	-63.
CAL PROCESS															
Los Angeles, CA	-32.	-21.	-43.	-4.	-34.	-12.	-15.	-17.	-5.	-16.	-12.	-24.	-11.	-35.	-47.
Ravenswood, CA	-13.	-38.	-1.	-24.	2.	-18.	-30.	-52.	61.	19.	-51.	-17.	-31.	-20.	10.
Oakland, CA	-99.	-99.	-99.	-99.	-99.	-99.	-49.	-99.	-99.	-99.	-99.	-99.	-99.	-99.	-99.
San Jose, CA	-34.	-24.	-26.	5.	54.	-13.	-21.	-14.	122.	20.	77.	-38.	-20.	6.	-23.
NSA															
Great Falls, MT	43.	28.	32.	22.	35.	44.	24.	44.	44.	17.	34.	42.	30.	14.	35.
Clear Lake, WA	-15.	-42.	-11.	-1.	15.	-6.	-5.	2.	-26.	-63.	-75.	-17.	-1.	-16.	-4.

Appendix Table A4-8

MAGNITUDE OF ADJUSTMENT FOR THE PRESCHOOL ADJUSTED LOCAL ANALYSIS OF COHORT III-K(PS)

	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS(-)	IARS(+)	Total Reading	Total Math	Language Part A	Language Part B
RESPONSIVE EDUCATION															
Buffalo, NY	-1.03	-1.30	-.99	-1.01	-.44	-.98	-.80	-.84	-.15	-.13	.03	-1.93	-2.66	-.49	-.51
Duluth, MN	1.85	1.42	1.14	.95	.76	1.49	1.70	.81	1.01	.12	.24	3.34	3.48	.45	.69
Fresno, CA	2.47	2.42	1.36	.35	1.17	1.47	1.60	.97	.33	.35	.32	3.75	2.93	.72	.64
St. Louis, MO	2.98	2.42	1.99	1.60	1.48	2.30	2.41	1.75	1.15	.16	.52	5.24	5.75	.62	1.37
Salt Lake City, UT	2.61	.65	1.49	.94	1.53	1.45	1.98	.76	.35	.16	.40	4.05	3.68	.49	1.28
Tacoma, WA	4.43	3.09	3.00	1.16	2.08	3.19	3.22	1.64	.78	.28	.50	7.82	6.03	.70	2.31
TEEM															
Chicasha, OK	7.16	5.54	4.46	4.24	2.60	5.05	5.53	4.67	2.24	.67	.49	12.21	14.43	1.61	3.04
Des Moines, LA	3.65	2.50	2.71	2.00	1.44	2.74	3.15	2.46	.87	.41	.21	6.40	7.59	.84	1.87
Lakewood, NJ	3.48	3.43	1.56	.82	.38	1.48	1.50	.94	.30	.06	.11	4.91	3.27	.79	.78
Newark, NJ	-.62	-.97	-.62	-.54	-.87	-.47	-.58	-.21	-.09	-.09	-.01	-1.07	-1.34	-.27	-.15
Lincoln, NB	1.64	1.30	.99	.90	.52	1.10	1.25	1.14	.30	.16	.10	2.73	3.29	.38	.63
Wichita, KS	4.34	5.87	3.79	3.41	1.97	4.39	5.02	4.33	1.13	.68	.46	10.71	12.76	1.09	2.70
BANK STREET															
New York, NY	-1.63	-2.41	-1.47	-.97	-.35	-1.18	-1.21	-.71	-.54	-.19	-.19	-2.80	-2.90	-.64	-1.03
Philadelphia, PA	-.93	-.93	-.82	-.51	-.49	-.79	-.58	-.40	-.26	-.09	-.10	-1.65	-1.48	-.34	-.48
Brattleboro, VT	2.98	2.95	1.95	1.40	.74	1.79	2.03	1.46	1.01	.20	.22	4.77	4.89	.75	1.20
Fall River, MA	.81	1.84	.25	.65	.21	.47	.42	.49	.18	.11	.23	1.29	1.55	.37	.11
New Haven, CT	-2.91	-2.54	-2.44	-1.23	-1.01	-2.00	-1.91	-1.69	-1.49	.06	-.24	-4.91	-4.83	-.67	-1.97
DIRECT INSTRUCTION															
New York, NY	-1.47	-2.54	-2.82	-1.74	-.48	-1.18	-1.51	-1.35	-.58	-.01	-.25	-2.86	-4.60	-.78	-2.04
Grand Rapids, MI	.59	1.74	.85	1.01	-.14	1.06	.96	1.07	.96	.05	-.03	1.67	3.04	.13	.73
W. Iron Co., MI	4.94	5.28	3.42	2.75	1.27	4.03	3.56	3.00	1.44	.09	.09	8.97	9.36	1.06	2.36
Flint, MI	-1.43	-1.98	-1.86	-.80	-.98	-.33	-.93	-.59	.82	-.17	-.34	-1.94	-2.31	-.77	-1.09
Providence, RI	5.08	4.79	3.65	1.98	1.35	4.07	4.04	3.63	1.89	-.09	.31	10.04	10.64	.92	2.62
BEHAVIOR ANALYSIS															
New York, NY	-2.71	-2.64	-2.82	-1.42	-1.35	-1.89	-1.55	-1.24	-.23	.04	-.34	-4.61	-4.40	-.80	-2.02
Philadelphia, PA	-.30	-.36	-.55	-.34	-.26	-.59	-.27	-.38	-.14	-.01	-.01	-.84	-1.00	-.20	-.35
Portageville, MO	-5.47	-5.98	-4.15	-2.93	-1.80	-3.11	-3.38	-2.76	-1.52	-.32	-.64	-8.58	-9.08	-1.56	-2.59
Trenton, NJ	.74	.94	.34	.43	.34	.64	1.04	.79	.83	.37	.06	1.38	2.28	.07	.41
Kansas City, MO	1.22	1.32	1.11	.78	.28	.89	.76	.66	.37	.03	.06	2.11	2.20	.40	.71
Louisville, KY	-2.19	-2.44	-1.78	-1.23	-.78	-1.23	-1.38	-1.02	-.69	-.11	-.32	-3.40	-3.63	-.68	-1.11
Waukegan, IL	.47	1.82	.73	.75	1.55	.90	.43	.59	.59	.01	.19	1.38	1.76	.04	.76
COGNITIVE CURRICULUM															
New York, NY	.23	-.10	.03	.81	.92	-.20	.50	.48	-.34	.46	-.04	.03	1.99	.03	-.01
Okaloosa Co., FL	5.70	3.36	4.48	2.50	3.27	4.10	3.34	3.63	1.35	-.09	.86	9.79	9.47	1.91	2.58
Greeley, CO	.41	1.47	.55	.08	-.10	.01	.78	.06	-.18	.13	.34	.42	.75	.19	.37
Seattle, WA	4.87	4.07	3.42	2.34	1.49	3.60	2.89	2.44	1.20	-.16	.33	8.46	7.48	1.24	2.39
Chicago, IL	-.92	-.77	-.09	-.22	-.86	.22	-.51	.10	.49	-.09	0	-.68	-.62	.27	-.36
PARENT EDUCATION															
Philadelphia, PA	1.21	1.35	.72	.90	.31	.46	.96	1.12	.37	.23	.30	1.68	3.00	.33	.39
Richmond, VA	2.03	1.27	.96	.37	.50	.44	.58	.42	.74	-.04	.06	2.68	1.35	.19	.79
Yakima, WA	1.41	.85	.19	.57	.12	.35	.26	.29	.30	.20	.09	1.76	1.12	.06	.25
Houston, TX	-2.41	-3.06	-1.53	-1.26	-.83	-1.01	-1.94	-2.03	-.87	-.21	-.60	-4.32	-5.24	-.59	-.95
Lawrenceburg, IN	4.33	4.83	3.27	2.18	1.59	3.43	2.95	2.35	1.44	.63	.67	6.75	7.45	1.21	2.66
EDC															
Philadelphia, PA	.06	.07	-.45	.39	.20	-.54	.09	.28	-.28	.25	.33	-.53	.76	-.10	-.36
Burlington, VT	2.18	2.53	1.47	.98	.42	1.80	1.67	1.16	1.75	.43	.38	3.98	3.80	.59	1.68
Lackawanna Co., PA	2.29	2.00	1.74	.69	.52	1.81	1.64	1.26	1.76	.21	.24	4.11	3.58	.47	1.27
Morgan Comm. Sch., DC	2.90	3.75	2.01	1.41	1.00	2.04	2.22	1.31	1.36	.40	.47	4.95	4.95	.87	1.13
Paterson, NJ	2.51	3.08	1.49	.83	.47	1.89	2.26	1.09	2.07	.82	.72	4.41	4.19	.73	.75
IELP															
Lock Haven, PA	2.13	1.96	2.21	.07	-.0	1.40	.87	.92	1.59	.10	.13	3.53	1.85	.74	1.47
Montevideo, MN	-.95	-.89	-.96	-.66	-.22	-.75	-.81	-.70	-.25	-.05	-.09	-1.69	-2.17	-.30	-.67
Akron, OH	-1.98	-1.77	-1.48	-.94	.08	-2.09	-1.02	-1.09	-.06	-.18	-.13	-3.99	-3.04	-.24	-1.24
ILM															
New York, NY	-1.62	-1.48	-1.80	-1.12	-.48	-1.32	-1.17	.21	-.81	.13	-.03	-2.94	-2.08	-.65	-1.15
Atlanta, GA	.33	.14	.59	.31	.33	.21	.06	-.32	.40	-.09	.09	.55	.06	.08	.52
SEDL															
Philadelphia, PA	3.24	2.79	1.42	1.04	-.17	.05	1.41	1.22	.63	.21	.31	4.18	3.68	.81	.62
Los Angeles, CA	-1.14	-2.01	-1.16	-.88	-.94	-.98	-.57	-.49	-.10	-.25	-.10	-1.45	-1.95	-.60	-.57
Tulare, CA	3.55	3.32	1.74	.97	.82	2.08	1.34	1.36	1.11	.17	.34	5.41	3.68	.72	1.42
St. Martin Parish, LA	.43	.78	.14	-.09	-.10	.30	-.18	.16	.15	-.06	.04	.72	-.12	-.01	-.12
San Diego, TX	1.97	2.44	1.08	1.11	.84	1.67	1.10	1.10	.47	.12	.25	3.05	3.30	.53	.54
CLA															
Chicago, IL	-.44	-1.00	.31	-.88	.06	-.80	-.68	-.39	-.08	-.28	-.23	-1.23	-1.94	.15	.16
Topeka, KS	3.19	4.50	2.24	2.15	.86	.68	1.78	2.06	2.17	.50	.07	3.87	6.00	1.03	1.20
HOME-SCHOOL PARTNERSHIP															
New York, NY	-1.34	-2.45	-.94	-1.10	-.47	-.94	-.87	-.42	-.72	.25	-.22	-2.30	-2.39	-.17	-.76
CAL PROCESS															
Los Angeles, CA	-5.12	-4.95	-1.37	-.25	-.94	-2.54	-2.39	-2.00	-2.90	-.40	.07	-7.66	-4.64	-.69	-.67
Ravenswood, CA	.93	2.11	.84	2.35	.17	1.58	2.05	.99	.58	.47	.49	2.49	5.38	.60	.28
Oakland, CA	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00
San Jose, CA	7.58	9.80	3.56	1.58	1.38	5.72	3.49	2.75	1.02	-.51	1.10	13.30	9.83	2.58	.97
NSA															
Great Falls, MT	3.40	2.58	4.67	2.12	.87	2.99	2.85	2.54	1.58	.39	.89	6.39	7.33	1.10	3.54
Clear Lake, WA	5.81	3.46	5.10	1.55	1.10	4.09	2.71	2.96	.42	1.07	.76	9.89	7.22	1.11	3.98

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Appendix Table A4-9

MAGNITUDE OF ADJUSTMENT FOR THE LOCAL ANALYSIS OF COHORT III-K

	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS(-)	IARS(+)	Total Reading	Total Math	Language Part A	Language Part B
RESPONSIVE EDUCATION															
Buffalo, NY	-1.53	-2.20	-1.11	-1.03	-.51	-1.34	-1.18	-.97	-.47	-.06	-.10	-2.88	-3.18	-.56	-.62
Duluth, MN	1.55	1.12	.95	.99	.49	1.08	1.22	.87	.65	.16	.23	2.63	3.07	.33	.63
Fresno, CA	2.05	1.63	1.46	.50	.90	.91	1.27	.91	-.35	.38	.31	2.96	2.69	.87	.89
St. Louis, MO	2.01	1.65	1.43	1.17	.95	1.39	1.45	1.12	.61	.16	.22	3.39	3.75	.42	1.00
Salt Lake City, UT	2.36	.47	1.04	.99	.09	1.39	1.39	.96	-.17	.36	.30	3.75	3.33	.37	1.57
Tacoma, WA	3.70	2.24	2.69	1.22	1.40	2.37	2.06	1.50	.47	.44	.61	5.97	4.78	.80	2.10
TEEN															
Chicasha, OK	5.78	4.50	4.04	3.39	2.24	4.35	4.81	3.86	1.68	.71	.43	10.12	12.08	1.30	2.73
Des Moines, LA	3.03	1.94	2.66	1.97	1.32	2.54	2.69	2.07	1.04	.39	.25	5.57	6.75	.83	1.82
Lakewood, NJ	2.08	2.00	1.32	.78	.54	1.23	1.57	.79	.26	.12	.22	3.30	3.14	.56	.76
Newark, NJ	-1.21	-1.34	-1.02	-1.03	-.27	-1.05	-1.02	-1.04	-.36	-.10	-.11	-2.26	-3.11	-.27	-.74
Lincoln, NB	1.26	1.02	.66	.74	.51	.88	1.05	.96	.26	.17	.13	2.14	2.74	.23	.42
Wichita, KS	5.55	4.67	3.38	3.33	2.04	4.04	4.61	3.93	1.32	.66	.55	9.59	11.87	1.07	2.30
BANK STREET															
New York, NY	-1.61	-1.84	-1.34	-.61	-.09	-.07	-.82	-.39	-.27	-.10	-.05	-2.59	-1.81	-.34	-1.00
Philadelphia, PA	-1.52	-1.45	-.99	-.64	-.49	-.80	-.89	-.66	-.37	-.11	-.11	-2.31	-2.19	-.38	-.62
Brattleboro, VT	2.03	1.50	1.32	.74	.47	1.25	1.05	.81	.52	.11	.04	3.27	2.60	.48	.92
Fall River, MA	.66	.78	.10	-0	.25	.19	-.15	.02	-.05	-.01	-.04	.85	-.14	.05	-.16
New Haven, CT	-3.78	-3.30	-2.86	-1.47	-1.06	-2.55	-2.28	-1.72	-1.49	-.01	-.18	-6.25	-5.48	-.79	-2.07
DIRECT INSTRUCTION															
New York, NY	-2.18	-2.80	-2.47	-1.51	-.24	-1.47	-1.64	-1.34	-.81	-.13	-.14	-3.44	-4.49	-.72	-1.95
Grand Rapids, MI	-.79	-.80	-.27	-.49	-.62	-.59	-.51	-.33	-0	.01	-.14	-1.32	-1.34	-.19	-.08
W. Iron Co., MI	4.28	4.72	3.40	3.25	1.25	3.09	2.73	2.36	1.24	.09	.37	7.30	7.34	.80	2.50
Flint, MI	-2.05	-2.66	-1.49	-1.22	-.91	-1.09	-1.41	-.91	-.43	-.28	-.29	-3.08	-3.53	-.60	-1.02
Providence, RI	2.41	1.92	2.33	1.46	1.06	2.25	1.96	1.87	.77	.16	.17	4.86	5.27	.85	1.77
BEHAVIOR ANALYSIS															
New York, NY	-1.43	-1.79	-1.41	-.88	-.84	-1.30	-.94	-.83	-.32	-.04	-.24	-2.73	-2.63	-.45	-.97
Philadelphia, PA	-.85	-.86	-.79	-.50	-.21	-.70	-.54	-.52	-.21	0	-.08	-1.55	-1.56	-.26	-.53
Portageville, MO	-5.07	-5.77	-3.65	-2.76	-1.41	-2.94	-3.26	-2.69	-1.58	-.39	-.63	-8.02	-8.72	-1.44	-2.21
Trenton, NJ	-.55	-1.13	-.38	-.45	0	-.19	-.33	-.22	-.38	-.09	-.14	-.73	-1.01	-.20	-.18
Kansas City, MO	.40	.51	.50	.25	.10	.41	.21	.27	.08	.02	.07	.82	.73	.14	.36
Louisville, KY	-2.39	-2.87	-1.72	-1.43	-.84	-1.38	-1.62	-1.23	-.97	-.23	-.31	-3.75	-4.28	-.73	-.99
Waukegan, IL	-.11	.69	.28	-.05	1.30	.41	-.22	-.01	.08	-.17	.12	.30	-.27	-.16	.44
COGNITIVE CURRICULUM															
New York, NY	.26	-.22	-.45	.66	.84	.27	.45	.70	-.79	.20	1.04	.53	1.81	.03	-.47
Okaloosa Co., FL	5.45	3.58	4.62	2.74	2.80	3.09	3.69	3.86	.94	-.13	1.01	9.59	10.29	1.49	3.12
Greeley, CO	.45	1.06	1.38	.48	-.12	.55	.97	.41	.25	-.03	.20	1.00	1.86	.29	1.09
Seattle, WA	5.16	4.83	3.65	3.20	2.60	3.40	3.66	3.15	.82	-.43	.56	8.77	10.01	1.33	2.22
Chicago, IL	-2.04	-1.24	-1.18	-1.04	-.89	-1.25	-1.55	-1.17	-.42	-.13	-.02	-3.30	-3.75	-.33	-.84
PARENT EDUCATION															
Philadelphia, PA	.34	.74	.24	.53	.12	.14	.49	.71	-.09	.18	.15	.46	1.75	.12	.12
Richmond, VA	.50	.27	.24	-.30	-.01	.08	-.26	-.20	0	-.19	-.08	.59	.75	-.23	-.01
Yakima, WA	.01	-1.64	-.73	-.65	-.24	-.32	-.55	-.48	-.74	-.30	-.28	-.30	-1.68	-.39	-.33
Houston, TX	-.76	-3.03	-.80	-.74	-.56	-1.08	-.86	-1.31	1.03	-.41	-.17	-1.83	-2.92	-.50	-.30
Lawrenceburg, IN	3.47	3.96	2.44	1.71	1.39	2.24	2.37	1.79	1.22	.43	.53	5.91	5.85	.96	1.48
EDC															
Philadelphia, PA	-.72	-.13	-.47	0	.07	-.07	-.57	-.16	-.31	.15	.17	-1.69	-.73	-.15	-.53
Burlington, VT	1.63	1.37	1.22	.66	.56	.07	.88	.82	.84	.06	.12	2.58	2.36	.34	.88
Lackawanna Co., PA	.84	.70	.80	.37	.35	.73	.68	.46	.47	.01	.02	1.57	1.50	.25	.56
Morgan Comm. Sch., DC	2.79	3.01	1.93	1.24	1.06	1.77	1.95	1.33	.85	.23	.34	4.57	4.53	.75	1.16
Paterson, NJ	1.43	1.21	.98	.22	.82	.49	.89	.45	.59	.04	.11	2.11	1.56	.34	.65
IELP															
Lock Haven, PA	.95	1.34	1.18	.18	-0	.89	.20	.58	.83	.06	.02	1.83	.94	.32	.86
Montevideo, MN	-.78	-.86	-.74	-.67	-.22	-.58	-.67	-.57	-.21	-.06	-.07	-1.34	-1.90	-.22	-.52
Akron, OH	-1.16	-.78	-.87	0	.25	-1.55	-.56	-.54	.30	-.16	-.15	-2.71	-1.10	-.26	-.59
ILN															
New York, NY	-1.60	-1.57	-1.33	-1.10	.02	-1.20	-1.11	-.27	-.67	.18	-.13	-2.80	-2.46	-.40	-.93
Atlanta, GA	-.36	-.35	-.26	-.23	-.15	-.25	-.25	-.19	-.10	0	-.03	-.61	-.67	-.09	-.18
SEDL															
Philadelphia, PA	2.25	1.92	.89	.41	-.40	.61	.76	.78	.21	.24	.18	2.87	1.94	.67	.22
Los Angeles, CA	-1.21	-1.68	-1.00	-1.15	-.48	-.55	-1.02	-.70	-.39	-.26	-.09	-1.76	-2.87	-.44	-.54
Tulare, CA	3.32	3.07	1.45	.81	.77	1.06	1.29	1.21	1.00	.24	.46	5.28	3.31	.65	.79
St. Martin Parish, LA	0	.09	.12	.07	.19	-0	.14	.08	.08	.02	.03	.02	.30	.04	.07
San Diego, TX	.89	1.15	.83	.87	.60	.59	.90	.63	.49	.17	.14	1.49	2.48	.34	.49
CLA															
Chicago, IL	-1.17	-1.75	-.62	-1.05	-.54	-.77	-1.11	-.78	-.49	-.22	-.23	-1.94	-2.93	-.29	-.32
Topeka, KS	2.00	3.07	.95	1.85	.39	.63	1.31	1.91	1.40	.30	.03	2.62	5.08	.55	.41
HOME-SCHOOL PARTNERSHIP															
New York, NY	-2.00	-2.20	-1.74	-1.42	-.53	-1.22	-.91	-.63	-1.29	.58	-.11	-3.22	-2.86	.08	-1.83
CAL PROCESS															
Los Angeles, CA	-5.62	-5.44	-1.95	-1.69	-1.29	-2.94	-3.26	-2.24	-2.82	-.60	-.30	-8.55	-7.21	-1.21	-.74
Ravenswood, CA	.10	.55	.40	.20	.09	.44	.74	.37	.18	.15	.02	.55	1.79	.17	.22
Oakland, CA	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00
San Jose, CA	6.78	6.98	5.65	5.25	.96	6.75	5.56	5.24	-.05	-.76	.64	11.53	7.06	2.12	.42
NSA															
Great Falls, MT	3.91	3.19	3.34	2.10	.94	3.30	2.59	2.46	.97	.35	.74	7.21	7.17	.98	2.57
Clear Lake, WA	5.14	3.45	4.11	1.58	.82	3.31	3.34	3.96	.28	.91	.42	8.45	6.84	.97	3.15

Appendix Table A4-10

MAGNITUDE OF ADJUSTMENT FOR THE PRESCHOOL ADJUSTED POOLED ANALYSIS OF COHORT III-K(PS)

	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IABS(-)	IABS(+)	Total Reading	Total Math	Language Part A	Language Part B
RESPONSIVE EDUCATION															
Buffalo, NY	-1.94	-2.30	-1.87	-1.05	-.46	-1.14	-1.19	-1.23	-.95	-.36	-.35	-3.09	-3.48	-.56	-.52
Duluth, MN	.36	-1.00	.83	-.52	.13	-.48	-.07	-.50	1.47	-.16	.89	-.18	-1.08	.02	.01
Fresno, CA	1.00	1.20	2.85	1.19	.89	2.08	1.89	1.09	.02	-.36	.31	5.09	4.18	.96	1.88
St. Louis, MO	1.80	1.37	2.84	1.49	1.22	2.05	2.97	1.42	1.35	.78	.50	5.86	6.08	1.22	1.62
Salt Lake City, UT	2.08	1.58	2.20	2.26	2.31	4.01	3.49	4.81	1.67	-.37	.41	6.08	10.56	.03	2.25
Tacoma, WA	4.50	4.41	4.50	4.50	1.86	5.69	5.32	4.06	2.93	.30	-.43	12.10	15.87	1.91	2.60
TEEM															
Chicasha, OK	4.63	6.34	4.70	5.61	2.11	5.04	4.92	4.64	.76	1.05	.47	11.69	15.15	1.29	3.41
Des Moines, LA	3.42	.56	3.49	1.79	.83	3.81	2.09	2.13	1.99	.50	.84	7.23	6.00	.99	2.69
Lakewood, NJ	1.38	4.02	4.03	-.02	-.02	.44	1.76	-.54	-.91	.65	.15	3.83	1.21	1.99	2.95
Newark, NJ	-.72	.15	-.87	-.28	-1.20	-.83	-1.28	-.55	-.30	-.33	-.42	-1.54	-1.01	-.38	-.49
Lincoln, NB	.49	.39	1.02	.88	.77	1.09	1.40	1.06	.55	.04	.22	1.57	3.34	.31	.71
Wichita, KS	4.15	6.48	5.27	1.89	1.58	4.35	5.12	3.72	1.35	-1.29	-.14	12.48	10.74	1.28	3.99
BANK STREET															
New York, NY	-1.49	-1.34	-1.10	.06	-.25	-1.49	-.84	-.49	.13	.02	-.11	-3.17	-1.29	-.42	-.68
Philadelphia, PA	-.58	-.79	-.74	-.44	-.42	-.55	-.04	-.59	.15	-.04	-.04	-1.13	-1.66	-.27	-.47
Brattleboro, VT	3.84	3.12	3.66	1.57	1.99	2.43	2.50	1.60	1.77	.64	.16	6.50	5.68	.66	1.90
Fall River, MA	-.41	.38	1.32	.29	.54	-.30	-.13	.37	-.85	.85	.20	-.70	.52	.27	1.06
New Haven, CT	-1.37	-.89	-2.05	-2.24	-2.18	-3.99	-1.81	-1.05	.76	-.23	-.13	-6.36	-5.10	-.62	-2.33
DIRECT INSTRUCTION															
New York, NY	-1.30	-1.08	-1.85	.05	-.47	-.91	.10	.39	-.75	-.09	-.09	-2.10	.54	-.39	-1.46
Grand Rapids, MI	.75	1.65	-.09	-.84	-1.11	1.68	-.00	-.06	.08	.74	.35	2.42	-1.50	.10	-.17
W. Iron Co., MI	1.91	2.49	2.65	1.83	2.43	2.49	3.00	2.31	.14	.21	.90	4.40	7.13	1.31	1.33
Flint, MI	-1.39	-.70	-.96	1.10	.44	-.03	-.50	-.47	.56	.18	.14	-2.30	.14	-.04	-.91
Providence, RI	8.03	12.00	4.90	6.74	1.42	4.30	4.94	3.66	2.08	1.15	1.10	12.32	15.35	3.39	3.50
BEHAVIOR ANALYSIS															
New York, NY	-2.14	-1.93	-2.76	-1.18	-1.47	-1.09	-.92	-.70	-1.31	-.28	-.23	-3.23	-2.79	-.49	-2.28
Philadelphia, PA	-.33	-.97	-.70	-.07	-.17	-.56	-.45	-.39	.07	.01	.04	-.90	-.92	-.23	-.47
Portageville, MO	-3.43	-5.97	-3.74	-2.75	-1.26	-3.51	-3.46	-2.82	-1.21	-.41	-.63	-8.94	-9.05	-1.18	-2.55
Trenton, NJ	4.10	4.94	4.95	1.21	3.10	4.70	.45	-.51	6.19	.49	-1.81	12.80	1.13	3.22	1.73
Kansas City, MO	.01	1.03	-.02	.89	.23	-.35	.95	.35	.19	-.14	-.05	-.33	2.18	.13	-.15
Louisville, KY	-2.59	-3.35	-2.22	-1.68	-.60	-3.27	-1.96	-1.59	.31	-.21	-.43	-6.84	-5.21	-.70	-1.52
Waukegan, IL	3.53	5.19	1.03	1.54	2.60	.99	.07	-.16	2.71	-.52	-.47	4.52	1.44	-.55	1.56
COGNITIVE CURRICULUM															
New York, NY	-.23	.32	-.35	1.19	.09	-.35	.84	.71	.42	.21	-.03	-.58	2.73	-.06	-.28
Okaloosa Co., FL	8.24	7.94	6.15	4.26	1.49	5.06	4.98	6.25	-1.61	.38	1.32	14.20	15.48	2.00	3.56
Greeley, CO	.05	1.14	.98	-.10	-.17	.74	-.03	-.23	.78	-.35	.41	.79	-.37	.11	.17
Seattle, WA	4.31	3.01	4.11	2.70	2.20	3.36	2.72	2.62	1.39	.32	.50	7.64	8.05	.97	3.15
Chicago, IL	-.42	-3.97	1.15	-2.27	-.44	-.58	-2.76	-1.64	.24	.01	-.20	-1.18	-6.67	.06	1.07
PARENT EDUCATION															
Philadelphia, PA	1.56	1.17	.95	1.18	.30	.82	1.38	1.07	.63	.23	.20	2.39	3.64	.28	.66
Richmond, VA	1.99	5.04	2.93	1.58	.91	2.95	2.07	1.50	2.98	1.30	.54	6.93	5.13	.89	1.37
Yakima, WA	1.29	-.24	.03	-.51	2.15	.06	.34	-.59	.86	.31	.04	2.25	-.74	-.23	.24
Houston, TX	-8.53	-8.49	-4.08	-4.06	-3.54	-4.44	-4.98	-3.68	-2.22	-1.16	-1.33	-12.99	-12.73	-1.89	-2.40
Lawrenceburg, IN	3.59	1.91	1.03	1.15	2.51	1.77	2.34	1.77	1.48	.71	.51	5.36	5.24	.33	.70
EDC															
Philadelphia, PA	-.47	-.97	-.69	.49	-.07	-.76	.07	-.15	.65	.04	.11	-1.22	.42	-.17	-.52
Burlington, VT	2.01	3.14	2.98	.91	1.77	2.10	.29	-.30	.26	-1.43	2.07	4.12	.90	.01	3.59
Lackawanna Co., PA	7.45	6.29	4.49	.99	.88	5.06	3.93	3.76	-1.31	.26	.37	12.71	8.67	1.27	1.22
Morgan Comm. Sch., DC	3.30	2.90	2.85	1.53	.65	2.96	2.26	1.78	1.89	.37	.38	9.66	9.56	.95	1.69
Paterson, NJ	.10	1.35	-.80	.67	-.34	.87	-.01	.14	-.58	1.47	.25	.97	.79	-.61	-.20
IELP															
Lock Haven, PA	4.74	2.89	3.75	.85	2.43	2.97	3.10	.36	1.90	.41	.27	7.72	4.29	1.06	1.69
Montevideo, MN	-.94	-.88	-.78	-.71	-.27	-.82	-.73	-.47	-.47	-.09	-.16	-1.77	-1.91	-.25	-.54
Akron, OH	-2.48	-1.92	-.89	-.47	.06	-1.41	-.83	-.40	-1.78	-.48	-.30	-3.88	-1.70	-.35	-.55
ILM															
New York, NY	-1.66	-1.26	-2.04	-.0	-.67	-.89	-.20	.30	-.88	-.08	-.07	-2.55	.10	-.48	-1.57
Atlanta, GA	-.20	.50	.09	-.31	.66	-.18	.20	-.61	-.21	.10	.56	-.38	-.71	-.06	.15
SEDL															
Philadelphia, PA	2.50	1.77	1.07	.56	-.32	.88	1.04	.73	.73	-.16	.37	3.37	2.34	.71	.37
Los Angeles, CA	-.42	-.59	.92	-3.74	-1.24	.98	-2.08	.23	-.75	-.34	.50	.35	-5.61	-.98	1.47
Tulare, CA	3.50	3.22	1.30	1.28	.27	2.47	1.61	1.76	.43	-.21	-.09	5.56	4.47	.71	.58
St. Martin Parish, LA	-.00	.07	.05	-1.33	.31	-.23	-.73	-.92	.70	-.13	.07	-.23	-2.99	.34	-.28
San Diego, TX	-1.47	-2.17	2.93	2.86	1.21	-1.39	.83	-.03	1.69	-2.39	.04	-2.86	3.65	.78	2.15
CLA															
Chicago, IL	-.86	-2.91	.32	-1.65	-.20	-.48	-1.85	-1.14	-.07	-.15	-.21	-1.53	-4.63	-.10	.42
Topeka, KS	2.05	2.05	.17	-.78	.91	-.80	.77	-.19	1.91	-.09	-.24	1.25	-.19	.59	-.42
HOME-SCHOOL PARTNERSHIP															
New York, NY	-.79	-.48	-1.40	.03	-.46	-.47	-.27	-.18	-.59	.09	.19	-1.45	-.42	-.29	-1.11
CAL PROCESS															
Los Angeles, CA	-1.62	-1.96	-.03	-3.29	-1.27	-1.48	-.99	-1.58	-1.84	-.63	-.87	-3.10	-5.87	-.73	.71
Ravenswood, CA	-.73	-.23	-.01	.81	.18	1.98	1.75	1.89	-.39	-.38	-.05	.55	4.44	-.88	.88
Oakland, CA	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00
San Jose, CA	3.81	7.54	5.98	2.93	2.45	2.88	2.74	2.71	4.94	-.78	.75	6.70	8.38	2.71	3.26
NSA															
Great Falls, MT	5.14	5.66	3.81	2.83	.86	3.90	3.66	3.00	1.46	.37	.57	8.94	9.51	1.27	2.93
Clear Lake, WA	-1.59	-.94	-2.82	.48	.64	-2.99	-2.78	-1.20	-.23	1.02	-.32	-3.89	-3.52	.72	-2.75

Appendix Table A4-11

MAGNITUDE OF ADJUSTMENT FOR THE POOLED ANALYSIS OF COHORT III-K

	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS(-)	IARS(+)	Total Reading	Total Math	Language Part A	Language Part B
RESPONSIVE EDUCATION															
Buffalo, NY	-1.30	-1.88	-.95	-1.01	-.48	-.90	-1.11	-.77	-.68	-.14	-.31	-2.21	-2.88	-.49	-.47
Duluth, MN	1.78	1.06	1.18	.87	.55	1.26	1.17	1.17	.42	.12	.12	3.04	3.26	.87	.91
Fresno, CA	2.26	2.11	1.83	1.12	.84	1.64	1.53	1.09	1.13	.07	.43	3.89	3.77	.67	1.16
St. Louis, MO	2.53	2.57	1.49	1.22	1.10	1.43	1.57	1.23	.85	.26	.23	3.96	4.05	.64	.84
Salt Lake City, UT	2.88	1.56	1.25	.98	1.19	1.44	1.47	1.52	.59	.12	.15	4.32	3.99	.44	.91
Tacoma, WA	4.93	4.07	3.60	2.01	1.73	3.36	2.74	2.62	1.38	.28	.45	8.29	7.40	.98	2.63
TEEM															
Chicasha, OK	6.76	5.10	5.27	3.52	2.25	5.11	4.55	4.17	2.10	.36	.55	11.86	12.29	1.41	3.84
Des Moines, LA	-1.18	.49	1.49	-3.38	.57	-1.49	-6.46	-12.14	-4.67	-2.30	-5.56	-2.64	-21.89	.45	1.23
Lakewood, NJ	2.04	1.68	1.03	.66	1.21	1.19	1.00	.39	.05	.16	.16	3.26	2.90	.48	.55
Newark, NJ	-.91	-1.40	-.73	-.74	-.43	-.85	-.85	-.59	-.56	-.09	-.18	-1.56	-2.15	-.37	-.35
Lincoln, NB	2.47	2.03	1.44	.95	1.56	1.26	1.36	.66	.14	.13	.13	4.16	3.59	.44	1.20
Wichita, KS	6.49	5.53	4.98	3.06	2.05	4.78	4.21	3.84	1.86	.39	.45	11.47	11.13	1.41	3.56
BANK STREET															
New York, NY	2.19	1.96	1.10	.80	.23	1.40	.71	.81	.39	.27	.37	3.58	2.38	.22	.67
Philadelphia, PA	2.17	2.00	1.11	.39	-.19	1.33	.47	.42	.47	.29	.33	3.52	1.33	.28	.82
Brattleboro, VT	2.06	1.57	1.07	.84	.47	1.44	1.28	1.07	.43	.18	.17	3.50	3.25	.35	.72
Fall River, MA	.57	.47	.20	.38	.31	.43	.36	.46	-.05	.12	-.14	1.00	1.18	0	.20
New Haven, CT	-3.16	-2.69	-2.14	-1.43	-1.03	-2.61	-2.15	-1.68	-.96	-.18	-.25	-5.17	-5.20	-.73	-1.41
DIRECT INSTRUCTION															
New York, NY	2.31	1.44	1.10	.76	.26	1.42	.76	.74	.43	.25	.29	3.72	2.30	.26	.84
Grand Rapids, MI	-.66	-.35	-.44	-.69	-.53	-.43	-.81	-.40	-.29	-.06	-.19	-1.09	-1.90	-.26	-.19
W. Iron Co., MI	4.04	3.74	3.30	1.99	1.08	3.15	2.65	2.35	1.20	.28	.30	7.19	7.04	.90	2.41
Flint, MI	-.99	-1.85	-.79	-.83	-.25	-.74	-1.08	-.63	-.45	-.14	-.23	-1.73	-2.51	-.39	-.40
Providence, RI	3.55	2.81	2.20	.37	1.29	2.36	1.97	1.87	1.04	.15	.30	5.92	5.21	.66	1.63
BEHAVIOR ANALYSIS															
New York, NY	1.51	1.14	.44	.13	-.75	.91	.06	-.05	.47	.02	.04	2.41	.20	.28	.15
Philadelphia, PA	2.56	2.19	1.32	.80	.11	1.71	.80	.68	.82	.35	.37	4.26	2.34	.41	.90
Portageville, MO	-5.02	-4.94	-4.36	-2.99	-1.43	-3.98	-3.65	-3.24	-1.85	-.30	-.46	-9.01	-9.83	-1.28	-3.98
Trenton, NJ	.27	-.26	-.10	-.34	.04	-.55	-.26	-.10	-.17	-.01	-.10	.23	-.68	-.09	-.01
Kansas City, MO	1.14	1.50	.41	.15	.16	.80	.29	.25	.38	.12	.14	1.65	.70	.28	.33
Louisville, KY	-1.53	-2.00	-1.21	-1.19	-.79	-1.55	-1.45	-.90	-.76	-.20	-.26	-2.66	-3.53	-.57	-.64
Waukegan, IL	1.52	2.00	1.10	.67	1.53	1.88	.55	.80	.79	.32	.18	2.59	2.05	.17	.93
COGNITIVE CURRICULUM															
New York, NY	3.14	2.74	1.68	1.27	.67	1.98	1.39	1.21	.61	.40	.38	5.12	3.93	.47	1.22
Okaloosa Co., FL	6.48	5.35	4.16	2.85	2.62	4.94	3.77	3.34	2.12	.36	.69	10.73	10.00	1.44	2.72
Greeley, CO	1.50	.61	1.39	.45	.08	1.10	.99	.55	.27	-.07	.16	2.60	2.02	.44	.95
Seattle, WA	5.82	5.51	3.90	3.11	2.21	3.98	3.86	3.23	1.82	.48	.67	9.80	10.23	1.37	2.93
Chicago, IL	1.59	1.91	.77	.01	-.76	.91	-0	.06	.23	.22	.36	2.50	.12	.20	.87
PARENT EDUCATION															
Philadelphia, PA	4.29	4.07	2.18	1.50	.54	2.34	1.93	1.55	.69	.45	.46	6.62	5.65	.83	1.35
Richmond, VA	.72	-.21	.98	.39	-.14	.87	.29	.84	.13	-.13	-.03	1.59	1.56	-.04	1.03
Yakima, WA	.82	-.17	-.41	-.30	.06	-.16	-.10	.06	-.30	-0	-.03	.67	-.30	-.01	-.39
Houston, TX	-.97	-2.17	-.41	-.66	.28	-.46	-.86	-.86	.45	-.27	.19	-1.63	-2.36	-.27	-.13
Lawrenceburg, IN	3.93	3.32	3.50	2.34	1.26	3.22	2.96	2.63	1.28	.26	.30	7.16	7.99	.91	2.60
EDC															
Philadelphia, PA	2.69	2.51	1.29	1.14	.78	1.63	1.09	.91	.65	.36	.44	4.32	3.20	.49	.80
Burlington, VT	1.90	1.35	1.48	.99	.56	1.46	1.22	1.25	.81	.10	.15	3.29	3.52	.39	1.10
Lackawanna Co., PA	1.54	1.24	1.19	.64	.41	1.06	.90	.90	.45	.10	.05	2.60	2.48	.29	.92
Morgan Comm. Sch., DC	3.12	3.27	1.96	1.48	1.16	1.83	1.97	1.40	1.02	.36	.38	4.95	4.90	.81	1.14
Paterson, NJ	2.19	2.20	1.30	1.00	1.02	1.21	1.20	.94	.88	.23	.37	3.40	3.18	.56	.75
IELP															
Lock Haven, PA	2.36	2.20	2.12	.79	.33	1.75	1.07	1.19	.71	.74	.14	4.16	3.68	.80	1.61
Montevideo, MN	-.33	-.48	-.40	-.40	-.17	-.34	-.47	-.37	-.17	-.02	-.05	-.68	-1.16	-.13	-.28
Akron, OH	-.18	-.64	-.34	-.23	-.09	-.23	-.47	-.08	-.11	-.09	-.08	-.41	-.75	-.15	-.19
ILM															
New York, NY	1.53	1.05	.70	.50	.14	1.01	.35	.49	.17	.22	.21	2.54	1.41	.05	.65
Atlanta, GA	.77	.97	.10	.05	.03	.21	.01	.16	.16	.08	.07	.98	.24	.11	-.02
SEDL															
Philadelphia, PA	3.02	3.18	1.56	.60	-1.27	2.11	1.00	.44	1.11	-0	.08	5.13	2.89	.81	.73
Los Angeles, CA	-.49	-.86	-.39	-.99	-.42	-.44	-.99	-.89	.41	-.19	-.04	-1.13	-2.86	-.12	-.27
Tulare, CA	2.50	2.49	1.35	.10	-.09	1.27	.33	.19	-.43	-.10	-.54	3.78	.63	.44	.90
St. Martin Parish, LA	.34	.41	.25	-.02	-.21	.26	-.04	.13	.02	.02	.01	.62	.10	.02	.24
San Diego, TX	.31	.45	.22	.35	.29	.29	.40	.51	-.21	.17	-.01	.61	1.30	-.06	.28
CLA															
Chicago, IL	1.81	1.53	.82	.01	-.38	.91	.20	.18	.06	.23	.27	2.72	.45	.17	.65
Topeka, KS	3.58	3.32	2.52	1.85	.65	2.55	2.32	2.23	.82	.21	.32	6.13	6.46	.81	1.71
HOME-SCHOOL PARTNERSHIP															
New York, NY	1.89	1.79	.92	.71	.06	1.30	.50	.63	.46	.23	.35	3.19	1.89	.20	.71
CAL PROCESS															
Los Angeles, CA	-3.75	-4.58	-2.34	-2.53	-1.32	-2.30	-2.96	-2.11	-1.38	-.43	-.50	-6.04	-7.59	-1.22	-1.12
Ravenswood, CA	.82	.72	.56	.46	.58	.45	.52	.40	.20	.09	.07	1.48	1.58	.10	.45
Oakland, CA	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00
San Jose, CA	4.73	3.91	3.75	1.91	.60	3.46	3.11	2.96	1.18	.19	.47	8.20	8.01	1.12	2.62
NSA															
Great Falls, MT	4.12	3.88	3.24	2.09	.98	3.05	2.81	2.49	1.14	.26	.21	7.17	7.25	.92	2.32
Clear Lake, WA	4.95	3.96	3.17	2.01	.53	3.26	2.58	2.79	1.01	.20	.11	8.22	7.42	.93	2.25

Appendix Table A4-12

MAGNITUDE OF ADJUSTMENT FOR THE LOCAL ANALYSIS OF COHORT II-K

	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS(-)	IARS(+)	Total Reading	Total Math	Language Part A	Language Part B
SELF-SPONSORED															
Detroit, MI	-.24	.51	.27	-5.31	.40	-.12	6.10	.06	.95	.68	-.76	.13	.85	.22	.05
New York, NY	-7.42	-4.41	-5.44	-3.98	-2.40	-5.95	-8.66	-4.97	-2.09	0	-.73	-13.37	-16.91	-.98	-4.45
Philadelphia, PA	1.19	2.24	1.21	1.00	1.22	1.29	.94	.63	1.40	.64	-.03	2.68	2.56	.41	.79
Portland, OR	-1.49	-2.69	-.71	-3.07	-.50	-2.04	.68	-2.22	1.18	.40	.45	-3.53	-4.61	-.18	-.53
San Diego, CA	.08	-1.80	.53	-1.38	-.53	.01	1.84	-.10	1.11	-.75	.62	.09	.35	-.04	.59
RESPONSIVE EDUCATION															
Berkeley, CA	1.57	.24	1.34	.57	.76	1.55	-.13	.98	.37	-.39	.58	3.13	2.89	.43	.90
Buffalo, NY	-1.15	-1.10	.08	-1.67	-.68	-1.19	.47	-.45	.03	.42	-.11	-2.27	-1.54	-.25	.34
Duluth, MN	.45	-.20	-.34	-.27	.43	.40	.76	.40	-.26	.44	-.46	1.04	.89	.05	-.39
Fresno, CA	.73	1.11	1.28	-1.39	-.01	.44	2.77	.54	.57	-1.41	1.69	1.17	1.93	.25	1.03
Lebanon, NH	.64	.56	-.85	.30	.48	.09	.29	.55	.08	1.12	-.95	1.63	1.14	.13	-.99
Salt Lake City, UT	4.70	3.80	.90	.44	2.07	4.53	4.43	2.69	3.75	1.04	-.99	9.23	7.56	1.26	-.35
Tacoma, WA	5.45	2.95	10.58	2.90	2.58	5.27	2.29	3.43	3.17	.13	-.08	10.72	9.59	1.36	.71
TEEN															
Baltimore, MD	.95	.27	.65	-1.02	.43	.58	1.89	.45	1.63	-.08	.28	1.55	1.33	.25	.40
Lakewood, NJ	1.71	1.78	.68	-.91	.04	1.11	2.51	.91	-.43	-.26	.17	2.84	2.53	2.09	.45
Lincoln, NB	3.47	2.44	2.16	2.20	.99	2.41	2.31	2.41	.13	.69	-.12	6.29	6.63	.64	1.53
Wichita, KS	-3.03	-2.11	-1.79	-2.37	-1.22	-2.28	-1.05	-.66	-2.33	-1.33	1.13	-5.31	-4.56	-.81	-1.00
BANK STREET															
New York, NY	-.28	.34	-.40	-1.48	5.58	.29	2.25	-.01	-.07	-.06	-.11	0	.75	-.10	-.29
Philadelphia, PA	.98	1.38	.79	.32	.50	.82	1.29	.43	.62	-.05	.25	1.90	2.06	.01	.80
Brattleboro, VT	-.44	-.54	-.17	5.18	.30	-.50	-6.30	-.25	.42	.31	-.51	-.95	-1.37	-.44	.29
Fall River, MA	.82	1.55	.57	-2.03	.44	.50	3.02	.53	.14	1.15	-.56	1.32	1.54	.17	1.19
Rochester, NY	-.56	-.87	-.45	-1.78	-.47	-.50	.89	-.51	.18	-.76	.42	5.78	-1.40	-.13	-.54
Wilmington, DE	1.21	1.34	1.05	3.62	.43	.98	.10	.73	.55	.66	-.28	2.05	2.05	.11	.13
DIRECT INSTRUCTION															
New York, NY	-2.01	-3.63	-2.84	-4.00	-.72	-2.82	-.33	-1.99	-.88	-.15	-.42	-6.79	-6.33	-.92	-1.92
E. St. Louis, IL	.48	.37	.29	-14.11	.20	.47	2.88	-7.58	-.44	-.40	.77	.94	1.37	.07	.22
Grand Rapids, MI	5.27	-.86	8.37	-1.61	-.07	.13	1.13	-.23	.07	-.27	.08	.06	13.48	-.23	-.62
Racine, WI	2.22	2.56	1.75	3.37	.49	2.17	1.77	.74	-.28	-.26	1.12	4.40	3.77	.56	1.21
Flint, MI	.98	.84	.98	-2.21	.41	1.06	4.28	1.09	.49	.51	-.08	2.08	3.17	.23	.75
BEHAVIOR ANALYSIS															
New York, NY	-3.43	-3.75	-2.70	-1.93	-1.82	-2.26	-2.61	-2.44	-.51	-.36	-.44	-5.78	-7.08	1.17	-1.72
Philadelphia, PA	-.27	.09	-.18	-2.49	.05	.17	2.41	-.26	.26	-.72	.63	-.41	-.34	-.08	-.11
Portageville, MO	.40	.14	.06	-2.85	-1.03	-.44	3.16	.24	-.14	-.43	1.35	-.23	.55	-.47	.54
Kansas City, MO	-1.83	3.97	3.82	-2.75	-.34	-.73	1.28	-.70	-.26	.21	-.43	-1.77	-2.16	-.32	-.54
Louisville, KY	-1.18	-7.33	-.90	-4.40	-.37	-.75	2.63	-.80	-.24	-1.45	-.69	-1.95	-2.57	-.43	-.48
Meridian, IL	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00
COGNITIVE CURRICULUM															
New York, NY	.79	1.05	.92	2.89	.38	.99	-1.02	.78	.23	.92	-.90	1.77	2.64	.28	.66
Okaloosa Co., FL	15.75	18.66	11.35	7.36	5.99	7.74	6.97	3.50	9.45	3.04	3.50	23.48	17.82	6.26	5.09
Chicago, IL	-13.16	-16.57	-9.25	-3.97	-5.15	-5.30	-7.42	-1.31	-8.20	-2.93	-2.88	-18.47	-10.41	-5.63	-3.64
PARENT EDUCATION															
Philadelphia, PA	1.93	1.22	1.35	.20	1.28	1.24	2.44	1.24	.79	.46	-.63	3.16	3.87	.38	.96
Jacksonville, FL	.58	1.14	.49	-.60	-.19	.47	1.38	.41	.44	-.89	1.16	1.05	1.19	.42	.26
Richmond, VA	-.43	-.38	-.21	1.78	-.43	-.04	-2.12	-.48	-.19	-.37	-.16	-.49	-.82	-.21	-.01
Houston, TX	-.02	.16	.28	-1.06	.34	.47	1.14	-.50	.28	-1.49	-.05	.46	-.41	-.04	.15
EDC															
Philadelphia, PA	.21	3.86	-.91	-4.39	-.41	-.99	1.57	-.55	-.78	-.27	-.12	-.58	-5.87	-.23	-.53
Paterson, NJ	-1.40	.09	-.45	-1.96	-.87	-.78	.32	-.59	-.79	.52	-1.24	-2.15	-7.34	-.28	-3.65
Chicago, IL	-1.87	-12.48	-1.41	-2.24	-.74	-1.21	.33	-.51	-.99	.91	-1.30	-3.08	8.59	-.40	-1.21
ILM															
New York, NY	2.45	3.12	1.16	1.98	2.21	2.45	2.28	1.27	-.20	-.06	.52	5.10	5.51	.22	.95
SEDL															
Philadelphia, PA	3.54	3.54	2.78	1.30	.77	2.59	3.81	2.52	.41	.73	.57	8.48	7.65	2.42	1.78
Tulare, CA	3.08	3.73	2.42	.88	1.32	2.44	4.46	1.99	1.30	.62	1.01	13.07	11.19	1.59	1.23
St. Martin Parish, LA	1.30	1.64	.98	.56	.42	.79	1.75	.82	.71	.19	.48	2.08	3.13	.44	.51
HOME-SCHOOL PARTNERSHIP															
New York, NY	-2.43	-2.58	-2.44	-.50	-.28	-1.47	-2.79	-1.78	-1.33	.65	-1.89	-4.29	6.37	-.85	-1.79
CAL PROCESS															
Los Angeles, CA	-1.02	.13	.08	.28	-.35	-.44	-.72	-.89	-.94	.08	-.03	-1.47	-1.33	-.15	.21
Ravenswood, CA	-.97	-3.12	-1.48	-7.82	.47	.01	4.20	-.37	.85	-.46	.82	-.96	-3.19	-.63	-1.84
Lamont, CA	-.56	-7.56	-5.21	-6.35	.77	.20	-.02	1.41	3.50	2.03	-.33	9.44	-4.95	-1.20	-4.02
San Jose, CA	2.78	-3.11	-2.82	-9.34	1.17	1.42	4.33	1.53	3.05	1.37	.22	4.20	-.49	-.29	-2.23

Appendix Table A4-13

MAGNITUDE OF ADJUSTMENT FOR THE POOLED ANALYSIS OF COHORT II-K

	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IASE(-)	IASE(+)	Total Reading	Total Math	Language Part A	Language Part B
SELF-SPONSORED															
Detroit, MI	-.12	-7.66	-.75	-7.53	-.66	.81	6.63	-.25	3.40	.75	-.51	.53	-1.36	.89	-1.19
New York, NY	-2.99	-8.38	-5.55	-3.56	-3.52	-3.55	-7.79	-5.34	2.55	.34	-1.01	-6.66	-11.18	-.91	-4.20
Philadelphia, PA	.01	-6.50	-.62	-.77	.86	1.58	1.25	1.58	2.38	.27	-.44	1.44	1.81	.17	.44
Portland, OR	-2.09	-10.62	-1.65	-.43	-1.01	-.52	1.17	-1.00	2.51	-.48	.05	-3.78	-.54	.31	-1.54
San Diego, CA	.86	-3.27	-.10	-2.24	-.28	1.16	2.12	.21	3.19	-.38	1.00	1.58	-.19	.97	-.47
RESPONSIVE EDUCATION															
Berkeley, CA	2.10	-5.03	1.11	-.87	.31	2.14	2.97	1.02	3.71	-.31	.86	4.11	2.58	1.30	.28
Buffalo, NY	-.18	-7.40	-.83	-2.24	-.56	.30	1.47	-.24	3.07	.64	-.35	.07	-1.28	.67	-1.03
Duluth, MN	1.34	-1.64	.11	-1.83	-.43	1.67	2.73	.43	3.61	.19	.21	2.67	.78	1.11	-.41
Fresno, CA	1.71	-1.94	.26	-2.56	-.24	1.75	3.41	.46	3.45	-.17	1.70	2.49	1.04	1.07	-.48
Lebanon, NH	1.05	-4.15	-1.47	-2.13	-.86	1.58	2.39	.08	4.05	.46	-.84	1.91	.52	.99	-.49
Salt Lake City, UT	4.33	-.68	3.05	-2.65	.62	4.23	6.92	2.05	4.20	.55	.32	8.12	6.05	2.88	1.49
Tacoma, WA	4.81	-2.93	6.02	.95	1.54	4.67	4.30	2.61	3.89	-.04	1.15	8.66	7.56	2.21	2.73
TEEM															
Baltimore, MD	1.55	-6.42	.41	-1.59	.48	1.87	3.16	.76	3.64	.15	.49	3.28	2.11	1.19	-.14
Lakewood, NJ	1.51	-4.11	.42	-2.81	-.22	1.87	3.74	.65	2.59	.17	.18	3.11	1.23	1.30	-.41
Lincoln, NB	3.43	-2.34	2.19	-.20	.36	3.68	3.84	1.77	4.11	.84	.38	6.25	5.30	1.89	1.08
Wichita, KS	-.24	-6.48	-1.39	-2.48	-1.30	.24	1.26	-.76	3.26	-1.35	1.35	-.21	-2.41	.63	-1.43
BANK STREET															
New York, NY	-.41	-6.74	.41	-2.19	5.65	.85	2.67	.76	2.97	-.22	-.43	.07	1.01	1.82	-.19
Philadelphia, PA	-.94	-5.95	-.49	-1.61	0	-.24	1.39	-.45	3.33	-.34	.42	-1.32	-.91	.92	-1.14
Brattleboro, VT	-.55	-5.58	-1.44	-2.66	-1.93	.16	-5.24	-1.31	3.14	.25	.55	-.92	-4.54	.63	-1.72
Fall River, MA	1.47	1.49	.45	-3.72	-.62	1.83	4.47	.39	3.89	.90	.73	3.14	.84	1.83	-.14
Rochester, NY	-.10	-6.52	-1.09	-3.16	-1.01	.62	2.00	-.48	3.15	-.48	.80	.19	-1.92	.76	-1.33
Wilmington, DE	.49	-7.35	-.23	-.77	-.19	1.11	.67	.14	3.25	.71	-.28	1.45	-.17	.98	-.72
DIRECT INSTRUCTION															
New York, NY	-.80	-9.86	-1.34	-2.67	1.00	-.80	5.22	.29	2.06	.30	-.86	1.23	2.62	.73	1.78
E. St. Louis, IL	1.80	-6.88	-.08	-3.32	-.10	1.17	4.07	.22	3.59	-.11	.62	3.07	.74	.98	-.69
Grand Rapids, MI	1.71	-6.08	.04	-2.13	.11	1.24	3.15	.33	3.60	.22	.30	3.27	1.08	1.16	-.88
Racine, WI	3.25	-3.10	1.76	.65	.46	2.07	2.88	1.57	3.82	-.21	1.13	6.28	4.67	1.46	.77
Flint, MI	1.64	-6.04	.63	-3.85	.22	1.04	5.48	.82	4.00	.78	-.07	3.42	2.18	1.28	-.16
BEHAVIOR ANALYSIS															
New York, NY	.12	-3.58	-1.89	-.72	-1.85	1.63	4.35	.60	2.56	.06	.42	1.37	3.98	.68	-2.87
Philadelphia, PA	4.14	-4.46	1.68	-2.89	.07	1.88	4.81	.53	3.70	.45	1.26	5.46	2.23	1.91	-.01
Portageville, MO	-2.25	-9.24	-2.65	-5.52	-1.15	-.73	2.86	-1.65	3.07	-.82	.26	12.94	-5.68	.21	-4.61
Kansas City, MO	-.45	-8.06	-1.06	-4.16	-.83	.66	2.79	-.42	3.56	.40	-.31	.05	-1.98	.77	-1.68
Louisville, KY	-.48	-8.48	-.86	-5.47	-.84	.67	4.17	-.39	3.20	-.91	.48	-.05	-1.88	.73	-1.12
Meridian, IL	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00	-99.00
COGNITIVE CURRICULUM															
New York, NY	.81	-6.71	-.16	-.49	.73	.75	-2.22	-.82	6.06	2.44	.44	1.41	-3.76	.81	-.47
Okaloosa Co., FL	15.99	10.73	11.41	6.41	5.54	9.29	8.52	4.07	12.80	3.13	3.43	25.13	18.78	6.99	4.86
Chicago, IL	-10.47	-22.06	-7.59	-4.23	-2.92	-2.80	-3.91	-.47	-4.51	-2.38	-2.44	-13.41	-8.78	-3.68	-3.49
PARENT EDUCATION															
Philadelphia, PA	-.66	-5.90	-.37	-2.30	.11	.38	2.30	-.13	3.67	.92	-.79	-.44	-.37	1.08	-.89
Jacksonville, FL	.73	-6.48	.16	-2.03	-.46	1.19	2.27	.12	3.10	.26	.36	1.77	.21	1.87	-.48
Richmond, VA	.02	-8.59	-.44	.77	-.30	.79	-.92	.03	3.24	.33	.01	.65	-.37	.81	-.79
Houston, TX	1.32	-1.49	.05	-1.58	.09	1.69	2.77	.41	3.48	-.44	1.09	2.47	1.21	1.68	-.54
EDC															
Philadelphia, PA	-5.53	-14.21	-6.78	-9.50	-1.97	-3.25	-2.54	-7.07	.77	-.97	-1.86	-8.92	-17.95	-.54	-5.79
Paterson, NJ	-.72	4.90	-.08	-2.79	-.44	.17	1.88	-.38	3.01	1.14	-.88	-.68	-14.39	-.66	.90
Chicago, IL	-6.38	-15.29	-1.58	-4.77	-2.28	-1.36	-.49	-.20	-3.21	-.39	-1.88	-7.87	-4.98	-1.44	6.32
ILM															
New York, NY	3.17	-3.44	1.39	1.45	.53	1.46	3.91	7.65	3.60	-.14	.30	6.49	7.11	1.32	.40
SEDL															
Philadelphia, PA	2.58	12.42	3.49	2.50	.98	2.78	.31	3.84	4.48	1.25	1.76	4.88	11.74	2.09	2.01
Tulare, CA	3.23	14.37	1.74	4.48	.22	3.12	2.99	1.54	3.47	.44	.82	5.74	3.80	1.88	.34
St. Martin Parish, LA	2.66	16.29	.85	4.29	.20	2.66	1.81	.91	3.63	.21	.54	3.95	2.61	1.44	.07
HOME-SCHOOL PARTNERSHIP															
New York, NY	.68	-5.70	-1.62	.68	-1.66	2.22	3.69	1.04	3.09	1.16	-.68	2.64	5.17	.74	-2.01
CAL PROCESS															
Los Angeles, CA	-.95	-9.32	-1.22	-1.77	-.61	.30	-.03	-.40	2.91	.14	-.17	-.82	-2.45	.93	-1.34
Ravenswood, CA	-.17	-9.02	-.79	-.33	.11	.86	6.45	.83	3.29	-1.34	1.32	.58	-1.89	.64	-1.00
Lamont, CA	5.40	11.70	3.44	-1.19	.48	4.49	6.25	2.96	3.65	.13	1.29	9.18	7.46	2.18	1.89
San Jose, CA	6.31	7.49	4.87	-5.06	.79	6.01	12.13	3.77	4.47	-.07	1.54	11.45	10.36	2.64	2.48

Appendix Table A4-14

MAGNITUDE OF ADJUSTMENT FOR THE LOCAL ANALYSIS OF
COHORT III-EF

	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS(-)	IARS(+)	Total Reading	Total Math	Language Part A	Language Part B
RESPONSIVE EDUCATION															
Goldsboro, NC	3.11	2.88	2.65	1.76	1.56	2.34	2.36	2.02	1.04	.51	.27	5.47	6.15	.77	1.87
Sumter, SC	-1.48	-1.94	-1.27	-1.46	-.55	-1.01	-1.15	-.83	-.52	-.22	-.06	-2.48	-3.46	-.39	-.89
Owensboro, KY	10.55	10.67	7.31	5.19	3.95	7.03	6.43	5.74	3.55	1.26	1.05	17.59	17.38	2.14	5.16
TEEM															
Vermillion Par., LA	3.69	1.82	2.74	2.52	2.75	3.02	2.61	2.32	1.28	.23	.26	6.71	7.45	1.04	1.71
Durham Co., NC	2.28	1.86	1.54	1.36	1.12	1.68	1.55	1.30	.38	.21	.19	3.96	4.21	.60	.94
Ft. Worth, TX	3.98	3.59	2.55	1.92	1.11	2.42	2.19	1.85	.64	.28	.36	6.38	5.95	1.09	1.46
Walker Co., GA	2.49	2.23	1.65	1.20	.77	1.41	1.46	1.15	.83	.17	.22	4.10	3.81	.53	1.13
Pike Co., KY	1.14	.35	.82	.93	.46	.89	1.01	.81	.07	.18	.14	2.02	2.75	.30	.53
MATHEMAGENIC															
Gulfport, MS	3.20	2.03	2.18	.76	1.52	2.22	1.98	1.64	.39	.07	-.09	5.43	4.37	.73	1.45
Pickens Co., GA	5.14	4.89	3.86	2.07	1.44	3.15	2.95	2.72	1.49	.50	.49	8.27	7.73	1.33	2.54
Lee Co., VA	-.27	-.14	-.13	-.41	-.26	.06	-.34	-.41	-.44	.08	-.22	-.23	-1.16	0	-.13
DIRECT INSTRUCTION															
Dayton, OH	1.74	1.71	1.86	1.28	.81	1.23	1.58	1.32	.63	.22	.35	2.97	4.18	.48	1.39
Tupelo, MS	3.43	2.13	5.77	2.01	3.44	1.81	3.38	2.44	-1.75	.28	-1.25	5.25	7.85	2.21	3.57
Williamsburg Co., SC	3.26	4.14	3.24	2.59	1.06	2.19	2.48	2.23	1.42	.30	.58	5.45	7.29	.98	2.25

Appendix Table A4-15

MAGNITUDE OF ADJUSTMENT FOR THE POOLED ANALYSIS OF COHORT III-EF

	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS(-)	IARS(+)	Total Reading	Total Math	Language Part A	Language Part B
RESPONSIVE EDUCATION															
Goldsboro, NC	3.26	2.53	2.41	1.67	1.87	2.14	2.40	1.97	.75	.42	.23	5.42	6.04	.84	1.58
Sumter, SC	-.13	-.26	1.14	.28	-1.16	-.22	.13	.72	-1.65	-.61	-.47	-.34	1.11	.23	.90
Owensboro, KY	10.42	9.83	8.06	4.86	4.00	7.12	6.75	5.74	2.71	.88	.80	17.55	17.37	2.61	5.45
TEEM															
Vermillion Par., LA	3.36	1.67	2.29	1.04	2.64	2.29	2.26	2.17	.20	.07	-.02	5.65	5.47	.73	1.56
Durham Co., NC	2.27	1.59	1.56	1.12	1.39	1.62	1.54	1.30	.45	.30	.08	3.89	3.96	.62	.94
Ft. Worth, TX	4.39	3.64	2.90	1.77	1.48	2.75	2.87	2.47	.88	.70	.18	7.13	7.12	1.30	1.61
Walker Co., GA	3.20	1.53	3.22	.83	.63	3.17	2.26	2.93	-0	-.30	.06	6.37	6.02	.83	2.38
Pike Co., KY	.72	.82	1.41	1.15	.27	.69	1.17	1.17	-.34	-.14	-.08	1.41	3.49	.35	1.07
MATHEMAGENIC															
Gulfport, MS	3.55	2.17	2.59	1.50	2.05	2.74	2.54	2.34	.54	.23	.07	6.30	6.37	.82	1.75
Pickens Co., GA	4.59	3.18	4.50	2.14	1.25	3.93	3.47	3.72	.71	.09	.28	8.51	9.32	1.26	3.26
Lee Co., VA	.09	-.18	.36	-.26	.20	.33	-.02	.19	-.19	-.23	-.10	.39	-.09	-.06	.42
DIRECT INSTRUCTION															
Dayton, OH	2.03	1.94	2.21	1.25	1.09	1.30	1.92	1.61	.30	.13	.16	3.33	4.78	.58	1.64
Tupelo, MS	12.38	9.56	8.45	4.50	5.08	8.40	7.40	6.78	1.99	.88	.64	20.99	18.69	3.03	5.42
Williamsburg Co., SC	2.92	4.25	2.09	1.88	.75	1.42	2.28	1.49	1.23	.21	.45	4.53	5.63	.79	1.29

Appendix Table A4-16

MAGNITUDE OF ADJUSTMENT FOR THE LOCAL ANALYSIS OF
COHORT II-EF

	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS (-)	IARS (+)	Total Reading	Total Math	Language Part A	Language Part B
BANK STREET															
Macon Co., AL	.98	1.87	1.33	.69	.39	1.40	.66	.69	.14	.19	.32	2.37	2.02	.57	.76
DIRECT INSTRUCTION															
E. St. Louis, IL	.57	.86	.77	.19	.32	.33	.42	.23	.41	.09	.04	.88	.84	.24	.53
Tupelo, MS	7.42	3.77	1.95	4.62	2.87	2.73	3.92	1.59	-.65	-.12	.93	10.34	10.13	1.36	.60
Williamsburg Co., SC	-.16	.05	.16	-.28	.21	-.12	-.17	-.04	.29	.07	-.08	-.31	-.50	-.07	.23
COGNITIVE CURRICULUM															
Leflore Co., MS	-1.81	-1.23	-1.12	.48	.08	-1.44	-.51	-1.00	-1.06	-.63	-.16	-3.24	-1.04	-.37	-.74
PARENT EDUCATION															
Jonesboro, AR	5.31	5.19	3.05	1.93	1.70	3.33	3.09	2.36	1.76	.43	.61	8.65	7.37	1.31	1.72
Chattanooga, TN	-2.91	-3.14	-1.42	-.72	-.95	-1.71	-1.46	-1.19	-.87	-.15	-.42	-4.66	-3.37	-.67	-.75
Hillsborough, FL	-.80	-.75	.12	.64	-.12	-.06	.26	.19	.85	.13	-.12	-.72	1.10	.05	.04
EDC															
Laurel, DE	2.75	3.08	2.28	2.04	1.56	1.98	2.29	2.09	.39	.18	.15	4.74	6.41	.63	1.64
Johnston Co., NC	4.88	4.79	4.35	3.12	2.90	3.67	3.67	3.22	.81	.39	.30	8.44	10.01	1.18	3.15

Appendix Table A4-17

MAGNITUDE OF ADJUSTMENT FOR THE POOLED ANALYSIS OF COHORT II-EF

	Word Knowledge	Spelling	Language	Math Computations	Raven's	Reading	Math Concepts	Math Problem Solving	Coopersmith	IARS(-)	IARS(+)	Total Reading	Total Math	Language Part A	Language Part B
BANK STREET															
Macon Co., AL	3.98	3.94	3.03	2.28	.93	2.80	2.61	2.25	.75	.36	.15	6.79	7.11	.85	2.14
DIRECT INSTRUCTION															
E. St. Louis, IL	3.05	2.78	2.10	1.56	.59	.85	1.77	1.57	.60	.31	.08	5.04	4.87	.57	1.51
Tupelo, MS	16.82	14.77	12.35	7.01	6.33	11.69	10.51	8.15	2.02	1.55	1.04	28.61	25.65	3.03	9.30
Williamsburg Co., SC	10.08	8.32	8.59	5.04	1.43	8.60	7.59	7.23	.26	.85	-.04	18.74	19.84	1.08	7.54
COGNITIVE CURRICULUM															
Leflore Co., MS	4.48	3.70	4.19	2.98	.67	3.64	3.28	3.42	-.08	.51	-.27	8.19	9.65	.59	3.61
PARENT EDUCATION															
Jonesboro, AR	5.63	5.15	4.07	2.64	1.84	4.14	3.51	2.80	1.07	.40	.42	9.78	8.90	1.15	2.92
Chattanooga, TN	-.58	-.88	-.09	.13	-.92	-.32	-.23	.09	-.68	.03	-.32	-.92	-.03	-.32	.23
Hillsborough, FL	.51	.84	.98	1.31	-.62	.39	.94	1.07	1.02	.24	-.05	1.04	3.31	.28	.66
EDC															
Laurel, DE	4.64	4.34	3.33	2.08	1.43	3.19	2.97	2.35	.82	.42	.27	7.81	7.34	.90	2.43
Johnston Co., NC	7.30	6.72	4.95	2.87	2.74	4.90	4.40	3.37	1.58	.66	.60	12.21	10.61	1.45	3.49

Appendix Table A4-18

SITE/OUTCOME COMBINATIONS WHICH ARE SHADED DUE TO SIZE OF ADJUSTMENT OR PRESCHOOL MISMATCH FOR COHORT III-K(PS) PRESCHOOL ADJUSTED LOCAL ANALYSIS

MODEL/SITE \ OUTCOME	Word Knowledge	Spelling	Language	Math Computations	Reading	Raven's	Math Concepts	Math Problem Solving	Coopersmith	IARS(+)	IARS(-)	Total Reading	Total Math	Language Part A	Language Part B	Language Part B
RESPONSIVE EDUCATION																
Buffalo, NY																
Duluth, MN																
Fresno, CA																
St. Louis, MO																
Salt Lake City, UT																
Tacoma, WA																
TEEM																
Chicasha, OK		A		A	A	A	A	A	A				A	A	A	A
Des Moines, IA																
Lakewood, NJ																
Newark, NJ																
Lincoln, NB																
Wichita, KS		A	A		A		A	A	A				A	A		
BANK STREET																
New York, NY																
Philadelphia, PA																
Brattleboro, VT																
Fall River, MA																
New Haven, CT																
DIRECT INSTRUCTION																
New York, NY																
Grand Rapids, MI																
W. Iron Co., MI		A					A	A					A	A		
Flint, MI																
Providence, RI		A					A	A	A				A	A		
BEHAVIOR ANALYSIS																
New York, NY																
Philadelphia, PA																
Portageville, MO		A	A	A									A	A		
Trenton, NJ																
Kansas City, MO																
Louisville, KY																
Waukegan, IL																
COGNITIVE CURRICULUM																
New York, NY																
Okaloosa Co., FL		A		A		A	A		A				A	A	A	
Greeley, CO																
Seattle, WA							A						A			
Chicago, IL																
PARENT EDUCATION																
Philadelphia, PA																
Richmond, VA																
Yakima, WA																
Houston, TX																
Laurenceburg, IN																
EDC																
Philadelphia, PA																
Burlington, VT																
Lackawanna Co., PA																
Morgan Comm. Sch., PA																
Paterson, NJ																

Note. -- A = Size of Adjustment
P = Preschool Mismatch

Appendix Table A4-18 (cont.)

MODEL/SITE \ OUTCOME	Word Knowledge	Spelling	Language	Math Computations	Reading	Raven's	Math Concepts	Math Problem Solving	Coopersmith	IARS(+)	IARS(-)	Total Reading	Total Math	Language Part A	Language Part B	
IELP																
Lock Haven, PA																
Montevideo, MN																
Akron, OH																
ILM																
New York, NY																
Atlanta, GA																
SEDL																
Philadelphia, PA																
Los Angeles, CA																
Tulare, CA																
St. Martin Par., LA																
San Diego, TX																
CLA																
Chicago, IL																
Topeka, KS																
HOME-SCHOOL PARTNER-SHIP																
New York, NY																
CAL PROCESS																
Los Angeles, CA		A														
Ravenswood, CA																
Oakland, CA		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
San Jose, CA		A	A		A		A	A					A	A	A	
NSA																
Great Falls, MT				A												A
Clear Lake, WA		A		A			A						A			A

Note. -- A = Size of Adjustment

P = Preschool Mismatch

* No test for size of adjustment or preschool mismatch was computed due to lack of local NFT group.

Appendix Table A4-19

SITE/OUTCOME COMBINATIONS WHICH ARE SHADED DUE TO SIZE OF ADJUSTMENT OR PRESCHOOL MISMATCH FOR COHORT III-K(PS) PRESCHOOL ADJUSTED POOLED ANALYSIS

MODEL/SITE \ OUTCOME	Word Knowledge	Spelling	Language	Math Computations	Reading	Raven's	Math Concepts	Math Solving	Math Problem	Coopersmith	IARS(+)	IARS(-)	Total Reading	Total Math	Language Part A	Language Part B	
RESPONSIVE EDUCATION																	
Buffalo, NY						A	A	A	A						A		
Duluth, MN							A	A	A						A		
Fresno, CA																	
St. Louis, MO																	
Salt Lake City, UT																	
Tacoma, WA		A	A	A	A									A	A	A	
TEEM																	
Chicasha, OK		A	A	A	A		A	A	A					A	A		A
Des Moines, IA							A										
Lakewood, NY			A	A												A	A
Newark, NJ																	
Lincoln, NB																	
Wichita, KS		A	A	A			A	A	A					A	A		A
BANK STREET																	
New York, NY																	
Philadelphia, PA																	
Brattleboro, VT																	
Fall River, MA																	
New Haven, CT						A											
DIRECT INSTRUCTION																	
New York, NY																	
Grand Rapids, MI																	
W. Iron Co., MI						A											
Flint, MI																	
Providence, RI		A	A	A	A		A	A	A					A	A	A	A
BEHAVIOR ANALYSIS																	
New York, NY																	
Philadelphia, PA																	
Portageville, MO		A	A				A							A	A		
Trenton, NJ		A	A	A		A	A				A		A	A		A	
Kansas City, MO																	
Louisville, KY																	
Waukegan, IL						A											
COGNTIIVE CURRICULUM																	
New York, NY																	
Okaloosa Co., FL		A	A	A	A		A	A	A				A	A	A	A	A
Greeley, CO																	A
Seattle, WA				A		A											
Chicago, IL																	
PARENT EDUCATION																	
Philadelphia, PA																	
Richmond, VA																	
Yakima, WA																	
Houston, TX						A	A	A	A				A	A	A	A	
Laurenceburg, IN		A	A	A	A	A											
EDC																	
Philadelphia, PA																	
Burlington, VT																	
Lackawanna Co., PA		A	A				A	A	A			A	A	A			A
Morgan Comm. Sch., DC																	
Paterson, NJ												A					

Note. -- A = Size of Adjustment
P = Preschool Mismatch

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Appendix Table A4-19 (cont.)

MODEL/SITE / OUTCOME	Word Knowledge	Spelling	Language	Math Computations	Reading	Raven's	Math Concepts	Math Problem Solving	Coopersmith	IARS(+)	IARS(-)	Total Reading	Total Math	Language Part A	Language Part B	
IELP																
Lock Haven, PA						A										
Montevideo, MN																
Akron, OH																
ILM																
New York, NY																
Atlanta, GA																
SEDL																
Philadelphia, PA																
Los Angeles, CA					A											
Tulare, CA																
St. Martin Par., LA																
San Diego, TX											A					
CLA																
Chicago, IL																
Topeka, KS																
HOME-SCHOOL PARTNERSHIP																
New York, NY																
CAL PROCESS																
Los Angeles, CA																
Ravenswood, CA																
Oakland, CA	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
San Jose, CA		A	A			A				A					A	A
NSA																
Great Falls, MT	A						A	A					A	A		
Clear Lake, WA																

Note. -- A = Size of Adjustment

P = Preschool Mismatch

Appendix Table A4-20

SITE/OUTCOME COMBINATIONS WHICH ARE SHADED DUE TO SIZE OF ADJUSTMENT OR PRESCHOOL MISMATCH FOR COHORT II-K LOCAL ANALYSIS

MODEL/SITE \ OUTCOME	Word Knowledge	Spelling	Language	Math Computations	Reading	Raven's	Math Concepts	Math Solving	Math Problem	Coopersmith	IARS(+)	IARS(-)	Total Reading	Total Math	Language Part A	Language Part B	
RESPONSIVE EDUCATION																	
Berkeley, CA												A	A				
Buaaflo, NY																	
Duluth, MN																	
Fresno, CA																	
Lebanon, NH																	
Salt Lake City, UT		P	P	P	P	P	P/A	P/A	P	P	P	P	P	P/A	P	P	P
Tacoma, WA		P/A	P	P/A	P/A	P/A	P/A	P	P/A	P	P	P	P	P/A	P/A	P	P
TEEM																	
Baltimore, MD																	
Lakewood, NJ		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P/A	P
Lincoln, NB																	
Wichita, KS		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
BANK STREET																	
New York, NY						A											
Philadelphia, PA																	
Brattleboro, VT		P	P	P	P/A	P	P	P/A	P	P	P	P	P	P	P	P	P
Fall River, MA																	
Rochester, NY		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Wilmington, DE		P	P	P	P/A	P	P	P	P	P	P	P	P	P	P	P	P
DIRECT INSTRUCTION																	
New York, NY					A												
E. St. Louis, IL		P	P	P	P/A	P	P	P	P/A	P	P	P	P	P	P	P	P
Grand Rapids, MI		P/A	P	P/A	P	P	P	P	P	P	P	P	P	P	P/A	P	P
Racine, WI																	
Flint, MI								A									
BEHAVIOR ANALYSIS																	
New York, NY																	
Philadelphia, PA																	
Portageville, MO																	
Kansas City, MO																	
Louisville, KY			A		A							A					
Meridian, IL		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
COGNITIVE CURRICULUM																	
New York, NY																	
Okaloosa Co., FL		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Chicago, IL		P/A	P/A	P/A	P/A	P/A	P/A	P/A	P	P/A	P/A	P/A	P/A	P/A	P/A	P/A	P/A
PARENT EDUCATION																	
Philadelphia, PA																	
Jacksonville, FL		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Richmond, VA																	
Houston, TX												A					
EDC																	
Philadelphia, PA																	
Paterson, NJ																	A
Chicago, IL		P	P/A	P	P	P	P	P	P	P	P	P	P	P	P	P	P
SELF-SPONSORED																	
Detroit, MI		P	P	P	P/A	P	P	P/A	P	P	P	P	P	P	P	P	P
New York, NY		A		A		A	A	A	A					A	A		A
Philadelphia, PA																	
Portland, OR		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
San Diego, CA		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

Note. -- A = Size of Adjustment

P = Preschool Mismatch

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Appendix Table A4-20 (cont.)

MODEL/SITE \ OUTCOME	Word Knowledge	Spelling	Language	Math Computations	Reading	Raven's	Math Concepts	Math Problem Solving	Coopersmith	IARS(+)	IARS(-)	Total Reading	Total Math	Language Part A	Language Part B	
ILM																
New York, NY																
SEDL																
Philadelphia, PA								A					A		A	
Tulare, CA								A					A	A		
St. Martin Par., LA	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
HOME-SCHOOL PARTNERSHIP																
New York, NY											A					
CAL PROCESS																
Los Angeles, CA					A			A								
Ravenswood, CA					P/A			P			P/A					
Lamont, CA	P	P/A	P/A	P/A	P	P	P	A	P	P	A	P	P/A	P	P	P/A
San Jose, CA					A			A								

Note. -- A = Size of Adjustment
P = Preschool Mismatch

Appendix Table A4-22

SITE/OUTCOME COMBINATIONS WHICH ARE SHADED DUE TO SIZE OF ADJUSTMENT OR PRESCHOOL MISMATCH FOR COHORT III-EF LOCAL ANALYSIS

MODEL/SITE \ OUTCOME	Word Knowledge	Spelling	Language	Math Computations	Reading	Raven's	Math Concepts	Math Problem Solving	Coopersmith	IARS(+)	IARS(-)	Total Reading	Total Math	Language Part A	Language Part B	
RESPONSIVE EDUCATION																
Goldsboro, NC Sumter, SC Owensboro, KY	P A	P A	P A	P A	P A	P A	P A	P A	P A	P	P	P	P A	P A	P A	P A
TEEM																
Vermillion Par., LA Durham Co., NC Ft. Worth, TX Walker, Co., GA Pike Co., KY						A										
MATHEMAGENIC																
Gulfport, MS Pickens Co., GA Lee Co., VA																
DIRECT INSTRUCTION																
Dayton, OH Tupelo, MS Williamsburg Co., SC				A		A						A			A	A

Note. -- A = Size of Adjustment
P = Preschool Mismatch

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Appendix Table A4-23

SITE/OUTCOME COMBINATIONS WHICH ARE SHADED DUE TO SIZE OF ADJUSTMENT OR PRESCHOOL MISMATCH FOR COHORT III-EF POOLED ANALYSIS

MODEL/SITE \ OUTCOME	Word Knowledge	Spelling	Language	Math Computations	Reading	Raven's	Math Concepts	Math Problem Solving	Coopersmith	IARS(+)	IARS(-)	Total Reading	Total Math	Language Part A	Language Part B	
RESPONSIVE EDUCATION																
Goldsboro, NC Sumter, SC Owensboro, KY		A	A	A	A	A	A	A	A				A	A	A	A
TEEM																
Vermillion Par., LA Durham Co., NC Ft. Worth, TX Walker Co., GA Pike Co., KY						A										
MATHEMAGENIC																
Gulfport, MS Pickens Co., GA Lee Co., VA				A			A		A							A
DIRECT INSTRUCTION																
Dayton, OH Tupelo, MS Williamsburg Co., SC		A	A	A	A	A	A	A	A				A	A	A	A

Note. -- A = Size of Adjustment
P = Preschool Mismatch

Appendix Table A4-24

SITE/OUTCOME COMBINATIONS WHICH ARE SHADED DUE TO SIZE OF ADJUSTMENT OR PRESCHOOL MISMATCH FOR COHORT II-EF LOCAL ANALYSIS

MODEL/SITE \ OUTCOME	Word Knowledge	Spelling	Language	Math Computations	Reading	Raven's	Math Concepts	Math Problem Solving	Coopersmith	IARS(+)	IARS(-)	Total Reading	Total Math	Language Part A	Language Part B	
BANK STREET																
Macon Co., AL	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
DIRECT INSTRUCTION																
E. St. Louis, IL	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Tupelo, MS	A			A	A			A					A	A		
Williamsburg Co., SC																
COGNITIVE CURRICULUM																
Leflore Co., MS																
PARENT EDUCATION																
Jonesboro, AR	A												A			
Chattanooga, IN																
Hillsborough, FL																
EDC																
Laurel, DE				A		A	A	A	A				A	A		A
Johnston Co., NC																

Note. -- A = Size of Adjustment
P = Preschool Mismatch

Appendix Table A4-25

SITE/OUTCOME COMBINATIONS WHICH ARE SHADED DUE TO SIZE OF ADJUSTMENT OR PRESCHOOL MISMATCH FOR COHORT II-EF POOLED ANALYSIS

MODEL/SITE \ OUTCOME	Word Knowledge	Spelling	Language	Math Computations	Reading	Raven's	Math Concepts	Math Solving	Math Problem	Coopersmith	IABS(+)	IABS(-)	Total Reading	Total Math	Language Part A	Language Part B	
BANK STREET																	
Macon Co., AL																	
DIRECT INSTRUCTION																	
E. St. Louis, IL																	
Tupelo, MS		A	A	A	A	A	A	A	A	A		A		A	A	A	A
Williamsburg Co., SC		A	A	A	A		A	A	A	A				A	A		A
COGNITIVE CURRICULUM																	
Leflore Co., MS				A			A		A					A	A		A
PARENT EDUCATION																	
Jonesboro, AR		A		A			A	A						A	A		
Chattanooga, TN																	
Hillsborough, FL																	
EDC																	
Laurel, DE																	
Johnston Co., NC		A	A	A		A	A	A	A					A	A		A

Note. -- A = Size of Adjustment
P = Preschool Mismatch

Appendix Table A4-26

SITE/OUTCOME COMBINATIONS WHICH ARE SHADED DUE TO SIZE OF ADJUSTMENT OR PRESCHOOL MISMATCH FOR COHORT III-K LOCAL ANALYSIS

MODEL/SITE \ OUTCOME	Word Knowledge	Spelling	Language	Math Computations	Reading	Raven's	Math Concepts	Math Solving	Math Problem	Coopersmith	IARS(+)	IARS(-)	Total Reading	Total Math	Language Part A	Language Part B	Language
RESPONSIVE EDUCATION																	
Buffalo, NY																	
Duluth, MN																	
Fresno, CA																	
St. Louis, MO																	
Salt Lake City, UT																	
Tacoma, WA																	
TEEM																	
Chicasha, OK		A		A	A	A	A	A	A					A	A		
Des Moines, IA																	
Lakewood, NJ																	
Newark, NJ																	
Lincoln, NB																	
Wichita, KS		A					A	A	A					A	A		
BANK STREET																	
New York, NY																	
Philadelphia, PA																	
Brattleboro, VT																	
Fall River, MA																	
New Haven, CT																	
DIRECT INSTRUCTION																	
New York, NY																	
Grand Rapids, MI								P									
W. Iron Co., MI																	
Flint, MI																	
Providence, RI																	
BEHAVIOR ANALYSIS																	
New York, NY																	
Philadelphia, PA																	
Portageville, MO		A												A			
Trenton, NJ								P									
Kansas City, MO																	
Louisville, KY																	
Waukegan, IL																	
COGNITIVE CURRICULUM																	
New York, NY																	
Okaloosa Co., FL		A		A		A	A	A	A					A	A		A
Greeley, CO																	
Seattle, WA		A				A	A	A	A					A	A		
Chicago, IL					P		P										
PARENT EDUCATION																	
Philadelphia, PA																	
Richmond, VA																	
Yakima, WA																	
Houston, TX			P		P	P							P				
Laurenceburg, IN																	
EDC																	
Philadelphia, PA																	
Burlington, VT																	
Lackawanna Co., PA																	
Morgan Comm. Sch., DC																	
Paterson, NJ												P					

Note. -- A = Size of Adjustment
P = Preschool Mismatch

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Appendix Table A4-26 (cont.)

MODEL/SITE \ OUTCOME	Word Knowledge	Spelling	Language	Math Computations	Reading	Raven's	Math Concepts	Math Problem Solving	Coopersmith	IARS(+)	IARS(-)	Total Reading	Total Math	Language Part A	Language Part B	Language Part B
IELP																
Lock Haven, PA												P				
Montevideo, MN																
Akron, OH																
ILM																
New York, kY																
Atlanta, GA																
SEDL																
Philadelphia, PA																
Los Angeles, CA																
Tulare, CA																
St. Martin Par., LA																
San Diego, TX																
CLA																
Chicago, IL																
Topeka, KS																
HOME SCHOOL PARTNERSHIP																
New York, NY																
CAL PROCESS																
Los Angeles, CA		A	A										A			
Ravenswood, CA																
Oakland, CA		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
San Jose, CA		A	A				A						A		A	
NSA																
Great Falls, MT																
Clear Lake, WA		A		A									A			A

Note. -- A = Size of adjustment

P = Preschool Mismatch

* No test for size of adjustment or preschool mismatch was computed due to lack of local NFT group.

Appendix Table A4-27

SITE/OUTCOME COMBINATIONS WHICH ARE SHADED DUE TO SIZE OF ADJUSTMENT OR PRESCHOOL MISMATCH FOR COHORT III-K POOLED ANALYSIS

MODEL/SITE \ OUTCOME	Word Knowledge	Spelling	Language	Math Computations	Reading	Raven's	Math Concepts	Math Problem Solving	Coopersmith	IARS (+)	IARS (-)	Total Reading	Total Math	Language Part A	Language Part B	Language
RESPONSIVE EDUCATION																
Buffalo, NY			P												P	
Duluth, MN																
Fresno, CA											P					
St. Louis, MO																
Salt Lake City, UT						P		P		P						
Tacoma, WA		A											A			
TEEM																
Chicasha, OK		A		A	A	A	A	A	A				A	A		A
Des Moines, IA								A	A	A	A	A		A		
Lake wood, NJ			P		P				P		P			P	P	P
Newark NJ																
Lincoln, NB																
Wichita, KS		A		A			A	A	A				A	A		A
BANK STREET																
New York, NY																
Philadelphia, PA																
Brattleboro, VT																
Fall River, MA																
New Haven, CT																
DIRECT INSTRUCTION																
New York, NY																
Grand Rapids, MI							P									
W. Iron Co., MI																
Flint, MI																
Providence, RI		P	P				P					P	P			
BEHAVIOR ANALYSIS																
New York, NY		P				P				P	P	P			P	P
Philadelphia, PA																
Portageville, MO		A		A			A	A	A				A	A		A
Trenton, NJ		P	P			P	P			P		P	P		P	P
Kansas City, MO																
Louisville, KY																
Waukegan, IL																
COGNITIVE CURRICULUM																
New York, NY																
Okaloosa Co., FL		P/A	P	A	P	P/A	P/A	A	P/A	P			P/A	P/A	P	
Greeley, CO																
Seattle, WA		A		A		A	A	A	A				A	A		
Chicago, IL		P							P			P				
PARENT EDUCATION																
Philadelphia, PA																
Richmond, VA																
Yakima, WA																
Houston, TX																
Laurenceburg, IN																
EDC																
Philadelphia, PA																
Burlington, VT																
Lackawanna Co., PA																
Morgan Comm. Sch., DC																
Paterson, NJ						P			P	P	P					

Note. -- A = Size of Adjustment

P = Preschool Mismatch

Appendix Table A4-27 (cont.)

MODEL/SITE \ OUTCOME	Word Knowledge	Spelling	Language	Math Computations	Reading	Raven's	Math Concepts	Math Solving	Math Problem	Coopersmith	IARS(+)	IARS(-)	Total Reading	Total Math	Language Part A	Language Part B	
IELP																	
Lock Haven, PA																	
Montevideo, MN																	
Akron, OH																	
ILM																	
New York, NY																	
Atlanta, GA																	
SEDL																	
Philadelphia, PA																	
Los Angeles, CA																	
Tulare, CA																	
St. Partin Par., LA																	
San Diego, TX																	
CLA																	
Chicago, IL					P	P			P				P			P	
Topeka, KS																	
HOME-SCHOOL PARTNER-SHIP																	
New York, NY																	
CAL PROCESS																	
Los Angeles, CA		P			P		P	P					P	P	P		
Ravenswood, CA					P												
Oakland, CA		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
San Jose, CA			P		P	P						P		A		P	P
NSA																	
Great Fall, MT																	
Clear Lake, WA		A											A				

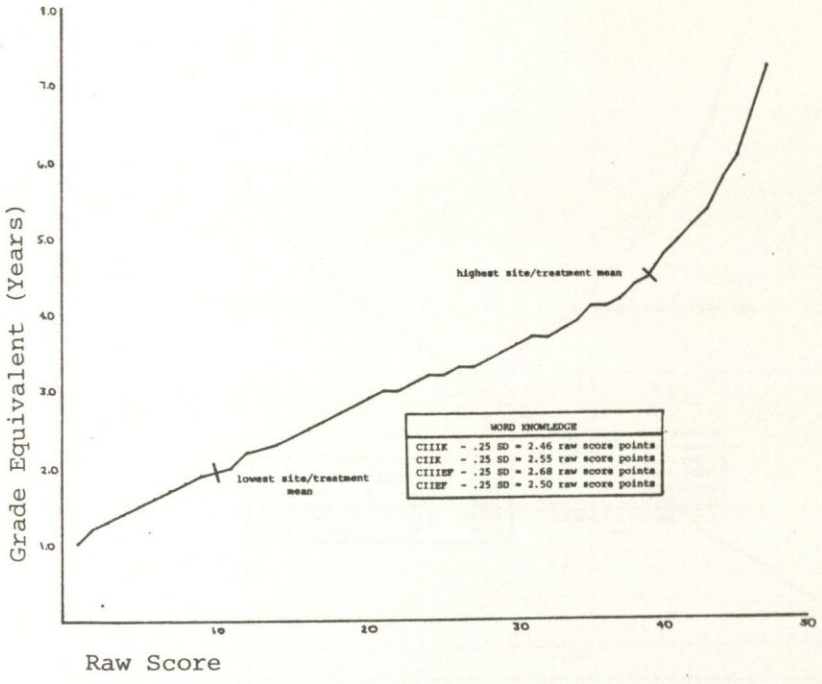
Note. -- A = Size of Adjustment

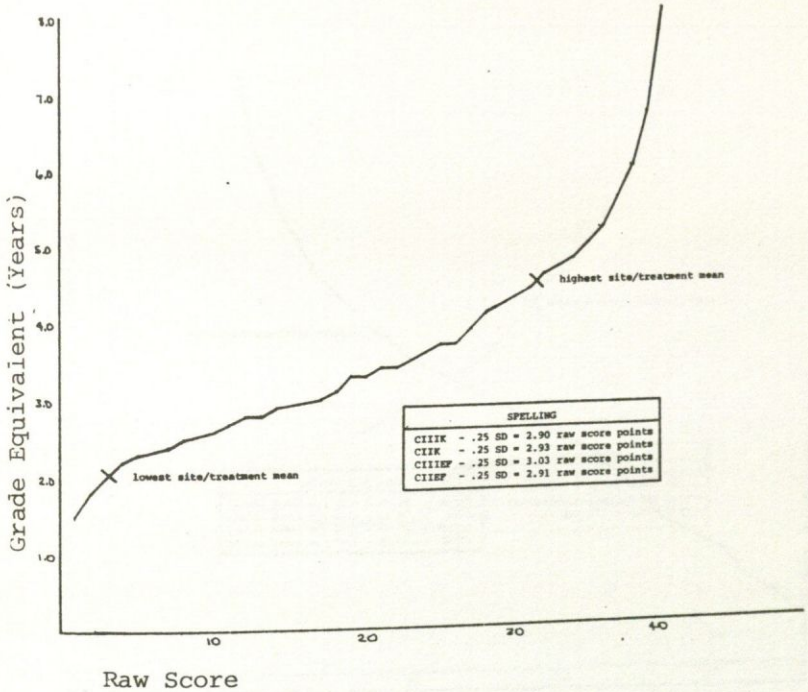
P = Preschool Mismatch

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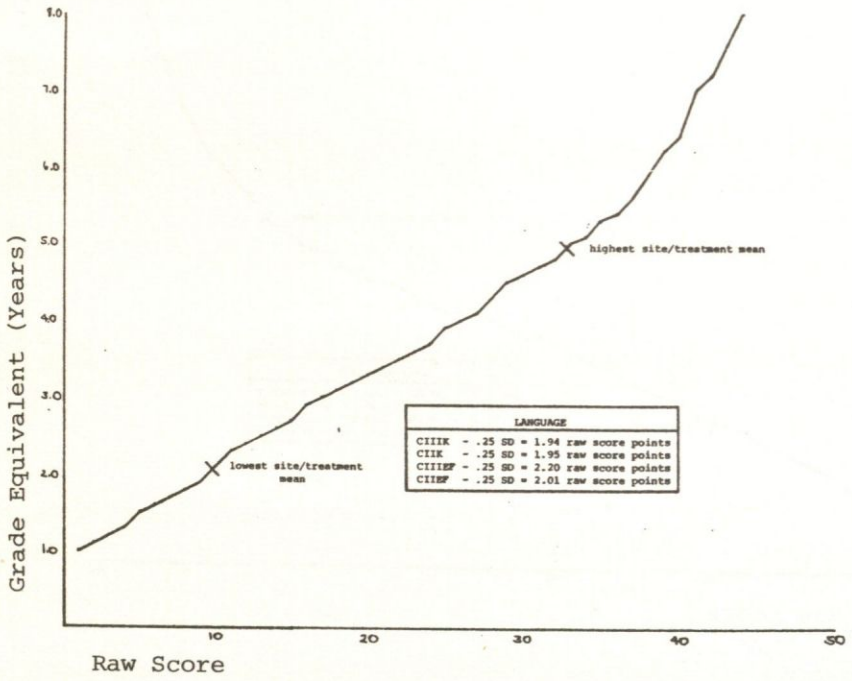
Appendix Figure A4-1

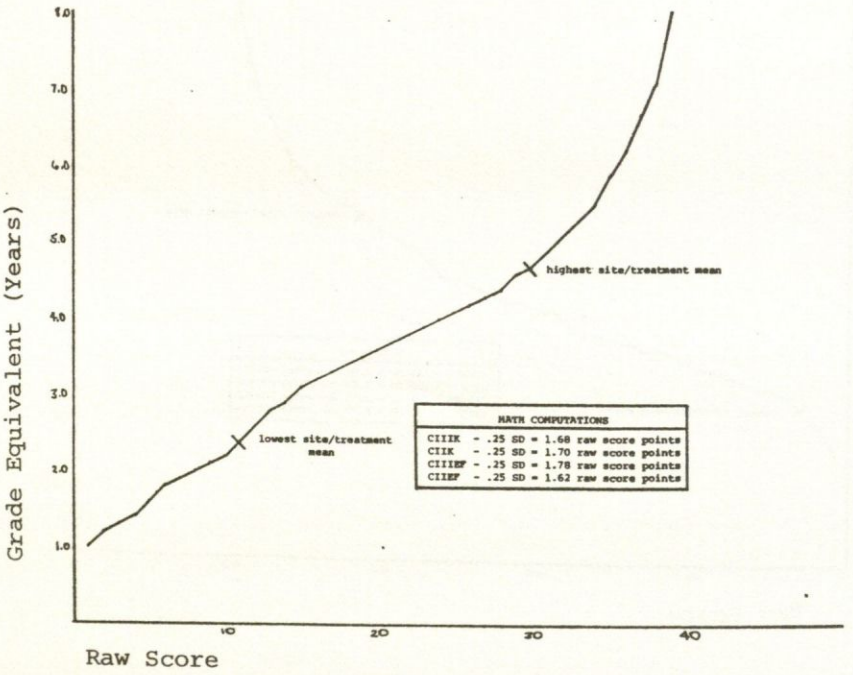
RELATIONSHIP OF RAW SCORES TO GRADE EQUIVALENTS



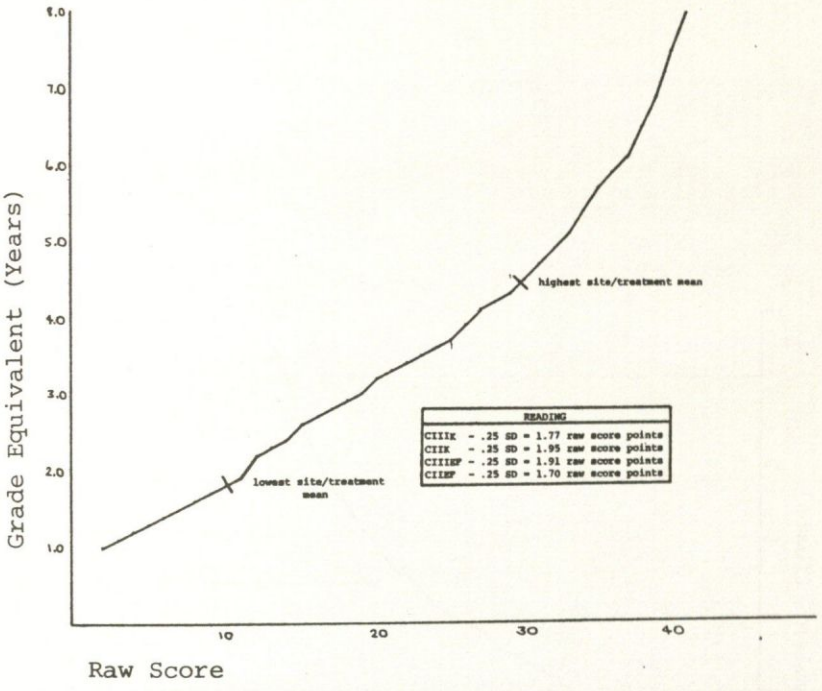


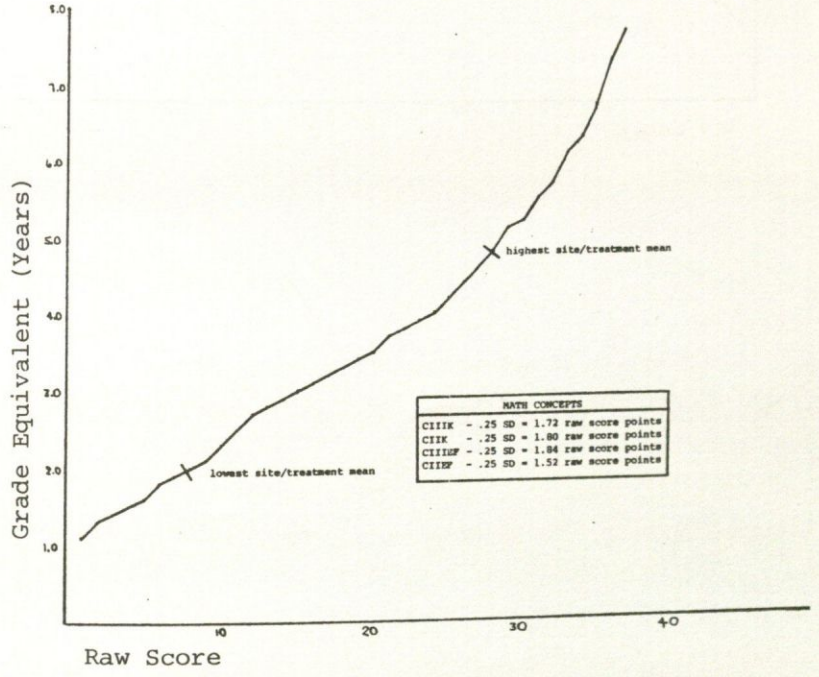
Appendix Figure A4-1 (cont.)



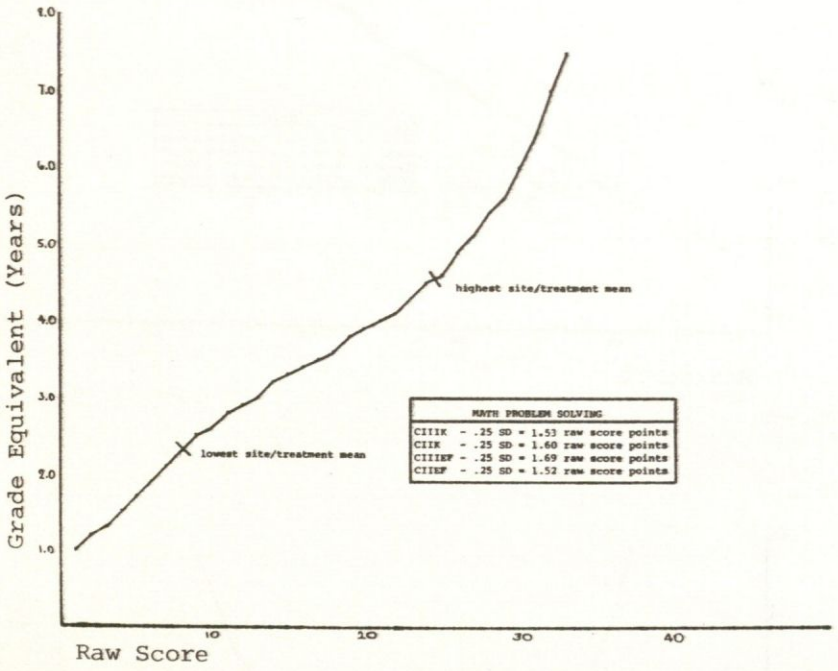


Appendix Figure A4-1 (cont.)





Appendix Figure A4-1 (cont.)

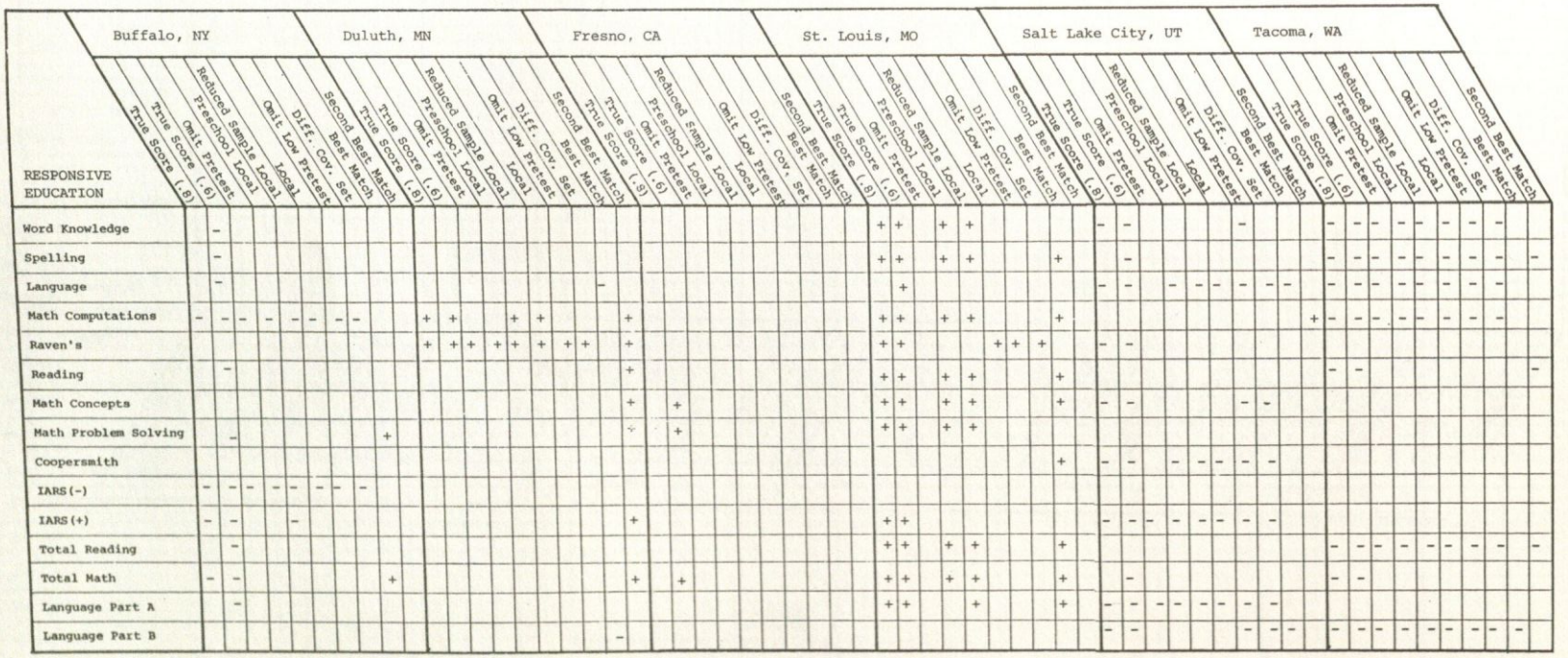


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Appendix Figure A4-2

SUMMARY OF PRIMARY AND SUPPLEMENTARY ANALYSES FOR COHORT III-K SPONSORS

RESPONSIVE EDUCATION

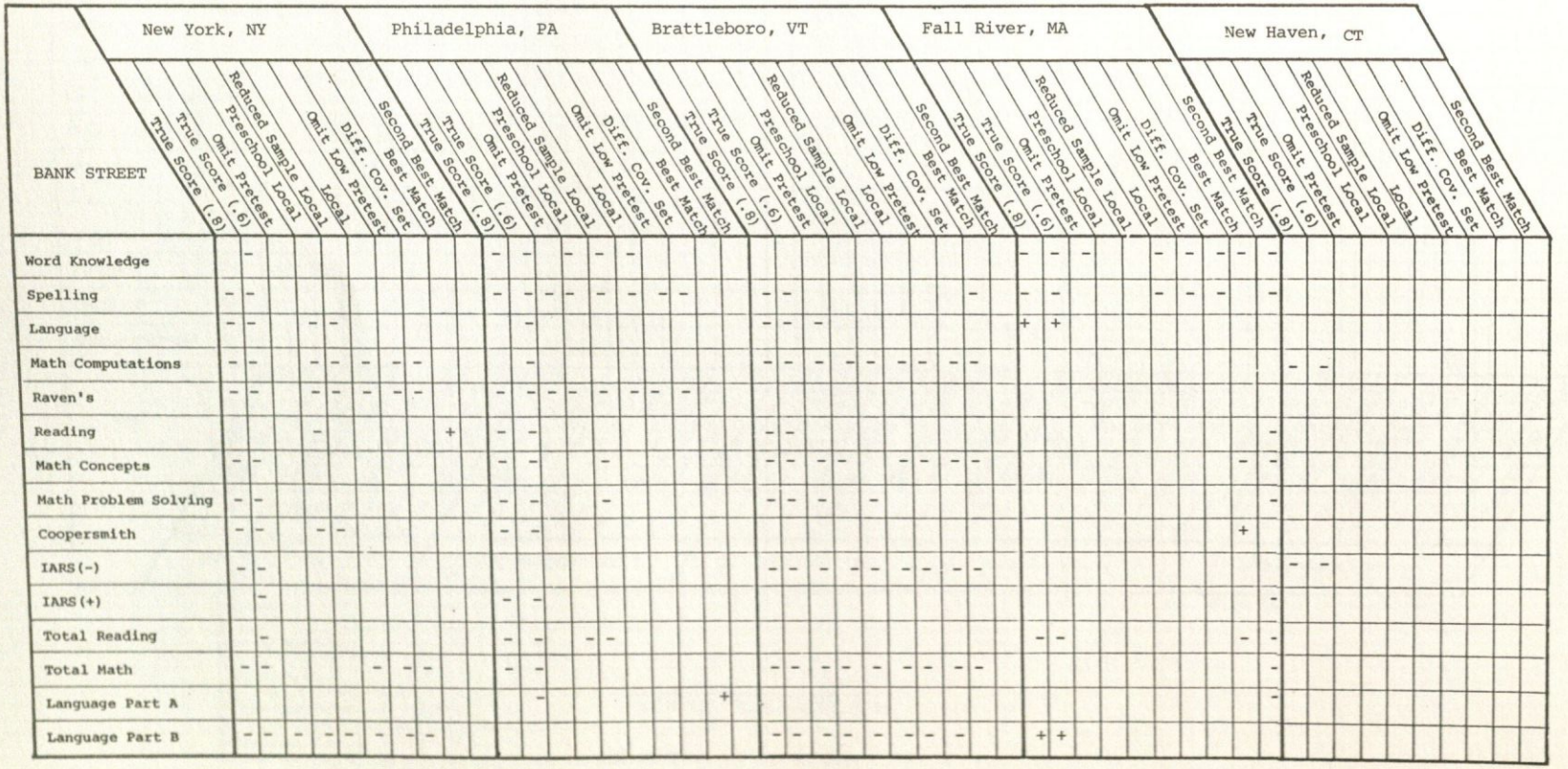


Appendix Figure A4-2 (cont.)
TEEM

TEEM	Chicasha, OK									Des Moines, IA									Lakewood, NJ									Newark, NJ									Lincoln, NB									Wichita, KS								
	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Omit Pretest Local	Local	Omit Low Pretest	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Omit Pretest Local	Local	Omit Low Pretest	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Omit Pretest Local	Local	Omit Low Pretest	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Omit Pretest Local	Local	Omit Low Pretest	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Omit Pretest Local	Local	Omit Low Pretest	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Omit Pretest Local	Local	Omit Low Pretest	Diff. Cov. Set	Second Best Match
Word Knowledge	-	-	-	-	-	-	-	-	+										-									-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	
Spelling	-	-	-	-	-	-	-	-	+										-	-								-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	
Language									+	+									-	-								-	-				-	-									-	-	-	-	-	-	-	-			-						-	
Math Computations		+							+	+	+	+	+	+	+	+	+											-		-								-																			-	
Raven's																																					-																			
Reading	-		-	-	-	-	-	-	+																			-	-					-	-			-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	
Math Concepts			-						+										-									-	-									-		-	-	-	-	-	-									-	
Math Problem Solving			-						+			+							-									-	-									-	-	-	-	-	-	-	-									-	
Coopersmith																												-								+																			
IARS(-)									+																																															
IARS(+)									+																			-	-					-	-	-	-																			
Total Reading	-	-	-	-		-	-	-	+																			-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	
Total Math									+	+	+	+							-									-										-	-	-	-	-	-	-	-									-	
Language Part A									+	+																			-																											
Language Part B									+	+									-	-								-	-					-	-									-	-	-	-	-	-	-	-							

Appendix Figure A4-2 (cont.)

BANK STREET



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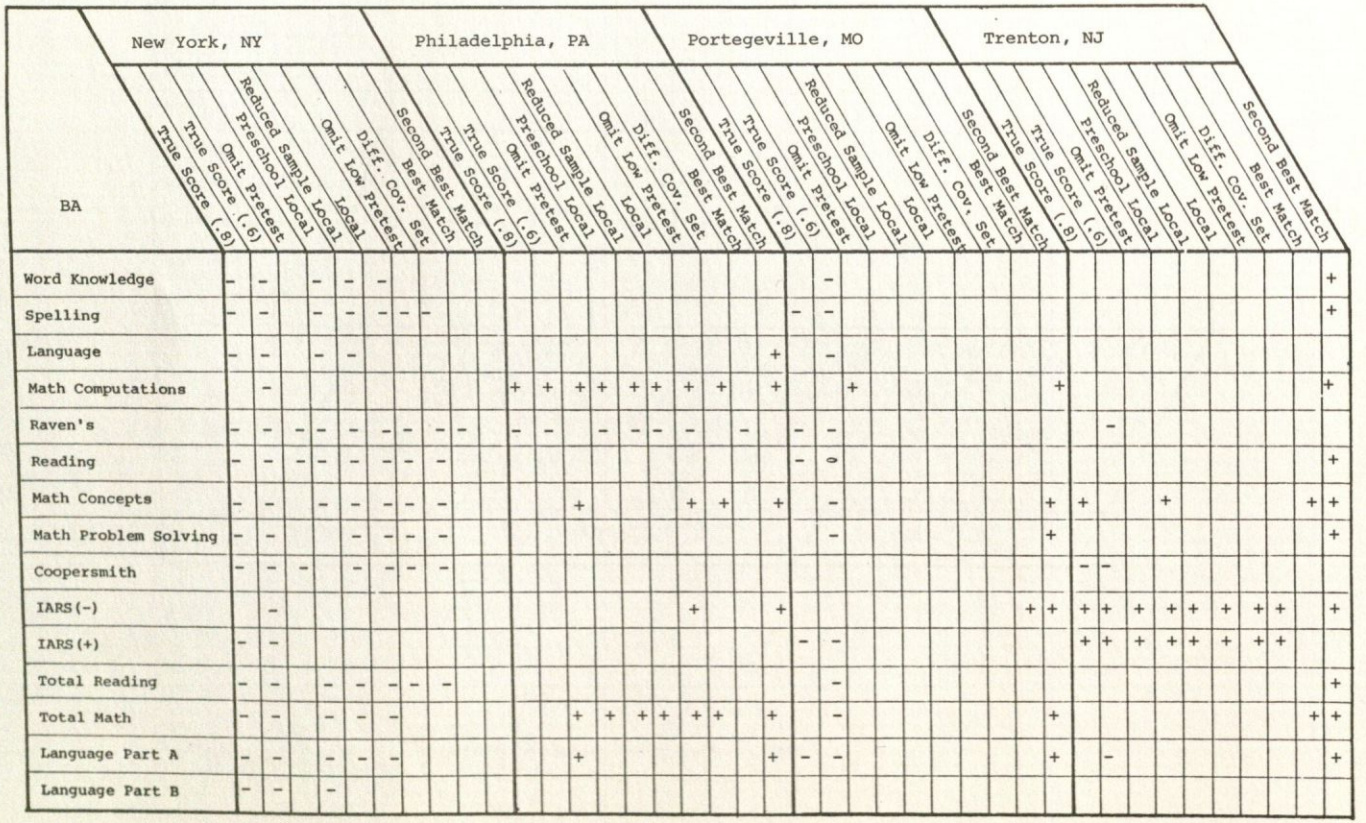
Appendix Figure A4-2 (cont.)

DIRECT INSTRUCTION

E-B	New York, NY										Grand Rapids, MI										W. Iron Co., MI										Flint, MI										Providence, RI									
	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Local	Preschool Local	Omit Low Pretest	Local	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Local	Preschool Local	Omit Low Pretest	Local	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Local	Preschool Local	Omit Low Pretest	Local	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Local	Preschool Local	Omit Low Pretest	Local	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Local	Preschool Local	Omit Low Pretest	Local	Diff. Cov. Set	Second Best Match
Word Knowledge		-									-																			-							+									+
Spelling																																															+
Language	+	+	+	+	+	+	+	+	+		-	-																+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Math Computations	+	+	+	+	+	+	+	+	+																					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Raven's		-																												-	-		-		-	-	-									+	
Reading																																+						+									+	+
Math Concepts	+	+	+	+					+		-	-				-	-	-			-	-	-		-	-	-				+						+	+	+	+	+	+	+	+	+	+	+
Math Problem Solving	+	+	+	+	+				+			-							+		-	-	-		-	-	-	-		+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Coopersmith	-	-			-							-																		-	-		-	-	-	-	-										
IARS(-)																																															+
IARS(+)	-	-																													-																+
Total Reading		-										-																				+							+									+	+
Total Math	+	+	+	+	+	+	+	+	+		-	-																		+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Language Part A									+									+																				+									+
Language Part B	+	+	+	+	+	+	+	+	+																					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Appendix Figure A4-2 (cont.)

BEHAVIOR ANALYSIS



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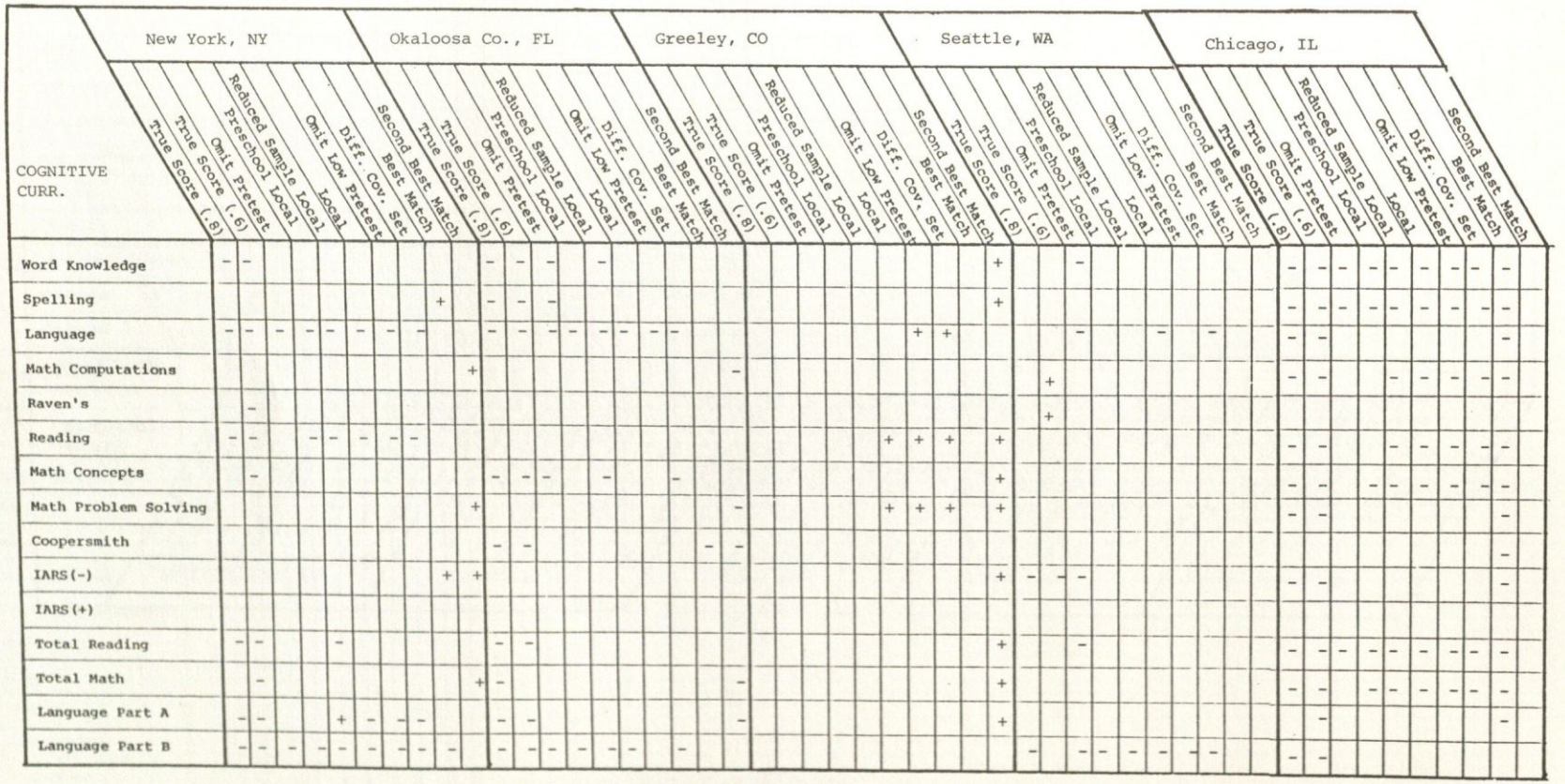
Appendix Figure A4-2 (cont.)

BEHAVIOR ANALYSIS

BA	Kansas City, MO									Louisville, KY										Waukegan, IL									
	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Omit Low Pretest Local	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Omit Low Pretest Local	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Omit Low Pretest Local	Diff. Cov. Set	Second Best Match								
Word Knowledge								+	+																		+	+
Spelling		+						+	+																			
Language									+											+	+		+	+	+	+	+	+
Math Computations										+	+	+	+	+	+	+	+		+	+	+						+	+
Raven's	-	-						+		-	-																	
Reading								+	+																			+
Math Concepts										+		+	+	+	+	+	+											
Math Problem Solving												+																
Coopersmith										-	-																	
IARS(-)								+	+	+	+	+	+	+	+	+			+									+
IARS(+)									+																			
Total Reading								+	+																		+	+
Total Math										+	+	+	+	+	+	+	+		+								+	
Language Part A									+																			
Language Part B																				+	+	+	+	+	+	+	+	+

Appendix Figure A4-2 (cont.)

COGNITIVE CURRICULUM



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Appendix Figure A4-2 (cont.)

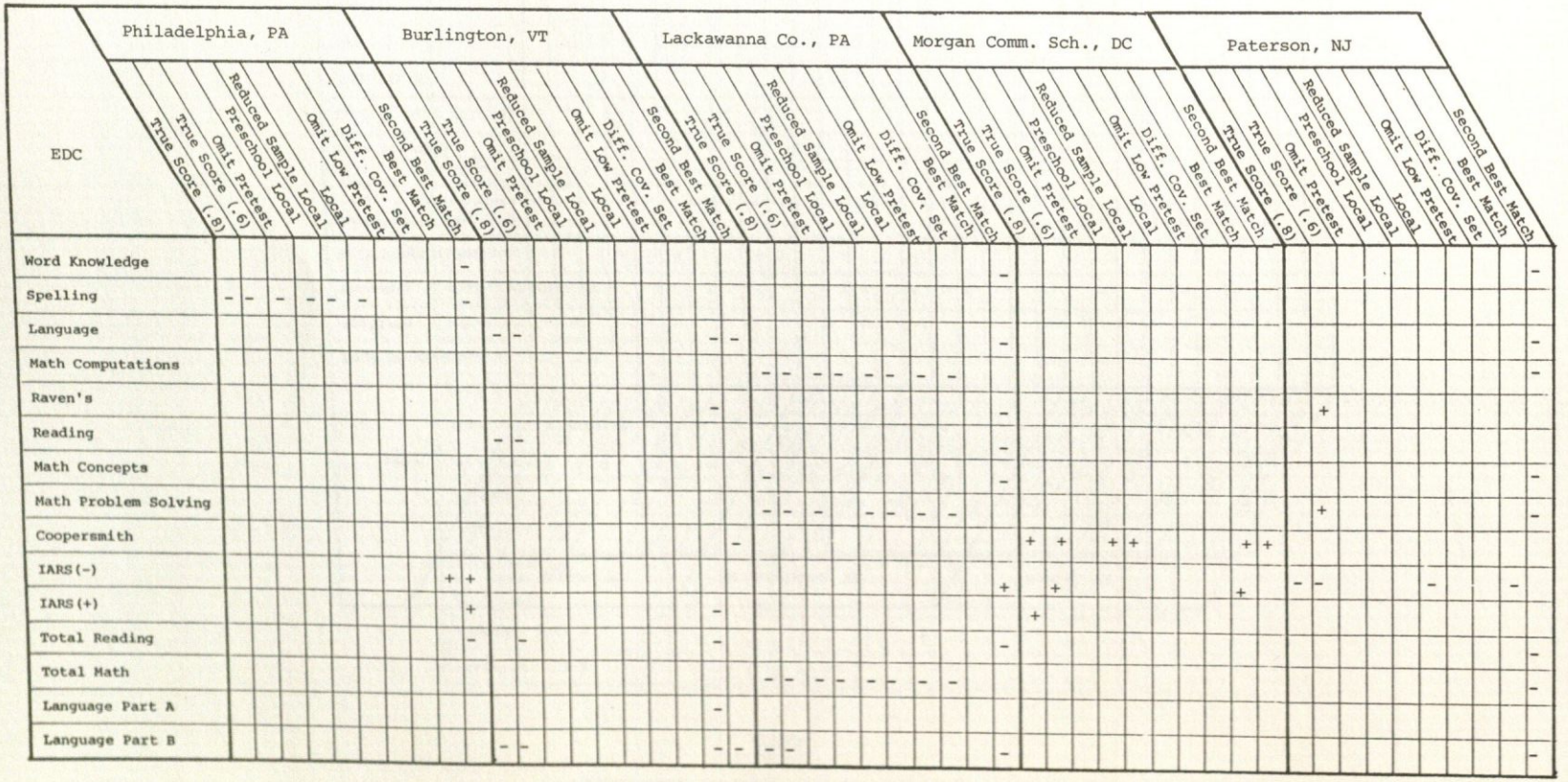
PARENT EDUCATION

PARENT EDUCATION	Philadelphia, PA										Richmond, VA										Yakima, WA									
	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Local	Preschool Local	Omit Low Pretest	Local	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Local	Preschool Local	Omit Low Pretest	Local	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Local	Preschool Local	Omit Low Pretest	Local	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest
Word Knowledge	-		-	-		-													+	+										
Spelling	-		-	-		-	-	-	-										+	+										
Language																				+										
Math Computations	-		-	-																+										
Raven's	-		-	-															+	+										
Reading																			+	+										
Math Concepts	-		-	-		-	-	-	-											+										
Math Problem Solving																			+	+										
Coopersmith																				+										
IARS(-)																			+	+										
IARS(+)	-																			+										
Total Reading	-																		+	+										
Total Math	-		-	-		-													+	+										
Language Part A																			+	+										
Language Part B																				-										

PARENT EDUCATION	Houston, TX										Lawrenceburg, IN									
	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Local	Preschool Local	Omit Low Pretest	Local	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Local	Preschool Local	Omit Low Pretest	Local	Diff. Cov. Set	Second Best Match	
Word Knowledge			+		+	+		+	+	+										
Spelling					+	+														
Language		-	-			-							-	-	-	-	-	-	-	
Math Computations		-	-	+		+	+						-	-	-	-	+	-	-	
Raven's					+	+	+													
Reading						+							-	-	-	-	-	-	-	
Math Concepts		-	-			+									-					+
Math Problem Solving		-	-			+							-		-					
Coopersmith						+														
IARS(-)			-			+							+	+		+				
IARS(+)				+	+	+	+						+	+						
Total Reading						+									-					
Total Math		-				+							-		-		-			+
Language Part A						+														
Language Part B		-				-							-	-	-	-	-	-	-	

Appendix Figure A4-2 (cont.)

EDC



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Appendix Figure A4-2 (cont.)

IELP

IELP	Lock Haven, PA										Montevideo, MN										Akron, OH									
	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Omit Low Pretest Local	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Omit Low Pretest Local	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Omit Low Pretest Local	Diff. Cov. Set	Second Best Match									
Word Knowledge	-	-	-	-	-	-	-	-													+		-							-
Spelling		-										+									+	-	-		-	-	-	-	-	-
Language	-	-		-	-	-	-	-	-		-	-	-	-	-	-	-	-			+	-	-		-	-	-	-	-	-
Math Computations	-	-	-	-	-	-	-	-	-		-	-		-	-	-	-	-	-			-								-
Raven's		-																	+			+	+	+	+	+	+	+	+	
Reading	-	-	-	-	-	-	-	-			+		+	+	+	+	+	+			+	-		-	-	-	-	-	-	-
Math Concepts	-	-	-	-	-	-	-	-	-														-							-
Math Problem Solving	-	-							-													-								
Coopersmith																														
IARS(-)		-									+	+	+	+	+	+	+	+												
IARS(+)	-	-				-	-	-	-																					
Total Reading	-	-	-	-	-	-	-	-					+								+	-	-				-	-	-	-
Total Math	-	-	-	-	-	-	-	-	-			-											-							-
Language Part A		-																			+	-	-		-	-	-	-	-	-
Language Part B	-	-		-	-	-	-	-	-		-	-	-	-	-	-	-	-				-	-		-	-	-	-	-	-

Appendix Figure A4-2 (cont.)

ILM

ILM	New York, NY									Atlanta, GA									
	True Score (.8)	True Score (.6)	Omit Pretest	Preschool Local	Reduced Sample Local	Local	Omit Low Pretest	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Preschool Local	Reduced Sample Local	Local	Omit Low Pretest	Diff. Cov. Set	Second Best Match	
Word Knowledge	-	-							-		+	+							
Spelling	-	-				-			-			+							
Language	-	-		-		-	-	-	-		+	+							
Math Computations	-	-							-			+							
Raven's																			
Reading	-	-		-		-	-	-	-			+							
Math Concepts	-	-							-										
Math Problem Solving	-	-																	
Coopersmith	-	-									-							-	
IARS(-)																			
IARS(+)	-	-							-										
Total Reading	-	-				-			-		+	+							
Total Math	-	-							-			+							
Language Part A	-	-							-		+	+							
Language Part B	-	-		-		-			-		+	+							

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Appendix Figure A4-2 (cont.)

SEDL

SEDL	Philadelphia, PA												Los Angeles, CA												Tulare, CA												St. Martin Parish, LA												San Diego, TX											
	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Local	Preschool Local	Local	Omit Low Pretest	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Local	Preschool Local	Omit Low Pretest	Local	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Local	Preschool Local	Local	Omit Low Pretest	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Local	Preschool Local	Local	Omit Low Pretest	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Local	Preschool Local	Local	Omit Low Pretest	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Local	Preschool Local	Local	Omit Low Pretest	Diff. Cov. Set	Second Best Match
Word Knowledge	-	-	-	-	-	-					-							-	-								+	+		+	+	+	+	+	+													-	-	-	-		-	-	-	-	-	
Spelling	-	-	-	-	-	-	-	-			-							-	-	-							+	+		+	+	+	+	+	+	-	-	-										-	-	-	-	-	-	-	-	-	
Language																											+	+		+	+																	-		+							+
Math Computations																											+	+	+	+	+	+	+	+																+	+							+
Raven's																																																		-									+
Reading																											+	+	+	+	+	+		+	+															-								
Math Concepts																											+	+		+	+	+	+																-								+
Math Problem Solving												+															+	+																					-								+
Coopersmith																											+	+																					-								
IARS(-)																											+	+																					-								
IARS(+)																											+	+																					-								
Total Reading	-		-		-							-															+	+	+	+	+	+	+	+	+													-	-	-				-		-	
Total Math																											+	+		+	+	+	+	+	+													-		+							+
Language Part A												-																+																					-								+
Language Part B																											+	+		+	+	+	+	+	+													-								

Appendix Figure A4-2 (cont.)

CLA

CLA	Chicago, IL										Topeka, KS									
	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Local	Omit Low Pretest Local	Diff. Cov. Set	Second Best Match	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Local	Omit Low Pretest Local	Diff. Cov. Set	Second Best Match				
Word Knowledge										+										
Spelling	+	+	+	+	+	+	+	+		+										
Language		-	-						-		-	-	-	-	-	-	-	-		
Math Computations	+		+	+	+	+	+	+		+	+	+								
Raven's			+																	
Reading											-	-	-	-	-	-	-	-		
Math Concepts																				
Math Problem Solving										+										
Coopersmith																				
IARS(-)																				
IARS(+)																				
Total Reading											-	-	-		-	-	-	-		
Total Math										+										
Language Part A				+	+															
Language Part B	-	-				-	-	-	-		-	-	-	-	-	-	-	-		

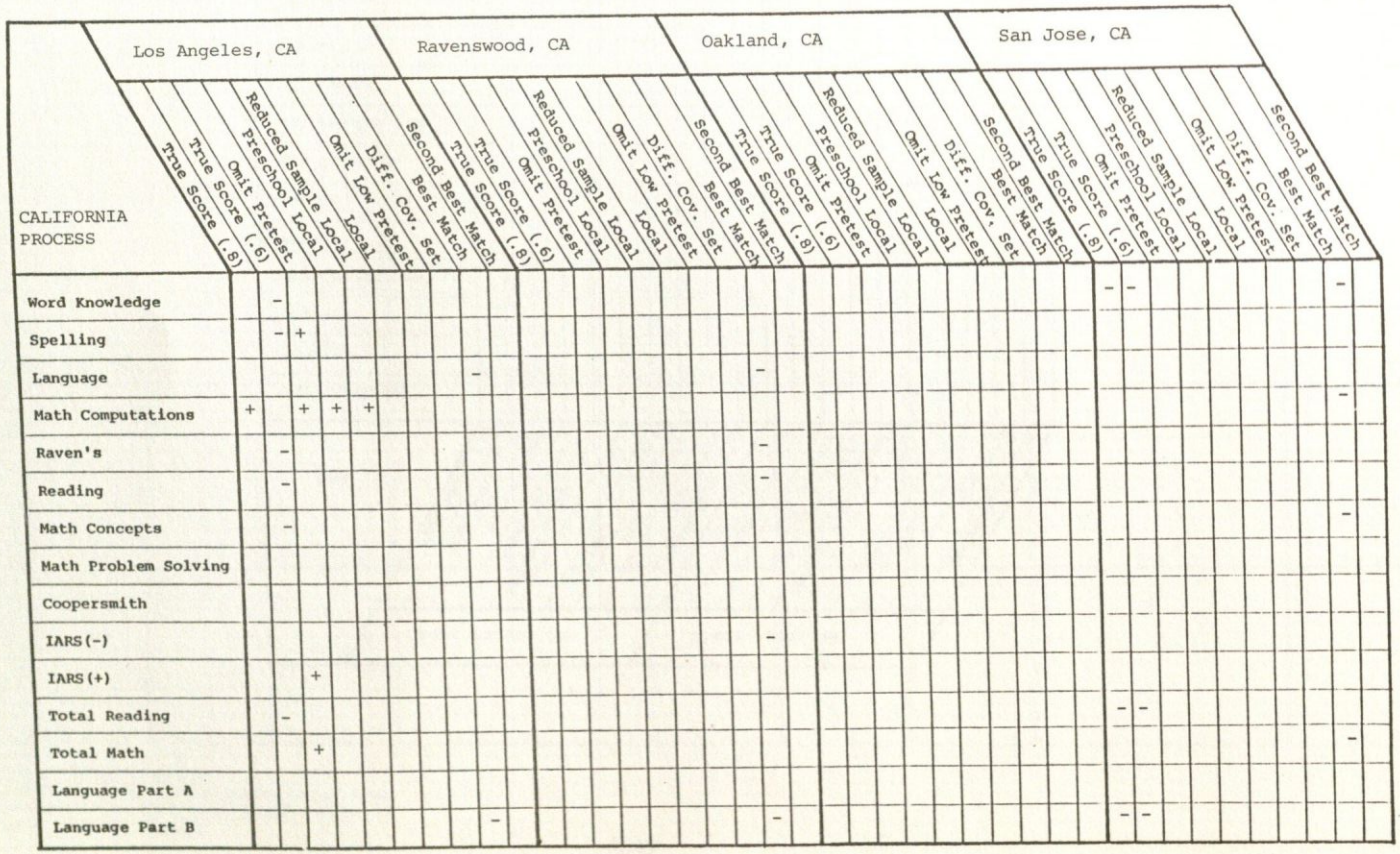
Appendix Figure A4-2 (cont.)

HOME-SCHOOL PARTNERSHIP

HOME-SCHOOL PARTNERSHIP	New York, NY								
	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Local	Omit Low Pretest Local	Diff. Cov. Set	Best Match	Second Best Match
Word Knowledge	-	-							
Spelling		-							
Language	-	-							
Math Computations									+
Raven's	-	-							
Reading		-							
Math Concepts									
Math Problem Solving								+	+
Coopersmith		-							
IARS(-)									+
IARS(+)		-							
Total Reading	-	-							
Total Math									+
Language Part A									
Language Part B	-	-							

Appendix Figure A4-2 (cont.)

CALIFORNIA PROCESS



Appendix Figure A4-2 (cont.)

NSA

NSA	Great Falls, MT										Clear Lake, WA									
	True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Local	Omit Low Pretest Local	Diff. Cov. Set	Second Best Match	True Score (.8)		True Score (.8)	True Score (.6)	Omit Pretest	Reduced Sample Preschool Local	Local	Omit Low Pretest Local	Diff. Cov. Set	Second Best Match		
Word Knowledge										+	-	-	-	-	-	-	-			
Spelling											-	-	-	-	-	-	-			
Language											-	-	-	-	-	-	-			
Math Computations				-				-			-	-	-	-	-	-	-			
Raven's																				
Reading				-							-	-	-	-	-	-	-			
Math Concepts	-			-	-	-	-	-					-							
Math Problem Solving											-	-	-	-	-	-	-			
Coopersmith																				
IARS(-)																				
IARS(+)											-	-	-	-	-	-	-			-
Total Reading				-							-	-	-	-	-	-	-			
Total Math				-			-	-	-		-	-	-	-	-	-	-			
Language Part A				-			-	-	-		-	-	-	-	-	-	-			
Language Part B											-	-	-	-	-	-	-			

Appendix Figure A4-3

SUMMARY OF EFFECTS
FOR LINKING OF ENTRY-EXIT AND LONGITUDINAL STUDIES

	RESPONSIVE EDUCATION				TEEM				BANK STREET				DIRECT INSTRUCTION				BEHAVIOR ANALYSIS				COGNITIVE CURRICULUM				PARENT EDUCATION				EDC				IELP				SEDL				CAL PROCESS			
	PBPA	PBPA No Site Code	PBPA Long. Sample	Long. Analysis E-E Mode	PBPA	PBPA No Site Code	PBPA Long. Sample	Long. Analysis E-E Mode	PBPA	PBPA No Site Code	PBPA Long. Sample	Long. Analysis E-E Mode	PBPA	PBPA No Site Code	PBPA Long. Sample	Long. Analysis E-E Mode	PBPA	PBPA No Site Code	PBPA Long. Sample	Long. Analysis E-E Mode	PBPA	PBPA No Site Code	PBPA Long. Sample	Long. Analysis E-E Mode	PBPA	PBPA No Site Code	PBPA Long. Sample	Long. Analysis E-E Mode	PBPA	PBPA No Site Code	PBPA Long. Sample	Long. Analysis E-E Mode	PBPA	PBPA No Site Code	PBPA Long. Sample	Long. Analysis E-E Mode	PBPA	PBPA No Site Code	PBPA Long. Sample	Long. Analysis E-E Mode	PBPA	PBPA No Site Code	PBPA Long. Sample	Long. Analysis E-E Mode
HEAD START																																													
Total Reading			-	-	-	-	-	-					+									-	-	-				-		-							-				-	-	-	-
Total Math										-			+	+	+	+		+	+			-	-	-				-									-				-	-	-	-
Math Computations	+								-				+	+	+	+	+	+	+	+		-	-	-				-								+					-	-	-
Math Concepts										-			+	+	+	+					-	-	-	-			-													-	-	-	-
NO PRESCHOOL																																													
Total Reading					-			-	-	-					+						-								-		-			+	+	+		-				-	-	-	-
Total Math		-							-	-					+		+	+	+	+																	+					-	-	-
Math Computations									-	-				+			+	+	+	+															-				+					-	-	-
Math Concepts									-	-								+																	+	+	+		+					-		-
SOME PRESCHOOL																																													
Total Reading					-				-					+	+						-														+				+					-	-	-
Total Math									-	-				+	+		+			+																								-
Math Computations									-					+	+	+	+	+	+	+															-	-	-	-							
Math Concepts					-				-	-	-	-	-	+	+					+	-																						-	-	-

PBPA = Preschool Blocked Pooled Analysis
PBPA No Site Code = Above analysis without between-site codes
PBPA Long. Sample = Above analysis on longitudinal sample
Longitudinal Analysis in Entry-Exit Mode

Exhibit A4-1

BEST MATCH ANALYSIS

Best match comparisons are an alternative to local and pooled comparisons. Our aim was to match each FT group with a comparable NFT group located in another site. We identified the NFT site group that best matched each FT site group with respect to seven background characteristics: ethnicity, family income, mother's education, preschool, whether or not mother was head of household, first language, and pretest score according to the following algorithm:

- FT and NFT site means on each matching variable were placed on a standardized (mean = 0, standard deviation = 1) distribution. (The standardization process used the unweighted means for FT and NFT sites as units.)
- A matrix containing one row for each FT site and one column for each NFT site was then constructed for each matching variable; the cells of the matrix contained the FT/NFT squared difference on that variable.
- These squared differences were summed across matrices, so that the resulting matrix contained as elements the sum of the squared FT/NFT differences across all matching variables.
- According to this algorithm the NFT site with the smallest sum of squared differences was selected as the best matched group for each FT site. However, in cases where several NFT sites had similar matched values, a judgment was made using other site characteristics not included as matching variables.

In the Best Match Analysis we computed separately for each of the sixty-three Follow Through sites a measure of how closely each non-Follow Through site resembles it in aggregate on a large number of initial characteristics. A separate analysis of covariance was performed on each dependent measure for each of the Follow Through sites and its best matched NFT site. We adjusted only for the eleven core covariates in this model; within a sponsor no variation between-sites was adjusted as in the Local Analysis. This is why we can find differences in the effects for a site between the Local and the Best Match Analyses even though the best matched site is the local one. (see Exhibit A4-3 for the specific regression model).

Exhibit A4-1 (cont.)

There has been much concern about the stability of the Best Match Analysis. The question of whether or not the results obtained when an FT site is compared with a matched NFT site are dependent upon the particular comparison site selected has been particularly worrisome. We approached this problem by assuming that if the pairing of an FT group and a best matched NFT group (according to some definition) makes sense, then the pairing of that FT group with another closely matched NFT group also makes sense -- and the two analyses should yield similar results. In order to check this hypothesis we performed a Second Best Match Analysis on Cohort III-K -- selecting as the comparison for each FT site group the NFT site group which was second best according to the matching algorithm. The results of the Best Match and Second Best Match Analyses are reported in Appendix Figure A4-2. The results are further summarized in the table below, which presents changes in the effects associated with the two analyses. An examination of this table reveals that 262 (30 percent) of the 870 effects estimated by both analyses* changed category. Further work showed that changes in category appeared to be unrelated to the relative degree of mismatch between the FT

SUMMARY OF CHANGES IN EFFECTS* BETWEEN THE BEST MATCH AND SECOND BEST MATCH ANALYSES FOR COHORT III-K

		Second Best Match Analysis			
		+	0	-	
Best Match Analysis	+	45	39	1	85
	0	88	540	72	700
	-	0	75	10	85
		133	654	83	870

Percent Agreement = 68

Correlation = .28

*A second best match analysis was not run for five sites due to technical problems that were not resolved since this analysis was auxiliary to our main task. Hence, only 870 effects were estimated (15 per site).

and two NFT sites. This strongly suggests that the results are inconsistent, that they are dependent on the comparison group selected, and that the use of NFT groups with similar characteristics on matching variables produces different results.

A second problem with the Best Match Analysis concerns the fact that the analysis is essentially an ANCOVA between the FT group of one site and the NFT of another. Thus, the treatment results are confounded with site effects. We tried to solve this problem by entering into the Best Match Analysis not only a given FT and best match NFT group, but also the local FT and NFT groups associated with the former two. It was then possible to remove the residual site effects from the treatment effect. Selected Cohort III-K sites were analyzed using this technique with the result that the removal of site variance enables a more sensitive analysis -- more positive and negative effects were found in the "unconfounded" analysis than in the "confounded" analysis. However, no pattern of changes emerged.

The results of both these investigations suggest that the Best Match Analysis is less trustworthy than our other analyses. Thus, we have excluded best match effects from the summary of effects tables presented in the sponsor chapters, and have not discussed best match comparisons at either the site or sponsor level. The results are included in Appendix Figure A4-1 for those who may wish to examine them.

Exhibit A4-2

MISSING DATA

Even though a child may have participated in the full four-year FT program, a complete set of evaluative information may not be available. The severity of the problem depends on which information is missing; that is, whether the variable is a dependent, independent, or covariate measure.

In this evaluation all children who lack valid information on one or more dependent (MAT, Raven's Coopersmith, IARS) or independent (treatment, sponsor, site) variables were dropped from the analysis. Without information on the treatment that a child received and the outcomes of that treatment, one can conclude nothing of evaluative worth. The effects of this procedure are indicated in Table 3-1 and are discussed in the section on sample attrition.

Missing data on one or more covariates, however, were not considered sufficient grounds for dropping a child from the evaluation. Many covariates were present for nearly all subjects--over 99 percent of the children had data on ethnicity, first language, entry age, and sex. The few subjects who were missing these covariates were assigned the grand mean for the particular analyses, across all sites. Other covariates had higher rates of absence: the pretest score was missing in five percent of the cases, while income and occupation were missing in thirty-nine percent of the cases. We treated these variables in two ways:**

- first, the appropriate grand mean was assigned to any child whose score was missing; and
- second, a dichotomous variable (a "missing data code") which assigns a score of one to subjects with missing data, and a score of zero to those with valid values, was added to the set of covariates.

---

*In the January 1973 Interim Report and in Vol. I missing data on any variable in an analysis resulted in exclusion of the child from the analysis. Beginning with the analysis reported in Vol. III, we used the techniques described in this section.

**See Cohen and Cohen (1975) for a more complete discussion of the techniques applied.

The treatment of missing data by this method has several advantages:

- it avoids the risk of nonrepresentativeness due to dropping children;
- it avoids the loss of statistical power due to reduced sample size;
- it uses the information contained in the absence/presence of the variable; and
- it uses the information present on other variables for children who might have been dropped otherwise.

In this manner all the information available can be used, the variable values which are present, as well as the absence or presence of information on the variables.

Exhibit A4-3

ANALYTIC MODELS

Local Analysis

With the child as the unit of analysis, the multiple regression procedure estimates the raw score regression weights b_i in the usual model

$$\hat{Y} = a_o + \sum_{i=1}^{2s+10} b_i x_i ,$$

where a_o is a constant, s is the number of sites in a given sponsor, and $b_1 \cdots b_{2s+10}$ are the regression weights for the predictor variables $x_1 \cdots x_{2s+10}$ which are defined as follows:

x_1 = fall kindergarden WRAT pretest score

x_2 = missing data code for pretest { 1 if pretest is missing; 0 if pretest is present

x_3 = family income (annual dollars)

x_4 = missing data code for family income { 1 if income is missing; 0 if income is present

x_5 = highest occupation in household*

x_6 = missing data code for occupation { 1 if occupation is missing; 0 if occupation is present

x_7 = ethnic membership { 1 if White; 0 if Other; -1 if Black

x_8 = ethnic membership { 1 if White; 0 if Black; -1 if Other

*The following ten occupational categories were assigned the numbers 1 through 10 as scores: semi-professional; farmers, farm members; proprietors, managers, officials; clerical and kindred workers; sales; craftsmen, formen, and kindred workers; operatives and kindred workers; service workers; farm laborers and foremen; laborers.

Exhibit A4-3 (cont.)

x_9 = sex { .5 if male; -.5 if female }

x_{10} = age at entry to kindergarten (months)

x_{11} = first language { .5 if English; -.5 if Other }

$x_{12} \cdots x_{s+10}$ = s-1 site codes reflecting membership in the sites in the sponsor's group (Cohen, 1975, pp. 171-211, for details on the coding of categorical variables with s distinct levels)

$x_{s+11} \cdots x_{2s+10}$ = treatment within site codes { .5 if FT; -.5 if NFT }

Variables $x_1 \cdots x_{11}$ functioned as covariates in this model. Where pretest and family income data are missing, the grand mean of the particular analytic sample (i.e., the site-specific FT and NFT groups being analyzed) is assigned.

With the regression coded in this fashion, the s regression weights $b_{s+11} \cdots b_{2s+10}$ may be used to calculate adjusted estimates of the FT/NFT outcome differences in the s sites. Likewise, the standard errors of the FT/NFT adjusted differences may be computed from the variance/covariance matrix of the predictor variables.

Preschool Adjusted Local Analysis

This analysis uses the same model as the Local Analysis with the addition of the following terms:

x_1 = preschool membership { 1 if Head Start; 0 otherwise }

x_2 = preschool membership { 1 if Some Preschool; 0 otherwise }

x_3 = preschool membership (x_1) by pretest interaction

x_4 = preschool membership (x_2) by pretest interaction

Preschool Blocked Local Analysis

This analysis used the same model as the Preschool Adjusted Local Analysis. The difference between the two techniques is that in the adjusted analysis we obtain site-level effects across preschool groups by adjusting for preschool experience while in the blocked analysis we obtain separate sponsor-level effects for each preschool group. That is, the model is run three times, once for each preschool group, and x_{12} to x_{s+10} are omitted.

Pooled Analysis

With the child as the unit of analysis, the multiple regression procedure estimates the raw-score regression weights b_i in the usual model:

$$\hat{Y} = a_o + \sum_{i=1}^{71} b_i x_i ,$$

where a_o is a constant and $b_1 \ldots b_{71}$ are the regression weights for predictor variables $x_1 \ldots x_{71}$ which are defined as follows:

x_1 = fall kindergarten WRAT pretest score

x_2 = missing data code for pretest { 1 if pretest is missing; 0 if pretest is present

x_3 = family income (annual dollars)

x_4 = missing data code for income { 1 if income is missing; 0 if income is present

x_5 = highest occupation in household

x_6 = missing data code for occupation { 1 if occupation is missing; 0 if occupation is present

x_7 = ethnic membership { 1 if White; 0 if Other; -1 if Black

Exhibit A4-3 (cont.)

x_8 = ethnic membership { 1 if White; 0 if Black; -1 if Other }

x_9 = sex { .5 if male; -.5 if female }

x_{10} = age at entry to kindergarten (months)

x_{11} = first language { .5 if English; -.5 if Other }

x_{12} = pretest by ethnicity interaction ($x_1 * x_7$)

x_{13} = pretest by ethnicity interaction ($x_1 * x_8$)

x_{14} = pretest by first language interaction ($x_1 * x_{11}$)

x_{15} = sex by ethnicity interaction ($x_9 * x_7$)

x_{16} = sex by ethnicity interaction ($x_9 * x_8$)

x_{17} = sex by first language interaction ($x_9 * x_{11}$)

x_{18} = entry age by ethnicity interaction ($x_{10} * x_7$)

x_{19} = entry age by ethnicity interaction ($x_{10} * x_8$)

x_{20} = entry age by first language interaction ($x_{10} * x_{11}$)

x_{21} to x_{71} = 51 effects coded site codes reflecting membership in the 52 NFT sites in the evaluation

In this analysis, the regression model is applied first to the total (summed across all sites) NFT sample to obtain $b_1 \ldots b_{71}$ regression weights. Variables $x_1 \ldots x_{20}$ operate as adjusting variables. Where pretest and family income data are missing, the grand NFT mean is assigned. These

NFT regression weights are then applied to variables $x_1 \ldots x_{71}$ for each FT child to generate a predicted outcome score for the individual. Where pretest and family income data are missing, the grand FT mean is assigned. The observed score is then subtracted from the predicted score. Site means of the observed/predicted difference are calculated to determine effects at the site level.

Preschool Adjusted Pooled Analysis

This analysis uses the same model as the Pooled Analysis except that the nine interaction terms (pretest, sex and entry age by first language and the two ethnicity vectors) are dropped (this provides comparability with the Preschool Adjusted Local Analysis). Three separate prediction equations were developed -- one for each NFT preschool group -- and applied to the variable values for the FT children in each site. The proper NFT site model was applied to each FT child depending upon preschool group membership. Effects were then calculated for each child (observed outcome score minus predicted outcome score) and aggregated to produce a site-level effect estimate.

Preschool Blocked Pooled Analysis

This analysis uses the same model as the Preschool Adjusted Pooled Analysis. The difference between the two techniques is that in the adjusted analysis we compute site-level average effects while in the blocked analysis we compute sponsor-level effects for each of the three preschool groups.

Best Match Analysis

With the child as the unit of analysis, the multiple regression procedure estimates the raw score regression weights b_i in the usual model:

$$\hat{Y} = a_o + \sum_{i=1}^{12} b_i x_i ,$$

where a_o is a constant and $b_1 \ldots b_{12}$ are regression weights for predictor variables $x_1 \ldots x_{12}$, which are defined as follows:

x_1 = fall kindergarten WRAT pretest score

x_2 = missing data code for pretest { 1 is pretest is missing; 0 if pretest is present

x_3 = family income (annual dollars)

x_4 = missing data code for income { 1 if income is missing; 0 if income is present

x_5 = highest occupation in household - coded as in the "local" model

x_6 = missing data code for occupation { 1 if occupation is missing; 0 is occupation is present

x_7 = ethnic membership { 1 if White; 0 if Other; -1 if Black

x_8 = ethnic membership { 1 is White; 0 if Black; -1 if Other

x_9 = sex { .5 if male; -.5 if female

x_{10} = age at entry to kindergarten (months)

x_{11} = first language { .5 if English; -.5 if Other

x_{12} = treatment { .5 if FT; -.5 if NFT

With the regression coded in this fashion, the regression weight b_{12} is the adjusted estimate of the FT/NFT outcome difference in any given site. Variables $x_1 \ldots x_{12}$ operate as covariates in this model. Where one or more covariates exhibit no variation across levels of x_{12} (e.g., if all children in both FT and NFT groups have English as a first language), the

covariates are omitted from the model. Where pretest and family income data are missing, the grand mean of the particular analytic sample (i.e., the "best match" FT and NFT groups being analyzed) is assigned.

Exhibit A4-3 (cont.)

REGRESSION COEFFICIENTS FOR THE COVARIATES
INCLUDED IN THE COHORT III-K POOLED ANALYSIS

	Total Reading	Total Math	Spelling	Language	Raven's	Coopersmith	IARS(-)	IARS(+)	Word Knowledge	Reading	Math Computations	Math Concepts	Math Problem Solving	Language Part A	Language Part B
Fall Kindergarten WRAT	.6034	.7035	.3888	.2677	.1290	.1156	.0294	.0326	.3492	.2541	.2115	.2698	.2223	.0865	.1812
Family Income	.0003	.0002	.0002	.0001	.0000	.0000	.0000	.0000	.0002	.0001	.0000	.0000	.0001	.0000	.0001
Missing WRAT	-3.1489	-.5423	-.8060	-2.0333	.6478	-4.1269	-.2475	-.0684	.3460	-3.4949	-.9017	.2215	.1379	-.4675	-1.5658
Occupation	.3321	.2130	.0724	.1327	.6692	.0479	.0071	.0227	.1957	.1364	.0235	.1089	.0806	.0340	.0987
Missing Occupation	2.6449	3.6472	1.5168	.5602	.5617	.6129	-.0164	.5820	1.6920	.9529	1.2889	.9186	1.4396	.4010	.1591
Missing Income	-2.6559	-2.2223	-1.6776	-.7970	-.4886	-.5460	.0131	-.5159	-1.7324	-.9235	-.5517	-.6067	-1.0638	-.3536	-.4434
First Language	3.2622	-.4535	3.0690	-1.0684	-.3714	.6692	.5890	.1344	2.9353	.3268	-.7479	.7830	-.4886	.3703	-1.4387
Sex	1.3017	1.2584	2.6597	1.0715	-.8823	.8822	.1015	.5300	.5368	.7649	.3118	.1363	.8103	.5109	.5605
Ethnicity (1) White vs. Black	3.6024	-1.7476	4.1497	-.6165	1.9775	2.7069	-.5618	-.0121	2.3663	1.2361	-.4572	.2637	-1.6541	1.3315	-1.9480
Ethnicity (2) White vs. Other	-1.9254	1.5296	-1.8118	-.6514	-.6570	-4.4472	4.4188	.8297	-2.3570	.4316	-.1189	-.1614	1.8100	-1.4751	.8239
Entry Age	-.3535	-.1654	-.2317	-.1159	-.0157	-.0501	-.0017	-.0204	-.2212	-.1323	-.0443	-.0821	-.0390	-.0508	-.0652
WRAT x Ethnicity (1)	.0496	.0846	-.0370	.0474	-.0304	-.0383	-.0090	-.0123	-.0028	.0524	.0144	.0222	.0479	-.0119	.0593
WRAT x Ethnicity (2)	-.0070	-.0060	-.0247	.0262	.0198	.0676	-.0042	.0033	-.0022	-.0048	.0081	-.0029	-.0111	.0057	.0205
WRAT x First Language	.2911	.2409	.1117	.1115	.0300	.0078	.0180	.0179	.1726	.1185	.0698	.0926	.0786	.0459	.0656
Sex x Ethnicity (1)	-.0347	-.9321	-.1206	.4806	.2872	-.3292	-.0190	-.3490	.0351	-.0698	-.3422	-.3004	-.2895	.1257	.3550
Sex x Ethnicity (2)	-.2809	.6742	.0565	.3027	-.2130	.3776	.0754	.2681	-.0306	-.2504	.3378	-.0440	.3804	-.2235	.5262
Sex x First Language	-1.4350	-4.1973	-.2532	-.2914	-.1217	-.8024	-.3186	-.8150	-.7397	-.6954	-.8182	-1.3095	-2.0696	-.0746	-.2168
Age x Ethnicity (1)	-.0290	.0565	-.0424	.0172	.0064	-.0123	.0147	.0140	-.0079	-.0211	.0204	.0096	.0265	-.0115	.0287
Age x Ethnicity (2)	.0260	-.0482	.0439	-.0189	-.0222	.0322	-.0246	-.0255	.0418	-.0158	-.0111	-.0092	-.0280	.0209	-.0398
Age x First Language	-.1556	-.0769	-.1211	-.0069	-.0066	.0029	-.0274	-.0005	-.1076	-.0480	-.0141	-.0335	-.0293	-.0149	.0080

Exhibit A4-3 (cont.)

REGRESSION COEFFICIENTS FOR THE COVARIATES
INCLUDED IN THE COHORT II-EF POOLED ANALYSIS

	Total Reading	Total Math	Spelling	Language	Raven's	Coopersmith	IARS (-)	IARS (+)	Word Knowledge	Reading	Math Computations	Math Concepts	Math Problem Solving	Language Part A	Language Part B
Fall Kindergarten WRAT	.7552	.7721	.5467	.3037	.1614	.1854	.0663	.0488	.4906	.2647	.2675	.3070	.1976	.1150	.1888
Family Income	.0001	.0003	-.0001	.0001	.0001	.0000	.0000	.0000	.0000	.0000	.0001	.0001	.0001	.0000	.0001
Missing WRAT	-2.3876	2.9972	2.1607	1.0236	2.0161	-3.0135	1.1445	-.0561	-1.6066	-.7810	8669	1.1065	1.0238	-.4776	1.5012
Occupation	.5999	.4768	.2348	.3737	.1095	-.0311	-.0104	.0234	.3335	.2664	.1505	.1901	.1362	.0941	.2796
Missing Occupation	1.0873	3.8583	1.1153	1.6213	-2.1514	.6080	.5570	.3797	1.1813	-.0939	.3666	1.7381	1.7536	.2668	1.3545
Missing Income	-1.5822	-2.6440	-1.9213	-2.0415	2.1416	-.5034	-.1216	-.2747	-1.3713	-.2109	.1961	-1.2684	-1.5717	-.0955	-1.9460
First Language	-32.8916	-46.8926	-11.6349	-33.9223	9.9025	2.5061	9.7868	3.2076	-14.5351	-18.3565	-14.6294	-13.3554	-18.9078	-12.9878	-20.9345
Sex	2.9886	-1.6669	4.9395	.8208	-1.7526	.0820	-1.2163	-.1604	2.6228	.3658	-.2221	-1.7402	.2954	-.4389	1.2597
Ethnicity (1) White vs. Black	-12.1779	-5.4019	6.7441	-2.3661	1.5461	-16.6748	1.5813	.8579	1.9989	-14.1769	-4.9759	1.1100	-1.5360	-5.1783	2.8122
Ethnicity (2) White vs. Other	54.9870	14.9489	-2.3242	14.5277	3.5258	29.4953	-1.6022	-.1667	18.6757	36.3113	6.0510	2.2826	6.6152	14.3124	.2153
Entry Age	-.4955	-.6294	-.6408	-.3190	.0298	.0547	.0250	.0037	-.3878	-.1077	-.1662	-.2566	-.2066	-.0847	-.2342
WRAT x Ethnicity (1)	.2357	.1658	.0427	.0924	.0053	-.0053	-.0130	.0159	-.0066	.1532	.0825	.0313	.0599	.0747	.0701
WRAT x Ethnicity (2)	-.0982	.0054	-.0535	.0056	.0200	.0175	-.0133	.0140	-.1042	.0060	.0178	-.0076	-.0048	-.0038	.0094
WRAT x First Language	-.0122	-.0087	-.0660	.0105	-.0420	-.0915	-.0467	-.0212	-.0325	.0204	-.0848	.0032	.0730	-.0166	.0271
Sex x Ethnicity (1)	.5462	-.0057	2.5387	2.4241	.7767	-.7849	.6130	.1948	-.0157	.5619	-.6472	-.5271	1.1686	.8485	1.5756
Sex x Ethnicity (2)	-.7908	-3.5492	-5.4435	-3.2969	-1.1764	1.6053	-.9382	-.3806	-.1673	-.6235	-.3509	-.2933	-2.9050	-1.2677	-2.0292
Sex x First Language	-1.3906	11.9011	2.5387	4.3124	1.9062	.3157	3.1439	1.6311	-2.1042	.7136	3.4077	5.2180	3.2754	3.6198	.6926
Age x Ethnicity (1)	.1350	.0638	-.0652	-.0079	.0088	.2659	-.0312	-.0058	-.0701	.2050	.0815	-.0209	.0031	.0701	-.0780
Age x Ethnicity (2)	-.8182	-.2917	.0219	-.2163	-.0875	-.4506	.0385	-.0106	-.2365	-.5816	-.1277	-.0518	-.1123	-.2038	-.0125
Age x First Language	.6667	.7632	.3129	.5007	-.1148	.0171	-.1132	-.0405	.3237	.3430	.2733	.2181	.2719	.2151	.2855

Exhibit A4-3 (cont.)

REGRESSION COEFFICIENTS FOR THE COVARIATES
INCLUDED IN THE COHORT II-EF **POOLED** ANALYSIS

	Total Reading	Total Math	Spelling	Language	Raven's	Coopersmith	IARS(-)	IARS(+)	Word Knowledge	Reading	Math Computations	Math Concepts	Math Problem Solving	Language Part A	Language Part B
Fall Kindergarten WRAT	.4860	.5033	.3117	.2104	.0851	.0989	.0130	.0281	.2855	.1996	.1545	.2016	.1471	.0826	.1187
Family Income	.0004	.0003	.0002	.0001	.0000	.0000	.0000	.0000	.0002	.0001	.0001	.0001	.0001	.0000	.0001
Missing WRAT	-4.4814	-7.9604	-2.0323	-3.5592	-.6121	.5386	-.4792	.6670	-2.3191	-2.1069	-3.5273	-1.8285	-2.6046	-.6531	-2.9040
Occupation	.3873	.1959	.2812	.1955	.0530	.0736	.0259	-.0646	.2519	.1565	.0641	.1000	.0318	.0189	.1752
Missing Occupation	.7883	-.9663	1.1120	1.0774	-.3632	-2.4426	-.5419	.0180	.2063	.5094	-.1637	.7608	-1.5634	-.0617	1.1179
Missing Income	-.8295	.9331	-1.5279	-1.2788	-.4472	2.2552	.3005	.0087	-.5333	-.2816	.5863	-1.1538	1.5006	.0607	-1.3544
First Language	-19.0988	-29.2205	-22.0869	-4.6856	-8.9248	-21.0800	-9.3046	.4565	-12.4492	-7.1110	-12.3932	-11.7769	-5.0504	-3.9181	-.6928
Sex	13.6150	6.9569	7.1751	3.8070	-2.5861	-.2341	1.2737	.3347	8.3381	5.2709	.9325	2.3217	3.7027	1.2808	2.5281
Ethnicity (1) White vs. Black	5.5266	6.7819	4.1445	2.7965	2.3242	.8249	1.2582	.7004	3.6871	2.1134	2.5060	2.5507	1.7252	.7917	1.9457
Ethnicity (2) White vs. Other	-2.7276	-4.5799	.1029	-1.0689	-2.6195	-7.6295	-1.6523	-.7358	-.7201	-1.3796	-2.9983	.0136	-1.5952	-.0863	-.9937
Entry Age	-.3350	-.4569	-.2712	-.1117	-.0910	-.1701	-.0768	-.0255	-.1823	.1171	-.1770	-.1671	-.1128	-.0517	-.0626
WRAT x Ethnicity (1)	.0755	.0812	.0176	.0362	.0005	-.0026	.0011	-.0010	.0402	.0353	.0208	.0309	.0294	.0042	.0322
WRAT x Ethnicity (2)	.0792	.0917	.0350	.0403	.0050	-.0093	.0065	-.0007	.0410	.0375	.0203	.0367	.0347	.0017	.0387
WRAT x First Language	.2586	.2505	.2258	.0997	.0647	.0662	.0111	.0163	.1400	.1179	.0797	.0796	.0912	.0397	.0601
Sex x Ethnicity (1)	-5.5063	-9.9908	-2.3453	-4.1561	-1.9651	.0517	-.4859	-.0700	-3.2755	-2.1583	-3.0522	-4.0891	-2.8495	-.5431	-3.6268
Sex x Ethnicity (2)	6.2295	16.9101	2.8306	7.9780	3.5619	-1.4875	1.7012	.5995	3.2883	2.9011	5.6965	7.3818	3.8318	1.1061	6.8528
Sex x First Language	-28.8670	-28.4457	-10.5332	-14.0126	-1.3375	1.4916	-2.9248	-.2100	-17.2535	-11.6514	-7.0957	-11.3687	-9.9813	-2.2427	-11.7063
Age x Ethnicity (1)	-.0010	-.0017	-.0010	.0006	.0003	.0004	-.0002	.0001	-.0007	-.0004	-.0005	-.0007	-.0005	-.0001	-.0006
Age x Ethnicity (2)	-.0005	0.0020	-.0009	-.0010	.0001	.0026	.0001	.0000	-.0005	-.0002	-.0004	-.0011	-.0005	-.0001	-.0008
Age x First Language	.0075	.0114	.0105	.0006	.0045	.0082	.0045	-.0003	.0052	.0027	.0066	.0041	.0008	.0012	-.0006

Exhibit 4-3 (cont.)

REGRESSION COEFFICIENTS FOR THE COVARIATES
INCLUDED IN THE COHORT III-K(PS) PRESCHOOL ADJUSTED POOLED ANALYSIS

		Sex	Entry Age	Missing Occupation	Missing Income	Occupation	Family Income In Thousands	White vs. Black	White vs. Other	First Language	Fall Kindergarten WSAT
Word Knowledge	Head Start	.12150	-.21785	-2.39010	1.96880	.17462	.02856	1.97590	-1.34200	-.49738	.49539
	Some Preschool	.53650	-.19176	2.88430	-6.18480	.25540	.35305	3.33640	-.88493	4.20450	.39143
	No Preschool	.00381	-.29464	2.07370	-1.53650	.19586	.22558	.65246	.16796	1.12990	.44185
Reading	Head Start	.43813	-.10506	-2.00740	1.99090	.25614	-.03072	2.98270	-3.08770	2.09690	.35341
	Some Preschool	1.28540	-.09329	1.40350	-4.19710	.19036	.18648	2.34250	-.33775	.36057	.28881
	No Preschool	.11239	-.21894	1.11660	-1.24020	.12351	.09422	.26716	.36191	-.47664	.31315
Language Part A	Head Start	.33676	-.05875	-.95964	.63066	.05246	.01259	.52961	-.58109	.78755	.12398
	Some Preschool	.34086	-.04655	.62596	-1.08230	.01787	.06802	.57777	-.51161	1.21480	.10911
	No Preschool	.40029	-.05761	.52766	-.62328	.04152	.02118	.04330	-.09450	.68039	.10900
Language Part B	Head Start	.25869	-.05490	-.19023	.51717	.24575	-.02687	1.38320	-1.23420	-.50606	.19221
	Some Preschool	.96563	-.08919	-.60736	-.89358	.18988	.14120	2.51580	-1.58530	.67474	.25097
	No Preschool	.61082	-.07415	.32269	-.86385	.06275	.03875	.32524	.24308	-.39061	.21801
Spelling	Head Start	1.39130	-.25054	-1.29850	.94892	-.22866	.09884	2.95020	-1.86480	1.13480	.51458
	Some Preschool	3.06230	-.13278	3.07460	-6.71310	.08445	.37437	1.64530	-1.75010	1.69810	.40721
	No Preschool	2.39250	-.36502	1.73290	-1.25920	.03983	.23893	-.24714	.44721	-1.41430	.44185
Math Computations	Head Start	-.15105	.01807	-.42428	.67310	.02785	-.03941	2.35940	-1.15650	-1.49140	.28538
	Some Preschool	.16049	-.03689	.25185	.36371	.04106	.05145	1.90300	-1.07280	-.42131	.25904
	No Preschool	-.18800	-.06662	1.51460	-1.63610	.01330	.09133	-.58806	.68668	-.92200	.23564
Math Concepts	Head Start	-.84010	-.12146	.07464	.27827	-.13814	-.02176	2.22380	-1.92950	.66132	.36792
	Some Preschool	-.17640	-.04832	1.78820	-2.14940	-.14300	.12266	2.27740	-1.34950	-.10752	.30896
	No Preschool	-.69190	-.10992	-.28267	-.62137	.10683	.02961	.10617	.06209	.47235	.31564
Math Problem Solving	Head Start	-.89405	-.10085	.90571	-.38600	.16306	.08957	2.26570	-.54220	-2.50260	.26918
	Some Preschool	.43790	.00741	1.05340	-1.72810	.12331	.07251	1.68530	.07924	-1.23810	.25583
	No Preschool	-.00465	-.06210	1.38860	-1.69480	.07988	.11379	-.28930	.51448	-.28025	.26535
Total Reading	Head Start	.55963	-.32290	-4.39750	3.95960	.43076	-.00716	4.95860	-4.42960	1.39950	.84880
	Some Preschool	1.82190	-.28585	4.28790	-10.38200	.44575	.53954	5.67900	-1.22270	4.56510	.68024
	No Preschool	.11620	-.51359	3.19030	-2.77670	.31937	.31981	.91963	.52985	.65327	.75499

Exhibit 4-3 (cont.)

		Sex	Entry Age	Missing Occupation	Missing Income	Occupation	Family Income In Thousands	White vs. Black	White vs. Other	First Language	Fall Kindergarten WRAT
Total Language	Head Start	.59545	-.11365	-1.14990	1.14780	.29520	-.01428	1.91290	-1.81520	.28151	.31619
	Some Preschool	1.30650	-.13574	.01860	-1.97590	.20776	.20922	3.09360	-2.09490	1.89150	.36809
	No Preschool	1.01110	-.13176	.85033	-1.48710	.10427	.05993	.36854	.14857	.29039	.32788
Total Math	Head Start	-1.88520	-.20423	.35606	.56539	.32905	.02841	6.84980	-3.62820	-3.33240	.92248
	Some Preschool	.42199	-.07740	3.09340	-3.51380	.30737	.24662	5.86570	-2.34300	-2.16690	.82383
	No Preschool	-.88455	-.23864	2.62060	-3.95220	.20001	.23473	-.77120	1.26320	-.52990	.81662
Coopersmith	Head Start	1.36180	-.02521	-1.35550	-.43279	.29592	-.20302	-.41677	-.57857	.44517	.18016
	Some Preschool	.73988	-.00917	3.44500	-3.11760	.04725	.08954	.27047	1.16780	-1.19480	.12004
	No Preschool	.83944	-.05479	.62219	-.74384	.00237	.07170	.70535	-.58493	.51496	.15111
Raven's	Head Start	-1.64910	.00759	1.36720	-1.16060	.16999	-.07703	.18444	-.98594	-.65311	.17097
	Some Preschool	-1.24590	.00078	.66352	-.74168	-.01857	.07022	1.34490	-.96227	-.19956	.14452
	No Preschool	-.85994	-.03265	.18218	-.34014	.08080	.01217	1.08430	-.99697	-.64981	.14796
IARS(+)	Head Start	.45867	.00801	-.86988	.56087	.03402	-.02380	.96097	-.71352	.49383	.05258
	Some Preschool	.24689	-.03648	1.23950	-1.31520	.00458	.07446	.17141	-.32337	1.24870	.04059
	No Preschool	.20748	-.02789	.78788	-.54224	.03273	.01785	.09296	-.31978	.15995	.04192
IARS(-)	Head Start	.36110	.02091	.21711	.08403	-.11178	-.07187	.16314	.08682	-.47997	.04493
	Some Preschool	.10842	-.01649	-.11544	-.09314	-.00180	.03848	.13454	-.54584	-.09139	.02193
	No Preschool	-.13792	-.02391	-.86770	.31778	.04073	.02961	-.21138	.10287	-.16616	.03697
Fall Kindergarten WRAT	Head Start	2.37730	.56128	-2.98868	3.61888	.41168	.32986	2.88478	.63118	2.10158	-8.88888
	Some Preschool	3.07230	.80553	-.18841	.54221	.26849	.47718	3.47868	-.25788	8.04888	-8.88888
	No Preschool	3.16188	.92749	-1.98338	1.71588	.08194	.31382	2.87288	1.08458	8.11878	-8.88888

Exhibit A4-4

PRESCHOOL DEFINITION

As part of our evaluation strategy we have attempted to equate Follow Through and non-Follow Through groups on various background characteristics by making statistical adjustments to the outcome scores of children in these groups. Because the evaluation is concerned with school performance as measured by achievement tests, one of the adjusting variables is the child's score on an achievement test which was administered early in the child's entry year (Kindergarten or Entering First). A child who has attended a formal preschool program is likely to attain a higher score on such an entry test (pretest) than a similar child who has had no preschool experience. This potential influence of preschool on pretest scores has been a particularly troublesome factor throughout our evaluation of Follow Through -- in part because of the difficulty in precisely classifying each child's preschool experience.

We have two sources of information about preschool: school records (recorded on a demographic form) and parents (recorded on a parent interview which was administered during the entry year.) These two sources differentiate only between Head Start and other preschool experience (not between day care, nursery school, etc.). They also indicate the number of months the child has spent in each type of program. However, the two sources do not always agree as to type of preschool attended nor to duration of attendance.

Let us look first at the problem of defining the type of experience. Different Head Start programs have different characteristics -- academic emphasis varies as well as the length of the program. Other types of preschool experience are probably even more variable in terms of academic emphasis (day care versus an academically oriented program). Furthermore, some parents indicated that their children attended preschool for up to four years. This probably indicates participation in nonacademically oriented child care programs. However, we have no way of determining whether some, or any, portion of that four years was in an academically oriented program.

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The problem of developing a precise definition coupled with resource constraints resulted in the exclusion of preschool as an adjusting variable in our first three years of analytic work. As we began our fourth year, the need to take account of preschool became increasingly apparent and resources were made available to develop a method for handling the issue. The specific analytic techniques which were developed have been presented in the section on ANALYTIC STRATEGIES in Chapter Four of the present volume. Our method for defining preschool is presented here.

The only way of arriving at a more precise definition of the type of preschool program that a child had attended was through additional data collection. This method was clearly not acceptable, and so we have had to accept the terms "Head Start" and "other preschool" as meaning two different types of program and not concern ourselves with variation within each. We also lacked sufficient information to differentiate in a meaningful way between varying amounts of exposure to these two types of preschool. The primary effort, therefore, was placed on resolving conflicts between our two sources of information (school records and parents).

A four category preschool variable was developed based on the school and parent data. The four categories are: Head Start, Some Preschool, None, Don't Know. Children who were assigned to the Don't Know category were not used in the preschool adjusting analyses.

A description and flow chart of our categorization follows:

A child is placed in the Head Start category if

- one source indicates that the child attended Head Start and
- the other source agrees with the first source or indicates nonknowledge or is missing.

A child is placed in the Some Preschool category if

- the child has not been assigned to the Head Start category and
- one source indicates that the child attended other preschool.

A child is placed in the None category if

- the child has not been assigned to the Head Start or the Some Preschool category and
- one source indicates that the child did not attend Head Start and/or other preschool.

A child is placed in the Don't Know category if

- the child has not been assigned to Head Start, Some Preschool, or None.

Exhibit A4-4 (cont.)

FLOW CHART FOR PRESCHOOL CATEGORIZATION

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Exhibit A4-4 (cont.)

FLOW CHART FOR PRESCHOOL CATEGORIZATION

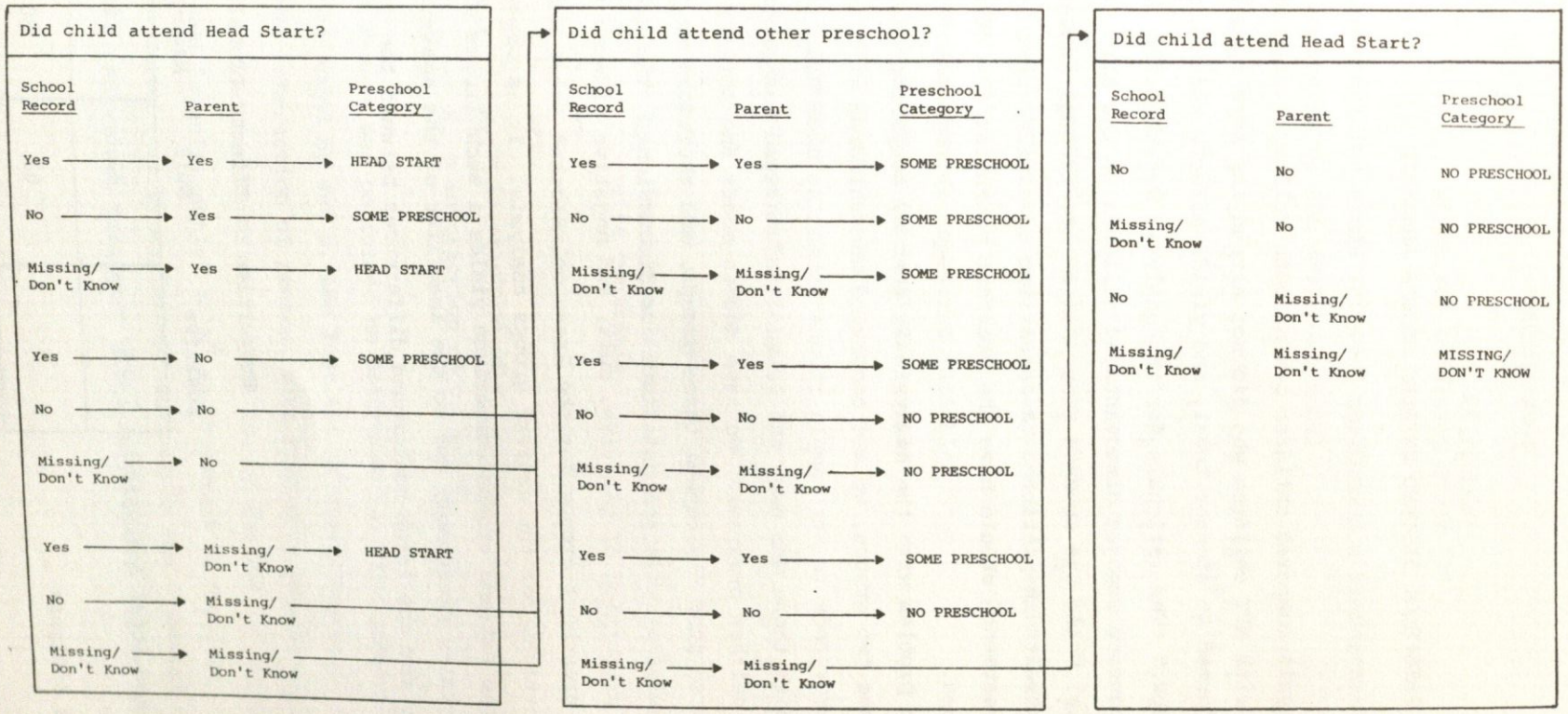


Exhibit A4-5

PRESCHOOL BLOCKED EXTREME GROUPS ANALYSIS

This analysis compared children having both Follow Through and Head Start experience with NFT children who did not attend any form of preschool. The analysis was performed at sponsor level, and yields effects which contrast these two "extreme groups." The rationale for the analysis was that the Head Start/Follow Through sequence exposes disadvantaged children to the most intensive treatment possible, while the no-Head Start/non-Follow Through sequence is as close to "no treatment" as possible. A comparison of similar children who have had these treatments should have the greatest potential for detecting outcome differences.

The major problem with the analysis is that by comparing children who fall into these two groups, we are comparing the children with the most disadvantaged backgrounds in our sample (those attending both Head Start and Follow Through) with those who have the least disadvantaged backgrounds (those attending neither program). We have doubts about the ability of covariance analysis to properly equate these groups, and therefore we do not integrate the results of this analysis into our discussions. The table below presents the proportion of positive, null, and negative effects averaged across the three preschool groups for the Preschool Blocked Local Analysis and similar proportions for the extreme groups analysis. It is clear from this table that the extreme groups comparison yields a much larger proportion of negative effects -- presumably due to the inability of the analysis to adjust sufficiently for the large background differences between the groups.

Proportion of Effects (Total N=225)

	Positive	Null	Negative
Preschool Blocked Local Analysis	5	83	12
Extreme Groups Analysis	3	67	30

Exhibit A4-6

MODEL FOR ATTRITION STUDY

The attrition study involved performing a hierarchical regression analysis according to the following model:

$$\hat{Y} = a_o + b_1x_1 + (b_2x_2 + \ldots + b_ix_i) + (b_{i+1}x_{i+1} + \ldots b_jx_j) +$$

$$(b_{j+1}x_{j+1} + \ldots + b_kx_k) + (b_{k+1}x_{k+1} + \ldots + b_Lx_L)$$

Where set A is composed of variables x_1 through x_k, set B is composed of variables x_{k+1} through x_L, and variables are defined as follows:

Y = dichotomous dependent variable

1 = not in the analytic sample

0 = in the analytic sample

a_o = constant

$b_1 \ldots b_1$ = regression weights for $x_1 \ldots x_L$

x_1 = pretest (or income)

$x_2 \ldots x_i$ = (number of sites -1) orthogonal between-sites contrast

$x_{i+1} \cdots x_j$ = (number of sites) orthogonally coded treatment within-site contrasts

.5 = FT

-.5 = NFT

$x_{j+1} \cdots x_k$ = interaction of x_1 and $x_2 \ldots x_i$

$x_{k+1} \cdots x_L$ = interaction of x_1 and $x_{i+1} \cdots x_j$

An F test was performed to determine the significance of the incremental variance added by set B, the last set of coefficients in the model ($b_{k+1} \ldots b_L$: the interaction of pretest with treatment within-site). If the overall F test proved nonsignificant, that is, if the set of interaction variables failed to add "significantly" to R^2 we proceeded no further. If, however, the interaction terms (set B) explained variance in the dependent variable, we examined the individual treatment within-site coefficients.

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