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AUTHOR Carter, Launor F.
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ABSTRACT

This interim report summarizes the procedures and results of the Sustaining Effects Study (SES) on Compensatory Education, conducted at selected elementary schools during the 1967-77 school year. Data from the study are presented for the following findings: (1) poor and educationally needy children are the principal recipients of Compensatory Education (CE) and Title I services; (2) CE is an amalgam of diverse services, and CE students receive more instruction in reading and math in smaller classes than do non-CE students; (3) CE improves reading achievement in grades 1-3 and math performance in all the elementary grades; (4) students promoted out of CE programs continue to perform at a relatively higher level; and (5) it is unrealistic to expect much academic growth over the summer, The characteristics of CE students, including economic status, educational attainments, family income, sex, and place of residence are examined and related to achievement levels in mathematics and reading. The instructional approaches and activities of Title I students and regular students are compared. Instructional and cost effectiveness of CE services, the relationship between instructional costs and achievement, and the nature of achievement growth over the summer are also examined. (JCD)

System Development Corporation

THE SUSTAINING EFFECTS STUDY

AN INTERIM REPORT

LAUNOR F. CARTER

TM-5693/200/00

PREPARED FOR THE
OFFICE OF PROGRAM EVALUATION
DEPARTMENT OF EDUCATION

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THE STAFF OF THE STUDY OF SUSTAINING EFFECTS

SYSTEM DEVELOPMENT CORPORATION:

Project Management. Launor F. Carter, Director (1975-); Raymond B. Stewart, Associate Director (1975-1979); Thomas F. Collins, Assistant Director for Planning and Control (1975-1978); Robert L. Lamoureux (1978); Marilyn Stevenson (1975-1977); Patrice Metro (1977-1979).

Design and Analysis: Ralph Hoepfner, Manager (1975-); Henry J. Zagorski (1975-); Ming-mei Wang (1976-); Charles E. Kenoyer (1975-1976, 1978-1979); Joel Moskowitz (1977-1978); Ray W. Baker (1976-1978); Mary Jean Austin (1976-); John McCall (1977); Lewis Zamora (1976-1977); Deborah S. Brown (1977-1978); Judith A. Hemenway (1977-1979); Thomas E. Locke (1977-); Wallace S. Tai (1977-1978); Marino Giustino (1978); Moraye B. Bear (1977-); Lawrence A. Jordan (1978-); Deborah Cooper (1978-); Edward J. Colon (1978-1979); Gerrie Smith (1978-1979); Eugene Won (1979-); Jon Conklin (1979-).

Instrumentation and School Characteristics. Jean B. Wellisch, Manager (1975-1977); Ralph Melaragno (1975-1976); Ronald A. Carrier (1975-1977).

Field Operations. Dean R. Lee, Manager (1975-); Cleone L. Geddes (1975-1980); Thomas A. Ramirez (1975-1979); Cynthia Hull (1976-1977); John R. Shiban (1975-1976).

Successful Sites Study. Dean R. Lee, Manager (1977-); Gary A. Duck (1977-1978); Lee J. Poynor (1977-); Ronald A. Carriere (1978-); Anne H. MacQueen (1978-); Fred E. Cromer (1978); Miles G. Rogers (1979-).

Distribution and Scoring. Patrick F. Carnes, Manager (1976-1979); Carl Molitor (1976-1977); Loren Southworth (1976-1977); Stanley A. Dounn (1976-1979); Herb Smith (1977-1978).

Editorial and Publications. Frank Tierney (1978-); Pamela Doherty (1978-); Bruce Severy (1980-); Kean Mantius (1975-1977); Una Vere Katter (1976-1978).

DECIMA RESEARCH:

Participation Study. Vincent J. Breglio, Manager (1975-1979); Ronald H. Hinckley (1975-1979); Richard S. Beal (1977-1978); Timothy McGrew (1975-1977); Claudia Washburn (1976-1977); S. Kay Lavish (1975-1977); Barbara Openshaw (1975-1977).

RMC RESEARCH CORPORATION:

Cost/Effectiveness and Summer Study. Sue A. Haggart, Manager (1975-1979); Leonard S. Klibanoff (1975-1979); Nabeel Al-Salam (1975-1977); Laurence A. Dougharty (1975-1977); Gerald C. Sumner (1977-1979); Richards S. Williams (1977-1979); Rita Steinmetz (1977-1979).

PACIFIC CONSULTANTS:

Functional Effectiveness Measures. Mary Spencer, Manager (1975-1976); David Bessemer (1975-1976) Nicolas Fedan (1975-1976); Bobby Offutt (1975-1976).

U.S. OFFICE OF EDUCATION:

Office of Planning, Budgeting and Evaluation. Janice K. Anderson, Project Officer (1979-) and Deputy Project Officer (1975-1979); George W. Mayeske, Project Officer (1975-1979); Kathryn E. Crossley, Administrative Assistant (1975-).

Division of Education for the Disadvantaged. Paul Miller (1975-); William Lobosco (1975-); Velma James (1975-).

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Policy Advisory Group. Edward Boddy (1975-); Oteal Bowen (1975-); Alan Davitt (1977-1979); Leo Doherty (1975-); Shirley Foster (1975-); Joe Hansen (1975-1976); Walter Hathaway (1975-1976); Rio Rita Jackson (1975-); Robert Lamborn (1977); Celia Martin (1975-); Roberta Martinez (1975-); Lucy Matos (1975-); Miles Myers (1975-); Thomas Ralls (1975-); Stanley Rumbaugh (1975-); Alexander Sergienko (1975-); Kenneth Smith (1977); Patricia Williams (1975-).

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Panel on Achievement Tests. William Coffman (1975-1976); Melvin Seeman (1975-1976); Floraline Stevens (1975-1976); Ralph Tyler (1975-1976); James Vasquez (1975-1976).

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CHAPTER I. AN INTERPRETIVE SUMMARY OF THE INTERIM REPORT

AN OVERVIEW OF THE INTERIM REPORT

The purpose of the Interim Report is to present an integrative summary of the results of the Sustaining Effects Study (SES) based on the results reported to October 1980. A short summary of the questions asked and the findings follows:

1. Who Receives Compensatory Education?

It is clear, in terms of percentages, that poor children and educationally needy children are the principal recipients of Title I and other Compensatory Education (CE) services. However, there are more non-poor than poor children, and more children achieving above an educational cut-off point (such as performing one year below grade level) than there are children below such a level. The absolute number of children receiving CE who are non-poor and achieving higher than one year below grade level is greater than the number of children receiving CE services who fall below these cut-offs. Thus, while the trends are in the intended direction, there could be a much better operation of the selection process to assure that more poor children, and more educationally needy children receive CE services. Possible improvements partially depend on a clarification of the intent of Congress regarding who should be served.

2. What Is Compensatory Education?

This question cannot be answered simply. CE is an amalgam of many different services delivered by diverse mechanisms. However, it is clear that CE students receive services that are to some extent different from those they would have received had they not been selected for CE services. CE students, relative to regular students, receive more hours of instruction in reading and math. This instruction is in smaller classes; more of it is in small group settings, and more of it is given by special teachers and aides. The instruction is more varied, involves different content and methods of instruction, and more materials and equipment are used. While CE students have significantly more money spent on their instruction, and while they receive much more basic reading and math services, they lose out on some of

the instruction that regular students receive while the CE students are receiving their special instruction.

3. How Effective Is Compensatory Education?

Based on the results of data from the first year of data collection it appears that CE, and particularly Title I, is effective in improving the reading achievement of students in the first, second, and third grades. It is effective in improving the math performance of students in all elementary grades. The amount of improvement relative to similar students who have not had CE services is not large, but it is statistically significant.

4. What Happens to the Achievement of Students When Their CE Services Are Discontinued?

There is considerable turnover among students receiving CE. About 40 percent of the students receiving Title I services in a given school year will not be receiving them the ensuing year. The figure is even higher for other forms of CE. The data shows that students who have had their CE services discontinued do, in fact, receive services similar to regular students. This discontinuation of CE services does not seem to have a deleterious effect. Students who lose their CE services because they achieved at a level which 'promoted them out' of CE continue to perform at their relatively higher level.

5. What Happens to Student Achievement Over the Summer, and Is Summer School Effective?

Generally all groups of students continue educational growth over the summer. This growth is greater in reading than in math. There appears to be a slightly greater summer growth for regular students relative to CE students in reading but not in math. This is judged to be practically insignificant. In comparing students who attended summer school with students who did not attend summer school, no increased achievement was evident. It is emphasized that the amount of instruction in reading and math in the typical summer school is quite small and it is probably unrealistic to expect much academic growth.

These are the major results of the study based on current and completed analyses. In the sections that follow these results are given in more detail and their implications are discussed. So far the results of the study have been reported in the series of technical reports listed at the end of Chapter II. Each of these reports contains an overview which attempts to summarize the important findings of the Report, while the text proper consists of detailed data and its analyses. Generally, the technical reports do not contain extensive interpretive or policy-oriented discussions. It is the intention of this report to summarize the important highlights of the reports, to integrate them, and to infer policy implications. The inference of policy implications is necessarily a somewhat speculative activity because, when done by a technical contractor, it reflects a limited perspective and one largely based on research data. Questions of congruence with other program objectives, and political considerations are frequently not adequately reflected i . a researcher's thinking and thus properly inhibit policy recommendations. While the interpretations offered here need to be viewed as reflecting a limited perspective, they do have the distinct advantage of being based on factual data and its analyses.

The results reported here are largely based on survey types of information collected at elementary schools during the 1976-77 school year. Later a final report will be prepared based on data collected over three consecutive school years and also on data collected in an 'in-depth' study of 55 high-poverty schools.

In this chapter a statement of the problem as studied in each of the subsequent chapters will be given; there will be a summary of the data available, and then a discussion of the possible implications of that data. Each of the subsequent chapters contains a more detailed presentation, so written as to be of interest to policy makers, educators, and citizens seriously concerned about elementary education. Each of the chapters in this Report is based on the relevant technical reports, which are quite detailed and analytical in nature, and are intended primarily for technical researchers, but will be of interest to anyone concerned about the details of the data on which this Interim Report is based.

HIGHLIGHTS OF CHAPTER II - INTRODUCTION

This chapter begins with a short history of the SES, pointing out that it started in July 1975 and, after a year of planning and preparation, data collection was begun at 329 public elementary schools in the fall of 1976. Data were collected for three successive school years. Each fall and spring all of the students in each school took a series of achievement and attitude tests; their teachers indicated the amounts and kinds of instruction each child received in reading and math during the school year, and the teachers and principals reported on their own training, characteristics, and methods of instruction.

The data collected were all designed to help obtain answers to a series of policy issues. The two major issues were:

1) Who receives Compensatory Education?

2) How effective is Compensatory Education?

Related to these primary issues were a number of secondary questions:

3) What is Compensatory Education?

4) What is the nature of the home environment of elementary school students and how is it related to school achievement?

5) What happens to the achievement of students when their CE services are discontinued?

6) Is there an optimum duration and period for receipt of CE services?

7) What happens to student achievement over the summer and is summer school effective?

The remainder of Chapter II discusses the design of the Sustaining Effects Study (SES), the various samples used in the study, the test and survey instruments used to collect data, relations with the schools and how the data were collected, the 'in-depth' study of high-poverty schools, and the SES Report Series. It is believed that high quality data were collected on a very large number of regular and CE students. The resulting data base constitutes the largest and most thoroughly integrated body of information about elementary education that has ever been collected.

HIGHLIGHTS OF CHAPTER III - WHO RECEIVES COMPENSATORY EDUCATION?

There are many kinds of Compensatory Education programs designed for different kinds of students. The Sustaining Effects Study was mainly concerned with Title I of the Elementary and Secondary Education Act, but since Title I operates in an environment which includes other CE programs it was necessary to consider both Title I and the other programs. Congress mandated the Participation Study and specified that information be obtained on the number of students receiving and not receiving Title I services as a function of, first, the poverty status of the student and, second, as a function of the academic achievement of the student. To obtain the economic status information, home interviews were conducted with a random sample of about 15,000 parents of students in the study. The students all took achievement tests in reading and in math during the fall of the 1976-77 school year, which provided the necessary information on academic achievement.

The results show that among students coming from a poverty* background, 40 percent receive CE services** and 60 percent do not, while for students coming from a non-poor background 21 percent receive CE services and 79 percent do not. In terms of the receipt of CE services it is clear that a greater proportion of poor students receive CE services than do non-poor students. However, because there are many more non-poor students than there are poor students, the number of non-poor students receiving CE services is greater than the number of poor students receiving such services (1,690,000 and 1,230,000 respectively). In the same population of students there are about 2,600,000 poor children not receiving CE services and about 14,100,000 non-poor students also not receiving CE. To the extent that the Congress intended Title I and other CE programs to be programs for both the poor and the educationally needy, it seems that there are many poor children who are not served while at the same time there are many non-poor children who are receiving CE services.

*See Chapter III and Report 2 (2) for a discussion of how poverty was defined.

**These figures are for all CE. Generally the trends are the same for Title I and other CE, but there are some differences. For data on these differences the reader should consult Chapter III and the relevant technical reports.

However, it is not clear that it was the Congress' intent that Title I was largely to serve the poor; rather it may be argued that it was the Congress' intent to provide services for the educationally needy. Of those students whose achievement is one grade level or more below their assigned grade level, (low achievers), 46 percent receive CE services, while 54 percent do not receive these services. Among those above this level of achievement (regular achievers), 19 percent receive CE services and 81 percent do not. But there are many more regular-achieving students in the nation than there are low-achieving students, so there are about 1,750,000 students who are low achievers and receiving CE services, while there are 2,000,000 at that level who are not receiving CE services. Also there are 2,400,000 regular-achieving students who are receiving CE.

Certain undesirable measurement problems are associated with using grade-equivalent scores, so the data were also analyzed in terms of percentiles. The percentage of students being served by CE increases progressively as the achievement percentile decreases. Nevertheless, among students above the national average in achievement level, 23 percent are receiving some CE. In terms of absolute numbers this means that there are about 1,200,000 students who are above the national average in achievement and who are receiving CE. There are about 3,750,000 students below the average who are receiving CE services and 6,100,000 below the national average who are not receiving CE.*

In judging the success of CE programs in reaching the intended students, one is faced with the ambiguity of Congress' intent. Some feel that CE programs are primarily for the poor and some feel they are primarily for the educationally low-achieving. It is usually assumed that there is a high degree of relationship between poverty and school achievement, and thus if one criterion is satisfied, the other will automatically be included. This is not the case. The relationship between economic status and educational achievement status is very modest when viewed at the individual student level. If one knows the economic

*The numbers presented depend on the definition of poverty and achievement level. With different definitions the numbers vary. See Chapter III and Report #2 for numbers using different definitions.

status of a student one can predict his academic achievement somewhat better than at the chance level, but not by a very large amount (the correlation is .30). The relationship becomes considerably stronger at the school level (.67). While students are selected for CE as individuals, they must be in a school having CE funds. Thus, funding schools in terms of poverty criteria tends to make CE available to the most educationally needy students.

When the joint relationship between poverty and achievement, and selection for CE are considered, the relationships become more complex. When all elementary school students are considered, then among the poor and low achievers,* 56 percent receive CE and 44 percent do not; among those who are non-poor but low achievers, 43 percent receive CE and 57 percent do not; among the poor who are regular achievers, 33 percent receive CE and 67 percent do not; and among the non-poor and regular achievers, 17 percent receive CE while 83 percent do not. In terms of absolute numbers it is clear that a large number of students who are non-poor and regular achievers are receiving CE, about 1,750,000 students, while there are about 3,750,000 receiving CE in all the other categories.

What do all these percentages and figures mean in terms of Congress' interest? First, it is clear that in a general way the intent of Congress that Title I funds should go to the poor and the educationally disadvantaged is being met. It is the case that poor students receive Title I services relatively more frequently than do non-poor students; similarly low-achieving students receive Title I services relatively more frequently than do higher-achieving students. But because there are more non-poor students and there are more regular-achieving students, the absolute number of children receiving Title I services is larger among both the non-poor and the regular-achieving students than it is among the poor and lower-achieving. While the general intent of Congress is being met, there are large numbers of students receiving Title I who do not fall within the intended target groups.

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*"Low" and "Regular Achievers" are defined here as being below or above one year below grade level. As discussed later, selection for Title I is based on a different criterion.

There are a number of reasons for this apparent misassignment of students. Most frequently principals and teachers report that they use some combination of teacher judgment and tests to select students for CE services. Both of these methods of assignment are somewhat unreliable and will misclassify some students. Also, within a given school district, some schools will receive CE funds and others will not. When the students in a particular school are selected for CE some will be selected who are less educationally needy than are low-achieving students in other district schools without CE. Also, some schools can be designated as 100 percent Title I schools and all matriculating students will receive CE whether or not they need it. There are also significant regional differences in the distribution of achievement scores. Title I funds are generally distributed to districts based on national poverty criteria, but the selection of students is based on local academic needs. At the school level the relationship between poverty and achievement is moderately high but is far from perfect. Thus, since there are regional differences in achievement, some schools in higher-achieving regions will have the funds to enable them to select students for Title I whose achievement would be too high to be selected if they were in a region populated with lower-achieving students.

Many analysts and administrators reviewing these data note that from the perspective of the national academic achievement, the number of regular-achieving students receiving Title I is so large that the whole selection system should be carefully reexamined. Congress should be more definitive regarding the intent of the Title I program: if it is a program simply for the educationally disadvantaged it will be aimed at a different, but moderately overlapping population. The present selection system results, at the national level, in many children receiving Title I who, from a national perspective, do not need it, and at the same time there are many children who need Title I but do not receive it. The solution to this problem requires a clearer definition of the intent of Congress and probably the funding of a larger Title I program. As will be seen later, Title I does have a positive impact on achievement and providing Title I services to additional educationally needy students can raise their levels of achievement. A better selection of students to receive Title I services would help, but even with the best selection system there are not enough funds to

serve all students who are below the national average. But, even at the present level of funding, a perfect selection system would allow the offering of Title I services to all who are one or more years below grade level.

While the relationships among poverty, educational achievement, and selection for CE constitute the major focus of Chapter III, other important findings are related. In terms of selection for CE, Hispanics are selected relatively most frequently, followed closely by blacks, and then somewhat further behind by whites. This appears to be the proper order in terms of what we know about relative achievement. In terms of urbanicity, students from large cities and rural areas are, relatively, selected most frequently. This is particularly true for the Title I program. Surprisingly, when all CE programs combined are considered, the suburbs show the highest relative frequency of selection for low-performing students. This is because the suburbs offer a proportionately larger amount of services to students from other than Title I funds. This implies that if a student in the suburbs is low-achieving, the local community or the state will find CE funds to support extra service. In terms of regions of the country, the West and the Northeast have the highest relative selection rates of students for CE services while the South and Mid-Atlantic have the lowest. However, the South is the highest for Title I but lowest for CE programs funded from other sources. These differences in regional and urban selection rates interact with the source of funding of CE services. National programs interact with state and local programs, and the fairness of distribution of nationally-funded programs depends on whether one believes that one region of the country should benefit at the expense of another because of its relative poverty.

There are sex differences in the rate of selection for CE. Boys receive CE services relatively more frequently than girls. However, this should not be attributed to sex discrimination. It is well known that in the lower grades girls have somewhat higher achievement scores than boys and thus the boys have a somewhat greater need for CE than girls. The differences in selection rates are small and it seems that the schools are not selecting students to receive CE services on the basis of gender.

Finally, Chapter III considers how students are selected for CE as reported by principals and teachers. There is a multitude of different methods used, but teachers' judgments and test scores are used most frequently. The chapter closes with a discussion of how a targeting index might be developed. The idea is to develop an index that would tell how well a school or district is doing in selecting students for CE. A number of indices are considered and it is concluded that it is feasible to develop such an index, depending on how comprehensive it should be and how many resources are available for computation. Technical Report #13 contains a table that summarizes the relevant features of each index and indicates how well it fulfills a number of requirements.

HIGHLIGHTS OF CHAPTER IV - WHAT IS COMPENSATORY EDUCATION?

CE cannot be defined or described simply. It is an amalgam of many different programs, practices, and services. Chapter IV contains several descriptions of CE programs. These qualitative descriptions support quantified material gathered from the schools by the use of survey questions completed by school superintendents, principals, and teachers. From data collected in 1976-1977, we determined that for the SES schools the average amount spent on the education of regular elementary students was $1,189. For students receiving Title I services this basic amount was supplemented by about $436. The exact additional amount is hard to determine because of the difficulty in determining precisely the number of students receiving Title I services, but the general magnitude of these figures is illustrative of the size of the additional services Title I students receive. This additional money buys a considerable mix of different services. The largest amount of Title I funds pay for additional regular teachers, special teachers, aides, and other instructional personnel. Smaller, but significant, amounts go for administrative services, training, planning, and evaluation. Also, Title I funds are used for instructional materials and audiovisual equipment, as well as for building alterations. Students receive guidance, counseling, health, and nutritional services from Title I funds. In Chapter IV the relative costs of these services are given.

Knowing where the money goes is interesting, but one wonders what actual impact it has on instruction. In terms of the number of hours of reading and math in-

struction, Title I students receive more hours of instruction than regular students in the same schools. In reading, in the first two grades, there are only small differences, but as grade increases there are large differences. For example, by the sixth grade Title I students receive 6.6 hours of reading instruction per week, while regular students receive 5.0. In math there are significant differences in all grades, with Title I students receiving about 5.7 hours of instruction per week, while regular students receive about 4.9 hours. These figures are gratifying in showing that Title I students actually receive more instruction in basic subjects, but there is another side to the picture. The length of the school day is the same for all students and while the Title I students are receiving additional reading and math instruction, the regular students are receiving other instruction. For example, teachers report that while Title I students are receiving additional reading instruction, the regular students are receiving instruction in reading, math or other subjects; are engaged in individual instruction; or are engaged in student-selected activities. Thus, while Title I students are getting more basic instruction, they are losing out on other instruction. Unless the number of school days is increased or the school day is extended for Title I students, this result is inevitable, and one wonders if the Title I students are receiving a net benefit.

Are there qualitative differences in the services delivered to Title I students? In terms of class size the data show that Title I students are instructed in slightly smaller classes than regular students. The size of classes varies by grade, but for both reading and math and for all grades, the Title I classes are smaller, with the average difference being about one student out of 19 in reading and one out of 24 in math. In the elementary grades, much of the instruction is given in small groups rather than to the class as a whole. This is particularly true in the first two grades but, for reading, even in the sixth grade, 80 percent of the instruction is in groups rather than the whole class. Title I students receive much more of their instruction in small groups.

Possible indicators of the quality of instruction include the number of students in a class and the size of the instructional group. These are both favorable for Title I students. But probably more important are the teachers and the

methods used in instruction. The teachers of Title I children tend to have less teaching experience than do the teachers of regular students. This is true of their total years of teaching experience and of the length of tenure in their present school. However, the teachers of Title I students tend to have had more college courses in instructional techniques and more inservice training. Both groups had similar amounts of total college training. In Report #10 it is shown that the single teacher characteristic that is associated with higher student achievement is the total amount of teaching experience. While the differences are not large, it is of concern that the teachers of Title I students have less teaching experience than the teachers of regular students.

The setting in which Title I students receive their instruction is quite different from the setting for regular students. In both reading and math, Title I students receive considerably less instruction in the whole-classroom setting from regular teachers. In contrast, they receive more of their instruction from special teachers, teaching assistants and aides, in small groups, both within a small part of the classroom or in some other room. Regular students receive more of their instruction from regular teachers in the regular classroom and they engage in considerably more individual study on their own. The major difference between Title I students and regular students is the difference in the amount of instruction in small groups with instructional personnel other than regular teachers. To us, as researchers, it seems appropriate that the Title I students should receive instruction in small groups but we believe it would be preferable that the instruction be given by the regular teachers, since, as shown in Report #10, students seem to learn more when instructed by regular teachers.

We examined in detail the kinds of activities and approaches used in teaching reading and math to Title I and regular students. There tended to be similar practices in the first two grades but then large differences appeared in the higher grades. In generalizing over the different activities, it appears that both the Title I and the regular students received instruction in basic subjects in the lower grades, but, as grade increases, the regular students receive

instruction in more abstract and advanced materials while the Title I students continue to be taught more basic subject matter. The use of a number of different approaches was examined. In the first grade, both Title I and regular students were most frequently taught reading through 'graded sight phonic analyses,' 'graded letter sound relationships,' and 'literal and implied comprehension.' By the sixth grade the methods used to instruct the Title I students were completely different from those used to instruct regular students. In the sixth grade, the three most frequently used methods with Title I students were the least frequently used with regular students, and the three most frequently used with regular students were the least frequently used with Title I students. For the regular students in the sixth grade, the most frequent methods used were 'literal and implied comprehension,' 'reading in content field,' and 'literary forms and appreciation.' In contrast the three most frequent methods used with Title I students were 'modified alphabet,' 'self instruction with reinforcement,' and 'student reading own writing.' These were the least frequently used techniques with regular students. It is clear that the methods used with Title I students are different from those used with regular students. We recommend that experts in the teaching of reading should examine this data and see if they think appropriate methods are being used with Title I students.

There are also differences in the methods used in teaching math. Relative to regular students, Title I students receive more math instruction by 'learning about the structure of number systems,' 'working with math games,' 'working with physical models,' and 'learning about sets.' Again we think this data should be examined to see if it is appropriate as the content of instruction for Title I students.

Finally, there are data on the uses of teaching materials and audiovisual equipment. Title I students tend to receive more of their instruction from non-textual material and from audiovisual equipment. This is particularly true in reading.

It is clear that Title I students receive instructional services that are in addition to, and different from, the instructional services of regular students. But it is not so clear that these services add up to a net positive effect. In theory, receiving more reading and math instruction in small groups from instruc-

tional personnel who can devote more individual attention to the Title I student should result in greater learning, but while the Title I student is receiving more reading and math instruction the regular student is frequently receiving instruction in a different subject or a different setting, but still getting something the Title I student is not. Also, the regular student is more frequently receiving the instruction from a regular teacher with more teaching experience than the special instructional personnel instructing the Title I students.

After the first two grades, the methods and techniques used in instruction for the Title I student and the regular student differ. Title I students tend to be instructed in more elementary or basic material while the regular students are receiving more advanced and abstract material. The methods used with the Title I students in the higher grades are quite different from those used with regular students. It is not intuitively obvious that the methods used with the Title I students are the best methods that might be used. We believe curriculum experts should examine our data to see if changes should be recommended. It is also clear that Title I students' teachers more frequently use non-text teaching materials and audiovisual aids. From results in Report #10 it is not clear that these materials are helpful; it is possible that they are used because they are available and that they are available because there is Title I money to buy them. In the next chapter we will examine the extent to which Title I services seem to lead to greater learning and we will attempt to determine what factors lead to any differences obtained.

HIGHLIGHTS OF CHAPTER V - HOW EFFECTIVE IS COMPENSATORY EDUCATION?

This chapter examines two questions. First, it considers whether Title I students show gains relative to a comparison group of educationally needy students who do not receive Title I services. Second, it examines the evidence to determine if there are school practices, instructional techniques, staff characteristics, and organizational settings which are associated with increased educational achievement.

There is a discussion of what is meant by 'Title I,' 'Regular Needy,' and 'Regular' students.* The problem of defining a student's status is not straight-

*Briefly, 'Title I' students are selected to receive Title I services, 'Regular Needy' students are students judged by teachers to need CE services but not receiving any, and 'Regular' students are not judged to need CE nor are they receiving any.

forward, and it is pointed out that over a period of time a particular student may belong to each of the above groups. Because students frequently change status from one group to the other the composition of the groups changes, particularly at the beginning of the school year. Because the Title I and Regular Needy groups are composed of relatively low-achieving students, at the beginning of the school year these groups tend to lose their higher-achieving students as the better students are 'promoted out' to the Regular group. Similarly, the Regular group tends to lose its poorer students to the Title I and Regular Needy groups because in the Regular group the low-achieving students are replaced by the higher-achieving students from the lower-achieving CE groups. Because of these changes in group membership there may be an apparent increase in the achievement gap between Regular students and Title I and Regular Needy students as grade increases. Likewise, the fact that there are fewer Title I students in the higher grades further increases the apparent gap, since the Title I students are generally the lowest-achieving students. If there are fewer Title I students and they are the most educationally needy, then as their proportion of a class becomes smaller the average difference between these Title I students and regular students will increase. Thus, the so-called increasing achievement gap between Title I students and regular students is partly artifactual.

Chapter V examines the evidence for achievement gains based on the data for one school year, the first year of SES data collection.* Graphs are presented that show the relative growth of Regular, Title I, and Regular Needy students. The evidence is quite clear in grades 1, 2 and 3 that the Title I students grow at a faster rate for reading than similar Regular Needy students. The Title I students do not grow at quite as fast a rate as the Regular students in grades 1 and 2 but seem to grow at a slightly faster rate in grade 3. For grades 4, 5 and 6 in reading, all three groups seem to grow at about the same rate. Thus we conclude that, for reading, Title I seems to have a positive effect in grades 1, 2 and 3 but not in the other three grades. For math, the picture is considerably more positive. In all grades for math the Title I students improve more than the comparison group composed of Regular Needy students. Furthermore, the Title I students appear to improve at a faster rate than the Regular students,

*Later technical reports and the Final Report will present results based on the three-year, longitudinal data.

while the Regular Needy students grow at a slower rate than the Regular students. We conclude that Title I services have a positive effect in math at all six grade levels.

There is a discussion of the reasons why Title I may be more effective in math than in reading. Basically, it is suggested that reading is learned in additional locations other than the school, such as the home and other non-school situations. On the other hand, math is largely learned in school. Thus Title I services offer greater relative exposure to math than is the case in reading.

Chapter V also examines the educational practices and other factors that might be associated with improved educational performances. Among the factors investigated were: student background variables, the amount and kind of instructional services, the type of school and instructional setting, the characteristics of instructional personnel, the characteristics of the instructional environment, and the characteristics of instructional practices.

The effects of these variables were explored by a number of different techniques, such as regression analysis and causal modeling. Generally, the results were disappointing in the sense that there were not strong relationships between any of the school-related variables and increases in achievement. There were some relationships that were statistically significant but not strong enough to clearly guide policy. The most noteworthy findings were:

- Greater experience in teaching is related to higher student growth in both reading and math.
- The amount of regular instruction and tutor/independent work shows some positive, but modest, effects on achievement growth. In contrast, the amounts of instruction by special teachers or in very small groups does not often contribute to the explanation of achievement growth, and when it does, a negative relationship is observed.
- In both reading and math, temporary disruptions of instruction tend to be unfavorable conditions for learning in the upper grades but not in the earlier grades.

- The frequency of feedback on progress sometimes relates positively to reading and math achievement growth.
- In reading only, a teacher's effort in planning and evaluation shows a positive relationship to achievement growth in some grades.

In summarizing this chapter, the evidence indicates that Title I services are positively related to achievement in reading in the first three grades and that Title I services are positively related to achievement in math in all grades. As just discussed, some educational practices are positively related to achievement growth. Noteworthy is the fact that students who receive instruction from more experienced teachers profit more than those receiving instruction from less experienced teachers. Also, instruction in the regular classroom setting seems to be a positive factor, as does receiving instruction in a setting without disruptions.

From a practical point of view, the implication of the finding that Title I can help students improve their performances in basic skills is that Title I services should be increased so that they might be available to all educationally needy students if our goal is to help all educationally needy students improve their achievement. Since only about half of all the needy students are now receiving Title I services this would require a very large increase in the amount of Title I funding. A political judgment is required as to whether the amount of gain is sufficient to justify this increased funding, but it is clear that a very large number of children who could profit from Title I services are not receiving them.

The findings also suggest that educationally needy students should be the ones to receive instruction from the most experienced teachers in a regular classroom setting. At present this tends not to be the case. Title I students tend to receive instruction from less experienced teachers, and not in the regular classroom. These are matters that could be corrected at the local district and school levels.

These findings are based on the analysis of the first year data. We are now analyzing the data from three longitudinal years. When these analyses are finished we will be able to refine and expand the results reported in this chapter.

HIGHLIGHTS OF CHAPTER VI - HOW COST-EFFECTIVE IS COMPENSATORY EDUCATION?

It seems reasonable that as more and more resources are made available for the instruction of low-achieving students, the achievement of the students should increase. One of the assumptions underlying the federal funding of educational programs is that poor school districts are not able to marshall enough local resources to provide the extra services that should help low-achieving students to improve their performances. Thus it is hoped that the federal funds will help improve the performances of these students. We attempted to test these assumptions by investigating the relationship between the amount or cost of resources used and changes in student achievement. The finding is that there is no positive relation between the total cost of the personnel and other resources used in instruction and growth in achievement. Since this finding is contrary to conventional wisdom and the assumption underlying Title I (and many other social programs), it deserves to be scrutinized carefully.

Early studies of cost-effectiveness were usually based on obtaining the total expenditures involved in a CE program and dividing them by the number of participating students. This gives a per-pupil cost, but there are many reasons why this approach gives untrustworthy results. In an attempt to overcome the limitations of this approach, researchers have recently developed a resource-cost model based on the idea of applying a standard price to each service actually received by students in their instruction. This bottom-up approach, as contrasted with the top-down approach, starts with a teacher's report of how much instruction each student receives. Standard prices are developed for each element of instruction given. These prices are uniform for all students and thus ignore actual variations in teacher salaries and the cost of instructional material from one region of the country to another. The basic assumption is made that a teacher with a certain amount of education and teaching experience does as effective a job in one job location as in another. Thus a uniform, common metric is developed and used to cost the instruction received by each student.

Chapter VII reports the results of applying this resource-cost technique to the SES data. Achievement gains were related to the cost of instruction. Overall the results show that there is no significant positive relationship between these two variables. For some grades there seems to be a slight positive relationship but it is countered by other grades with slight negative relationships. In Report #7 detailed statistical tests are reported and the overall conclusion is that there are few statistically significant trends and, where they are significant, they tend to be negative. This negative correlation means that the more costly the services a student receives the less the achievement gain made by the student.

It can be argued that the reason for the slightly negative relationships found is due to the fact that more resources are given to the more needy students than to less needy ones. It is argued that the most needy students will have more difficulty in improving their levels of achievement than less needy students and thus the negative relationship found is determined by the nature of the students receiving the more costly services rather than the ineffectiveness of the increase in services.

This idea was investigated and it was found that lower-achieving students do receive more costly services than higher-achieving students. While the relationships are not strong they are at least large enough to support the idea that the negative relationship between cost of service and achievement gain is a function of the achievement level of the students being served.

While it is possible to offer explanations for the negative relationship it is still important to ask why a fairly strong positive relationship was not found. The idea that increasing the funding, and thus services to needy students, will lead to increased achievement is so pervasive and fundamental to federally-funded programs that these findings need to be most carefully examined for faulty analysis. One way of checking the possibility that the results are due to a faulty resource-cost model is to undertake the same analyses using total hours of instruction received by the student. The use of hours of instruction received is independent of any cost model and in a sense is more basic than a cost-effectiveness analysis. Yet the results are the same as those found with the resource-cost model.

The resource-cost model used has been criticized by some researchers as faulty. We believe these criticisms are not valid; nonetheless, the importance of the relationship between the cost of services received and gains in achievement is such that we recommend that an independent analysis of the SES data be undertaken. We believe it is important either to confirm the results reported here or to clarify the methodological problems in such analyses.

HIGHLIGHTS OF CHAPTER VII - WHAT HAPPENS TO THE ACHIEVEMENT OF STUDENTS WHEN THEIR COMPENSATORY EDUCATION SERVICES ARE DISCONTINUED?

Compensatory education programs are designed to serve students who need additional services to help them overcome educational deficits. Particularly in Title I, the goal is to serve the most needy students. From year to year, the particular students to be served will depend on a number of factors such as the availability of funds for CE programs in specific grades and subjects. When students whose achievement levels increased during the year are considered for services the next year, it may be that they have progressed sufficiently, in comparison to other students with lower achievement levels, to make them no longer educationally needy. It has been argued that, as soon as these students begin achieving at higher levels, they are promoted out of CE programs and thus lose the impetus that has built up and may fall back to a lower level.

In the Sustaining Effects Study we examined three questions related to this problem. First, we studied the frequency of changes in CE status in students receiving CE services from year to year to see if it was frequent enough to merit attention; next we determined whether or not there really was a change in the instructional services received by students once they had lost their CE status; and finally, we examined whether those students losing their CE services continued to achieve at a relatively high level or reverted to the lower level characteristic of CE students. The findings are relatively clear. Among CE students there is considerable change in status from year to year. Among Title I students, about 40 percent of the students who received Title I services in one year will not receive Title I services the next year. There is even greater turnover in other programs. For the other federally-funded programs, the turnover figure is about 80 percent, and for state and local programs it is about

65 percent. Thus it is clear that there is a large amount of student turnover from year to year. Next we examined the hours and costs of instructional services offered to regular students, to students whose CE programs continued from one year to the next, and for students who had received services in one year but had their services discontinued for the second year. The results show quite clearly that regular students receive services costing considerably less than CE students and also that the students who had received CE services the previous year, but were not now receiving them, got services that cost about the same as the cost of services for regular students, rather than the cost of services for CE students. Thus, we know that there are many students who have their services discontinued and that the services they receive essentially revert to the kind of instructional services received by regular students. What happens to their achievement levels as a result of this change? The results indicate that those students who no longer received CE services since they were no longer qualified because of relatively high achievement continued to maintain relatively high achievement levels during the next year. In other words, there did not seem to be any deleterious effect of their no longer receiving CE services. The policy implication of these findings is that there is really no great problem associated with the turnover of CE students who lost services because of high achievement. While it is undoubtedly wise to give administrators flexibility to handle the cases of individual students judged to remain in need of CE services, there is not a national problem of CE students being 'promoted out' and then falling back because their CE services were discontinued.

HIGHLIGHTS OF CHAPTER VIII - WHAT HAPPENS TO STUDENT ACHIEVEMENT OVER THE SUMMER, AND IS SUMMER SCHOOL EFFECTIVE?

All groups of students show achievement growth during the regular school year. But what happens to that growth over the summer? To what extent do students continue to mature even though they receive no formal instruction? We have already seen that during the regular school year the rate of growth for compensatory education students is slightly less than it is for regular students. Some have suggested that during the summer regular students continue to improve due to informal learning experiences, but that CE children lack both the motivation and resources to engage in these informal learning activities. However, the

evidence is less than clear-cut. Some have argued that, for all students, achievement suffers an absolute decline over the summer; other evidence suggests that CE students suffer a loss relative to regular students. It has been further suggested that among CE students those who achieved the highest gains during the regular school year suffered the sharpest losses during the summer.

Based on these ideas, it has been suggested that summer school has an unusually important role to play. If CE students have regular school year learning experiences which enable them to achieve high gains, it is important that efforts be made to continue this high rate of achievement, and summer school seems a reasonable way of doing it. Since summer school classes are available to only about half of all students, it has been argued that their availability should be increased, particularly so that they would be available to CE students.

The question of whether achievement levels increase or decrease over the summer has implications for both the evaluation of CE programs and for the wisdom of funding summer schools. Starting in 1976, a series of reports was published that indicated that there was an absolute loss in achievement over the summer and that CE students lose relatively more than regular students. These reports were influential in shaping federal thinking about the whole question of the intellectual growth of CE students and the Executive Branch's position on legislation to increase support for summer schools. Since then several reports have produced data which seemed not to support the conclusions of the previous reports.

In the Sustaining Effects Study we were able to examine a large amount of high quality longitudinal data to evaluate these contentions. The results are quite clear. For reading, there is not a summer loss but a consistent gain for all grades and all kinds of students. For math, there is also a summer gain, but it is not as large as it is for reading. It is reasonable to suggest that in reading the students have considerable exposure to reading material over the summer, while for math there is less opportunity for summer learning. The earlier reports also suggested that there was a relative loss for CE students in comparison to regular students. Here the SES results are less clear-cut. For

the non-CE students in reading there is a decrease in the rate of growth over the summer for the lower grade cohorts but very little, if any, for the higher grades. For the CE students in reading there is a similar decrease in the lower grades, but considering their slightly slower rates of growth during the regular year, there may be slight summer gains relative to non-CE students. In the higher grades the CE students in reading drop off slightly more than their non-CE peers. For math, the picture is somewhat different. Both the CE and the non-CE students show a lessening in the rates of growth over the summer for all grade cohorts. The change for CE and non-CE students is very similar with, perhaps, slightly larger drops for the non-CE students. In summary, the results show that there may be a very slight overall relative summer drop for CE students in reading, but not in math. Neither the SES data, nor data reported by NIE, give credence to any large or particularly significant summer loss.

It had also been proposed that CE students who were high achievers during the school year lost more than low achievers, where achievement was defined in terms of the level of performance, not in terms of gains during the school year. The SES data show that low-achieving students continue to grow over the summer and at about the same rate as during the school year, and there is no significant difference between CE and non-CE students. On the other hand, high-achieving students grow at a faster rate during the school year. For reading, non-CE high-achieving students continue to grow over the summer, but high-achieving CE students show a loss, particularly a relative loss. For math, both CE and non-CE high-achieving students show a loss over the summer, but the CE students have a larger loss.

The importance to be attached to this relative loss for high-achieving students depends on where the emphasis for CE resources should be placed. There are about six times as many CE students below the national median in achievement as there are above it. If the goal is to help the vast majority of CE students, can one justify exceptional resource expenditures for high-achieving CE students on the grounds that they lose more over the summer than their non-CE peers? On the other hand, low-achieving CE students gain over the summer. Perhaps low-achieving students would gain more if they had special summer services.

It has also been argued elsewhere that those CE students who are high gainers during the school year suffer high losses during the summer. According to this argument these students need the stimulation of intensive instruction to achieve high gains and, lacking such stimulation during the summer, they lose more than those having smaller achievement gains. This idea was tested by separating those who had high regular school-year gains and comparing them with students who had relatively small gains. Comparisons were made for both individual students and for school classes having high and low gains. The results show that indeed those who had high school-year gains had quite high summer losses. But, at the same time, those who had low school-year gains had high summer gains. In other words, the result demonstrates the regression-to-the-mean phenomenon. Because of measurement unreliability, the individuals at the extremes of both ends of a distribution tend to move toward the mean on any subsequent measurement. Thus the overall results are largely due to statistical artifact and do not represent a real difference in gains or losses between high and low gainers.

From this wealth of data we conclude that there is no absolute summer drop-off, and that there may be a slight, but not particularly significant, relative loss for CE students in comparison to non-CE students. The more detailed analyses of high and low gainers, and of members of high-gain and low-gain projects, leads us to believe that reported relative summer drop-off is more of a measurement artifact than a reality.

The practical implications of these findings regarding the "summer drop-off phenomenon" are that it is not something that requires any special action or concern. Our findings, and those of others, do illustrate, however, that policy makers need to be very careful regarding the soundness of reports and the appropriateness of any actions based on them. In hindsight, it is difficult to understand why some policy makers placed so much confidence in reports based on quite limited data which was expressed in a poor metric.

The place of summer school in the general schema of elementary education is not well defined. Some have suggested that students who have not performed well during the regular school year should go to summer school as an additional learning

experience that would help them in the coming school year. It has been thought that this might be particularly important for CE students who are having difficulty keeping up with their peers and, if high-achieving CE students lose a large amount of their school-year gains, it would be particularly important that they attend summer school to help mitigate such losses. Of course, summer school serves functions in addition to instruction in basic subjects. There are recreational and special-interest classes that many students find attractive. Summer school can also serve as a safe summer haven for children whose parents are working or need to be away from home. Summer school serves many purposes in addition to instruction in reading and math.

About half of all students have summer school available either at the students' regular-year school or elsewhere in the school district, with larger schools more frequently having summer programs. There is a slight tendency for schools having a high concentration of minority students more frequently to have summer programs. About two-thirds of all summer schools receive some support from Title I funds, but only a quarter are completely supported by Title I. The average length of these summer school sessions was five to six weeks, which is 25 to 30 school days. The amount of reading and math instruction is not large. On the average, there are about 17 hours of reading instruction and about 14 hours of math instruction. There is no difference in the amount of instruction as grade level increases, nor do Title I students receive more instruction than others. However there is a clear tendency for CE students to attend summer school more than non-CE students. By grade cohort, the percentages of CE students who attend range from 21 to 32, while the percentages of non-CE students who attend range from 7 to 20. In terms of judgment by teachers of need for CE services, twice the percentage of 'needy' students attend summer school than the 'not needy.' In terms of achievement test scores, students attending summer school score considerably lower than those not attending, and this is true among both CE students and non-CE students.

In judging the effectiveness of summer school, it is not sufficient to show that students who attend summer school increase their performances over the summer. Rather, one must compare students who attend summer school with similar students who do not. First, we examined the summer growth of all the SES students who

attended summer school and compared their growth with that of students who did not attend. For both reading and math, the students who attended summer school grew at the same rate as those who did not attend. Since these comparisons lump all students together, it can be argued that the results would be different for CE students, so we made two other comparisons. In one case we compared only CE students who attended summer school with CE students who did not attend. In the other sample we compared Title I students who attended summer school and were from schools offering summer school, with Title I students who did not attend summer school and were from schools which did not have summer school. In neither case was there any evidence that students attending summer school performed better the next fall than those who did not attend summer school.

All the analyses from the SES data discourage the idea that summer school, as it is now conducted, is an effective mechanism for improving the performances of CE students. As we compare students who attended summer schools with those who did not attend, we are simply finding that present summer schools are not effective in raising basic achievement test scores. What effect should be reasonably expected from four or five weeks of instruction of less than an hour a day for reading or math? When children are rapidly maturing in their reading skills and can have summer reading experiences without summer school, should we expect summer-school-related reading gains? In the data there is a hint that summer school in the higher grades may be effective in math, and, in comparison to reading, there is less summer growth in math in the higher grades. Probably there is less opportunity for summer math-related experiences than there are for reading.

We should not construe these results to mean that summer school cannot be effective. If summer school were longer, had more hours per day devoted to basic subjects, and had experienced regular teachers, it might well result in achievement gains for attendees, but that is still to be demonstrated. Indeed, we will never know how effective summer school can be until a careful study is made of summer schools that are designed to give intensive instruction in the basic reading and math skills. If such summer schools prove effective, then there would be a sound educational basis for legislation to provide funds for similar summer schools for CE students.

CHAPTER II. INTRODUCTION

Summary

This introductory chapter of the Interim Report starts with a short history of the Sustaining Effects Study. Next is a discussion of the overall design of the study and of the way in which the sample was selected. Then there is a description of the instruments (tests, questionnaires, forms, etc.) used to collect data. This is followed by a short consideration of how the data were collected and analyzed. The in-depth study of high-poverty schools is described. Finally, there is a list of the reports issuing from the Sustaining Effects Study.

A SHORT HISTORY OF THE SUSTAINING EFFECTS STUDY

In March 1975 the U.S. Office of Education issued a Request for Proposal entitled "A Study of the Sustaining Effects of Compensatory Education on Basic Cognitive Skills." Soon the project became known as "The Sustaining Effects Study (SES)." The study was motivated by two major factors: one was a mandate from Congress and the other was the educational community's concern over the effectiveness of compensatory education (CE). The Introduction to the Request for Proposal said,

> "A near decade has passed since Congress enacted the Elementary and Secondary Education Act (ESEA) which authorized the Federal Government to join hands with State and local education agencies in a partnership designed to enhance the education of educationally disadvantaged children in areas with concentrations of children from low income families. During this period and under the authority of this legislation almost fourteen billion dollars have been made available. These funds have affected the school lives of six to seven million children every year in myriad ways. The evaluation requirements of this legislation have helped to create a national concern for the benefits that children derive from their years of schooling and for the costs of these efforts.
>
> Recently Title I of the Elementary and Secondary Education Act of 1965 has been extended and modified in many important ways. In particular, the Educational Amendments of 1974 (P.L. 93-380) direct the U.S. Commissioner of Education to expand his efforts to describe the actual and potential recipients of Title I ser-

vices and to evaluate the effects of such participation. The evaluative study proposed herein is both a response to these new requirements and an outgrowth of prior experience in evaluating this program."

The Educational Amendments of 1974 also instructed the National Institute of Education to undertake a series of studies which became known as "the NIE Compensatory Education Study." NIE was authorized to spend fifteen million dollars on those studies and entered into a number of contracts to study different aspects of Title I compensat education. A list of the studies is given in the NIE Interim Report (14). In addition, the Department of Health, Education and Welfare and the Department of Commerce investigated ways in which poverty indexes could be updated more frequently than every ten years through the census. Their report, "The Measure of Poverty" (22) shows the impact that alternative methods of estimating poverty would have on funding for different geographic regions. This study and the NIE studies had a shorter time frame than the Sustaining Effects Study and the results have now been published (see (15) for the final report on the NIE studies).

Much of Congress' concern regarding the effectiveness and operation of Title I stemmed from several evaluation studies which cast doubt on the effectiveness of compensatory education. Wargo, et al. (25) reviewed a number of evaluations conducted in the first five years of Title I and concluded that there was little evidence that Title I had a positive impact on participating students. Subsequent to that report, the Office of Education sponsored the Compensatory Reading Study (21). While the results were more encouraging, they were limited in the number of grades studied and in the length of exposure of students to compensatory services.

The first year of the SES (1975-76) was devoted to planning; to selecting the sample and to persuading schools to join the study; to the selecting, developing, and clearance of instruments; and to the formation of various advisory groups. Data collection started in the fall of the 1976-77 school year and continued for three successive years. Dr. George Mayeske was the Office of Education Project Officer during the first four years of the study and was succeeded by Dr. Jan Anderson in November 1979.

THE PURPOSE OF THE SUSTAINING EFFECTS STUDY

The Sustaining Effects Study is concerned with a number of areas; there are two major policy issues and five secondary ones. The policy areas are:

1) Who receives Compensatory Education? Among children coming from different economic strata, how many receive Title I, other federal, or state, or local CE services? Similarly, among children performing at different achievement levels, how many receive Title I, other federal, or state, or local CE services?

2) How effective is Compensatory Education? Do those students receiving CE services benefit from such services? What are their performance levels relative to students who do not receive CE services? Similarly, what are their performance levels relative to students who are judged to need CE but who do not receive CE services?

Secondary to these two issues are a number of related questions.

3) What is Compensatory Education? Frequently we speak of Title I programs as though they had a cohesiveness of content or method of instruction. To talk about the effectiveness of CE, we should know what CE is. How does it differ from the instruction children would have received if they had not been selected for CE? How does it differ from the instruction received by students not receiving CE who are in schools where CE is offered?

4) What is the nature of the home environment of elementary school students and how is it related to school achievement? Questions 2 and 3 above are concerned with school instructional programs and their effectiveness. Question 4 investigates the relationship of home environmental factors to school achievement. School achievement is examined as it relates to such factors as parents' educational and economic status, intellectual stimulation in the home, homework, and parents' involvement with the school.

5) What happens to the achievements of students when their CE services are discontinued? CE services are discontinued for a number of reasons. After receiving CE services some students improve to such an extent that, relative to other needy students, they are no longer eligible to receive CE services. Other students have CE services discontinued for administrative reasons, such as their new classes do not offer such services. Still others lose CE services because their schools no longer offer CE services. If students have been receiving CE services, but these services are discontinued due to one or another of the above reasons, what happens to their achievement levels in subsequent years?

6) Is there an optimum duration and period for receipt of CE services? It is sometimes argued that CE students need CE services throughout their elementary education. Others believe that concentrating services in the first or second grade is most beneficial. Still other periods or durations receive support. What is the optimum duration of CE services?

7) What happens to student achievement over the summer and is summer school effective? There are a number of questions concerning how student achievement changes over the summer. Do regular and/or CE students experience an absolute or a relative change in achievement over the summer? Is summer school effective in increasing the achievements of regular and/or CE students?

These questions will all be considered in the final report. Information on questions 1, 2, 3, 5, and 7 is presented in this report.

THE DESIGN OF THE SUSTAINING EFFECTS STUDY

To obtain answers to the policy questions previously discussed it was necessary to obtain a large amount of data through a very complex design. The Sustaining Effects Study consisted of five substudies, which were:

1. The Longitudinal Study. In the Longitudinal Study, educational achievement was assessed in the fall and spring for three consecutive years. The children took achievement tests in reading and math, a functional literacy test, and a measure of attitudes toward school and toward themselves as students. The amount and nature of instruction in reading and math was determined for each student four times during the school year. In addition, teachers and principals reported on their practices of instruction. Thus, it was possible not only to assess student growth over a three-year period, but to relate this growth to the kinds and amount of instruction being received.

2. The Successful Practices in High-Poverty Schools Study. This study identified and described the instructional practices and contexts that appear to be effective in raising the reading and math achievements of educationally disadvantaged students. In the longitudinal study data were obtained by formal tests, questionnaires and schedules. In contrast, in the High-Poverty Schools Study, 'in-depth' or ethnographic material was obtained from 55 high-poverty schools that were a part of the Longitudinal Study sample.

3. The Participation Study. The purpose of the Participation Study was to determine the relationships among economic status, educational need, and instructional services received. The educational achievement of the students and the services they receive were obtained in the Longitudinal Study. Measures of economic status were obtained in the Participation Study. A random sample of over over 15,000 students was drawn from the schools and visits were made to the homes of these students. During the visits, information was collected on the economic level of the home and on the parents' attitudes toward their children's schools and learning experiences. Thus, the level of student achievement and services could be related to the economic level of the home.

4. The Cost/Effectiveness Study. Information was obtained on the resources and services to which each student was exposed during reading and math instruction. Cost estimates were generated on the basis of this information. Because the effectiveness of the instructional programs was determined in the Longitudinal Study, it was possible to relate educational effectiveness to the cost of each program.

5. The Summer Study. The Sustaining Effects Study also examined the effectiveness of summer-school programs. Information about the 1977 summer-school experiences of the students was combined with other data from the Longitudinal Study. The amount of growth over the summer was determined, as was the effect of attending summer school.

THE SAMPLE FOR THE SUSTAINING EFFECTS STUDY

The requirements of the sample for the Sustaining Effects Study had two somewhat conflicting objectives. For the Longitudinal Study it was desirable to have a sample of schools and students with a wide variation in the variables to be studied, such as the kinds of schools, the extent of CE, the nature of the instructional practices, the kind of school leadership, the abilities of the children, and the level of the funding. On the other hand, the Participation Study required that projections be made for the nation's schools regarding the number of students receiving CE services, such as Title I. It was also necessary in the Participation Study to report the number of students at various poverty levels who were receiving CE and to find the number of children at various levels of academic achievement who were or were not receiving CE services. Since the federal government was funding Title I programs at a level of about three billion dollars a year, it was particularly important that the

study be able to describe the effectiveness of Title I activities. To meet these requirements we formed three different samples: a Representative Sample, a Comparison Sample, and a Nominated Sample.

The Representative Sample. The Representative Sample was drawn to be representative of the nation's schools. It was a stratified, random sample. Three stratification dimensions were used, namely: geography, size of the school district, and a district poverty index. The technical details describing how the sample of 243 schools was drawn are reported in Sustaining Effects Study Report #1. In that technical report there are a number of tables showing comparisons between the characteristics of the Representative Sample of schools and the known population characteristics. From these comparisons, and from the sampling procedures used, it is concluded that the Representative Sample allows quite accurate projections of the characteristics of the nation's elementary school students.

The Comparison Sample. In trying to assess the effectiveness of CE it would be desirable to be able to compare the achievements of CE students with other similar students who were not receiving CE. We were able to locate 29 schools situated in high poverty areas which were not receiving CE funds. These form the Comparison Sample.

The Nominated Sample. Since one of the major purposes of the Sustaining Effects Study was to determine the effects of Title I, it was essential that the total sample of students contain a large number of Title I students. Another purpose of the study was to determine those teaching practices which seemed particularly effective. Thus a Nominated Sample was formed which consisted of 43 Title I schools that were thought by state departments of education, the U.S. Office of Education, and other agencies, to be particularly good examples of effective CE practices.

In the first year of the study there were 329 schools having about 120,000 students. As will be described later, data were obtained on each student in the school, thus there are data on regular students, Title I students, students receiving Other CE, affluent students and poor students, high-achieving and low-achieving students, students with different racial backgrounds and, in short, all the different kinds of students that exist in the nation's elementary schools. (There were some exclusions; excluded were schools with instruction largely for handicapped students, students in bilingual programs, students in English-as-a-Second-Language programs, etc. These exclusions are described in Report #1.)

Originally it was planned to continue the study with all 329 schools throughout the three years of data collection. However the full funding of the project was not available during the second operational year of the study, which resulted in a reduction in the size of the Representative Sample. During the first operational year we were able to collect all of the data that were required to make the national projections required by the Participation Study. Since the analytical methods involved in the Longitudinal Study do not depend on strict representation, but rather that there be as much variation as possible in the variables being studied, it was decided to drop schools from the Representative Sample and retain the other samples intact. Even though the Representative Sample was reduced by 60 percent it still remained a remarkably representative sample. Of the 120,000 students in the first operation year, about 70,000 remained in the study during the second year. Readers interested in the technical details of the sample should refer to Reports #1 and #13.

The Data Collected and Instruments Used. To undertake a study as diverse as the Sustaining Effects Study it was necessary to collect information about the students, the kinds of instruction they received, their teachers, their school principal's philosophy of instruction and administrative practices, and descriptive material regarding the school district. Table II-1 lists the major instruments used, what was described by each instrument, the person completing it, the frequency of administration, and the month during the school year in

Table II-1

The Instruments Used in the Sustaining Effects Study

Instrument Name	Describes	Completed by	Times Per Year	Month Administered
Comprehensive Tests of Basic Skills	Student	Student	2	Sept/Oct Apr/May
Practical Achievement Scale	Student	Student	2	Sept/Oct Apr/May
Student Affective Measures	Student	Student	2	Sept/Oct Apr/May
Student Background Checklist	Student	Homeroom Teacher	1	March*
Summer Activity Slipsheet	Student	Student	1	Sept/Oct
Compensatory Education Roster	Student	School Coordinator	1	March
Student Participation and Attendance Record	Student	Homeroom Teacher	4	Nov Jan Mar Apr
Student-Teacher Linkage Roster	Student/Teacher	Homeroom Teacher	2	Nov March
Teacher Questionnaire, Section A	Teacher/School	Teacher	1	February
Teacher Questionnaire, Section B	Reading Program	Teacher	1	February
Teacher Questionnaire, Section C	Math Program	Teacher	1	February
Principal Questionnaire, Section A	Principal/School	Principal	1	February
Principal Questionnaire, Section B	School	Principal	1	February
District Characteristics Questionnaire Section A	District	Superintendent	1	February
District Characteristics Questionnaire, Section B	Title I Program	Superintendent	1	February
District Expenditure Information Questionnaire	District/School	Business Manager	1	February

*Oct/Nov for the first year of data collection.

which it was completed. Most of the instruments used are compiled in Report #9A and the psychometric properties of the instruments are given in Report #9.

Each fall and spring every student completed three instruments: The Comprehensive Tests of Basic Skills, a Practical Achievement Scale, and a Student Affective Measure. The Comprehensive Tests of Basic Skills were administered in the fall and spring of each year to determine the student's achievement in reading and math.

There has been considerable criticism of standard achievement tests. It is sometimes claimed that they are biased against minority or poor students and also that they tend to measure academic subjects that are unrelated to real life situations. To attempt to overcome the criticism of the academic nature of achievement tests, we developed a 'functional literacy' test. This test was a picture test which presented pictorially a number of situations that children commonly encounter in their everyday lives. While viewing the picture, students were asked questions about the situations pictured. This test involved both reading and math problems set in the context of practical situations. It was administered to all fourth-, fifth-, and sixth-grade students. Each student also completed a measure of attitudes toward school and toward reading and math. It turned out that the scales of this instrument were so highly interrelated that it was sensible to use only the total scale score.

Once a year the teachers filled out a questionnaire. The first part of the questionnaire asked for demographic and general information. A second part was for reading or math and asked about instruction in that subject area, how students were grouped, how lesson plans were used, how instructional materials were used, what instructional methods were used, etc. Similarly, each Principal reported on a set of demographic questions, as well as upon his or her philosophy of instruction, attitude toward discipline, efforts at coordination of instruction, and similar items. The Principals also described their schools in terms of size, grade range, sources of funding, class assignment practices, parent participation, and staff training. Likewise, the district superinten-

dent and the business manager completed questionnaires describing district instructional policies and expenditure information.

Two very important instruments were the Compensatory Education Roster and the Student Participation and Attendance Record. At each school the Local Coordinator completed the Compensatory Education Roster by indicating for each student whether or not the student was designated to receive CE funded by Title I, other federal funds, state funds, district or private funds. This roster was important because it allowed us to classify students in terms of their CE status. A Student Participation and Attendance Record was filled out by each student's teacher, for reading and for math; it reported the number of hours of instruction the student received in reading or math during a 'typical' week. The teacher also reported on the size of the instructional group and the person giving the instruction (homeroom teacher, special instructor, aide, tutor, etc.).

The Student Background Checklist gives information on such items as age, sex, race, previous education, grade, parent's education, parent's participation in school activities, student's participation in school lunch programs, and receipt of special services. The Summer Activities Slipsheet obtained information from the student on activities during the previous summer, such as whether or not the student went to summer school, to camp, took a trip, etc. It also inquired about reading activities during the summer.

Interested readers should refer to SES Reports #9 and #9A for the psychometric characteristics and exact material contained in each of the instruments described above.

Data Collection. Because the amount of data to be collected was large and the amount of time involved long, special steps were taken to assure that quality data would be obtained. As soon as a school agreed to participate the principal was asked to appoint a Local Coordinator who would be paid by SDC for his or her services. Frequently the principal acted as the Local Coordinator but at other schools the Local Coordinator might be the Title I director, the curriculum coordinator, or some other staff member. During the summer of each

year a training program for Local Coordinators was held which included instruction on the procedures required in filling out the forms, administering tests, maintaining confidentiality, securing cooperation of the teachers, returning material to SDC, and similar matters.

Special steps were taken to assure confidentiality. Number-Name identification rosters were retained at the school so SDC had no record of the names of any of the students in the study. Because of these efforts to maintain confidentiality, particular attention was paid to the maintenance of the linkage numbers for each student from year to year and also to link the students' numbers with their teachers' numbers.

High Poverty Schools Data Collection. It is often argued that information from formal tests, questionnaires, and standardized forms do not give a real understanding of the capabilities of students or of the school or institutional settings. Certainly the more intimate details of classroom instruction are not captured. In an attempt to overcome this problem, 'in-depth' data were collected at 55 high-poverty schools. High-poverty schools were desirable because they had the highest concentrations of CE students, the students with whom the Sustaining Effects Study was most concerned. Teams of two observers each visited the 55 schools twice. The purpose of the first visit was to become acquainted with the school setting, to make arrangements with the school principal and the Local Coordinator for a subsequent longer visit, to become familiar with the school organization, and to have a preliminary meeting with the teachers whose classrooms would be observed. The second visit lasted for two weeks and involved the collection of information in a number of areas including instructional practices in the second and fifth grades. At each school a lengthy interview was conducted with the principal and each of the involved teachers. Classrooms were visited and the way in which instruction was conducted was noted. The teaching techniques used were recorded. Periodically a count was made of the number of students exhibiting on-task behavior. Much of the material was recorded on prepared forms, but lengthy narrative descriptions were also recorded on audio tape. The data collected by the in-depth techniques will be combined with the more traditional data

which had been collected for the Longitudinal Study and results will be included in the SES Final Report as well as in Technical Report #16.

THE SUSTAINING EFFECTS STUDY REPORT SERIES

The detailed results of the Sustaining Effects Study are contained in a series of reports. These reports contain tables giving very extensive details about all of the data collected during the study from thousands of students in 329 elementary schools. In addition to the detailed data, the reports include the results of various statistical analyses. The report series will be made up of the following volumes:

Report Number

1. "The Sample for the Sustaining Effects Study and Projections of Its Characteristics to the National Population" by Hoepfner, R., Wellisch, J., and Zagorski, H. (Published)

2. "Students' Economic and Educational Status and Selection for Compensatory Education" by Breglio, V. J., Hinckley, R. H., and Beal, R. S. (Published)

3. "Students' Economic and Educational Status and Receipt of Compensatory Education" by Hinckley, R. H., Beal, R. S., and Breglio, V. J. (Published)

4. "Student Home Environment, Educational Achievement, and Compensatory Education" by Hinckley, R. H. (Editor). (Published)

5. "The Nature and Recipients of Compensatory Education" by Wang, M., Hoepfner, R., Zagorski, H., Hemenway, J. A., Brown, D. S., and Bear, M. B. (Published)

6. "Resource Analysis of Compensatory Education" by Haggart, S. A., Klibanoff, L. S., Sumner, G. S., and Williams, R. S. (Published)

7. "An Analysis of the Cost and Effectiveness of Compensatory Education" by Sumner, G. C., Klibanoff, L. S. and Haggart, S. A. (Published)

8. "Summer Growth and the Effectiveness of Summer School." (At the printers)

9. "The Measures and Variables in the Sustaining Effects Study" by Hemenway, J. A., Wang, M., Kenoyer, C. E., Hoepfner, R., Bear, M. G., and Smith, G. (Published)

9A. "A Compilation of the SES Instruments" by the SES Project Staff. (Published)

10. "Student Educational Development During the School Year and the Effects of Compensatory Education" by Wang, M., Bear, M. B., Conklin, J. E. and Hoepfner, R. (In second draft)

11. "The Effects of Discontinuing Compensatory Education Services" by Kenoyer, C. E., Cooper, D. M., Saxton, D. E. and Hoepfner, R. (At the printers)

12. "Longitudinal Effects of Compensatory Education on Educational Growth." (Analysis underway)

13. "A Collection of Supplemental Reports from the Sustaining Effects Study" by Hoepfner, R. (Editor) (In final editing)

14. "Achievement Growth and Duration of Receipt of Compensatory Services." (Analysis plan developed)

15. "The Characteristics of Students, Teachers, and Services that Affect Achievement Growth." (Analysis plan developed)

16. "Successful Practices in High-Poverty Schools." (Analysis is underway)

17. "A Study of Students in Junior High School Who Had Been Title I Students in Elementary School." (Data collected)

18. "A Narrative Description of Compensatory Education." (Data collected)

19. The Final Report of the Sustaining Effects Study.

20. Glossary of Terms and an Index to the Sustaining Effects Study Report Series.

CHAPTER III. WHO RECEIVES COMPENSATORY EDUCATION?

Summary

Based on economic data gathered by home interviews and achievement data based on achievement tests, it was possible to determine the percentage and number of students receiving Title I and other CE services in terms of poverty and academic achievement classifications. The results show that:

- *Among economically poor students 40 percent receive CE while 60 percent do not. Among the non-poor students 21 percent receive CE while the remainder do not.*
- *Since there are many more non-poor students than there are poor students, the absolute number of non-poor students receiving CE is larger than the number of poor stuaents receiving CE. There are about 1,230,000 poor students and 1,693,000 non-poor students receiving Title I.*
- *There are about 2,500,000 poor students who do not receive any CE.*
- *Among low-achieving students 46 percent receive CE while 54 percent do not. Among regular-achieving students 19 percent receive CE.*
- *Since there are many more regular students than there are low-achieving students, the absolute number of low-achieving students receiving CE is smaller than the number of regular-achieving students receiving CE. There are about 1,200,000 low-achieving students and 1,300,000 regular-achieving students receiving Title I.*
- *When considering students who do not receive CE, we find that there are about 2,000,000 low-achieving students who do not receive any CE.*
- *Numbers are presented which show the joint distribution of CE selection, economic status and achievement status. Among the poor and low achievers, 40 percent receive CE while 60 percent do not. Other comparisons show that there are significant numbers of non-poor, regular achievers who receive CE.*

- *The results show that the highest proportion of CE recipients are Hispanic and black, are in large cities and rural areas, are in the West and Mid-Atlantic regions (although if only Title I is considered the largest proportion is in the South).*

- *Schools are selected for CE funds by a number of different criteria but the most frequently used are free or reduced-price lunch counts and/or AFDC enrollment. Within schools students are most frequently selected in terms of teachers' judgments or test scores.*

- *Several targeting indexes are presented which measure the efficiency with which schools select students for CE.*

INTRODUCTION

Title I of the Elementary and Secondary Education Act was first authorized and funded in 1965; by 1980 it is distributing over three billion dollars annually. Title I funds are received by all the states and by 96 percent of the nation's school districts. As McLaughlin (13) points out, the original Title I authorization was supported by a mixed and powerful constituency. Those whose major concern was with poverty and ways of alleviating it believed that the funds would go to poor schools and districts and thus help the poor. Those who were principally concerned with improving the education of low-achieving students felt that the funds would help such students and thus they supported the Title I program. It was assumed that there was a close relationship between poverty and low educational achievement. McLaughlin makes the point that

> "Senator Robert Kennedy did not share the general euphoria that pervaded Washington when the 1965 Elementary and Secondary Education Act (ESEA) was ratified. ESEA was enacted with high hopes for benefiting disadvantaged children. Title I of that act, which targets more than $1 billion a year to 'meet the special educational needs of educationally deprived children,' was the particular cause of excitement and self-congratulation on the Hill. It had broken through the long-standing opposition to federal aid to education and was viewed as an effective way to 'break the cycle of poverty.' Lawmakers were confident in 1965 that schoolmen knew what to do with the added resources, and that they would thereby establish effective compensatory programs for poor children. Title I was perceived as a central part of President Johnson's War on Poverty.

> Reports from some of Senator Kennedy's constituents, however, counselled against such optimism. He concluded that some schoolmen might not use the new Title I dollars in the best interest of poor children unless the act included some way to insure that they would not be cheated of the special attention intended by the legislation."

Those who were mainly oriented toward poverty considerations were able to specify a funds-allocation formula in such a way as to assure that the money was spent in poor districts and schools. Funds are first allocated to states as a function of the number of poor families in the districts of the state, the number of mothers receiving assistance under Aid for Families with Dependent Children, the number of neglected and delinquent children in schools and institutions, and several other poverty-oriented considerations. Based on the amount of money received the districts select schools to receive money or resources depending on various poverty criteria. However, at the school level the criteria for allocating resources to students become clouded because of the need to consider what other resources the school is receiving, say from ESAA, or from state programs. However, those concerned with poverty could be quite pleased that Title I funds were targeted toward the poor communities throughout the nation.

There was, however, an important minority that felt that the targets of Title I funds should be children with low educational achievements. After all, Title I was an educational program. Was the assumption that there was a high correlation between economic need and educational need really true? By 1974 this argument had enough force that Congress decided that there should be a study to determine the economic and educational status of students participating in Title I programs. In the Educational Amendments of 1974 Congress mandated the Participation Study, by saying:

> "In the case of programs and projects assisted under Title I of the Elementary and Secondary Education Act of 1965, the report under this subsection shall include a survey of how many of the children counted under Section 103 (c) of such Act participate in such programs and projects, and how many of such children do not, and a survey of how many educationally disadvantaged children participate in such programs and projects, and how many educationally disadvantaged children do not."

While Congress specifically authorized a study focusing on Title I students, Title I operates within a school environment of other compensatory education programs as well as the regular school program. The general idea is that compensatory education (CE) consists of instruction in addition to regular instruction. It is given to students who have received the regular instruction program and are having trouble progressing at the expected rate. But as soon as one gets from the general concept to specifics, troubles arise. How does one judge that a student is not progressing at the expected rate? Also, there are many special programs in addition to the regular program. Which are the CE programs? There is Title I, Follow Through, English as a Second Language, Services to Migratory Children, Services to Handicapped Children, the Emergency School Aid Act, Programs for American Natives, special state programs, special district programs, etc. Are all of these CE, and are the different activities funded under them properly called CE? In Chapter IV we will describe the CE instructional program. For the purposes of this Chapter, CE is defined as an instructional program providing services to low-achieving students that are different from, or in addition to, the services provided to regular students. While this definition seems straightforward, it has a number of difficulties when applied to individual students and programs. The interested reader may refer to Report #9 (p. 69 ff) for discussion of the problems we encountered when we tried to determine which students were CE students.

In the participation Study we were mainly concerned with the Title I Program but we also had to consider other programs. Frequently Title I students receive services from several programs. Also, the nature of the Title I program in a school is affected by the other programs in the school. All of these considerations affected the design of the Participation Study.

THE DESIGN OF THE PARTICIPATION STUDY

The basic idea of the Participation Study was to determine the number of children in the nation's elementary schools who were receiving Title I services and came from poverty families, and also to see how many children were from poverty families and were not receiving Title I services. In other words we were to determine the relationship between receipt of Title I and poverty status.

Similarly, we were to determine the relationship between receipt of Title I and educational status. In the law authorizing the study, Congress defined poverty in the same terms as those used to determine poverty for the allocation of Title I funds. They also defined students as being educationally disadvantaged if they were one or more years below grade level. Thus, to undertake the study we had to do three things:

1. Obtain a sample that was representative of the nation's elementary school children.
2. Determine the poverty status of the families from which the children came.
3. Determine the educational status of each of the children in the the sample.

The Sample and Home Interviews

To determine the poverty status of the children in the sample it was necessary to conduct a home interview with the parents of each student. Since home interviews are expensive, we had to balance expense against the desired accuracy of the national projections to be made as a result of the home interviews. It was decided that a representative sample of 15,000 parents would be interviewed. It will be remembered from Chapter II that one of the samples for the Longitudinal Study was a Representative Sample. This sample included 243 schools that were representative of the nation's elementary schools. A random sample of students was drawn from each of these schools. Interviewers visited the parents of these students and asked a series of questions regarding the economic status of the family, the attitude of the parents regarding their children's school and the education they were receiving, the amount of time the child spent doing homework, the extent of parental assistance with school work, the child's leisure activities, and other educationally related questions. For a full discussion of the sampling procedure and the content of the home interview the reader is referred to SES Report #2.

The Determination of Poverty Status

Based on the data collected during the home interview, an index value was computed for each child in the sample. The Orshansky index is a measure based on a family's income, size, adult-child composition, and farm-nonfarm status. It is the official index used by the federal government in connection with its poverty programs and in the allocation of Title I funds.

The Determination of Educational Status

In connection with the Longitudinal Study, the Comprehensive Tests of Basic Skills in reading and math were given to every child in the sample. Since the sample for the Participation Study was a subsample of the sample for the Longitudinal Study, these achievement test scores were available for each student. Congress had defined educational disadvantagement in terms of grade equivalents, a measure that has several psychometrically undesirable characteristics. As a result the grade equivalent score for each student was determined, but we also ascertained the percentile score and vertical scale score for each student. More details regarding the determination of educational status can be found in SES Report #2.

ECONOMIC STATUS AND SELECTION FOR COMPENSATORY EDUCATION

Congress wanted to know several things. It wanted to know, from the population of poor children, how many were receiving CE services and how many were not. It also wanted to know how many students were receiving CE services who were not poor. Whether or not a student came from a family that was poor was determined by applying the Orshansky index to information collected during the home interview.* Table III-1 shows both the percentages of students receiving CE when classified as poor or non-poor and also the estimated total numbers of such students. Note that students are classified as receiving Title I and/or Other CE, Other CE only, no CE at a school having CE, or no CE at a school which does not offer CE.

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*AFDC was also included.

Table III-1

Percentage and Number of Students Receiving Various CE Services by Family Economic Status

Economic Status	CE Status: Title I and other CE	Other CE only	No CE at CE School	No CE at Non-CE School	Total
Poor	29%	11%	53%	7%	100%
Non-Poor	11	10	64	16	101
	Number of Students				
Poor	1,230,000	443,000	2,199,000	309,000	4,181,000
Non-Poor	1,693,000	1,551,000	10,065,000	2,516,000	15,825,000
Total	2,923,000	1,994,000	12,264,000	2,825,000	20,006,000

What message can be drawn from this table? The interpretation of the numbers varies depending on one's expectation as to whether or not CE should go primarily to poverty-level students. Forty percent of all poverty-level students are receiving some kind of CE, but 21 percent of the non-poverty-level students are also receiving CE. One can reflect that, percentage-wise, twice as many poverty-level students as non-poverty-level students are receiving CE. But in terms of the total number of students, there are about 16 million non-poverty-level students and about four million poverty-level students; of these, there are about 1,690,000 non-poverty-level and 1,230,000 poverty-level students receiving Title I. Thus, there are actually more non-poverty level students receiving Title I than there are poverty students. Or to look at the other side of the coin, 60 percent of the poor students and 80 percent of the non-poor do not receive Title I. In terms of the total number of students, about two and one half million poor students are not receiving CE, while about twelve and one half million non-poor students are also not getting CE. Roughly speak-

ing, there are about 1.7 million poor students receiving CE, and about 2.6 million poor children not receiving it. In brief, in absolute numbers, there are somewhat more non-poor than poor students receiving CE. (These figures are for Title I and Other CE combined. The picture is similar for Title I considered separately.)

Is this bad? It depends on what students one thinks should be targeted to receive Title I services. Remember that the funds go to poor districts and schools, but the individual students selected to receive Title I services are selected on the basis of educational need, not in terms of economic status. Also, the definition of poverty is such that only the lowest 21 percent of the students are classified in the poverty group. One might speculate that the vast majority of those receiving CE and classified as non-poor are just above that poverty level. Table III-2 indicates that this is not the case.

It will be seen that there is a regular progressive decrease in the percentage of students receiving Title I services as family income increases. A similar but less marked tendency is evidenced by the numbers for "Other CE only." Since Title I is more of a poverty program than most other CE programs this is the relationship we would expect to see. However, the idea that non-poverty students selected for CE are hovering just above the poverty line is dispelled by the table. Clearly there are significant percentages of CE students who are not in the two lowest fifths of family income. As will be seen in the next section, the correlation between student income status and educational achievement status is relatively low. Thus, to the extent that students are selected for CE programs on the basis of their educational need, we would expect many of those selected to come from non-poor families.

POVERTY AND THE CHARACTERISTICS OF STUDENTS SELECTED FOR CE

We have already seen that proportionately more poor children than non-poor children are selected for CE. What about some of the other student characteristics, such as race, urbanicity and region of the country? Sometimes it is thought that CE programs are primarily for black children in the ghettos of

Table III-2

Percentage and Number of Students Receiving Various CE Services by Family Income.

Family Income	Title I or Title I and Other CE	Other CE Only	No CE at a CE School	No CE at a Non-CE School
Lowest Fifth	37%	21%	17%	13%
Second Fifth	24	27	18	18
Third Fifth	17	21	20	22
Fourth Fifth	13	16	22	22
Highest Fifth	8	14	23	25
	Number of Students			
Lowest Fifth	1,090,000	428,000	2,070,000	360,000
Second Fifth	702,000	534,000	2,226,000	514,000
Third Fifth	507,000	427,000	2,460,000	616,000
Fourth Fifth	390,000	320,000	2,695,000	616,000
Highest Fifth	234,000	285,000	2,813,000	719,000
Totals	2,923,000	1,994,000	12,264,000	2,825,000

large cities. As can be seen from Table III-3, that is not the case. If we combine the number of students receiving CE under Title I and from other CE funds* we wee that, among poor whites, that 37 percent receive CE; among poor blacks, that 40 percent receive CE; and among poor Hispanics; that 47 percent have CE services. At the same time we find for the non-poor that 19 percent of of the whites, 27 percent of the blacks and 44 percent of the Hispanics receive

*From the point of view of equality of services, it is not quite appropriate to add together those receiving Title I and those receiving CE service funded from other sources. The costs of service under "Other CE only" is about a quarter less than under Title I.

CE. Looking at the poor and the non-poor together, we see that proportionately somewhat fewer whites than blacks, and somewhat fewer blacks than Hispanics receive CE. There are, however, classification problems in presenting the results in this fashion. Althoug we instructed the teachers not to count those participating in bilingual programs as CE students, we suspect that some teachers did so, and this accounts for the relatively high percentage of Hispanic students listed in the "Other CE only" category. Likewise, among the non-poor, it is probable that the blacks and Hispanics are lower in the economic status scale than are the whites, and thus more near-poor blacks and Hispanics receive CE. Thus, it seems probable that about the same proportion of blacks and Hispanics receive CE and that somewhat more of them, relatively, receive CE than whites.

Table III-3

Percentage of Students Receiving Various CE Services
By Family Economic Status and Racial/Ethnic Group

Economic and Racial/ Ethnic Status	CE Status				
	Title I or Title I and Other CE	Other CE Only	No CE at CE School	No CE at Non-CE School	Numbers of Students
Poor and:					
White	27%	10%	55%	8%	2,011,000
Black	33	9	51	7	1,501,000
Hispanic	29	18	51	2	556,000
Other	38	6	35	20	113,000
Non-Poor and:					
White	9	10	65	16	13,546,000
Black	19	8	55	18	1,266,000
Hispanic	24	18	54	5	696,000
Other	5	5	43	47	317,000
Total	2,941,000	2,000,000	12,264,000	2,801,000	20,006,000

As already noted, it is frequently thought that CE is a program for students in large city ghettos. Table III-4 shows that this is not the case, although there are many CE students in large cities. The rank order of urbanicity for those receiving Title I and "Other CE only" combined, among the poor, is 46 percent for rural areas, 45 percent for cities over 200,000, 35 percent for cities under 50,000, 34 percent for suburbs, and 28 percent for cities from 50,000 to 200,000. The order is the same for the non-poor, with 26 percent for rural, 24 percent for cities over 200,000, 19 percent for cities under 50,000, 17 percent for suburbs, and 15 percent for cities from 50,000 to 200,000. In terms of absolute numbers, the number of students from rural areas receiving CE outnumbers those for any other category. The percentages for the suburbs tend to be lower than for large cities and rural areas, but there is still a sizable number of students receiving CE in the suburbs. While there is a trend for CE to be most prevalent in the large cities and rural areas, it is significant that there are sizable numbers of CE students throughout the country, irrespective of the population density of the area in which they live.

While some say that CE is for the ghetto, others think of it in terms of a program for "the poor rural south." Again this is not in accord with the facts. Table III-5 shows the percentage of students receiving services by region of the country. If Title I services and "Other CE only" are combined, among the poor, 51 percent of the students in the West, 42 percent in the Mid-Atlantic, 41 percent in the South, 38 percent in the Northeast, and 30 percent in the Midwest receive CE. The picture among the non-poor is different than it is for the poor. For the non-poor, the Northeast with 31 percent and the West with 26 percent are considerably higher than the other areas, which are quite close together, with the Mid-Atlantic and the Midwest both having 17 percent, and the South having 15 percent. To understand this, it is worthwhile to look at the Title I and the "Other CE only" figures separately. Among the poor it is noticeable that the percentage for Title I in the South is much higher than elsewhere in the nation. Associated with this is the fact that the South is lowest in "Other CE only," reflecting the fact that there are few local or state CE programs in the South. In fact the percentage of students receiving

Table III-4

Percentage of Students Receiving Various CE Services
by Family Economic Status and Urbanism

Economic and Urbanism Status	Title I or Title I and Other CE	Other CE Only	No CE at CE School	No CE at Non-CE School	Number of Students
Poor and					
City over 200,000	33%	12%	50%	5%	1,334,000
Suburbs	18	16	61	5	238,000
City from 50,000 to 200,000	15	13	52	20	443,000
City under 50,000	27	8	57	8	1,133,000
Rural	36	10	49	5	1,033,000
Non-Poor and					
City over 200,000	16	8	65	11	1,757,000
Suburbs	5	12	68	15	2,421,000
City from 50,000 to 200,000	5	10	50	35	2,105,000
City under 50,000	12	7	66	15	4,969,000
Rural	13	13	64	10	4,573,000
Total	2,941,000	2,000,000	12,264,000	2,801,000	20,006,000

Title I services, both for the poor and the non-poor is fairly similar throughout the country, except for the South. The big differences are in the "Other CE only" category where the South and Midwest have few programs, in contrast to the West and Northeast, which have the most. The relatively larger number of students receiving Title I services in the South is probably a reflection of the relatively lower economic status of the South and the influences of the Title I allocation formula that allocates larger sums to states having more poor families.

Table III-5

Percentage of Students Receiving Various CE Services
by Family Economic Status and Geographic Region

Economic and Regional Status	CE Selection Status: Title I or Title I and Other CE	Other CE Only	No CE at CE-School	No CE at Non-CE School	Number of Students
Poor and					
Northeast	24%	14%	59%	3%	853,000
Mid-Atlantic	24	18	49	10	330,000
South	38	3	50	9	1,443,000
Midwest	24	6	63	6	832,000
West	27	24	39	10	723,000
Non-Poor and					
Northeast	10	21	56	13	2,994,000
Mid-Atlantic	9	8	75	8	2,057,000
South	11	4	65	20	3,988,000
Midwest	11	6	72	11	4,478,000
West	11	15	46	28	2,358,000
Total	2,941,000	2,000,000	12,264,000	2,801,000	20,006,000

Report #2 examines other student characteristics relative to selection for CE services, but there are fewer interesting trends. There are slightly more male than female CE students, about a 4-percentage-point difference. Also, there tends to be slightly more CE offered to students in the second, third and fourth grades than to those in the first grade or in the fifth and especially the sixth grade.

In summary, poor students are more frequently selected to receive CE services than non-poor students, but because there are more non-poor than poor students, there are larger numbers of non-poor students than poor students receiving CE. Relatively, there are more Hispanic than black students, and more black students than white students receiving CE, but in terms of absolute numbers, there are more white students than black students receiving CE, and more black students than Hispanic students receiving CE. Again, in terms or percentages, there are more CE students in rural areas and large cities than there are in medium- and small-sized cities. The percentage of students receiving Title I services is quite uniform over the various regions of the country, except for the South, where there is a much higher percentage receiving Title I. But when "Other CE only" is included a different picture emerges. The South has a very low percentage of students in these other programs while the West and the Northeast have high percentages. It appears that other federal agencies, and the state and local governments, are funding sizable programs in the West and the Northeast, and to a lesser extent in the Mid-Atlantic area, while there are few programs in the Midwest and even fewer in the South.

EDUCATIONAL ACHIEVEMENT AND SELECTION FOR CE

Schools are selected for receipt of Title I resources based on the economic status of the populations they serve. But once a school receives Title I resources the students are selected to receive Title I services on the basis of educational need. Title I regulations give guidelines as to which students should be selected. Generally, it is expected that the most educationally needy students will be selected first and that the students selected will be in the bottom half of the achievement distribution. But within these broad guidelines the actual selection of students is left up to the local district and school authorities. Thus, from locale to locale, one finds considerable variation in the achievement level of students selected.

In the Participation Study all of the students took the Comprehensive Tests of Basic Skills in reading and math in the fall and again in the spring. Based on the scores obtained from the several administrations, scales were developed which allowed us to convert raw scores into percentiles and into vertical

scale scores, and to determine the score corresponding to the median for each grade. This median score was necessary because, for the purpose of this study, achievement was defined by Congress as "Educationally disadvantaged children refers to children who are achieving one or more years behind the achievement expected at the appropriate grade level for such children." Table III-6 shows the percentages and numbers of students in various CE categories in terms of grade equivalents as measured by the CTBS.

Table III-6

Percentage and Number of Students Receiving Various CE Services by Educational Achievement Status

Educational Achievement	CE Selection Status				
	Title I or Title I and Other CE	Other CE Only	No CE at CE School	No CE at Non-CE School	Total
Low Achievers*	31%	15%	42%	12%	100%
Regular Achievers	10	9	66	15	100%
	Number of Students				
Low Achievers	1,188,000	577,000	1,576,000	456,000	3,797,000
Regular Achievers	1,307,000	1,068,000	8,245,000	1,948,000	12,568,000
	2,495,000	1,645,000	9,821,000	2,404,000	16,365,000*

*Omitting the first grade, since it does not fit into the definition of having students "one grade level below."

It will be seen that in terms of percentages there are many more students selected for CE services who are performing at least one grade level below their assigned grade level than there are among higher-achieving students.

Forty-six percent of the low-achieving students* are selected for some CE while only 19 percent of the regular students are selected. At the same time, 54 percent of the low-achieving students are not receiving CE services. In terms of absolute numbers, about two million low-achieving students are not receiving extra services, in contrast to about 1,750,000 who are receiving CE services. It should also be noted that about 2,400,000 high-achieving students are receiving CE services. It is clear that many students are receiving CE who are less educationally needy than the many needy students who are not receiving CE. We will see some of the reasons for this later when we consider the joint relations between economic status, which determines which schools receive CE funds (such as Title I) and educational status, which determines those students within a school who are selected.

There are a number of psychometric problems in defining achievement in terms of grade equivalents. For one thing, the first-grade students cannot be defined in terms of being one year below grade level. Also, the amount of variance or spread in student scores changes from grade to grade. For example, in the sixth grade there may be students three or more years below grade level, but in the second grade they can only be one year below. The result is that different percentages of students are included in one year below grade level as grade level changes. There are also other statistical problems. The interested reader is referred to Tallmadge, G. K., and Wood, C. T. (18), for a detailed discussion of the problems with using the grade equivalent metric. Because of these problems, we converted each student's raw test score to a percentile equivalent and divided the distributions into quartiles. Table III-7 shows the results.

*"Low" and "Regular Achievers" are defined as achieving below or above one year below grade level. This definition was contained in the law authorizing the Participation Study. Selection of students for Title I is based on several criteria. The Title I regulations suggest that all children below the median be considered.

Table III-7

Percentage and Number of Students Receiving Various CE Services by Achievement Quartiles*

Achievement Status	CE Selection Status				
	Title I or Title I and Other CE	Other CE Only	No CE at CE School	No CE at Non-CE School	Total
Bottom Quartile	32%	14%	42%	11%	99%
2nd Quartile	19	11	58	12	100%
3rd Quartile	7	8	70	15	100%
Top Quartile	2	6	75	17	100%
	Number of Students				
Bottom Quartile	1,579,000	718,000	2,110,000	560 000	4,967,000
2nd Quartile	910,000	543,000	2,809,000	605,000	4,867,000
3rd Quartile	368,000	411,000	3,600,000	762,000	5,141,000
Top Quartile	89,000	301,000	3,772,000	869,000	5,031,000
	2,946,000	1,973,000	12,291,000	2,796,000	20,006,000

*Derived from Table V-5, Report #2.

There is a clear tendency for there to be proportionately more CE students as achievement scores decrease. This is true of both Title I and "Other CE only." It should be noted that the percentage of students in the bottom quartile is very similar to the number in the previous table who are one year below grade level. (The absolute numbers between the two tables cannot be compared because Table III-6 does not include first graders.) It appears that the selection of students corresponds reasonably well with the educational need of the students, but a fairly large number of students do not seem to need CE but are receiving it. About 450,000 Title I students, and 700,000 "Other CE only" students, are above the median in achievement and are receiving CE services.

Some of these students may be misclassified due to the unrealiability of the CTBS, but a similar number below the median should be classified above it, so the figures average out. Also, some of the CE selectees are in schools which are 100 percent CE, which is allowed by Title I under certain conditions.

While significant numbers of educationally non-needy students are certainly receiving CE, the more significant problem is the 2,700,000 students who are in the lowest quartile academically and who are not receiving special services; or, if one believes that all students below the average should receive CE, one should be concerned with the 6,100,000 students who are in the bottom half in terms of achievement and are not receiving CE. Clearly, if all students who are above the median and are receiving CE were to be replaced by students below the median there would still be sizable numbers of students below the median who would not receive CE services. The only way to correct this situation is to dilute the services being given so more students could receive a little, or to increase the funds so that more students could be given services at the same intensity level as is currently practiced.

EDUCATIONAL ACHIEVEMENT STATUS AND THE CHARACTERISTICS OF STUDENTS SELECTED FOR CE

We have already examined the relationship between poverty status and the characteristics of students selected for CE. While at the student level the correlation between poverty and educational achievement is not high, it is considerably higher when school averages are correlated. Because of the higher correlation at this group level, we would expect the relationship between educational achievement status and the characteristics of students selected for CE to be fairly similar to that for these same characteristics as when related to poverty. The achievement levels of students by race/ethnicity who are selected for CE were examined. The result show the effects are the same as found for poverty, although the trends do not seem to be quite as pronounced as when classified by educational achievement.

Again there are some interesting trends in the relationship between achievement status and urbanicity with respect to selection for CE. As with poverty,

students from large cities and from rural areas are most frequently selected for CE services. This is true for students who are either low or high achievers.

On examining the relationships among geographic regions of the country, educational achievement and selection for CE, we again find that the Northeast and the West have the highest percentages of students selected for CE services, while the South has the lowest. Again, the South is low because it has so few students served by other federal, state or local programs. Almost all of the students served in the South are served by Title I.

THE JOINT EFFECT OF ECONOMIC STATUS AND EDUCATIONAL ACHIEVEMENT

It seems probable that the supporters of the Title I program assumed that there was an almost one-to-one relationship between poverty status and educational achievement. It is widely believed that schools in poor areas have students who score poorly on achievement tests. But what is the actual relationship? In the Participation Study we were able to relate family income with achievement test scores. The overall correlation between economic level and achievement scores at the student level was .29, and varied, grade by grade, from .20 in the first grade to .32 in the third and fourth grades. Relationships of this magnitude are generally considered small-to-moderate and imply that if one knows a student's economic status one can predict the student's achievement level with only very modest success. It is this low relationship which accounts for the finding, reported earlier, that many non-poor students perform poorly and are receiving CE. On the other hand when groups of students are combined, say by taking the average achievement level for a school, then the combined average scores relate more highly. In fact, when the average family economic level for a school is correlated with the average student achievement level for students in a school, the correlation is .67. This means that if one knows the average poverty level of a school one will be able to predict the average level of the performance of students in the school much more accurately than one can predict the achievement level of any given student on the basis of the student's family economic level.

When schools are allocated CE funds based on poverty level, the students will tend to need supplemental services if the school is within a poverty area, but there may also be many individual students who do not need CE services; and conversely, if schools are not given CE funds because of their relatively high economic levels, these schools will still probably contain many students who need CE services as indicated by their low achievements. Table III-8 shows the mean achievement percentiles for students with various family incomes. This table illustrates the marked relationship between family income and achievement when data are grouped, but such grouped data mask the wide variation within any group. The large standard deviations emphasize this fact.

Table III-8

Student's Family Income and Achievement Level

Family Income	Mean Achievement Percentiles*	Standard Deviation	N
Below $5000	34	25	1524
5,000 to 7,000	37	25	1005
7,001 to 9,000	41	27	1109
9,001 to 11,000	45	28	1188
11,001 to 13,000	48	28	1234
13,001 to 15,000	52	28	1259
15,001 to 17,000	53	29	1248
17,001 to 19,000	57	28	1146
19,001 to 21,000	58	28	997
21,001 and above	62	27	3087

*There are technical statistical reasons why it is usually inappropriate to average percentiles; however, when used to show a trend, as is done here, the practice is less objectionable.

Economic status and achievement level are related to a number of other variables. As in the previous sections, we will examine the joint relationships among poverty, achievement level, and race, urbanicity, and geographic region, and we will also consider the relationship of CE selection to the child's sex

and mother's education. Table III-9 shows the relationships between poverty, achievement and race. The average achievement percentile for whites is 56, while that for blacks is 32 and for Hispanics 31. "Others," who are largely Orientals, have an average percentile of 51. When examined in terms of poverty, the poor whites have an average score of 41, while that for the non-poor is 57. In comparison the score for both the poor blacks and poor Hispanics is 27, while that for the non-poor blacks is 36 and for the non-poor Hispanics it is 34. It should be noted that the score for the non-poor blacks and Hispanics is below that of the poor whites. No doubt the economic level of the non-poor blacks and Hispanics is lower than that of the non-poor whites, but it is above the economic level of the poor whites. Children from black and Hispanic non-poor families need CE considerably more than children from not only the non-poor white families, but also more than those from many poor white families. The "Other" minorities are more similar to the whites than they are to the blacks and Hispanics.

Poverty level and the parent's formal education are linked, and children's achievement levels are also related to both economic status and the parent's education. Table III-10 shows this relationship. It is seen that the percentile achievement level of children whose mothers had eighth grade educations or less is 32 and that the level of achievement progresses regularly to 70 for students whose mothers are college graduates. The achievement of children from poverty homes is considerably below that of their peers who are from non-poor homes but whose mothers had the same amount of formal education. The jump in scores between the children of mothers with an eighth grade education or less and those with a high school education is 21 percentile points, and that between high-school-educated mothers and college graduates is 17. The jump between children whose mothers had similar educations, but whose family income places them in the poor or non-poor category, is about 12. Thus, a mother's education seems to have a larger effect on her children's achievement than does her economic status.

Table III-11 shows the relationship between economic status, academic achievement, and urbanicity. The table shows that, in general, the achievement level is near the 50th percentile except for the suburbs, where it is 59, and for

Table III-9

Student's Family Income, Achievement Level and Race

Race/Ethnic Group	Mean Achievement Percentile			N		
	Poor	Non-Poor	Total	Poor	Non-Poor	Total
White	41	57	56	1,192,000	10,598,000	11,178,000
Black	27	36	32	949,000	1,100,000	2,049,000
Hispanic	27	34	31	343,000	590,000	933,000
Other	33	56	51	70,000	260,000	330,000

Table III-10

Student's Family Income, Achievement Level and Mother's Education

Mother's Education	Mean Achievement Percentile			N		
	Poor	Non-Poor	Total	Poor	Non-Poor	Total
Grade 8 or Less	28	35	32	793,000	917,000	1,710,000
Grade 9-11	31	44	40	892,000	2,269,000	3,161,000
Grade 12	38	55	53	635,000	5,518,000	6,153,000
Some College	48	62	61	185,000	2,382,000	2,567,000
College Graduate	60	70	70	50,000	1,409,000	1,459,000

Table III-11

Student's Family Income, Achievement and Urbanicity

Urbanicity	Mean Achievement Percentile			N		
	Poor	Non-Poor	Total	Poor	Non-Poor	Total
City over 200,000	27	44	38	802,000	1,409,000	2,211,000
Suburbs	35	61	59	144,000	1,879,000	2,023,000
City from 50,000 to 200,000	33	55	53	254,000	1,675,000	1,929,000
City Under 50,000	37	55	52	675,000	3,924,000	4,599,000
Rural	37	55	52	668,000	3,577,000	4,245,000

the large cities, where it is 38. This very low score for the large cities means that they should have many students enrolled in CE programs, and indeed this is the case. But we have previously seen that rural areas also have many students in CE programs, and yet they have achievement levels slightly above the national mean. This probably reflects the relative poverty of rural areas, whereby they get relatively more Title I funds than would be indicated by the achievement levels of rural students. Within urban areas of the same size, there is a marked difference in the achievement levels of students from poor and non-poor families, with the children from poor families scoring about 18 percentile points below those from non-poor families.

The analyses done over regions of the country are shown in Table III-12 and show some expected and unexpected results. As reflected by the overall figures, the rank order of the regions, in terms of achievement, is Midwest, Northeast, Mid-Atlantic, and South and West tied at the bottom. The rank orders, when examined separately for the poor and the non-poor, are essentially the same. As expected, the Midwest and Northeast are at the top of the rankings, and the South is at the bottom. But what is unexpected is that the West should be at the bottom with the South. When the West is examined in more detail it turns out that Pacific Northwest children have scores which are slightly higher than

those for the Midwest, but the scores for the Pacific Southwest are lower than for any other sub-region of the country. This is presumably due to the fact that there are many Hispanics in the Pacific Southwest and, as we have previously seen, their scores are among the lowest of any group. This finding should be interpreted cautiously because of possible sampling errors for sub-regions, and because of problems that many Hispanic children may have had with an achievement test where the test items were in English (but it should be noted that the instruction in the schools was also in English). Nevertheless, there are large regional differences and the need for CE is reflected in these regional differences in achievement.

Table III-12

Student's Family Income, Achievement and Geographic Region

Geographic Region	Mean Achievement Percentile			N		
	Poor	Non-Poor	Total	Poor	Non-Poor	Total
Northeast	36	58	54	474,000	2,414,000	2,888,000
Mid-Atlantic	34	55	52	195,000	1,618,000	1,813,000
South	31	49	45	1,013,000	3,117,000	4,130,000
Midwest	40	60	58	497,000	3,533,000	4,030,000
West	30	48	45	407,000	1,939,000	2,346,000

Finally, it should be noted that there are sex differences associated with CE selection. It has long been known that at the elementary level girls score higher on achievement tests than do boys. Table III-13 again demonstrates this fact. It will be seen that for both poor and non-poor children the mean test score for girls is somewhat higher than for boys. There are thus more boys receiving CE than there are girls. This should not be attributed to sex discrimination, but rather to the fact that, in terms of a uniform standard of achievement, boys need CE more than girls do.

Table III-13

Student's Family Income, Achievement and Sex

Sex	Mean Achievement Percentile			N		
	Poor	Non-Poor	Total	Poor	Non-Poor	Total
Boys	31	52	49	1,263,000	6,409,000	7,672,000
Girls	36	57	54	1,253,000	6,098,000	7,351,000

At the beginning of this chapter we mentioned Congress' requirement that a study be undertaken to determine the number of students receiving Title I services as a function of the poverty level of the families from which the students came and also as a function of the levels of achievement of the children. We will now examine the joint effect of poverty and achievement on selection for CE services. Table III-14 shows the percentage of students selected for CE as a function of the definitions in the law, namely poverty, defined in terms of the Orshansky Index, and achievement defined in terms of low or regular achievement. One can determine from the table that 74 percent of the students do not receive any CE, 16 percent receive Title I, and 10 percent receive Other CE. Of the students who are both poor and low achievers, 47 percent do not receive any CE while 53 percent do. Of those who are non-poor but low achievers, 58 percent do not receive CE while 42 percent do. Similarly, among those who are poor but regular achievers, 70 percent do not receive CE, while among the non-poor and regular achievers, 83 percent do not receive CE--although 17 percent do. Ideally there would be no students in the low-achieving group who were not receiving CE, and there would be few regular-achieving students who are receiving it. But when one considers the difficulty of correctly classifying children (often based on subjective judgments and less than perfectly reliable tests) the numbers shown seem to represent a reasonable performance on the part of the schools in selecting CE students. Given an effective selection system, the most straightforward way of supplying CE services to the large number of educationally needy students who do not receive CE is to increase the funds available.

Table III-14

Student's Family Income, Achievement and CE Selection
(Grades 2-6)

	Title I/Title I and Other CE	Other CE Only	No CE
	Percent Selected		
Poor - Low Achiever	40%	14%	47%
Non-Poor - Low Achiever	26	16	58
Poor - Regular Achiever	22	8	70
Non-Poor - Regular Achiever	8	9	83
	Number Selected		
Poor - Low Achiever	573,000	196,000	671,000
Non-Poor - Low Achiever	606,000	376,000	1,358,000
Poor - Regular Achiever	442,000	164,000	1,391,000
Non-Poor - Regular Achiever	851,000	900,000	8,821,000
Total	2,472,000	1,636,000	12,241,000

We have previously noted that the Office of Education regulations regarding how students should be selected for CE indicate that they should be selected from the bottom half of the achievement distribution. Table III-15 shows how CE selection is related to economic status in terms of poverty level, as defined by the Orshansky index, and achievement, defined as falling above or below the midpoint of the achievement distribution. Under this relaxed definition many more students are eligible for selection because they fall in the bottom half of the achievement distribution. This table shows that 53 percent of the students who are poor and in the bottom half in achievement do not receive CE, while 67 percent of the non-poor and low achievers do not receive CE.

Table III-15

Student's Family Income, Achievement and CE Selection with Different Selection Criteria*

	Title I/Title I and Other CE	Other CE Only	No CE
	Percent Selected		
Poor and bottom half in achievement	37%	10%	53%
Non-Poor and bottom half in achievement	20	13	67
Poor and top half in achievement	9	7	84
Non-Poor and top half in achievement	4	7	89
	Number Selected		
Poor and bottom half in achievement	916,000	244,000	1,292,000
Non-Poor and bottom half in achievement	1,111,000	736,000	3,679,000
Poor and top half in achievement	82,000	65,000	752,000
Non-Poor and top half in achievement	278,000	540,000	6,605,000
Total**	2,387,000	1,585,000	12,328,000

*Table III-14 shows the percent selected for CE in terms of the criteria selected by Congress for the Participation Study. This table retains the same definition of poverty but divides the students in half on the achievement criterion.

**These totals differ from those in Table III-14 because of rounding errors.

On the other hand 16 percent of the poor and in the upper half in achievement do receive CE and 11 percent of the non-poor and high-achieving students receive CE. In Report #2, other definitions of eligibility are considered. The number of students who do or do not receive CE services varies considerably as various definitions are adopted. Thus, a judgment about how well students are selected and how many are served by CE programs depends on how poverty and achievement are defined.

THE EFFECT OF DIFFERENT MEASURES OF ACHIEVEMENT

The analysis of the number of children receiving CE as a function of their achievement level has been based on combined reading and math measures. That is to say that a student's CE status was defined in terms of whether or not the student was receiving reading and/or math CE services, with the achievement level being determined by the score on a combined reading and math achievement test scale. While the law requiring the Participation Study spoke of Title I as an overall program rather than in terms of reading services or math services separately, it seemed desirable to see if the classification of students would be changed if the classification were based on a reading test, a math test, or the two combined. It has also been argued that the results might have been different if the analysis had been done separately if the students receiving reading CE had been classified on a reading test and the students receiving math CE had been classified on the math test results, rather than on results from combining the reading and math tests.

The reason the original analyses were done on the basis of the combined scores was the belief that the separate analyses would give essentially the same results as those based on combined test scores and that the law did not make any distinction. This belief was based on the fact that there was a high correlation between the combined score and either the math or the reading test separately. Table I-16 of Report #9 shows that these correlations range from a low of .82 to a high of .96. However, interest continued as to the nature of the results if the analyses had been done using separate test scores. We therefore made a special analysis for this report. Table III-16 shows the percentage of students receiving various CE services when classified in terms

Table III-16. Percentage of Students Receiving Reading and/or Math CE Services by Achievement Level Based on Reading, Math, or Combined Achievement Tests

Achievement Level	CE Selection Status												Total
	Title I or Title I and Other CE			Other CE Only			No CE at a CE School			No CE at Non-CE School			
	Reading %	Math %	Both %	Reading %	Math %	Both %	Reading %	Math %	Both %	Reading %	Math %	Both %	
Low Achievers	31	28	31	16	17	15	42	45	42	10	11	12	99% 101% 100%
Regular Achievers	9	12	10	9	10	9	69	67	66	11	12	15	98% 101% 100%

of a reading test, a math test, and both tests combined. Here the students are classified as CE students if they are receiving reading CE only, math CE only, or both. Table III-17 shows similar results except that the students are classified in terms of achievement test quartiles rather than in terms of grade equivalents. It will be seen that the results are very similar irrespective of whether the classification is done by the use of combined tests or separately by the reading or math tests. Thus, we conclude that the results reported in Reports #2 and #3 are invariant to the particular achievement classification scheme used.

As indicated above, it was also suggested that the classification of students should have been done separately for reading or math CE services and the appropriate reading or math tests should have been used to make the classifications. Again special analyses were done for this report and the results are shown in Tables III-18 and III-19. The tables show that the percentages of students classified in the various achievement levels by type of CE service are almost identical whether classified in terms of the reading test for reading CE or the math test for math CE or in terms of both tests combined. Of course the tables also show that there are only about one half as many students classified as receiving math CE as there are receiving reading CE. The results reported here are almost identical to those previously reported in Table 2-2 of Report #3 of the Participation Study.

Our overall conclusion is that it makes little difference whether the achievement scores used to classify students on achievement are reading scores alone, math scores alone, or both combined. The proportion of students designated as receiving various CE services in terms of levels of achievement is essentially the same irrespective of the particular achievement measure used.

HOW ARE STUDENTS SELECTED FOR CE?

The selection of schools to receive CE resources and the selection of students for CE services is a complex process and varies considerably from district to district and from school to school. SES Report #5 explores this problem in some detail. It concludes that in selecting schools for CE resources, dis-

Table III-17. Percentage of Students Receiving Reading and/or Math CE Services by Quartiles on Reading, Math, or Combined Achievement Tests

Achievement Level	CE Selection Status												Total
	Title I or Title I and Other CE			Other CE Only			No CE at a CE School			No CE at Non-CE School			
	Reading %	Math %	Both %	Reading %	Math %	Both %	Reading %	Math %	Both %	Reading %	Math %	Both %	
Bottom Quartile	31			17			42			10			100%
		28			16			46			10		100%
			32			14			42			11	99%
2nd Quartile	19			13			57			10			99%
		20			13			57			11		101%
			19			11			58			12	100%
3rd Quartile	7			9			73			11			100%
		10			9			70			12		101%
			7			8			70			15	100%
Top Quartile	3			6			79			12			100%
		3			8			79			11		101%
			2			6			75			17	100%

Table III-18. Percentage of Students Receiving Reading (or Math) CE Services by Achievement on Reading (or Math) Achievement Tests or Both Tests Combined

Achievement Status	Reading CE Selection Status								Total
	Title I or Title I and Other CE		Other CE Only		No CE at a CE School		No CE at Non-CE School		
	Reading %	Both %	Reading %	Both %	Reading %	Both %	Reading %	Both %	
One Grade Level Below	27	28	17	18	46	44	11	10	100%
Above One Grade Level Below	8	7	8	8	72	73	12	12	100%

Achievement Status	Math CE Selection Status								Total
	Title I or Title I and Other CE		Other CE Only		No CE at a CE School		No CE at a Non-CE School		
	Math %	Both %	Math %	Both %	Math %	Both %	Math %	Both %	
One Grade Level Below	15	18	13	14	61	58	11	10	100%
Above One Grade Level Below	5	4	8	7	75	77	12	12	100%

Table III-19. Percentage of Students Receiving Reading (or Math) CE Services by Quartiles on Reading (or Math) Achievement Tests or Both Tests Combined

Achievement Status	Reading CE Selection Status								Total
	Title I or Title I and Other CE		Other CE Only		No CE at a CE School		No CE at a Non-CE School		
	Reading %	Both %	Reading %	Both %	Reading %	Both %	Reading %	Both %	
Bottom Quartile	27	28	17	17	46	45	10	10	100%
2nd Quartile	17	16	12	13	61	60	10	11	100%
3rd Quartile	5	6	8	8	75	75	11	11	100%
Top Quartile	2	2	5	5	81	81	12	12	100%

Achievement Status	Math CE Selection Status								Total
	Title I or Title I and Other CE		Other CE Only		No CE at a CE School		No CE at a Non-CE School		
	Math %	Both %	Math %	Both %	Math %	Both %	Math %	Both %	
Bottom Quartile	14	16	13	13	62	61	10	10	100%
2nd Quartile	9	9	10	10	69	70	11	11	100%
3rd Quartile	4	4	8	8	76	77	12	11	100%
Top Quartile	2	1	7	6	81	81	11	12	100%

tricts use a number of criteria and that "the most frequently used criteria, either alone or in combination are: free or reduced-price lunch counts alone (22 percent), AFDC enrollment alone (15 percent) and free or reduced-price lunch counts combined with AFDC enrollment (14 percent). The remaining 49 percent of the districts reported using other combinations of criteria with no single combination being used by more than 6 percent of the districts." Once a school receives CE resources it has the problem of how to determine which students actually are selected to receive these resources. Again, we find a number of different methods being used. When school principals were asked to indicate how CE students were selected they indicated the methods shown in Table III-20.

It seems that test results and teachers' recommendations are the two most frequently used methods. Membership in targeted groups or parents' requests are used much less frequently.

Earlier we saw the relationship between poverty and achievement level and student selection for CE services. We concluded that generally the schools were doing a reasonable job in selecting the educationally needy students for receipt of CE services. Note that we resort to statements such as "generally" to describe the success in selecting CE students. It would be desirable to have a numerical index to describe the relationship between need and selection--a Targeting Index. If there were such an index it would allow comparisons of actual performances against some numerical standard. It would make it possible to compare the success of selection practice between schools, districts, or other categories of interest. In SES Report #13 a study is reported that investigates the appropriateness of a number of proposed targeting indexes. Twenty-five different indexes were examined based on different assumptions about what such an index should measure. Here we will examine only two of the possible indexes. The interested reader will want to turn to the full report.

All of the indexes are based on the idea that students should be selected for CE based on educational need. In exploring the indexes, the levels of achievement on the CTBS are taken as indicators of educational need. The first index

Table III-20

Criteria Used by Title I Schools for Selection of CE Participants, and Selection Rates for 'Needy' and 'Non-Needy' Students*

School Selection Criteria	Percentage of 'Needy' Students Selected	Percentage of 'Non-Needy' Students Selected
Test results alone	51	7
Test results and teacher recommendation	49	4
Some combination of test results, teacher recommendation, volunteer, and/or parent request	47	3
Teacher recommendation alone or combined with parent request and/or volunteer	49	5
Membership in one or more target groups only, or in combination with test results	59	10
Target groups, test results, and teacher recommendation	43	--
Some combination of target groups, test results, teacher recommendation, volunteer, and parent request	40	3
All students in the school participate**	(29)	(3)
Total	48	5

*'Needy' and 'Non-Needy' students are defined in terms of teacher's judgment of student's need for CE services.

**Some principals reported that all students in their school participate in CE programs. However, the records of the Compensatory Education Roster (CER) do not indicate that all students in these schools are selected for Title I services.

uses the simple idea that the index should be based on the proportion of students selected for CE who fall below some cut-off point in achievement level. Thus, a school with all of its CE students below, say, the 50th percentile, and none of them above it, is presumably doing a better job of selection than a school where only half of the CE students are below the 50th percentile and half of them are above that level. Table III-21 shows the actual distribution of schools in our sample when the cut-off point is in the 50th percentile. It also shows the percentage distribution for the 35th percentile. The 50th percentile is based on the idea that Title I regulations suggest that Title I students should be selected from those in the lower half of the academic achievement distribution. The 35th percentile was chosen because when teachers are asked which students they think are in need of CE services they tend to select students who fall below the 35th percentile. The table should be read as follows: for the 50 percentile cut-off it shows that if a school had 100 students receiving CE reading services then there were 2 percent of the schools where 60 of the students were below the 50th percentile and 40 students were above the 50th percentile. Similarly there were 11 percent of the schools where out of 100 students, 68 were below the 50th percentile and 32 were above it. At the mid-point in the distribution of schools, the typical school selected reading students in such a manner that 88 percent of the students selected for CE were in the bottom half on achievement, and 12 percent in the top half. For math the split is 84 percent in the bottom half and 16 percent in the top half. If the cut-off is changed to the 35th percentile then for the median school the split is 70 percent of the students below the 35th percentile in reading and 30 percent above it. For math the split for the median school is 62 percent below the 35th percentile and 38 percent above it. It will be noticed that schools do a better job of selecting educationally needy students for reading CE than they do for math CE. It will also be seen that the apparent success of schools in selecting students to receive CE varies depending on the cut-off level used; the schools give the appearance of doing a better job if the criterion is the 50th percentile. This fluctuation in the implications of the index is probably not serious if comparisons are made between schools or districts, but the fluctuation is not desirable if an absolute standard is needed. The most serious problem with this index is that it con-

Table III-21

Percentage of Schools Having CE Selectees Who Score Above and Below the 50th and 35th Percentile

Percentage of Students Selected for CE: Below 50th Percentile	Above 50th Percentile	Reading % of 206 Schools	Math % of 161 Schools
36	64	0	2
44	56	1	3
52	48	2	4
60	40	2	5
68	32	11	11
76	24	12	13
84	16	24	24
92	8	33	19
100	0	15	19
Below 35th Percentile	**Above 65th Percentile**		
12	88	0	1
20	80	0	4
28	72	2	2
36	64	5	4
44	56	6	7
52	48	12	8
60	40	13	16
68	32	17	18
76	24	21	15
84	16	17	10
92	8	6	6
100	0	1	9

siders only the characteristics of the students who are selected for CE and does not consider the characteristics of the students who are not selected. A school with almost all of its students needing CE would look very good on the index irrespective of who they selected, since almost all of the students selected would be below the cut-off point and there would be few students misselected. On the other hand a school with a smaller proportion of needy students might try to do a very careful job of selection but would make some classification errors and would look relatively poor on the index. A good index should consider the characteristics of both students who are selected and those who are not selected.

An index to address that problem can be based on the phi coefficient. A phi coefficient provides a measure of the degree of relationship in a four-celled table. One could make up a table showing the number selected for CE, the number not selected, and whether or not each student scored above or below some defined achievement score. Such a table would look like the one below.

Achievement Scores

	Above 35th Percentile	Below 35th Percentile
Selected	0	35
Not Selected	35	0

Adjusted phi = 1.0

The closer the relationship between selection for CE and scoring below the achievement criterion, the higher the phi coefficient. Also, when the coefficient is corrected for the marginal splits, it will vary from -1.00 to +1.00, thus giving an absolute standard. Table III-22 shows the adjusted phi coefficients for our schools for reading and math. It will be seen that a few schools do worse than would be expected by random selection, but most of

Table III-22

Percentage of Schools By Adjusted Phi Coefficients, Showing Relationship Between CE Selection and Achievement Scores Dichotomized at the 35th Percentile

Adjusted Phi Coefficient	Reading % of Schools	Math % of Schools
Less than -.22	0	1
-.22 to -.13	0	2
-.12 to -.03	1	1
-.02 to .02	0	3
.03 to .12	0	3
.13 to .22	6	7
.23 to .32	8	15
.33 to .42	12	9
.43 to .52	22	17
.53 to .62	21	14
.63 to .72	12	6
.73 to .82	11	7
.83 to .92	6	4
.92 and above	1	11

them do better and a few are very good in the quality of their selection. The median coefficient for reading is .53 and for math it is .48. It seems that for most purposes this Targeting Index is preferable to that based only on the characteristics of the students selected, although it requires more complex calculations.

Other indexes can be developed. For example, instead of dichotomizing the achievement scores as above or below a certain cut-off, one could use the achievement scores as percentiles or as percentile ranks and compute a point-biserial correlation. This has the advantage of using more of the achievement information than does the phi coefficient. In Report #13 still other methods are considered and each has its advantages and disadvantages. The index to be preferred depends on the use to be made of it and on the ability to do complex calculations. The discussion in Report #13 includes a table that answers a number of questions for each index. The questions considered are:

Is the index easy to calculate?
Does the index consider the actual receipt of services?
Does the index consider only CE students?
Is the index based on national or school 'norms'?
Does the index consider all the needy students?
Are the schools penalized if they provide CE services to all students?
Are the schools penalized if they target CE to selected grades only?
Does the index have a known sampling distribution?

At first blush the development of a targeting index would seem like a simple task but, when seriously considered, it is quite complex. The discussion in Report #13 should be helpful to anyone trying to develop a targeting index.

CHAPTER IV. WHAT IS COMPENSATORY EDUCATION?

Summary

To describe Compensatory Education we have contrasted the instructional services received by CE students with those received by regular students in the same schools. It is clear that there are important differences in the services received by these two groups of students. Some of the important differences are:

- *Title I students receive services costing about $436 more than the services regular students receive. Most of this money is spent on teachers, remedial specialists and aides.*

- *Title I students receive considerably more instruction in reading and math than do regular students. But while the Title I students are receiving this additional reading and math instruction the regular students are receiving instruction in these same and other subjects. Thus it is not clear that Title I students enjoy a net gain in total instruction.*

- *Title I students receive their instruction from teachers who have had somewhat less teaching experience than regular teachers. However, the special teachers have had somewhat more coursework and inservice training in teaching methods.*

- *Title I students receive their instruction in somewhat smaller classes than regular students.*

- *The major difference between Title I instruction and regular instruction is that Title I students receive less of their instruction in large groups in regular classrooms and receive much more instruction in small group settings from special teachers and aides.*

- *Teachers of Title I students report using different methods and practices in teaching Title I students than do the teachers of regular students. In reading, Title I students are exposed, throughout their elementary grades, to more elementary or basic reading methods than are regular students, who receive instruction in more complex materials. In the first two grades the approaches used in teaching reading are similar for Title I and regular students, but then they begin to diverge. By the sixth grade the approaches most frequently used with Title I students are least frequently used with regular students and vice versa.*

- *Teachers of Title I students report a much higher use of audiovisual equipment in their instruction than do teachers of regular students.*

We have seen who gets CE but we haven't yet said what CE is. There is no simple explanation or description of CE; it is an amalgam of many different programs, practices, and services. In the Sustaining Effects Study we have two main sources of information about what constitutes CE. First, we have information gained from questionnaire material completed by teachers, principals, and district personnel. From this survey material we can determine what services regular and CE students are reported to receive. Second, we conducted an in-depth study of 55 poverty schools. At these schools we went into classrooms and observed the instruction being given to regular and CE students. We talked to the teachers and principals about what their programs included. From these site visits we have detailed descriptive narratives of CE programs. In this Interim Report we are including only two short descriptions to give a flavor of the variety of CE programs in different schools.

School A

Three discrete Title I program components serve identified students in this fairly large, 63-year-old urban school. The kindergarten program, which will not be described here, serves 48 students. The primary grades' Title I Reading Program serves 144 students in grades 1-3, while the Computer-Assisted Instruction (CAI) Lab serves 266 students in grades 4-6 in both reading and math.

The three primary grades' Title I reading teachers share a single huge room, where each is scheduled to see six groups of eight students for daily 50-minute sessions. Each has responsibility for teaching students from a single grade, but their teaching procedures are generally the same. Early in the fall, a diagnostic test is administered to each pupil. A needs-assessment sheet profiling the student's strengths and weaknesses is developed based on the results of the diagnostic test. On the basis of the needs-assessment profile, the teacher develops a separate prescriptive educational plan for each child, outlining the sequence of skills to be attacked and materials to be used by the student.

Students leave their homeroom classrooms to attend Title I reading instruction. Upon arrival at the Title I room, students pick up their work folders, which contain assignments for the week, and start to work independently, calling on their teachers when they need help. The teachers also provide some small-group instruction daily, usually to subgroups of three to four students who have common instructional needs. Skill profiles are kept up to date as prescriptions are completed, and the diagnostic test is readministered periodically. The Title I room is well-supplied with a wide variety of high-technology equipment and materials which are called into play in the various prescriptions. Heavy use is made of controlled readers, feedback teaching machines, audio tapes, filmstrips, records, instructional kits, and a variety of texts, workbooks, worksheets, and dittos.

The CAI Lab is staffed by one teacher and one aide who oversee students' progress on the 14 teletype terminals in the lab. The terminals are connected to a minicomputer, housed in the school, which serves a number of other schools as well. The provider of the CAI software also provides a curriculum guide, specifying for various levels of performance on the CTBS where students should start in the math and reading curricula. The curricula cover 14 levels of difficulty, depending upon the students' grade levels, entry skills, and progress. The software also provides a "time-out" feature, whereby repeated slow responding is quickly brought to the attention of the teacher. This was perceived to be very valuable for keeping the students consistently on-task.

The teacher and aide monitor student work and provide assistance with either content or machinery as needed by the students. The teacher or the aide reviews the summary printed out on the teletype at the end of each student's daily, approximately 20-minute session. A student who has received 100 percent correct on the day's drill in either subject receives a colorful ribbon award to wear back to the regular classroom. This is called "The 100 Percent Club." When the teacher decides that one or more pupils need additional instruction, help is provided in one of several ways. In most cases, the teacher or the aide will work individually with students while they are at the terminals. In some cases, if there are several students having trouble with a particular skill, the lab

teacher will take a small group into the adjoining room, which is equipped with a chalkboard and several chairs, and will provide small-group instruction on that skill. On occasion, the CAI Lab teacher will also go into the regular classroom during regular math instruction to give a special lesson to an individual or to a group.

School B

The Title I program serving grades 1-8 in this small rural school consists basically of two full-time aides who provide tutorial and small-group instruction. One aide, who has had one year of college, works primarily with second- and third-grade students in reading and math, and occasionally in spelling and penmanship. Due to overcrowding in the school, she is forced to use about the last twenty feet at the end of a hallway as her classroom. The second aide is a former teacher who has been a Title I teacher's aide at the school for 15 years. She meets with students from grades 1-8, variously for reading, math, spelling, social studies, and penmanship, in a combined office/kitchen/music lounge room.

There is fluctuation during the year in terms of which students see the aides for supplemental instruction. Regular teachers send students in need to the aides, with a priority being given to those judged to be most needy. One of the aides estimated that she had served 43 students for at least six weeks, 11 of whom she had worked with for the entire year. Students who are seen on a regular and long-term basis tend to be those who generally have difficulty understanding new concepts as they are introduced in the regular classroom, and thus are behind the other children. Other students are sent on an as-needed basis, when their regular classroom teacher sees that they are having difficulty with a particular new concept or skill. In such cases, they may go to the aide for a few days or a few weeks. Still other children are sent to the aides long enough to catch up on work they have missed during absences from school. For students who attend regularly, the scheduled number of sessions weekly and the duration of those sessions varies from pupil to pupil or from small group to small group. Some students see an aide daily, while others go only once a week,

in sessions ranging from 15 to 45 minutes. The aides work with a maximum of five students in a group, and usually with either one or two students at a time.

The regular classroom teachers generally tell the aides fairly specifically what skills need work by their students, with the aides having more or less latitude in selecting the materials and approach to be used depending upon their relationships with the particular teachers involved. During the 1978-79 school year, no Title I-funded equipment or materials were received at this school, but audiovisual equipment and instructional kits received in previous years are available for use by any teachers in the school. Undoubtedly, in part because of their teaching locations, the aides tend not to use any of the equipment, and generally base their work on whatever texts, workbooks, or worksheets are being used in the regular classroom.

The two Title I programs described here are in marked contrast, but even more extreme pictures could have been chosen to highlight the differences in intensity and content of the instruction received by students, all of whom are labeled Title I students. Survey techniques tend to lump together students receiving quite different services, but in terms of the national program, survey data can give a good summary of the Title I CE program. The material that follows was collected by questionnaires completed by the district staff, by school principals and by teachers and are reported in detail in Report #5.

COMPENSATORY EDUCATION FUNDS--HOW MUCH MONEY IS THERE AND ON WHAT IS IT SPENT?

There are many different sources of CE funds; there is money from local, state and federal sources. The amount of these funds varies widely from district to district and, within a given district, schools vary considerably in the amount and kind of funds they have available. Title I is the largest single source of CE funding, and we will examine Title I in detail throughout this chapter.

We asked the business managers of the school districts to describe the amount of Title I funds that was spent for various kinds of services during the 1976-77 school year. Table IV-1 shows the different services on which Title I funds are spent for reading, math, and common services not associated with either

Table IV-1

Per-Pupil Expenditures of Title I Funds*

	Reading	Math	Common Costs
Teachers	$237	$223	
Remedial and Curriculum Specialist, Teaching Assistants and Aides	181	109	
Training of Instructional and Non-Instructional Staff	11	16	
Administrative Services, Planning, Evaluation	30	37	
Instructional Supplies (texts, AV aids, supplies)	26	21	
New Equipment, Building Alterations, etc.	47	42	
Staff and Materials for School PAC, PTA, etc.			$22
Other Costs**			94

*Columns cannot be added since different schools have different mixes of services.

**Other costs include guidance, counseling, health and nutritional services.

subject. It will be seen that the largest amounts are spent on teachers, curriculum specialists, teaching assistants and aides. Smaller, but in the aggregate, significant amounts are spent on planning and evaluation, supplies, and equipment. Important amounts are spent on parent advisory groups, parent-teacher associations, and the like. Also, funds go to guidance, counseling, health and nutritional services. While these figures cannot be added up to find the expenditures per pupil, since different schools have different mixes of services, they represent significant supplementation to the regular school expenditures. For the schools in the SES sample, the average annual per-pupil regular expenditure was $1,189, and the average Title I per-pupil expenditure was about $436

for Title I students. The exact amounts for per-pupil expenditures are difficult to obtain because of different ways of counting the number of students receiving various services. However, these figures do give an indication of the relative degree to which Title I students receive services over and beyond those given to regular students. The $436 Title I dollars go to pay for the various services that will be described throughout this chapter. There can be no doubt that Title I students receive instructional services different from those received by regular students.

What are these instructional services? In the elementary grades they are largely reading and math instruction. Thus, much of this chapter will be devoted to comparing the amount and kind of instruction received by regular and CE students in reading and math. The school setting in which CE instruction is given varies significantly from school to school. Our approach to defining CE is to ask what services CE students receive in contrast to those received by regular students. Thus, throughout this chapter we will be comparing the amount of instruction CE students received with that received by regular students; we will compare the kinds of teachers giving instruction to CE students with those giving instruction to regular students; we will contrast the instructional approach and techniques used with CE students with those used with regular students.

HOURS OF INSTRUCTION

Generally the number of hours in the school day is fixed, with CE students and regular students in a school receiving a similar number of hours, but the amount of instruction CE students receive in reading and math is different from the amount of instruction received by regular students. Figure IV-1 shows the number of hours of reading instruction received by three groups of students: Title I students, regular students in the same schools, and students in schools that do not have any CE students. The figure shows that in the first and second grades Title I students and regular students in Title I schools receive essentially the same amount of reading instruction. However, students in schools not having CE programs (and thus probably being in more affluent attendance areas and having somewhat higher-achieving students) are, even in the first and second grades receiving, and presumably needing, fewer hours of reading instruction. Starting

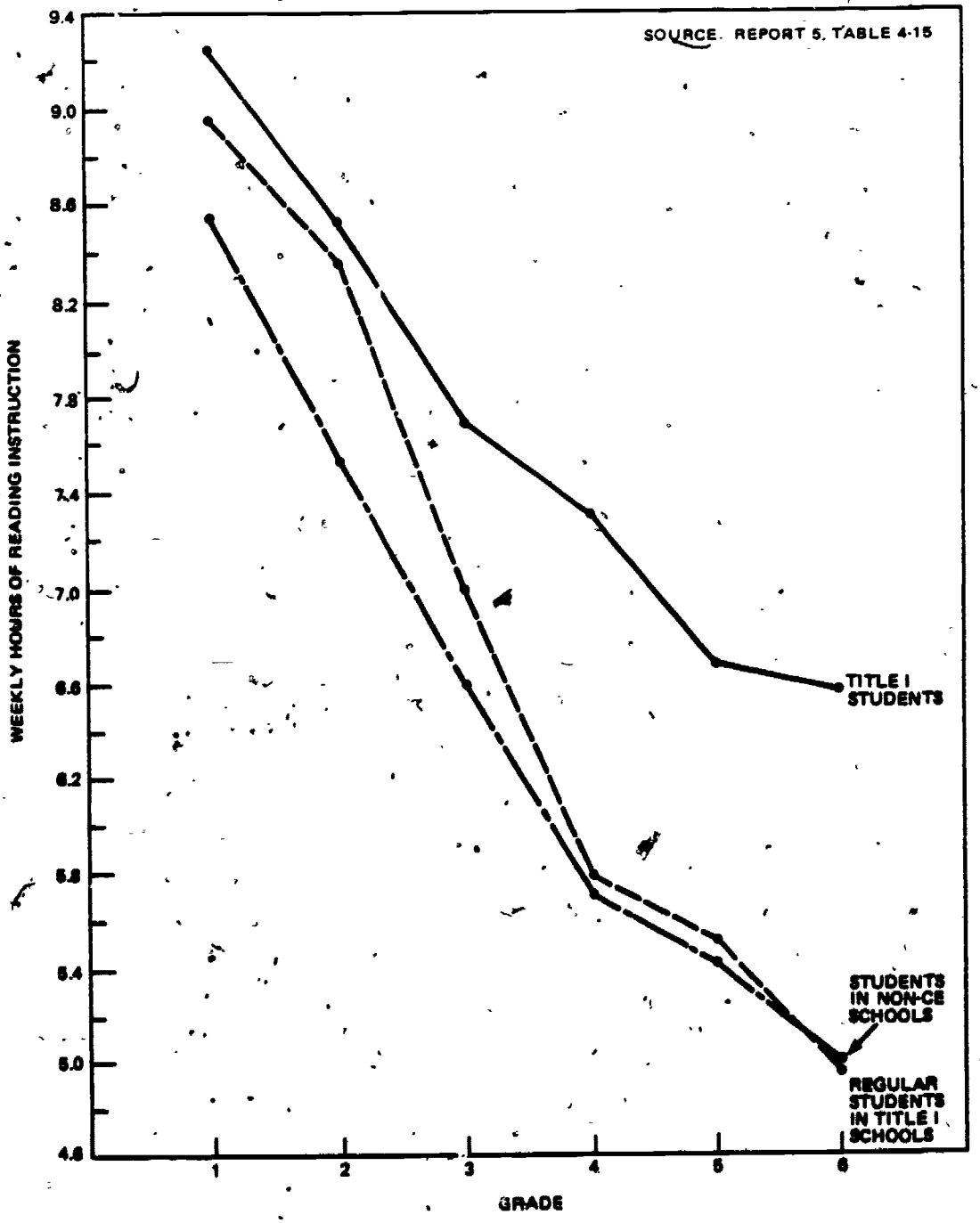

Figure IV-1. Hours Per Week Devoted to Reading Instruction for Title I and Regular Students in Title I Schools and Non-CE Schools

in the third grade and continuing through the sixth grade, Title I students receive much more reading instruction than regular students in either Title I or non-CE schools.

Since CE students spend more of their time on reading instruction than regular students, are the CE students missing out on other instruction? Figure IV-2 shows the amount of reading-related activities received by Title I and regular students. Reading-related activities are in addition to regular reading and include spelling, vocabulary study, grammar, and writing. It seems that the Title I students spend a little less time in reading-related activities than regular students, but the difference is only about a tenth of an hour a week while the difference in reading instruction is as much as 1.8 hours per week.

We asked reading teachers, "When students are participating in compensatory reading activities, in what types of activities are their non-participant peers involved?" Teachers were asked to check all items that applied. The response from grade to grade tended to be quite similar. A majority checked other reading activities, 30 percent checked math activities, about 45 percent checked activities related to other subject matter areas, about 30 percent checked "study time," and about 25 percent checked "student selected activities." About 15 percent checked "visits to the library," about 5 percent indicated physical education activities, and about 2 percent checked "field trips." Thus, while the CE students get more reading instruction, they are missing other instruction. Given the fixed length of the school day, this is almost inevitable and it means that regular students get more instruction in other subject areas than CE students. Reading is basic, and CE students need instruction in reading, but they pay a price for it in terms of other instruction missed.

Figure IV-3 shows that Title I students receive much more instruction in math than do regular students. On the average, regular students receive about 4.8 hours per week of math instruction while CE students receive about 5.8 hours per week; the difference in favor of the CE students starts in the first grade and continues through the sixth grade. In reading we saw a sharp decrease in hours of instruction as grade increased, but in math this is not the case; in math there is a very slight tendency for hours of instruction to increase from

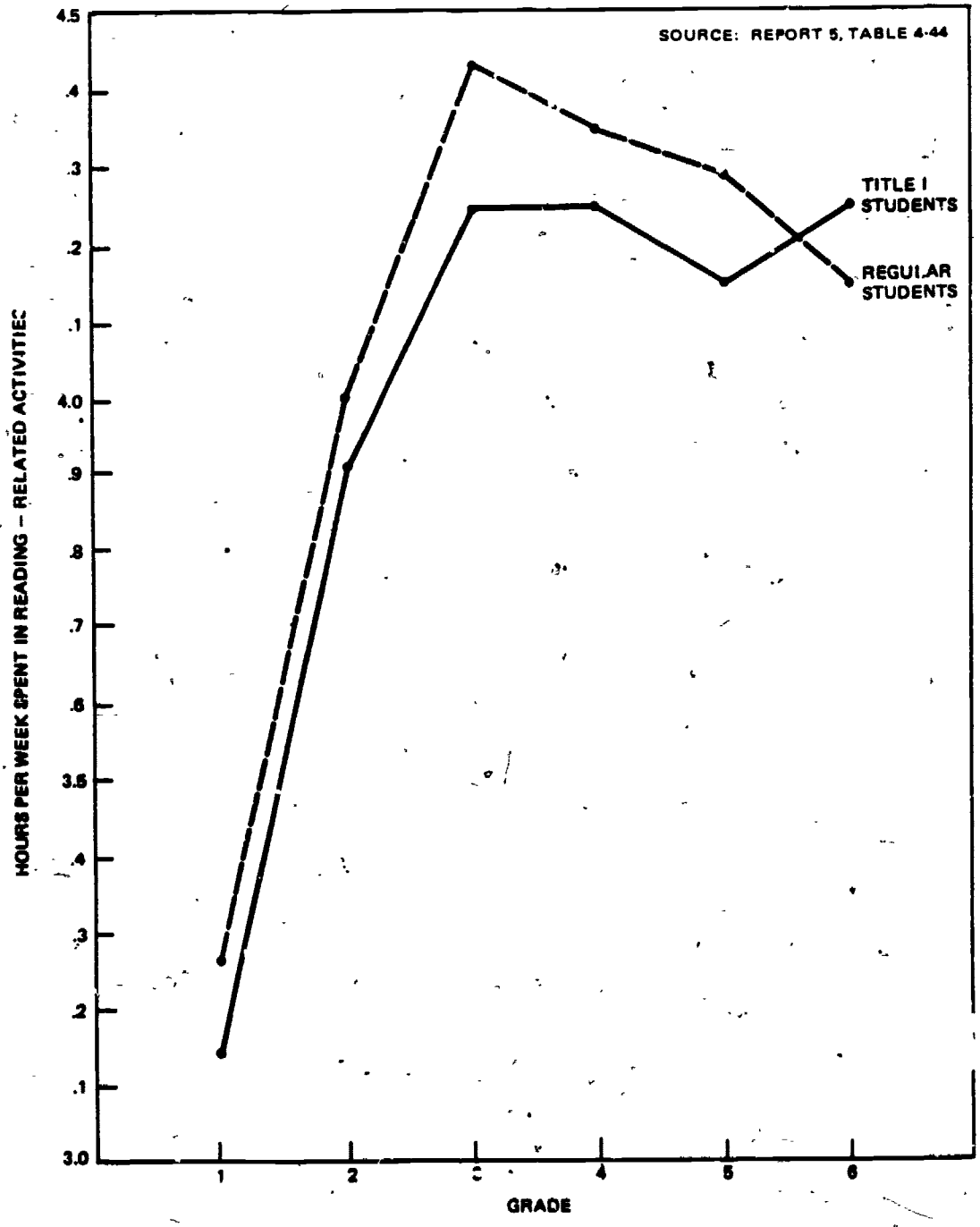

Figure IV-2. Hours Per Week Spent on Reading-Related Activities by Title I Students and Regular Students in Title I Schools

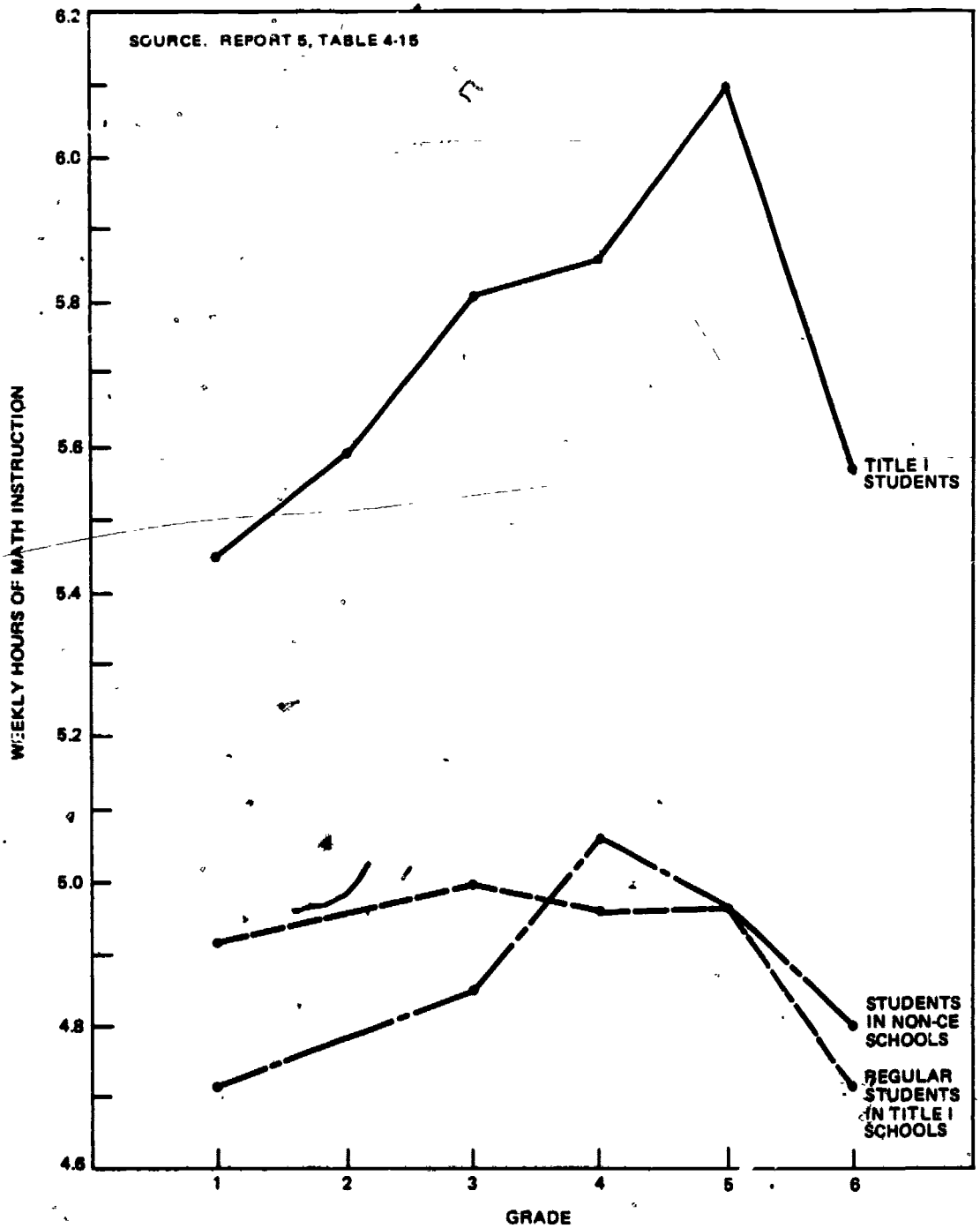

Figure IV-3. Hours Per Week Devoted to Math Instruction for Title I Students and Regular Students in Title I Schools and Non-CE Schools

the first to the fifth grade and then to drop in the sixth grade. Math teachers were also asked to indicate what the regular students did during the time when CE students were receiving additional math instruction. The results are very similar to those reported for reading. The regular students are involved in other math activities, reading activities, activities in other subject areas, general study time, and student-selected activities while the CE students are studying additional math.

In summarizing the results for hours of instructional service, it is clear that CE students receive very significantly more hours of reading and math instruction than do regular students. But while the CE students are receiving this additional instruction the regular students are often receiving instruction in these and other subjects. Thus, CE students have a gross gain in reading and math instruction, but it is questionable whether they have a net instructional gain when the whole range of curricula is considered.

CLASS SIZE

CE students receive more instruction in reading and math than do regular students, but is it of the same or a different quality? One measure of quality is the size of the class in which the instruction is given. Figure IV-4 shows the average class size by grade for Title I students and for regular students in Title I schools. It will be seen that for both reading and math the size of the class increases as grade increases. It is also apparent that classes composed of CE students are smaller than similar classes of regular students. The differences are not large, but even a difference of one or two students should result in somewhat more individual attention for the CE students. At the elementary level much of the instruction in basic subjects is not given to the whole class but rather to smaller groups of students. Figure IV-5 shows the way in which reading instruction is given in terms of the use of subgroups of the full class. In the first four grades almost all of the reading instruction takes place in a subgroup setting and even in the fifth and sixth grade subgroup instruction is the predominant mode of instruction. The use of subgroups characterizes instruction for both Title I students and regular students. There is some tendency for the use of subgroups to decrease as grade increases, and there is a tendency for

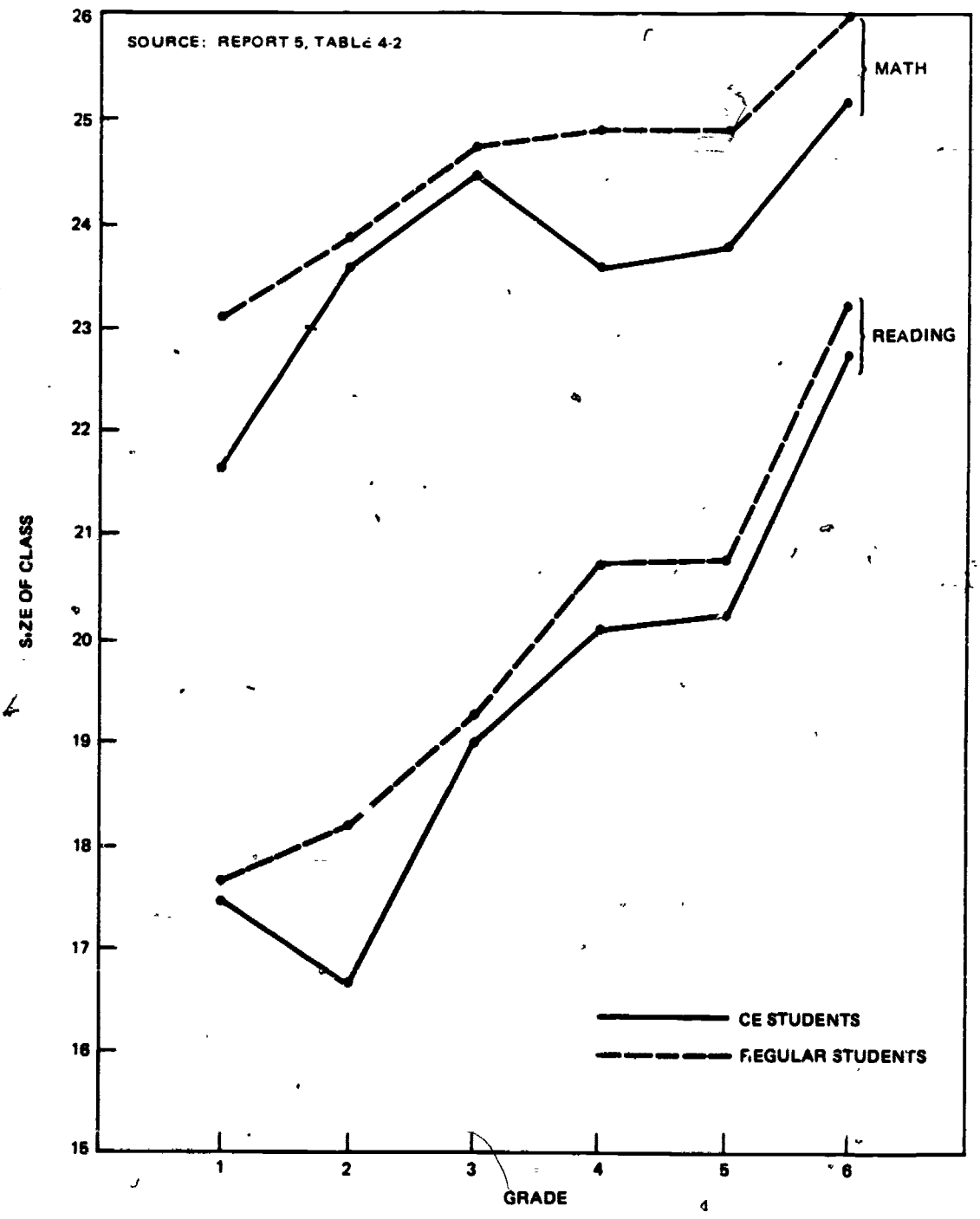

Figure IV-4. Size of Reading and Math Classes for Title I and Regular Students in Title I Schools

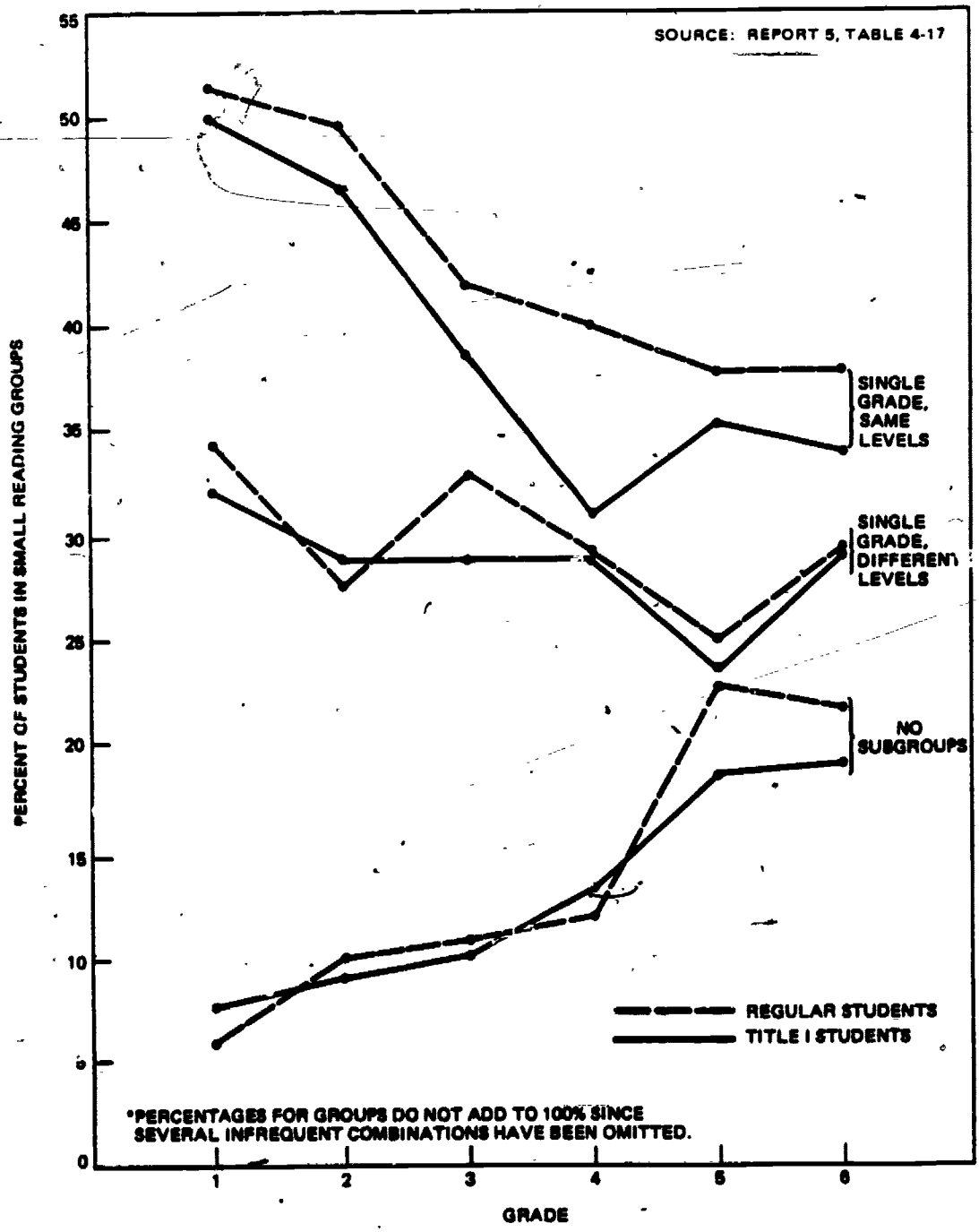

Figure IV-5. Percentage of Students in Various Types of Subgroups for Reading Instruction for Title I and Regular Students in Title I Schools*

regular students to be more frequently in groups composed of students at similar levels of achievement than is the case with Title I students.

A figure similar to Figure IV-5 for reading could be presented for math, but the six lines cross so much that the figure would be more confusing than illuminating. The interested reader can refer to Table 4-17 in Report #5 for detailed figures. The general results are that for math, grouping is used considerably less frequently than it is in reading. For Title I students math instruction is given in groups about 70 percent of the time while for regular students the figure is about 60 percent.

In summary it can be said that Title I students receive their instruction in somewhat smaller classes than regular students. Much of the instruction in reading is given in subgroups rather than to the whole class, and there is a tendency for Title I students to receive subgroup instruction in groups of students of differing achievement levels when compared to regular students. For math the situation is somewhat different with more of the instruction being whole class instruction, but when groups are used we again see that the Title I groups are of differing achievement levels.

WHO TEACHES TITLE I AND REGULAR STUDENTS?

In trying to understand what compensatory education is, we have examined the amount of instruction received by CE and regular students and found that CE students receive more reading and math instruction than regular students. We have also found that CE students receive their instruction in slightly smaller classes than regular students. We now examine whether or not Title I students and regular students receive the instruction from similar or different teachers. Table IV-2 shows a number of characteristics associated with teachers in various classroom settings.

In our sample of schools about a tenth of the teachers were in non-CE schools. Among the reading teachers in CE schools 17 percent teach only CE students, 60 percent teach both CE and non-CE students, and 23 percent teach non-CE students. The corresponding figures for math teachers are 11 percent, 43 percent, and 46

Table IV-2

Average Experience and Training of Teachers

	Teaching Only CE Students	Teaching Both CE and Non-CE Students	Teaching Only Non-CE Students in CE School	Teaching Only Non-CE Students in Non-CE School
Reading				
Percentage of Teachers Who Were:	15	54	21	11
Percentage of Teachers in CE Schools Who Were:	17	60	23	--
Number of Years Teaching in Any School	10.3	11.2	11.0	11.9
Number of Years Teaching in Current School	6.1	6.8	6.6	6.6
Highest Gained College Degree*	2.6	2.4	2.5	2.5
Number of College Courses in Teaching Reading	1.9	1.3	1.1	1.2
Number of Hours of Inservice Reading Training	14.3	12.0	10.2	10.9
Math				
Percentage of Teachers Who Were:	10	38	40	12
Percentage of Teachers in CE Schools Who Were:	11	43	46	--
Number of Years Teaching in Any School	9.3	10.8	11.5	11.9
Number of Years Teaching in Current School	5.8	6.6	7.1	6.7
Highest Gained College Degree	2.5	2.4	2.5	2.5
Number of College Courses in Teaching Math	.9	.7	.5	.6
Number of Hours of Inservice Math Training	8.2	9.0	5.5	6.9

*1 = less than 4 years of college, 2 = bachelor's degree, 3 = 5-year preparation, master's degree, or 6 years specialist degree, 4 = doctor's degree.

percent. Thus, we see that in reading in CE schools most teachers teach both CE and non-CE students, while roughly a fifth teach only CE students and another fifth teach only regular students. In math the situation is somewhat different. There are somewhat fewer math teachers in CE schools who teach only CE students, but there is a considerably higher percentage of math teachers who teach only non-CE students.

For both reading and math, those teachers who teach only CE students have had less total teaching experience and less teaching experience at their current schools. However, those who teach only CE students have slightly more college education, have more college courses in teaching, and somewhat more inservice training than other teachers. Presumably such training should make these teachers more effective. On the other hand, the regular teachers have had more teaching experience, which should make them more effective. In Report #10 the one teacher characteristic which seems to be associated with greater student achievement was the amount of teaching experience of the teacher. Thus, to the extent that Title I students are receiving their instruction from less experienced teachers, and our evidence suggests this is the case, they may be at some disadvantage relative to regular students.

IN WHAT INSTRUCTIONAL SETTING DO TITLE I AND REGULAR STUDENTS RECEIVE INSTRUCTION?

As already indicated instruction can be given in many different settings. It can be given to the whole class in the regular classroom by the regular teacher, or it can be given in small groups by a special teacher, or in a special room by a special teacher, and any number of other combinations. Four times a year we had teachers complete a Student Participation and Attendance Record which, for each student, gave us a report on the setting in which the student received instruction. From this record we can compare the setting in which Title I students and regular students in Title I schools received instruction. Figure IV-6 shows, by grade, the hours of instruction for Title I and regular students in the regular whole classroom setting by the regular teacher. It will be seen that Title I students receive considerably less instruction in reading in this setting. Figure IV-7 shows the same thing for math instruction with the same results. Figures IV-8 and IV-9 show the amount of instruction in reading and math with the

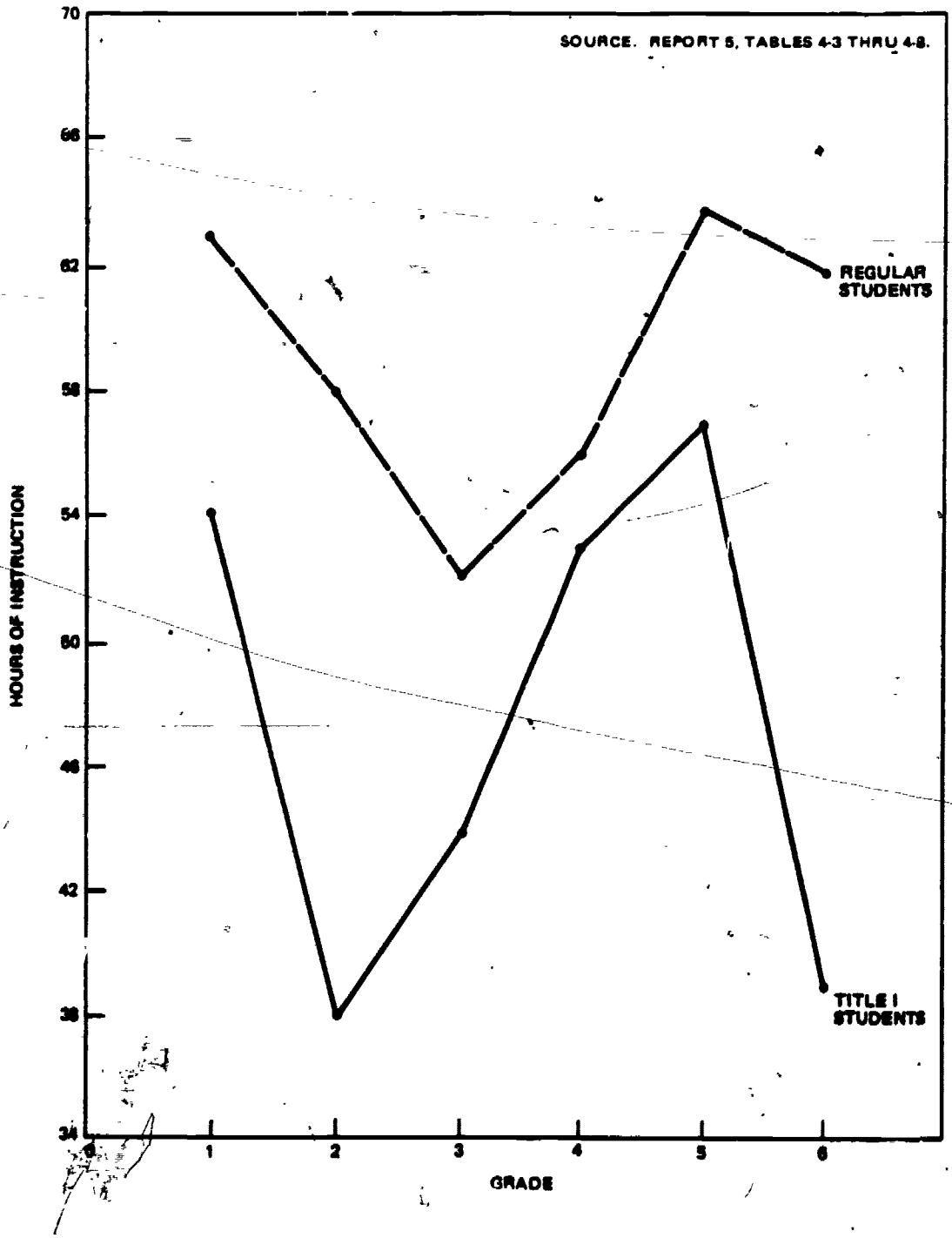

Figure IV-6. Annual Hours of Reading Instruction Received by Title I and Regular Students From Regular Classroom Teachers in Student Groups of 14 or More in Title I Schools

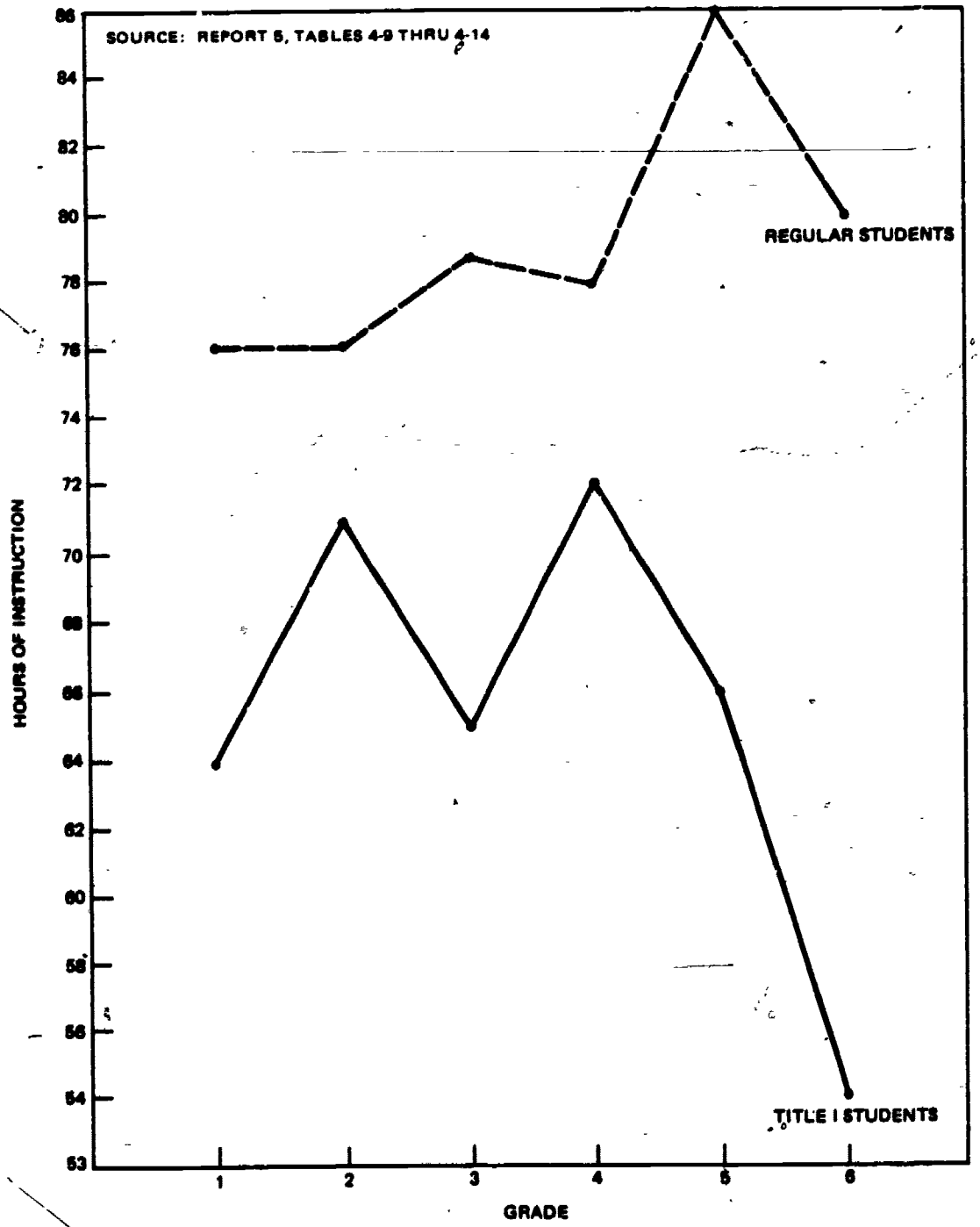

Figure IV-7. Annual Hours of Math Instruction Received by Title I and Regular Students From Regular Classroom Teachers in Student Groups of 14 or More in Title I Schools

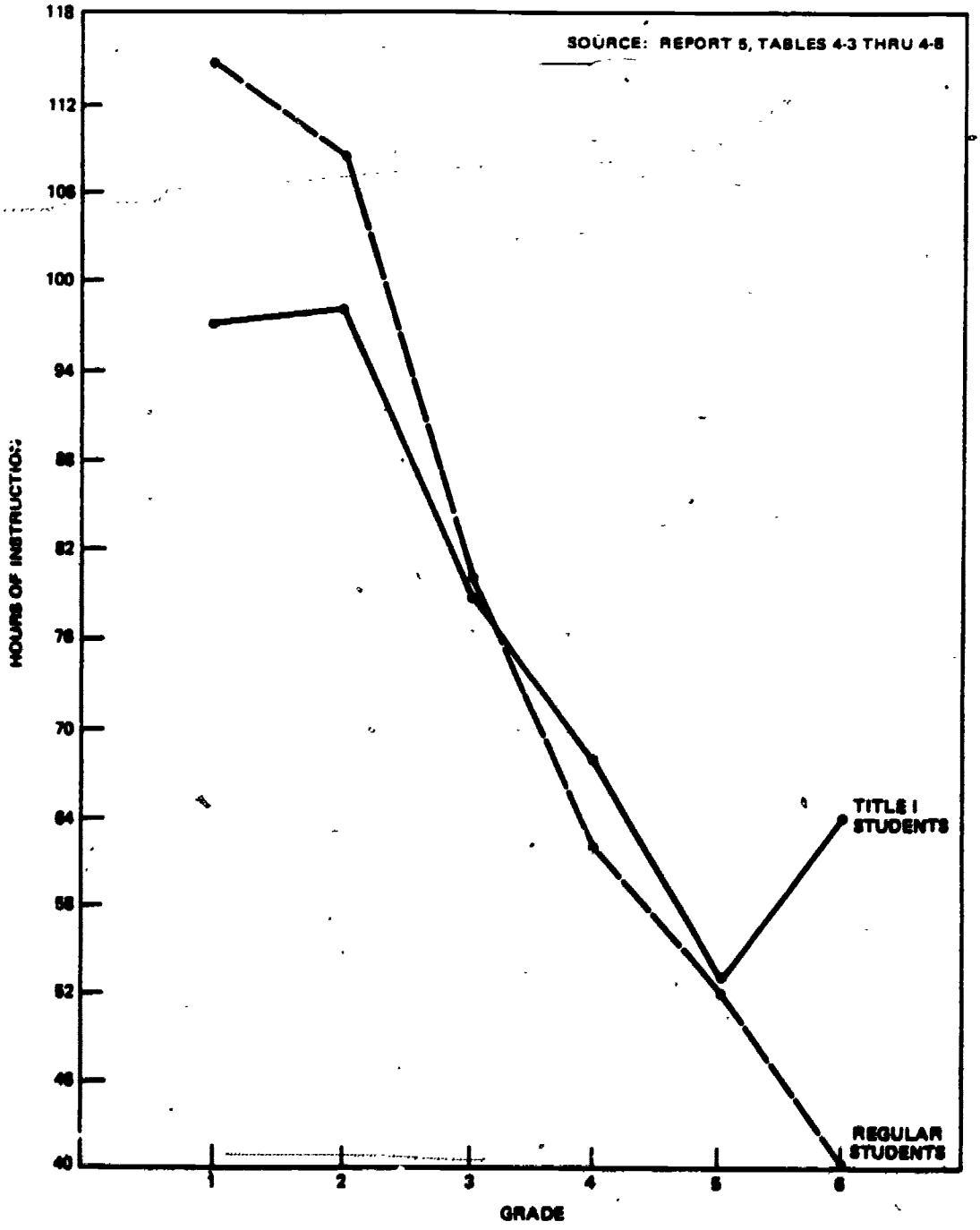

Figure IV-8. Annual Hours of Reading Instruction Received by Title I and Regular Students From Regular Classroom Teachers in Student Groups of 1-13 in Title I Schools

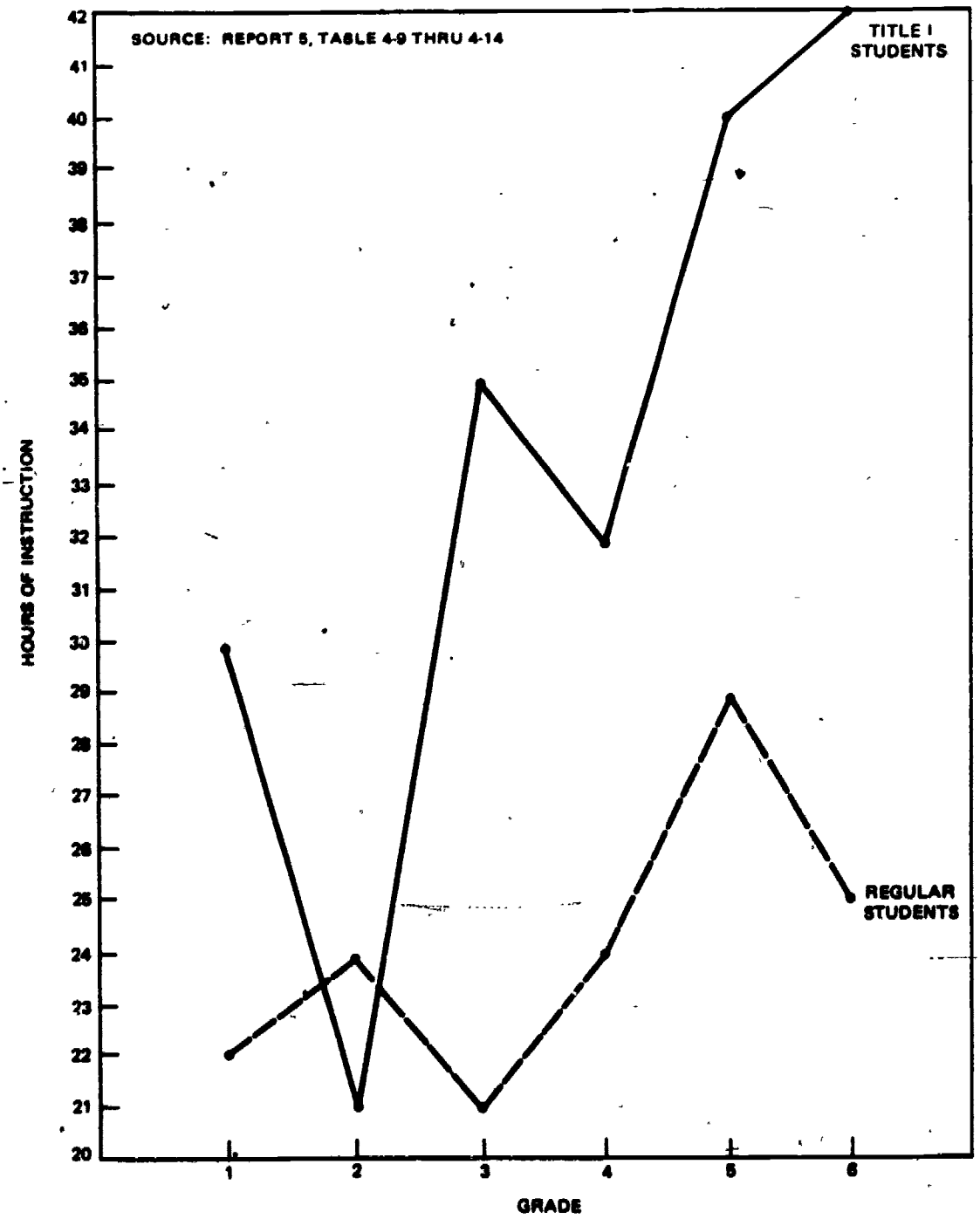

Figure IV-9. Annual Hours of Math Instruction Received by Title I and Regular Students From Regular Classroom Teachers in Student Groups of 1-13 in Title I Schools

regular teacher when the class is broken down into smaller groups. For reading, both Title I and regular students receive about equal amounts of instruction in this setting, but for math, the Title I students receive considerably more instruction from the regular teacher in small groups than do the regular students. Figures IV-10 and IV-11 show the amount of reading and math instruction given by special teachers and aides (usually in a small group setting) for Title I and regular students. It will be noted that the Title I students receive much more instruction in these settings than do regular students. Finally, Figures IV-12 and IV-13 show the amount of instruction where the student is working alone without the immediate assistance of a teacher or aide. It will be noted that regular students engage in considerably more of this kind of learning than do Title I students. This should be to the advantage of the Title I students since they should learn more when being actively taught rather than when working by themselves.

We have included so many graphs on this subject because we think it presents one of the most important instructional distinctions between Title I and regular students. It should be remembered that all of these students come from the same Title I schools. The graphs show clearly that in both reading and math Title I students receive less instruction from the regular teachers in whole classroom settings and that Title I students spend much less time working on their own with workbooks, dittoed sheets, etc. But the most significant difference is that, in contrast to regular students, Title I students receive much more instruction from special teachers and aides in small group settings. The Title I dollars largely go to buy this difference in instructional personnel and setting, a setting that should be favorable to learning. (In Chapter V we will see whether this is indeed the case.)

ARE THE TYPE AND CONTENT OF INSTRUCTION DIFFERENT FOR TITLE I STUDENTS?

We have seen that the services given Title I students and regular students differ in terms of total hours of instruction, size of classes, experience of the teachers, and the setting in which instruction is given. We will now examine the instructional practices used by teachers to see if the way instruction is given differs between Title I students and regular students in the same schools.

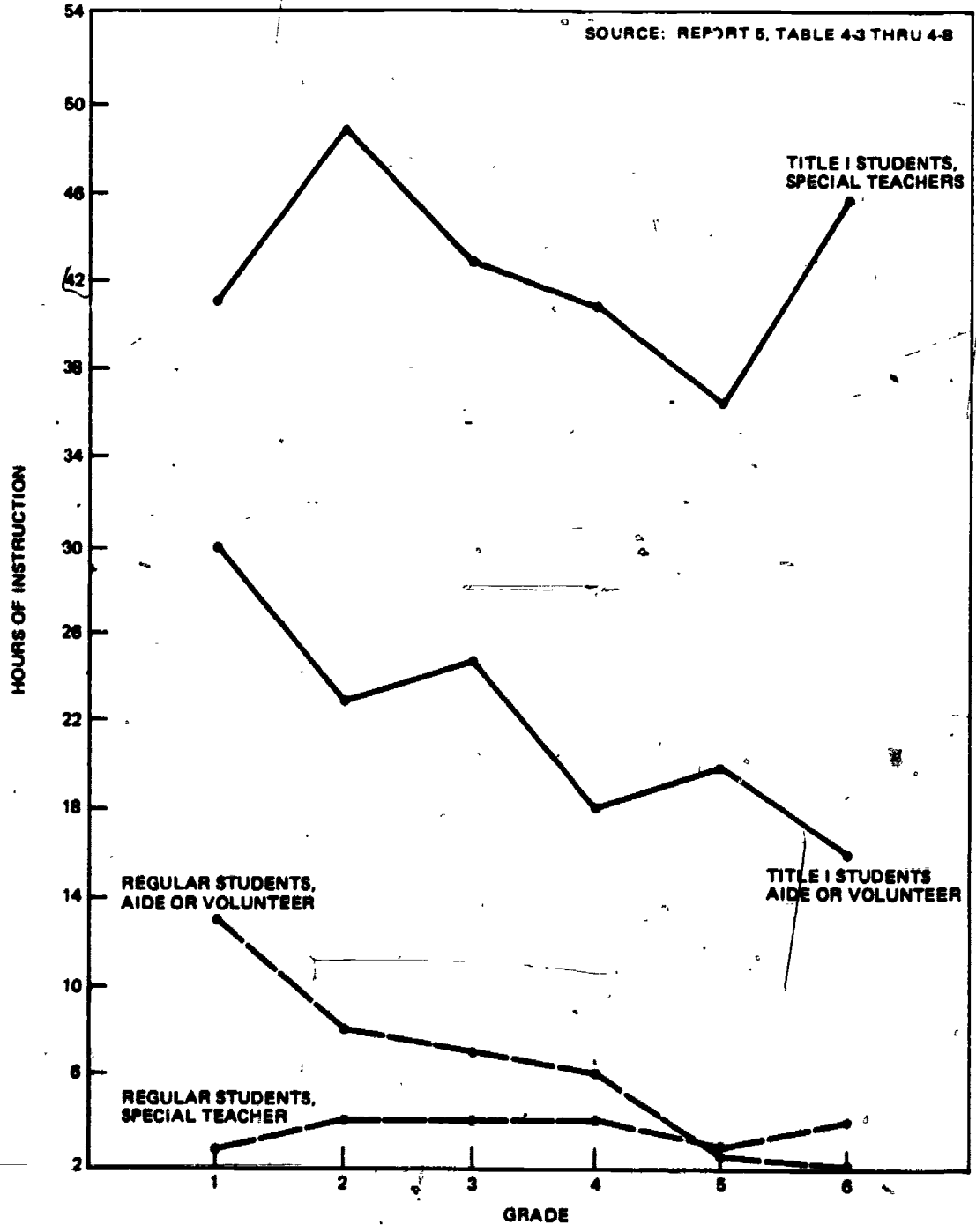

Figure IV-10. Annual Hours of Reading Instruction Received by Title I and Regular Students From Special Teachers and From Aides or Volunteers in Title I Schools

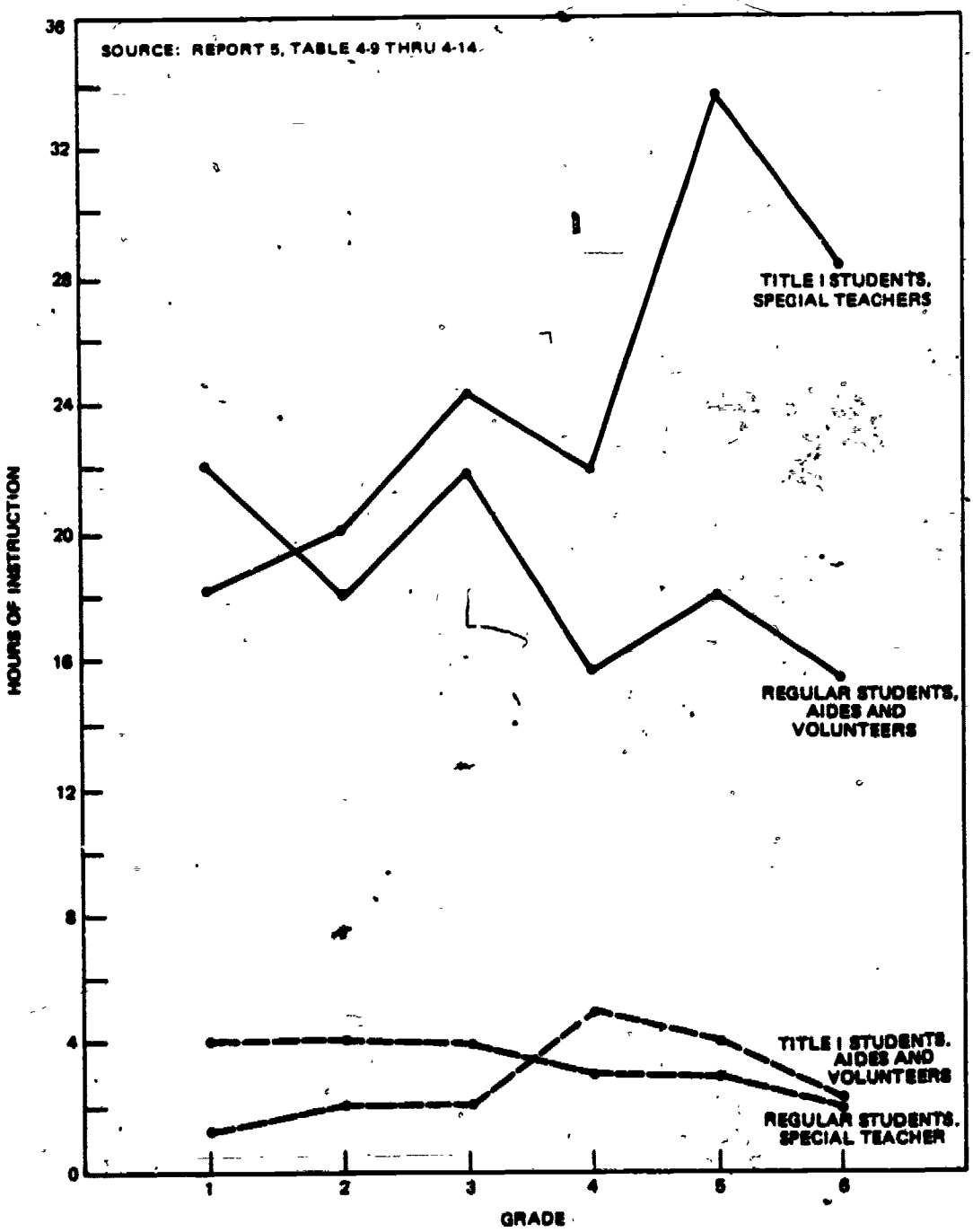

Figure IV-11. Annual Hours of Math Instruction Received by Title I and Regular Students From Special Teachers and From Aides and Volunteers in Title I Schools

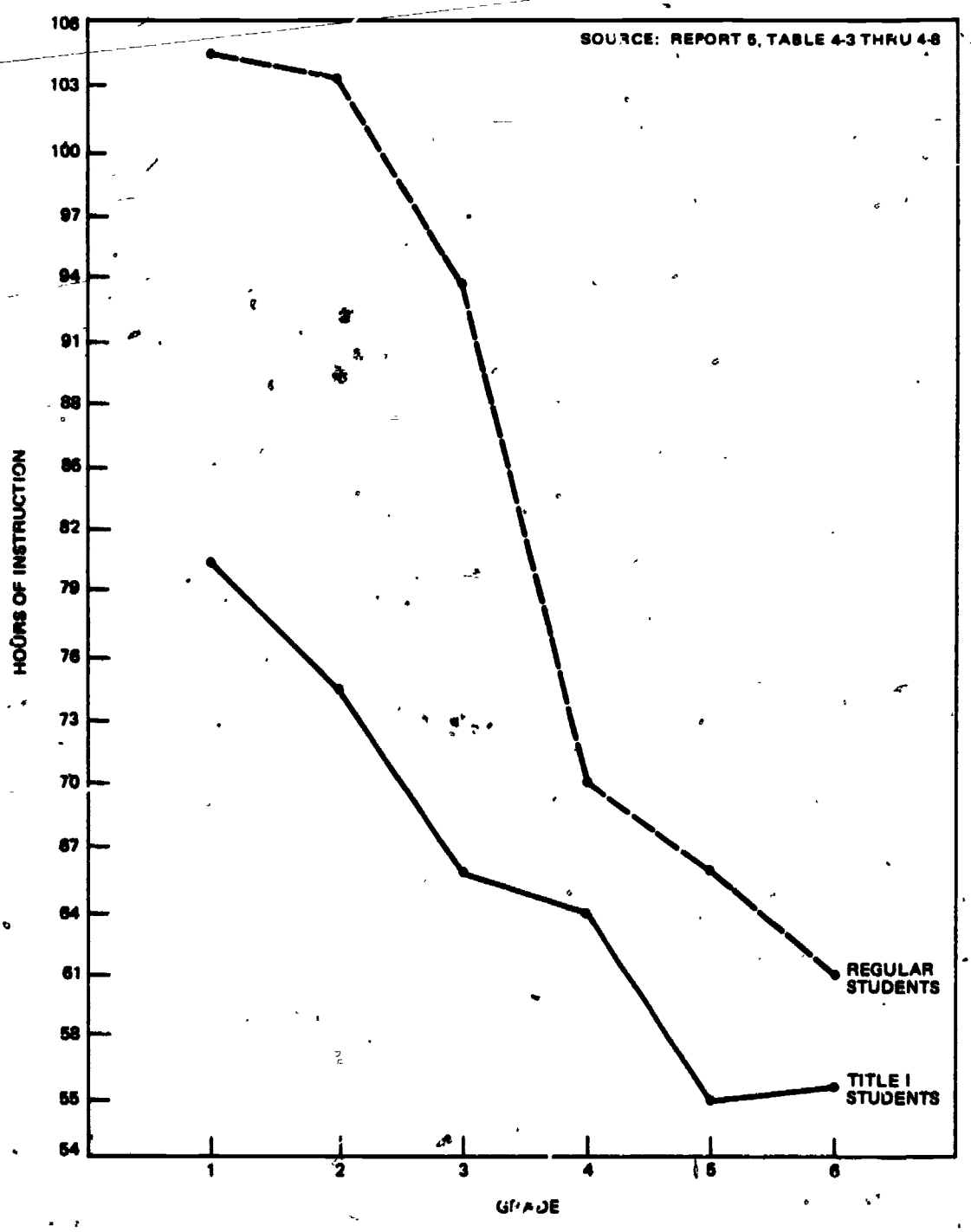

Figure IV-12. Annual Hours of Reading Instruction Received by Title I and Regular Students by Individual Seat Work in Title I Schools

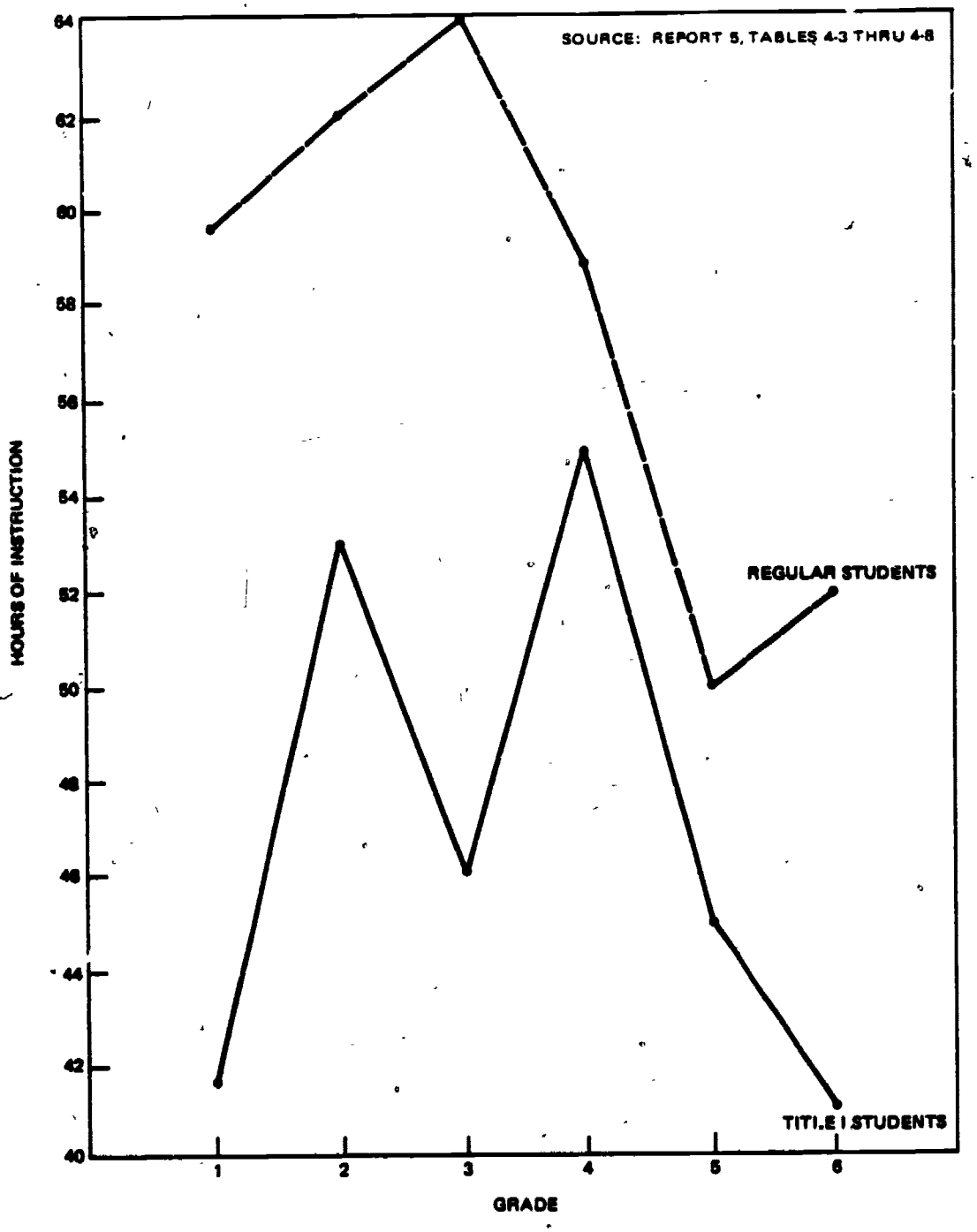

Figure IV-13. Annual Hours of Math Instruction Received by Title I and Regular Students by Individual Seat Work in Title I Schools

Teachers were asked a series of questions about how they gave instruction in reading and math. Teachers were asked, "To what extent are the following aspects of your reading (or math) instruction basically the same for all or most of your students?" They could mark "basically the same for most of the students" or "tends to vary among students." Table IV-3 shows the percentage of students whose teachers reported that instruction varied in a number of areas. In contrasting Title I students and regular students we see that there were a number of areas where instruction varied more for Title I students than for regular students: the amount of time spent in instruction tended to be more variable

Table IV-3

Percentage of Students Whose Teachers Report That Instruction Varies Among Title I and Regular Students in Title I Schools

	Reading		Math	
Type of Instruction:	Title I Students	Regular Students	Title I Students	Regular Students
Total Time in Subject	32	29	32	23
Instructional Objectives	62	54	50	37
Sequence of Activities	56	48	46	34
Expected Rate of Progress	91	92	89	85
Teaching Method	72	69	64	54
Types of Instructional Materials	68	52	56	44
Content of Instruction:				
Based on Approved Curriculum	33	43	32	46
Based on tested needs assessment	19	11	22	10
Both approved curriculum and needs	48	46	45	43

for Title I students, particularly in math; the instructional objectives tended to be more variable for Title I students; the sequence of activities was more variable, again particularly in math, as were the teaching methods and the types of instructional materials. Most teachers of both Title I students and regular students expected the students to show equal amounts of variation in their rates of progress. In terms of the content of instruction there was considerable variability. There was considerably less use of an approved curriculum for Title I students than for regular students. In the case of Title I students there was a considerably more frequent use of a curriculum devised in terms of a test-based needs-assessment rather than on the standard approved curriculum. As grade increased there was much less use of the approved curriculum for Title I students and much greater resort to instructional material based on a needs-assessment. Table IV-3 shows that there is a noticeably greater effort to individualize the type and content of instruction for Title I students than there is for regular students. Many believe this should be a positive factor leading to greater learning.

ARE THE READING AND MATH ACTIVITIES OF TITLE I STUDENTS DIFFERENT FROM THOSE OF REGULAR STUDENTS?

As we progress we are examining in finer detail the actual activities that the teachers use in teaching their students. It is the actual instructional process used that determines the intellectual content or material that the student receives. Teachers were asked to describe the frequency with which they engaged in a variety of instructional activities. There were twelve different reading activities which the teachers described as being used "very frequently" (scored 5) to "never or almost never" (scored 1). The teachers responded on a five-point scale.

The following activities were used with great frequency in the first grade, and their use progressively declined through the sixth grade. Also, these activities tended to be used more frequently with Title I students than with regular students. The activities were:

Identifying and practicing letter-sound correspondence
Identifying and writing letters or groups of letters

Blending sounds letters stand for to form words
Learning and practicing sight words
Reading texts orally

These are all basic activities and are ones students start with in the first grade, where these activities were rated about 4.5 on a five-point scale. While these activities decrease with grade they are still being used "sometimes" in the sixth grade, but they are being used considerably more frequently with Title I students than with regular students.

Similarly there was a group of activities that was used relatively infrequently in the first grade, but its use increased in the higher grades. These activities were:

Dividing words into syllables
Answering comprehension questions on timed reading
Using reference materials such as dictionaries and encyclopedias

These are more complex activities than those in the previous list. There is some tendency for regular students to engage in these activities more frequently than Title I students, as might be expected since the regular students are achieving at a higher level than the Title I students. Finally there was a group of activities that showed no increasing or decreasing trend with grade. The following two activities were engaged in frequently in the first grade and throughout the elementary grades:

Using context clues to gain meaning
Answering questions on comprehension

The following activity was low in the first grade and then at the "sometimes" level in the remaining grades:

Reading and writing stories created by self or other students

In summary, there are a number of different processes used in teaching reading. Basic processes are used very frequently in the lower grades but are used with

decreasing frequency as grade progresses. However, Title I students at the higher grades continue to be instructed through the use of more of these activities than do regular students. More complicated reading processes are used infrequently in the lower grades and more frequently in the higher grades. There is a slight tendency for Title I students to be instructed in these activities less frequently than regular students.

Since learning to read is such an important part of a child's education, we gathered extensive data on teachers' practices in teaching reading. We wanted to see if teachers used different practices in teaching Title I students from those they used with regular students. We have just seen that there are significant differences in the activities that are most frequently used. We went further and attempted to see within these activities if there were particular approaches that were favored by teachers teaching Title I children. For each approach teachers were asked to indicate whether the approach was "used as a major approach," which was scored 3; was "used as a secondary approach," and was scored 2; or was "not used," and scored 1. Listed below are approaches that increase with increasing grade and which are also used more frequently with Title I students. The approaches are listed in the order of the difference in their use for Title I and regular students.

1. An approach that uses a modified alphabet system which either augments or marks the regular alphabet so that it corresponds more closely to the sounds of the language.

2. A self-instructional approach that uses a series that presents material in 'frames' containing small bits of information to which the children are asked to respond. Immediate confirmation as to the correctness of their answers is given in the text.

3. An approach in which children select their own reading materials, such as library-type books, and receive instruction primarily through teacher-child conferences.

4. An approach that uses a reading series and/or library-type books to teach forms of literature and literary appreciation.

5. An approach in which children read their own writings. These 'stories' provide the material on which reading instruction is based.

6. An approach that includes reading in the content fields, such as science and social studies; teaching of study skills, such as how to use tables of content, indices, graphs, dictionaries, encyclopedias, etc., and how to organize materials into outlines, summaries, and reports.

There was only one approach that was used more frequently in the first few grades and was then used less frequently as grade increased. This approach was also one which was used by teachers of Title I students much less frequently than with regular students.

7. An approach that uses a graded reading series containing a vocabulary based upon words that occur frequently in the language. New words are introduced by sight and by a phonic analysis presenting the letter-sound relationship of consonants before that of vowels.

There were two approaches that were used as frequently in the higher grades as in the lower grades, but these approaches were used significantly more frequently with Title I students than with regular students.

8. An approach that uses a graded reading series containing a vocabulary based primarily upon words that are regularly spelled. The most common patterns, those containing short vowels, appear first, a typical sentence in an early reader being: Nat is a fat cat. Gradually, more complicated, less frequent patterns are introduced. New words are learned by analysis of spelling patterns or by sounding and blending.

9. An approach that uses a graded reading series containing vocabulary that rapidly introduces the letter-sound relationships of all the sounds in the language. Long and short vowels are introduced at the onset. New words are learned by sounding and blending.

Finally, there was one approach which differed by having one trend for Title I students and a different one for regular students. This approach was used with equal frequency for both groups in the first grade, increased with frequency of

use in the second grade and for regular students continued to increase to the sixth grade. But with Title I students its use decreased after the second grade and was lower in the sixth grade than it had been in the first grade.

10. An approach that uses a reading series and/or other books to teach both literal comprehension and understanding of implied meanings in the text.

The previous results have been presented in terms of changes in frequency of use of the various approaches as grade changes and in terms of the size of the differences in use with Title I and regular students. This presentation may give a wrong impression regarding the frequency of use of the various approaches. The frequency of use varies greatly from the first grade to the sixth. In the first grade the same approaches tend to be used with Title I students as with regular students, but the differences increase with grade. The following list gives the rank order of the frequency of use of the approaches for Title I and regular students in the first grade. The approach listed first is the most-used approach while the last one is least used. (In the list the number is the one used in the text above to identify the description of each approach while the short sentence is a capsuled statement of the major characteristics of the approach.)

Title I Students in the First Grade	Regular Students in the First Grade
7. Graded sight phonic analysis	7. Graded sight phonic analysis
9. Graded letter-sound relationships	10. Literal and implied comprehension
10. Literal and implied comprehension	9. Graded letter-sound relationships
8. Graded spelling, sounding/blending	8. Graded spelling, sounding/blending
4. Literary forms and appreciation	4. Literary forms and appreciation
5. Students read own writing	5. Students read own writing
1. Modified alphabet	3. Students select own materials
3. Students select own materials	2. Self instruction with reinforcement
6. Reading in content fields	6. Reading in content fields
2. Self instruction with reinforcement	1. Modified alphabet

As the list shows, the frequency with which the approaches are used is about the same for Title I students and regular students in the first grade. Phonics, letter-sound relationships, and comprehension are the three most frequently used approaches for both groups in the first grade. Among the least frequently used approaches are modified alphabet, reading in content field, and self instruction. Those who are strong advocates of phonics should be pleased to see that it is the most frequently used approach for Title I students and regular students in the first grade. But what happens as grade increases? The following list shows the rank order of the same approaches for students in the sixth grade.

Title I Students in the Sixth Grade	Regular Students in the Sixth Grade
1. Modified alphabet	10. Literal and implied comprehension
2. Self instruction with reinforcement	6. Reading in content fields
5. Students read own writing	4. Literary forms and appreciation
3. Students select own materials	7. Graded sight phonic analysis
4. Literary forms and appreciation	3. Students select own materials
6. Reading in content fields	9. Graded letter-sound relationships
8. Graded spelling, sounding/blending	8. Graded spelling, sounding/blending
9. Graded letter-sound relationships	2. Self instruction with reinforcement
7. Graded sight phonic analysis	5. Students read own writing
10. Literal and implied comprehension	1. Modified alphabet

In this list for the sixth grade the contrast between the approaches used for Title I students and regular students is striking. The first three approaches used with Title I students are the last three used with regular sixth grade students. The three most-used approaches with regular students are the last three approaches used with Title I students. It seems that the most-used approaches with regular students in the sixth grade are advanced approaches, that is, they assume a mastery of elementary reading and emphasize comprehension, literary form and content-field reading. The first three approaches with Title I students are different. Students who are having reading difficulty are exposed to approaches emphasizing modified alphabet, self instruction, and reading their own writing. And this is no fluke of the data. The list for the fifth grade is almost identical, with the first three items for the fifth grade being the same

ones as for the sixth grade for both Title I students and regular students. It seems that Title I students are much more frequently taught by special teachers and aides and are assigned to self instruction and the reading of their o[illegible] writing in the higher grades. As researchers we are not reading specialists, but this ordering of approaches may not be the best. We believe it would be useful for these data to be explored in depth by reading specialists to see if, in their judgment, the proper approach is being taken to teaching reading to Title I students in the higher grades.

In summarizing this material on the practices used in teaching reading it is clear that both the activities engaged in and the approaches used vary considerably with grade. Some practices are used more frequently as grade increases, others are used less frequently, and some retain about the same frequency. For many of the teaching practices there are clear differences in the activities and approaches used with Title I students and with regular students, and this varies with grade. Some of the practices used with Title I students in the higher grades do not have intuitive appeal and should be studied in detail by reading specialists to see if the best approaches are used with Title I students.

For math the trends are not as strong as they are in reading. The activities that are used relatively frequently in the lower grades and less frequently in the higher grades are, in the order of their frequency of use:

Learning about number sentences
Learning about sets
Learning symbols
Working with math games
Working with physical models

To those of us who were in elementary school a number of years ago this is a surprising list. That learning about number sentences and about sets should be high in the first grades and then decrease does not fit our expectations. The activities which are low in the first grades and increase as grade increases are, again in order of most use:

Reviewing computational skills
Learning about number theory
Learning about measurement
Learning properties and axioms

Again speaking as laymen in math instructional theory, it seems appropriate that computational skills should be emphasized in the early grades, but it is surprising that it increases up to the sixth grade. It is surprising that number theory is emphasized early.

Activities which are flat and ordered from high to low use are:

Learning about fundamental operations
Learning math vocabulary
Learning geometric concepts
Learning about structure of number systems

One final activity, solving word problems, starts with a low frequency in the first grade, then increases through the second, third and fourth grades, and then decreases. There are small differences between Title I and regular students in terms of the activities used in their math instruction. Relative to regular students, Title I students receive more "learning about the structure of number systems," "working with math games," "working with physical models," and "learning about sets." While these differences are not large, it surprises us that they are emphasized with Title I students.

DO TEACHERS USE MATERIALS AND EQUIPMENT DIFFERENTLY WITH TITLE I AND REGULAR STUDENTS?

In teaching reading and math, teachers use a number of different approaches to teaching. They all use some kinds of materials and equipment. Among the materials used by teachers are regular texts, supplemental readers, 'free reading' books, reference books, workbooks, dittos, programmed texts, games, puzzles, geoboards, and many others. We compared the use of these materials for regular-achieving students and low achievers and found some differences although all these materials were used with all kinds of students. There was a slightly

smaller use of texts with low-achieving students and a slightly larger use of programmed materials. As a general rule it seemed that the low-achieving students were given more instruction with materials that were obtained in addition to the regular text material. The same tendency was definitely the case with equipment such as sound projectors, individual viewing equipment, tape recorders, listening centers, special reading machines, study carrels, etc. Title I students receive much more instruction through the use of equipment than do regular students as is shown in Figure IV-14. If such use of equipment is effective, Title I students should certainly show achievement improvements.

What is compensatory education? There is no single thing that can be called compensatory education. It is a whole series of things which are different in the education of CE students than would have been the case if they had been regular students. The instruction of Title I students differs from regular students in the following respects:

Title I students receive services costing about $436 more than the services regular students receive. Most of this money is spent on teachers, remedial specialists and aides.

Title I students receive considerably more instruction in reading and math than do regular students. But while the Title I students are receiving this additional reading and math instruction the regular students are receiving instruction in these same and other subjects. Thus, it is not clear that Title I students enjoy a net gain in total instruction.

Title I students receive their instruction from teachers who have had somewhat less teaching experience than regular teachers. However, the special teachers have had somewhat more coursework and inservice training in teaching methods.

Title I students receive their instruction in somewhat smaller classes than regular students.

The major difference between Title I instruction and regular instruction is that Title I students receive less of their instruction in a large group in the regular classroom and receive much more instruction in a small group setting from special teachers and aides.

Teachers of Title I students report using different methods and practices in teaching Title I students than do the teachers of regular students. In reading, Title I students are exposed,

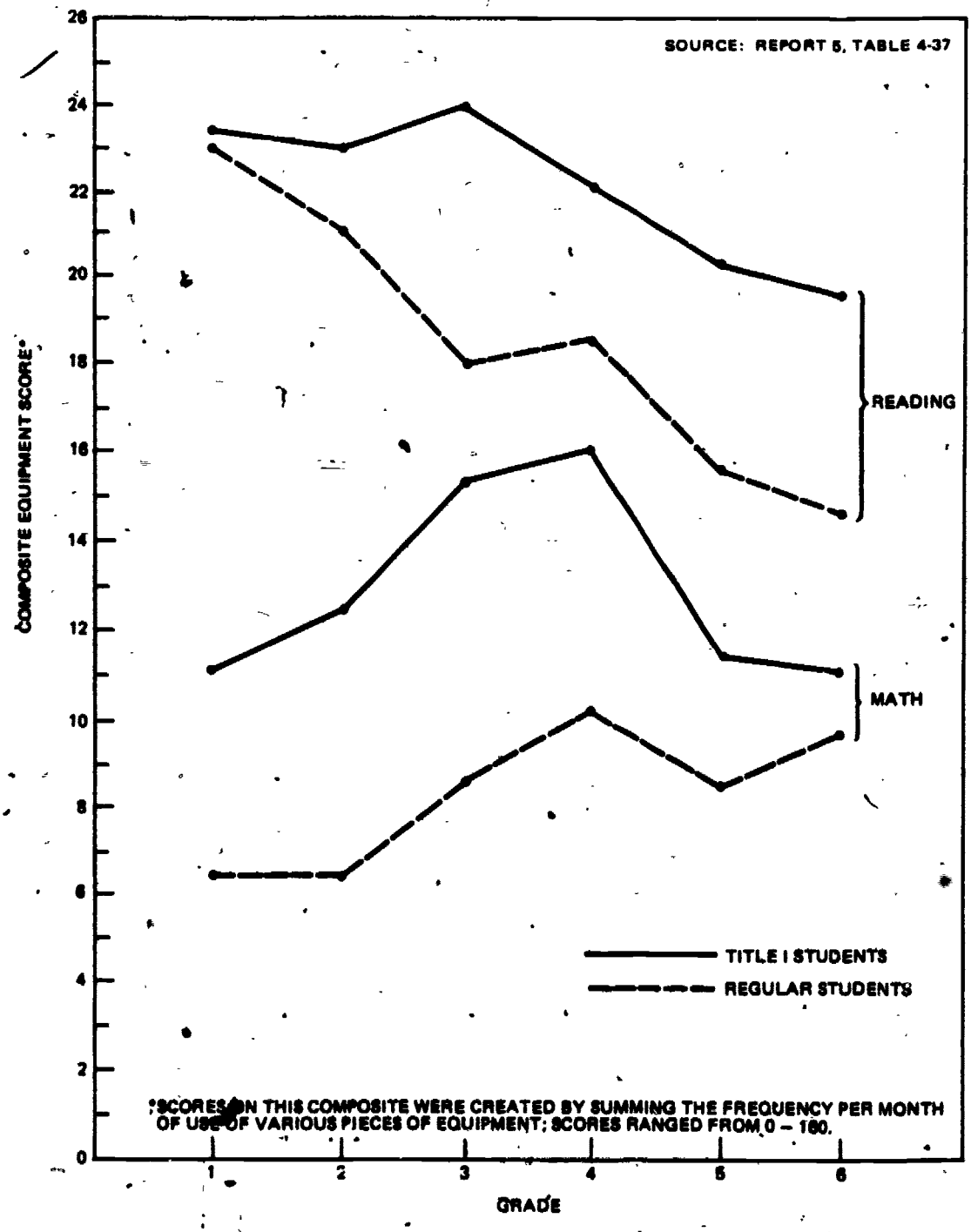

Figure IV-14. Use of Reading and Math Equipment by Title I and Regular Students in Title I Schools

throughout their elementary grades, to more elementary or basic reading methods than are regular students, who receive instruction in more complex materials. In the first two grades the approaches used in teaching reading are similar for Title I and regular students, but then they begin to diverge. By the sixth grade the approaches most frequently used with Title I students are least frequently used with regular students and vice versa.

Teachers of Title I students report a much higher use of audiovisual equipment in their instruction than do teachers of regular students.

Our results show that there are clear and significant differences in the instruction received by Title I students and regular students. In the next chapter we will see whether there is evidence that these differences lead to greater achievement.

CHAPTER V. HOW EFFECTIVE IS COMPENSATORY EDUCATION?

Summary

This chapter is concerned with the amount of achievement growth resulting from Title I services. First, a hypothetical example is given to illustrate the problems involved in forming proper comparison groups, and also to show the way students change in CE status from year to year. The example will aid in understanding the major results. The results are presented by comparing the rate of growth of Title I students with the rate of growth of Regular Needy students and Regular students. The results show:

- *In reading, in grades 1, 2, and 3, Title I students grow at a faster rate than similar Regular Needy students. In grades 4, 5, and 6, the Title I students grow at the same rate as Regular Needy students.*
- *In math, for all grades from 1 thru 6, Title I students grow at a faster rate than similar Regular Needy students.*
- *Title I students usually grow at a rate that is similar to the rate of growth of Regular students. Nevertheless, the gap between Title I students and Regular students widens as grade increases. It is shown that this increasing achievement gap is to a considerable extent artifactual.*

School, principal, and teacher characteristics (as well as instructional practices) associated with achievement growth were examined. It was found that:

- *Greater experience in teaching is related to higher student growth in both reading and math.*
- *The amount of regular instruction and tutor/independent work shows some positive, but modest, effects on achievement growth. In contrast, the amount of instruction by special teachers or instruction in very small groups does not often contribute to the explanation of achievement growth, and when these do negative relationships are observed.*

- *In both reading and math, the disruption of instruction tends to be an unfavorable condition for learning in the upper grades but not in the earlier grades.*

- *Frequency of feedback on student progress sometimes relates positively to reading and math achievement growth.*

- *In reading only, a teacher's effort in planning and evaluation shows a positive relationship to achievement growth in some grades.*

We have now examined the questions of who receives compensatory education and what constitutes compensatory education. We will now explore the evidence on the effectiveness of CE. But before we do so we should ask how we will judge CE's effectiveness. What do we expect CE to achieve? Students receiving CE are doing so either because tests show that their levels of achievement are low or because teachers judge that their performances are low and they would benefit from CE services. How much do we expect them to benefit? Some would say that if their performances improve at all then the cost of CE is justified. This is an absolute criterion in the sense that we are simply asking for some improvement over the student's previous level of performance. But they will grow in achievement even without CE, so we usually require that CE result in an improvement greater than would have been achieved had the students not had CE. But how do we tell how much the student would have improved without CE? We need some kind of a comparison standard. With the use of a comparison standard the judgment of improvement has changed from a requirement of absolute change to a relative change. What is an appropriate comparison group? Some will say that they would like CE students to improve enough to equal the performance of their peers, presumably meaning the average performance of the non-CE students in the school or class. This is probably an unrealistic expectation: some individual students may make such gains but not the average of all the CE students.

Another comparison group might be made up of students who are similar to the students receiving CE in initial performance scores and home background. In this case we ask that those students receiving CE for a period of time show

performance scores which are superior to the comparison group of similar students who have not received CE. Many would be encouraged if we could simply show some improvement relative to the comparison group even if it were not large. In theory it would be possible to form such comparison groups and after students have received CE services for a year or two to determine how much the CE students have benefited. In practice this is a very difficult thing to do. It will be worthwhile to understand why this is the case.

The first problem is one of definition. In this chapter and in several that follow we will be presenting data on the relative performances of groups of students that we call 'Regular Students,' 'Regular Needy Students ' and 'Title I Students.' By Title I students we mean those students who are reported by their schools to be "designated to receive" Title I services. The amount of services varies from student to student as does the nature of the services, but, as we saw in Chapter IV, these students as a group do in fact receive more hours of reading and math instruction in a different context than other students in the same schools. By Regular Needy students we mean students who are not receiving CE services but are judged by their teachers to need such services; in other words, they are receiving only regular instruction even though they have an educational need for additional services. By Regular students we mean the remaining students in a school or class who are receiving regular instruction. It would seem that these groups of students are fairly clearly defined.* They are at any one period of time, but when one considers the progress of a student through several school years, the student may, from time to time, belong to all three groups. For example, a student might be a regular student in grade 1 and do rather poorly. In grade 2 the student might be judged as in need of CE but not receive any CE services because there are insufficient resources available for this particular student. In grade 3 the

*Except for the Regular students. In some comparisons Regular students are all the students in a school except for the CE students. At other times Regular students are the students remaining after the CE students and Regular Needy students are subtracted. The text will make clear which definition is being used. Another group of students, not considered in this chapter, are students receiving other than Title I CE services.

student may still be educationally needy, there may be resources available, and the student may become a Title I student. Thus, in three years this student has been a Regular student, a Regular Needy student, and a Title I student. Or consider the student who performs at the 25th percentile on a test at the beginning of the first grade and is designated a Title I student. Because of Title I services this student's performance improves, and in the spring he scores at the 35th percentile. Next year in the second grade there are many needy students below the 35th percentile so the student is 'promoted out' of Title I. The student is still somewhat needy but not among the most needy and thus is no longer a Title I student. It is easy to follow the changing classification of individual students, but in an evaluation of the effectiveness of CE we are dealing with thousands of students in each classification and the change of students from one category to another makes the formation of comparison groups extremely difficult.

A HYPOTHETICAL EXAMPLE

In this chapter, and in later ones, we will be presenting tables and graphs to show the relative achievement gains of different groups of students. To help in understanding the meaning of these graphs and tables, and to illustrate how they have been derived, we present a hypothetical illustration. In the 'Example School,' during the first year, there was only a single third grade class consisting of eight students. Table V-1 shows these eight students and their fall percentile scores on an achievement test. Based on these achievement scores the school classified the eight students as follows: A, B, C and D were classified as Regular students because they scored above the 50th percentile and were not in need of CE services. Students E and F, who had scores of 35 and 30, were judged by their teacher to be in need of CE but since the school has only enough resources for two Title I students, students E and F were classified as Regular Needy students. Students G and H, who had the lowest achievement scores of 25 and 15, were selected to receive Title I services.

An achievement test was given again in the spring to the grade 3 students and the four Regular students still performed well with some improving slightly

Table V-1

Percentile Scores for Students in Example School-
Grade 3

Student	Classification	Fall Percentile Score	Spring Percentile Score
A	Regular	85	80
B	Regular	75	75
C	Regular	70	75
D	Regular	65	65
E	Regular Needy	35	25
F	Regular Needy	30	20
G	Title I	25	35
H	Title I	15	25
Class Average		50	50
Regular Average		74	74
Regular Needy Average		32	23
Regular & Regular Needy Average		60	57
Title I Average		20	30

and some performing somewhat less well. But the two Regular Needy students, E and F, performed less well than they did in the fall and now have the lowest scores of the whole class. The Title I students, G and H, profited from their Title I services and registered gains, gains that placed them above E and F, the two Regular Needy students.

All of the students were promoted to the fourth grade and Table V-2 shows the results for both years. At the beginning of the year the teacher was faced

Table V-2

Percentile Scores for Students in Example School—
Grades 3 and 4

	Grade 3			Grade 4		
Student	Classification	Fall Percentile Score	Spring Percentile Score	Classification	Fall Percentile Score	Spring Percentile Score
A	Regular	85	80	Regular	80	80
B	Regular	75	75	Regular	75	75
C	Regular	70	75	Regular	75	70
D	Regular	65	65	Regular	65	60
E	Regular Needy	35	25	Title I	25	30
F	Regular Needy	30	20	Title I	20	25
G	Title I	25	35	Regular Needy	35	35
H	Title I	15	25	Regular Needy	25	25
Class Average		50	50		50	50
Regular Average		74	74		74	71
Regular Needy Average		32	23		30	30
Regular & Regular Needy Average		60	57		59	58
Title I Average		20	30		22	27

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with a difficult decision. The Title I students, G and H, had clearly profited from their Title I services and were no longer the neediest students in the class. But if their services were taken away what would happen to their performances? On the other hand, the two Regular Needy students, E and F, clearly needed Title I services and were now performing less well than the Title I students. What to do? Facing the realities of limited funds, the two Title I students had their services taken away and in the fourth grade were classified as Regular Needy students. The two formerly Regular Needy students, E and F, now became Title I students. The last column of Table V-2 shows the performance scores at the end of the fourth grade. It will be seen that the Regular students generally maintained their previous positions and the new Title I students improved relative to their previous position. The previous Title I Students, G and H, who became Regular Needy students in the fourth grade, maintained their relative position and did not fall back as a result of losing Title I services.

All of this is shown graphically in Figure V-1. Here it is important to note the relative slopes of the lines. During grade 3 all groups of students improved their performances, but the Title I students improved at a considerably faster rate than the Regular Needy students and at a slightly faster rate than the Regular students. During grade 4 all groups continued their improvements, with the new Title I students improving at a faster rate than the now Regular Needy students and at about the same rate as the Regular students. While this example is hypothetical, it corresponds reasonably well with the actual findings to be presented. In fact, Title I students do tend to do somewhat better than a comparison group composed of Regular Needy students. Also, there is considerable change in status from one year to the next. Of those students receiving Title I services during a particular school year, about 40 percent will not receive Title I services the next year, and those who do not receive them because they were 'promoted out' will continue to perform at the now-higher level that caused them to lose Title I services.

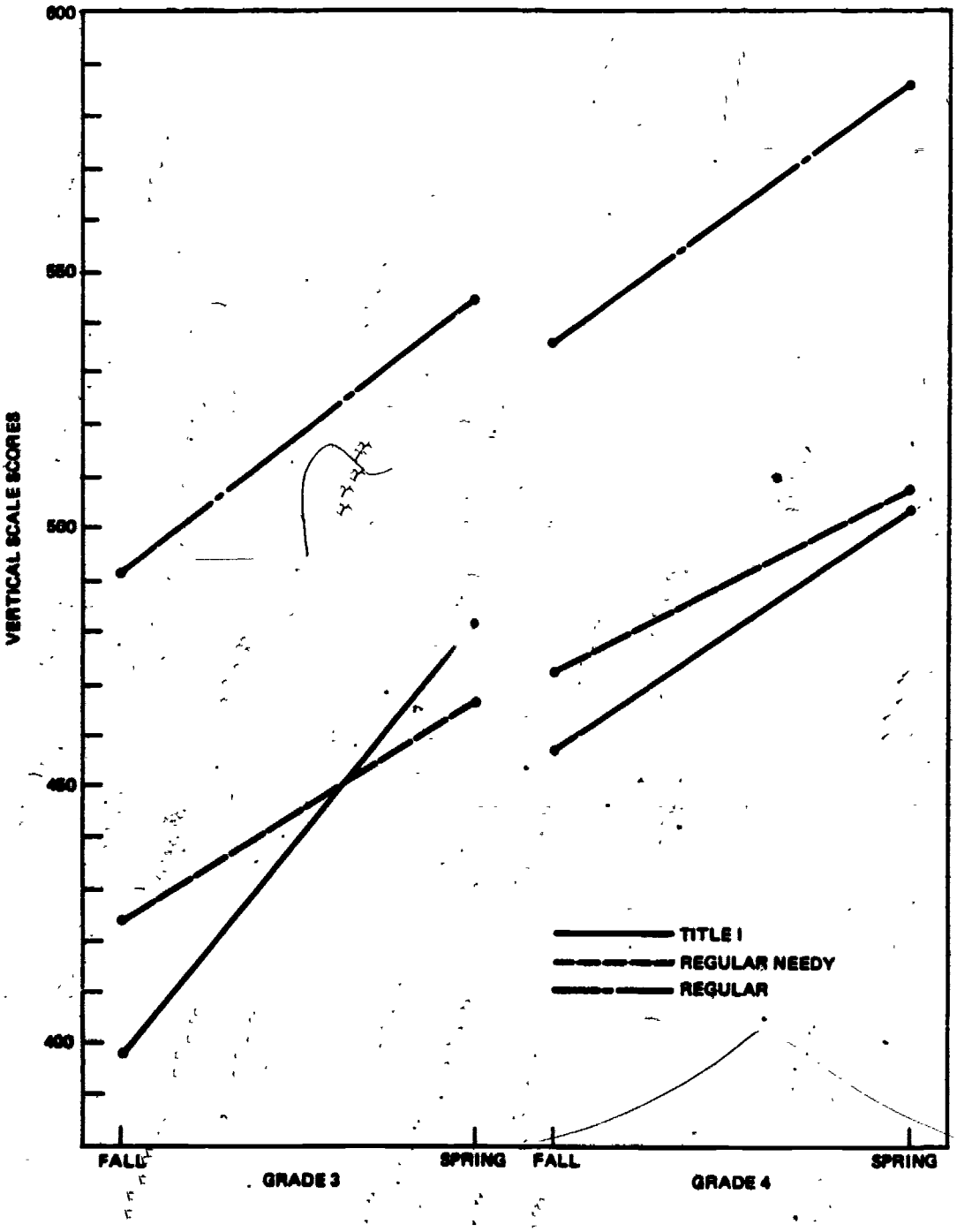

Figure V-1. Gains in Vertical Scale Scores for Example School-Grades 3 and 4 (Hypothetical Data)

ARE TH[illegible] HIEVEMENT GAINS FOR TITLE I STUDENTS?

At the time of writing this Interim Report, the analysis showing the amount of achievement gains for Title I students has been completed for the first year data. Later, there will be a report based on three years of longitudinal growth data. Report #10, Student Educational Development During the School Year and the Effects of Compensatory Education, is in press and will be published in early 1981. It is a lengthy and complete description of educational growth during one school year and is also a description of efforts to find those educational practices that lead to achievement growth. In this Interim Report only a few of the most significant highlights will be presented since the results in Report #10 are quite consistent, independent of the particular technique used in analyzing the data.

The basic results are shown in Figures V-2, V-3, V-4, and V-5. The first two figures show the results for reading, with the first figure showing the results for grades 1, 2, and 3 and the second figure showing the results for grades 4, 5, and 6. We have chosen to use two graphs to show the results in each subject because it makes the presentation less complicated. (We could have shown the results for six different groups of students, but the number of lines crossing and occupying nearly the same space would have confused the picture.) Thus, each graph shows the results for Regular students* (in Title I schools), for Title I students (in these same Title I schools) and for Regular Needy students in schools not having CE. The choice of this last group as the comparison group is somewhat arbitrary. We could have chosen Regular Needy students in the Title I schools, but there are two drawbacks to using this comparison group. In the first place, these students are needy, but the school authorities have decided that they are not as needy as those chosen for Title I services, and thus they differ from the Title I students. In the second place, there is the problem of the "spillover effect" which might contribute to all students in Title I schools but particularly the Regular Needy students. This is the problem that the instruction in Title I schools may affect all the stu-

*These Regular students include the Regular Needy students in the Title I schools.

dents in the school, not just the Title I students. An examination of Report #10 will show that the results for either comparison group lead to the same conclusion.

An inspection of the figures shows the results of the analysis, but such a presentation is not adequate for those who require statistical tests. First, it should be mentioned that the backup numbers for these figures will be found in Tables B4-1 and B4-3 of Report #10. The approximate number of students in each grade for Regular, Title I, and Regular Needy groups in reading are, respectively, 6,400, 2,600, and 600. In math the approximate number of students is 7,500, 1,500 and 1,150. The exact numbers differ from grade to grade. The larger numbers of Regular and Regular Needy students in math is caused by the smaller number of Title I math students. The main point of the above is to stress that each data point is based on a large number of students and thus is quite stable.

Figure V-2 shows that for reading the Title I students in grades 1, 2, and 3 grew at a somewhat faster rate than the comparison group of Regular Needy students. All groups of students had educational growth during the school year. In each grade the Regular students started out a higher levels and ended the school year at higher levels. In grades 1 and 2 the Regular students grew at slightly faster rates than either the Title I or the Regular Needy students. In the third grade the Title I students grew at slightly faster rates than the Regular students. In each of the three grades the Title I students grew at rates which were higher than those of the comparison group of Regular Needy students. We conclude that in reading for the first three grades students receiving Title I services show improvements that are greater than would have been the case if they had not received these Title I services. At the same time the amounts of improvement are not great enough to narrow the 'achievement gap' between the Title I students and the Regular students. In fact, the gap is becoming larger.

Figure V-3 shows similar data for reading in grades 4, 5, and 6. For these grades there do not seem to be beneficial effects from Title I services.

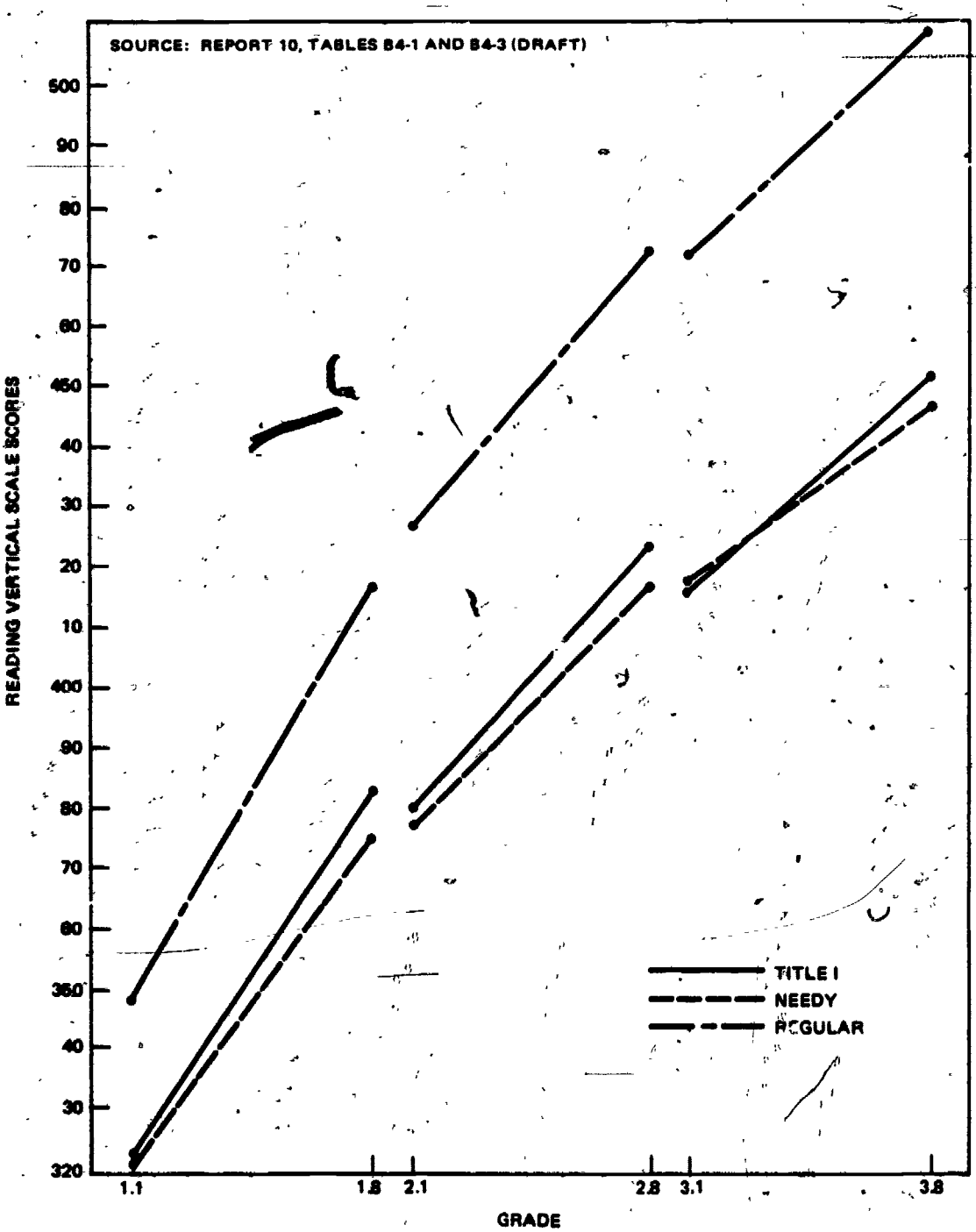

Figure V-2. Reading Vertical Scale Scores for Title I, Regular Needy, and Regular Students in Grades 1, 2 and 3

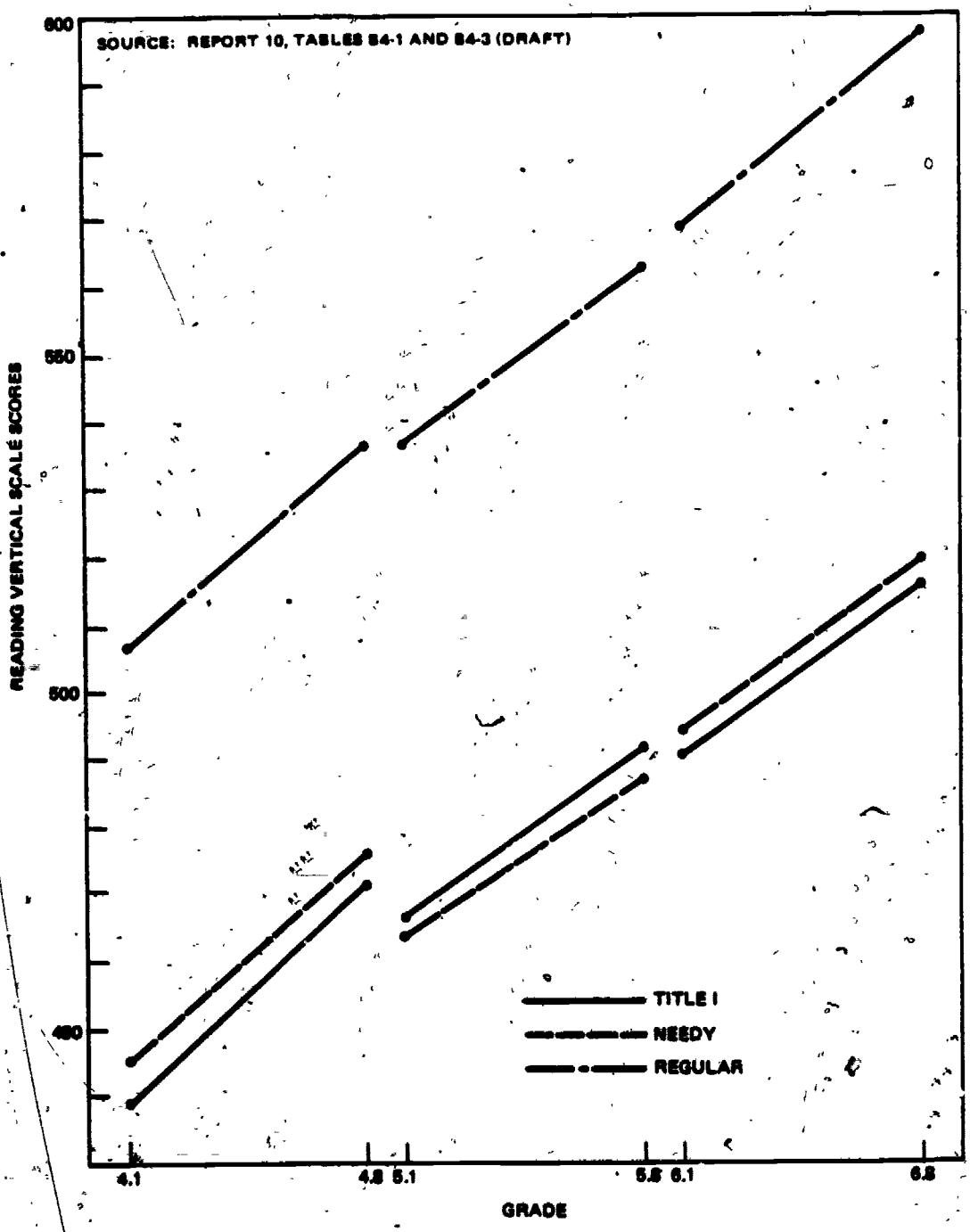

Figure V-3. Reading Vertical Scale Scores for Title I, Regular Needy, and Regular Students in Grades 4, 5 and 6

However, the rates of growth for all three groups appear to be the same. In spite of this apparently equivalent growth rate the gap between the Regular students and the other students continues to grow. This growth in the achievement gap is something of an artifact since the composition of the three groups keeps changing from year to year, as it must in a cross-sectional comparison. The better Title I students and better Regular Needy students keep being promoted out of the bottom groups as their achievement scores improve. In any grade, at the beginning of any year (after the first grade), the Regular group is composed of the relatively high scoring Regular students plus the better scoring Title I and Regular Needy students from the previous year. At the same time the Regular group loses its poorest scoring students to the Title I and Regular Needy groups, who have in turn lost their better students and had them replaced by poorer scoring students. Thus, it is almost inevitable that in cross-sectional data the gap between Regular and Title I or Regular Needy students appears to widen as grade increases. Another contributing factor is that the absolute number of Title I students decreases as grade increases with the result that the average achievement level of Title I students in the higher grades is lower relative to that in the earlier grades. This is true because the most needy students are being selected and since fewer are selected in the higher grades they are relatively lower scoring. In summary, for reading Title I seems to be somewhat effective in grades 1, 2, and 3, but not effective in grades 4, 5, and 6.

Figures V-4 and V-5 show the results for math. The results here are more positive than they are for reading. They show that for all grades the Title I students improve at a faster rate than the Regular Needy students. Furthermore, the Title I students in math improve at faster rates than the Regular students while the Regular Needy students change at slower rates than the Regular students. It seems quite clear that Title I is effective in math and considerably more so than in reading.

An explanation for this may be the difference in the way reading and math are learned by students. Reading is learned in school but also in a number of other settings. There are opportunities to learn reading at home from many

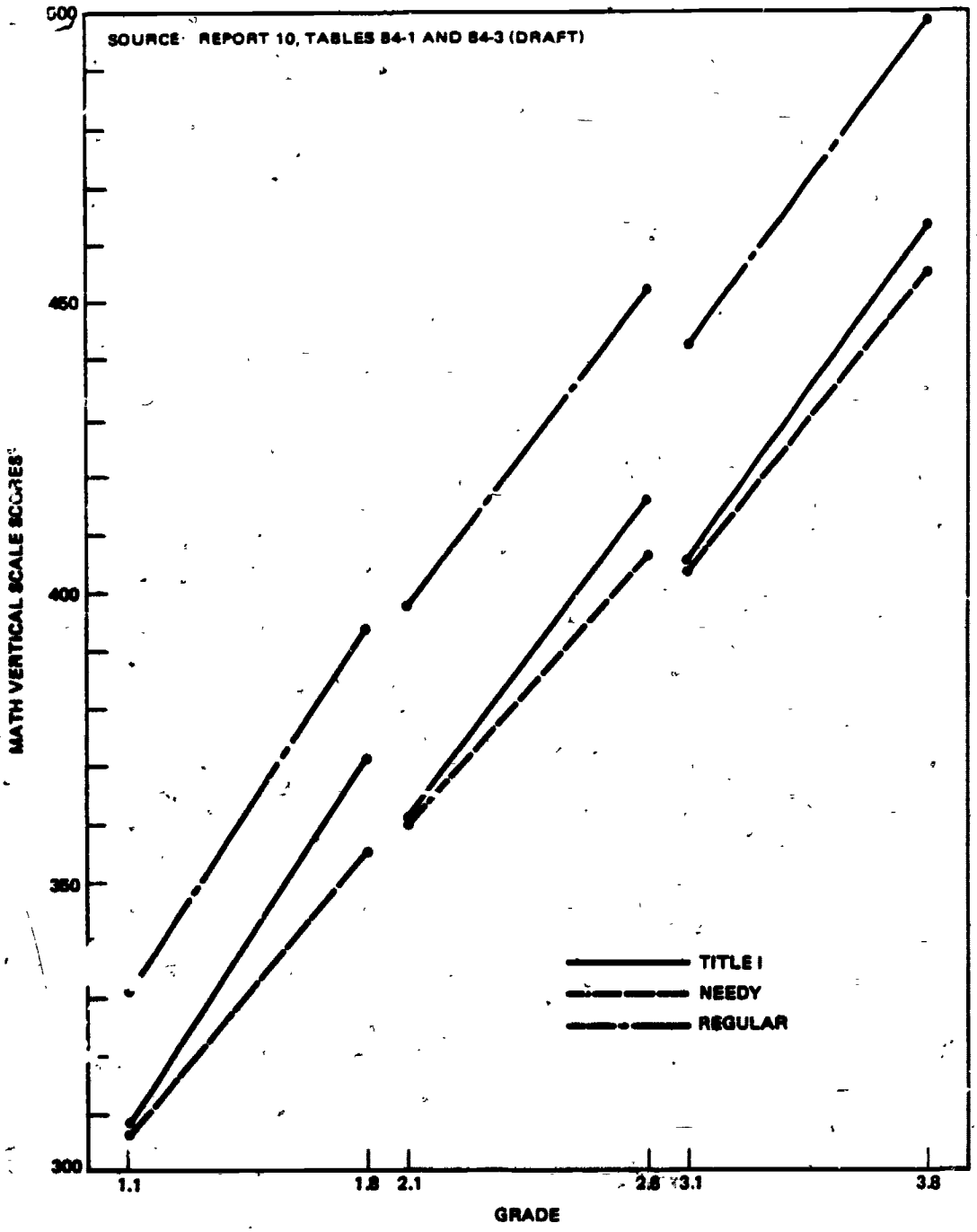

Figure V-4. Math Vertical Scale Scores for Title I, Regular Needy, and Regular Students in Grades 1, 2 and 3

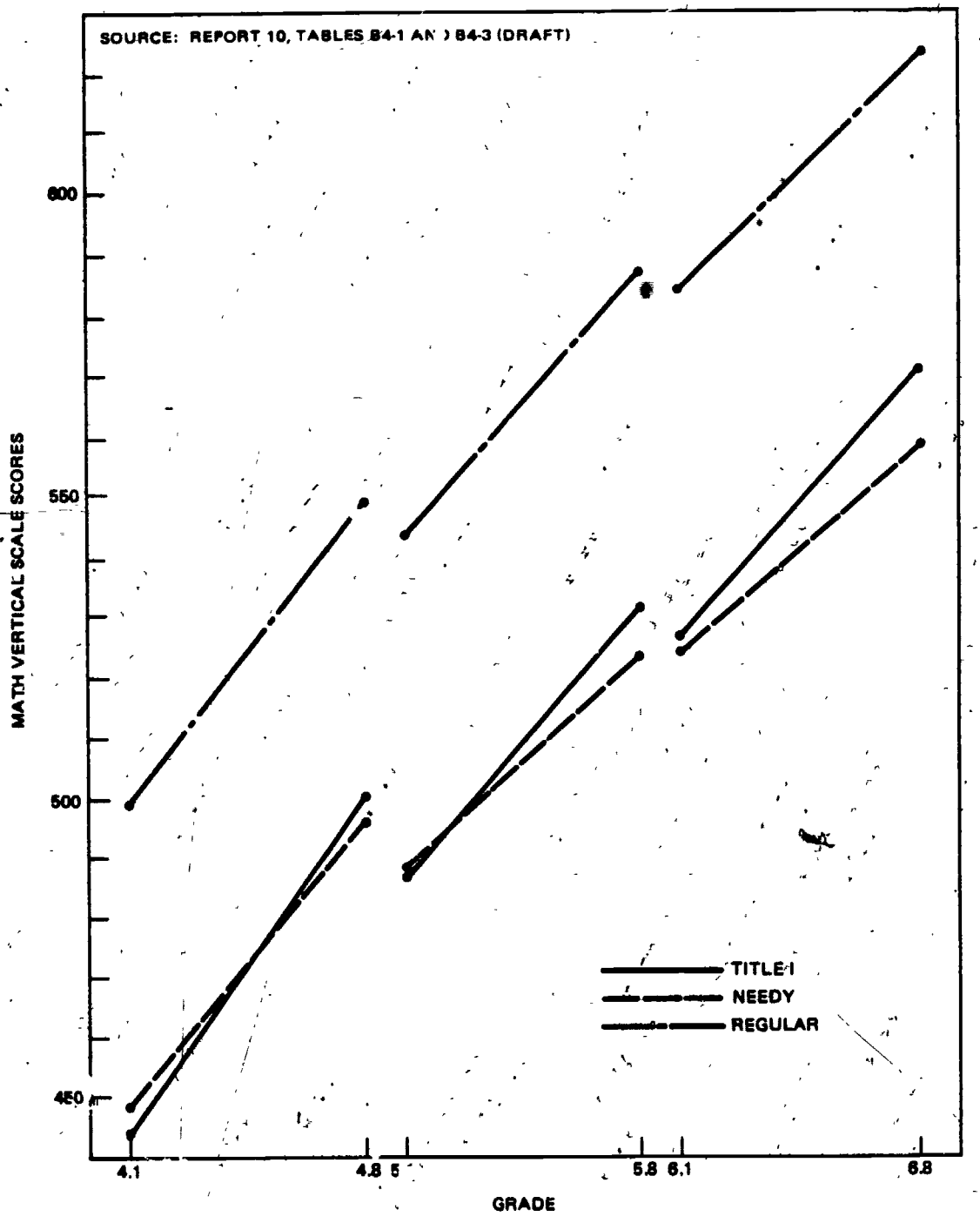

Figure V-5. Math Vertical Scale Scores for Title I, Regular Needy, and Regular Students in Grades 4, 5 and 6

sources, such as comic books, regular books, newspapers, instructions on toys and packages, and also away from home on posters, advertisements, in Sunday School and in other social settings. On the other hand, the opportunity to learn math is much more limited. Outside the school there is some opportunity to learn math in changing money, in sports in keeping score, etc. but such math is quite simple and generally does not increase in complexity with the increasing age of the student. Thus, the school is the main place where math is learned, and it seems apparent that the additional services provided by Title I to math students result in increasing their levels of achievement.

The four figures showing graphs of achievement change give the basic results, but the technical reader will want to refer to Report #10 for the detailed statistical analysis. In describing the methods used in analyzing the data, Ming-mei Wang, the author of Report #10 says:

> "Five types of evaluation models are employed that are related to the models required by the Education Department for use by grantees in evaluating and reporting on their local Title I projects (45 CFR, Parts 116 and 116a.) The large SES samples provide us a unique opportunity to apply a variety of methods that require different subsets of data to address the same question. Briefly, the norm-referenced analyses are variations of Model A (norm-referenced design). The analyses of variance (ANOVA) with different layouts and different measures of growth, and the analyses of covariance (ANCOVA) using different analysis groups and adjusted for unreliabilities of the covariate (pretest score) are designed to address the cases of Model B (control-group design). The comparison of gains conditional on pretest scores is a deviation of Model C (special regression design). Additionally, the comparisons with expected growth represent a blend of Models B and C where regression-based prediction models are employed to mimic the performance of a control group that is like the treatment group in pretest scores and other relevant characteristics. The analysis of each design further encompasses a class of sub-analyses. All the analyses are devised to complement one another so that pitfalls in one may be avoided in another. In the end, we hope that the integrated findings from these different approaches will approximate an accurate evaluation."

The different analyses mentioned above were carried out and are contained in Report #10. They essentially confirm one another and indicate the statistical soundness of the conclusions previously stated, namely that Title I does have

a positive effect for reading in the 1st, 2nd, and 3rd grades and in all grades for math.

WHAT EDUCATIONAL PRACTICES ARE ASSOCIATED WITH TITLE I EFFECTIVENESS?

We have shown that Title I is effective in increasing the performance of low-achieving students. We would like to be able to show that certain educational practices, principal and teacher characteristics, and methods of classroom organization are related to this effectiveness, so that the useful ones could be more widely adopted. Therefore, we explored a number of these variables. We investigated the relationship of the following to increased achievement:

- Instructional services such as the number of hours of instruction and the costs of that instruction. Also, such factors as the amount of instruction received from regular instructors, special instructors, tutors, or through individual instructional materials.
- Student background variables such as economic status, white/minority status, and mother's education.
- The type of school and instructional setting. That is, whether the school was a Title I school, an Other CE school, or a non-CE school. Also, whether the instruction was given in the whole classroom setting, in small groups, or through individual instruction.
- Characteristics of the instructional personnel such as years of teaching experience, amount of college training, amount of in-service training, and attitude toward the school program.
- Characteristics of the educational environment such as the school's minority concentration, school's CE concentration, district's control of instruction, principal's instructional leadership, amount of classroom disturbances, etc.

- Characteristics of educational practices such as: the amount of effort devoted to planning and evaluation, use of lesson plans, frequency of feedback, amount of homework, individualization of instruction, and use of audiovisual aids.

The possible effectiveness of these variables was explored by a number of different techniques such as regression analysis and causal modeling. Generally the results were disappointing in the sense that there were no strong relationships between any of these variables and increases in achievement. There were some relationships that seemed to be significant but they were not strong. The most noteworthy findings were:

- Greater experience in teaching is related to higher student growth in both reading and math.
- The amount of regular instruction and tutor/independent work shows some positive, but modest, effects on achievement growth. In contrast, amount of instruction by special teachers or in very small groups does not often contribute to the explanation of achievement growth, and when it does, a negative relationship is observed.
- In both reading and math, disruption of instruction tends to be an unfavorable condition for learning in the upper grades but not in the earlier grades.
- Frequency of feedback on a student's progress sometimes relates positively to reading and math achievement growth.
- In reading only, a teacher's effort in planning and evaluation shows a positive relationship to achievement growth in some grades.

In summarizing this chapter it can be said that there is evidence that Title I services are positively related to achievement growth in reading in the first three grades and that Title I services are positively related to achievement growth in math in all grades. As just discussed, there are some educational

practices that are positively related to achievement growth. Particularly noteworthy is the fact that students who receive instruction from more experienced teachers profit more than those receiving instruction from less experienced teachers. Also, instruction in the regular classroom setting seems to be a positive factor as does receiving instruction in a setting without disruption.

From a practical point of view the implications of these findings are that Title I services should be increased so that they are available to all needy students. Since only about half of all needy students are now receiving Title I services this would require a very large increase in the amount of Title I funding. A political judgment is required as to whether the amount of gain is sufficient to justify this increased funding, but it is clear that a very large number of children who could profit from Title I services is not receiving them.

The findings also suggest that educationally needy students should be the ones to receive instruction from the most experienced teachers in a regular classroom setting. At present this tends not to be the case. Title I students tend to receive their instruction from less experienced teachers and not in the regular classroom. These are matters that could be corrected at the local district and school level.

These findings are based on the analysis of the first year data. We are now analyzing the data from three longitudinal years. When these analyses are finished we will be able to refine and expand the results reported in this chapter.

CHAPTER VI. HOW COST-EFFECTIVE IS COMPENSATORY EDUCATION?

Summary

In CE programs it is usually assumed that as the cost of the resources increases, there will be a corresponding increase in the growth of student achievement. This assumption is basic to most federal education programs. To test this assumption, a "resource-cost" model was developed that allowed us to examine the relationship between instructional costs and achievement growth. The results were that:

- *There is no demonstrated relationship between the costs of the instruction students receive and changes in academic achievement.*

It has consequently been argued that this finding can be explained by the fact that the least able students receive the most costly services, and they are also the ones that are least likely to improve academically. This idea was tested and it was found that:

- *The cost of instructional services received by the least able students is higher than the cost of instruction for more able students.*

While this finding offers some explanation for the lack of relation between instructional cost and achievement growth, it is not a sufficient explanation. In view of the importance of these findings, it is suggested that an independent analysis of our resource-cost data be undertaken to confirm the results, or to develop a more appropriate methodology.

INTRODUCTION

It seems reasonable that as more and more resources are made available for the instruction of low-achieving students, the achievement of the students should increase. One of the assumptions underlying federal funding of educational

programs is that poor school districts are not able to marshall enough local resources to provide the extra services that should help low-achieving students to improve their performances. We attempted to test this broad assumption by investigating the relationship between the amount and costs of resources consumed and consequent changes in student achievement. The finding is that there is no positive relationship between the total cost of the personnel and other resources used in instruction and growth in achievement. Since this finding is contrary to conventional wisdom, as well as the assumption underlying Title I and many other social programs, it deserves to be scrutinized carefully.

THE RESOURCE-COST MODEL

Early studies of cost-effectiveness were usually based on obtaining the total expenditures involved in a CE program and dividing them by the number of participating students. This gives a per-pupil cost, but there are many reasons why this approach gives untrustworthy results. Report #7 discusses these reasons, which include: the assumption that all students in a project receive the same services, the vastly different amounts of money that actually are used for instructional purposes even thoug the per-pupil expenditures are the same (due to different amounts that are taken 'off-the-top' for such things as administration, building use, capital expenditures, and staff training), and variations in costs for similar services between different regions the country.

In an attempt to overcome the limitations of the above approach, researchers have recently developed a "resource-cost" model based on the idea of applying a standard cost to each service actually received by students. This bottom-up approach, as contrasted with the top-down approach, starts with a teacher's report of how much instruction each student received. The teacher indicates for each student the amount of reading instruction (or math instruction) received, and the situation or context in which the instruction was given; that is, whether the instruction was given in the whole classroom by the regular teacher, in a small group by a special teacher, in a small group by an aide,

or in some other instructional setting. The teacher also reports the instructional materials and equipment used.

Standard prices were developed for each element of instruction given under the various conditions described above. These prices are uniform for all students under similar conditions and thus ignore actual variations in teacher salaries from one region of the country to another. The basic assumption is that a teacher with a certain amount of education and teaching experience is doing as effective a job in one job location as in another. Likewise, it is assumed that similar instructional materials and equipment have the same effectiveness, irrespective of their actual cost. Thus, by using this type of thinking formulated in a resource-cost model a uniform, common metric was developed and used to cost the instruction received by each student. (This metric did not include administrative costs, building costs, and other overhead time, which, while real, were believed not to have a direct impact on instruction.) The resource-cost model is described in detail in Reports #6 and #7, which also cite relevant literature regarding the model and alternative methods of measuring cost-effectiveness.

THE RELATIONSHIP BETWEEN INSTRUCTIONAL COSTS AND STUDENT ACHIEVEMENT GROWTH

Figure VI-1 shows the relationship between reading program costs and student achievement growth* for Title I students, and Figure VI-2 shows this relationship for educationally needy students in non-CE schools. Overall, the results show that there is no significant positive relationship between these two variables. For some grades there seems to be a slight positive relationship but it is countered by other grades with slight negative relationships. In Report #7, detailed statistical tests are reported and the overall conclusion is that there are few statistically significant trends and, where they are significant, they tend to be negative. (This negative correlation means that the more costly the services a student receives the less the achievement gain made by the student.) The authors of Report #7 say:

*The figures show percentage gain in student achievement during the school year: percentage gain equals raw gain divided by the pretest score times 100.

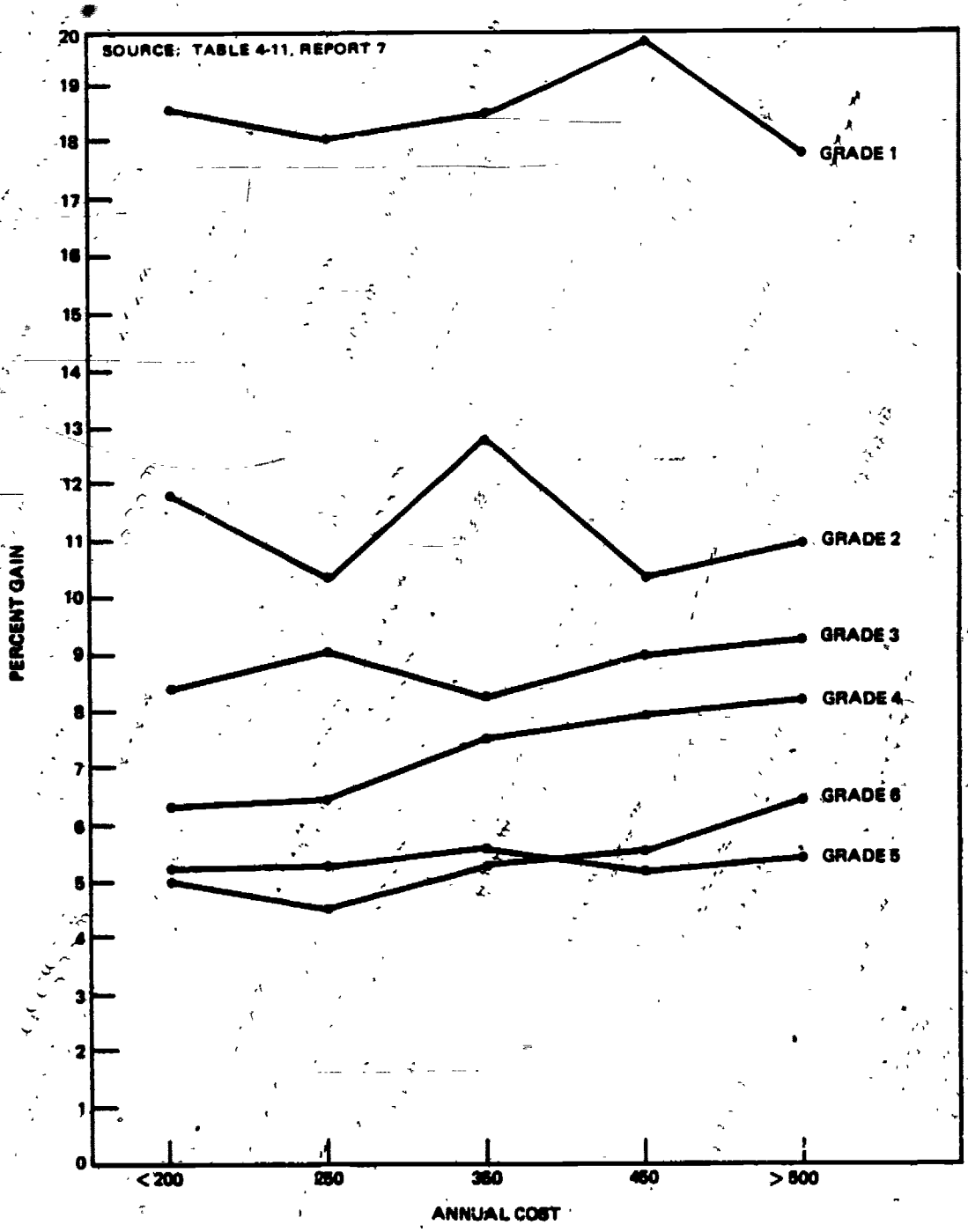

Figure VI-1. Reading Program Costs and Student Gain by Grade--Title I Students

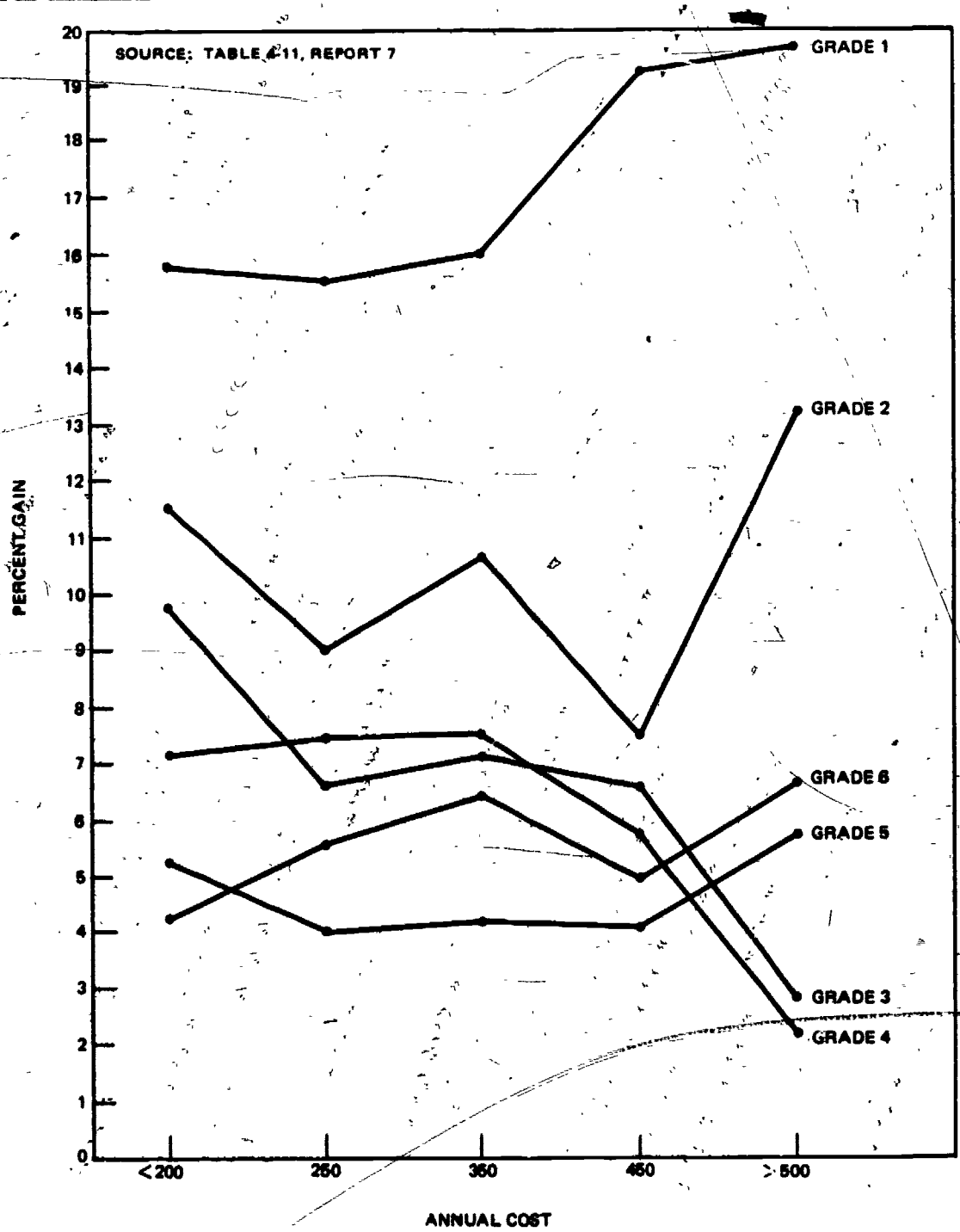

Figure VI-2. Reading Program Costs and Student Gain by Grade--Educationally Needy Students in Non-CE Schools

"Our results have been nondecisive in the sense that none of our comparisons among groups of students reveal meaningful differences in cost-effectiveness. On the other hand, we are not quite prepared to conclude that the level of resource utilization has no independent effect on outcome. Though small, the raw regression coefficients that served as our indices of cost-effectiveness frequently exceeded two and three times their standard errors, and were often disturbingly negative.

Taking these results at face value, one might conclude that increased utilization of resources has a nuisance effect that tends to diminish achievement across most of the range of program cost that we observed in our sample. If this were truly the case, we might be able to find a critical cost below which the returns to cost are increasing, and above which they are decreasing. We believe such critical points should have been revealed by our models that specified cost in both first and second order terms, but the evidence was not decisive one way or the other."

It can also be argued that the reason for the slightly negative relationships is due to the fact that more resources are given to the more needy students. It is argued that the most needy students will have more difficulty in improving their levels of achievement than less needy students and thus the negative relationship found is determined by the nature of the students receiving the more costly services rather than the ineffectiveness of the increase in services. Figures VI-3 and VI-4 show the relationship between fall reading achievement scores and the cost of reading services received by the students. It will be seen that the lower-achieving students do receive more costly services than higher-achieving students. While the relationships are not strong they are at least large enough to support the idea that the negative relationship between cost and achievement is a function of the achievement level of the students being served. The authors of Report #7 say:

"Much the same reasoning obtains here as in the area of health care. That is, grieviously ill patients consume more costly and intensive medical care; yet the returns to such medical care, as measured in success rates (cures), are probably lower than those encountered with less seriously ill patients who receive less costly or intensive treatment. In effect, then, the same non-equivalence among treatment groups exists in terms of allocating services."

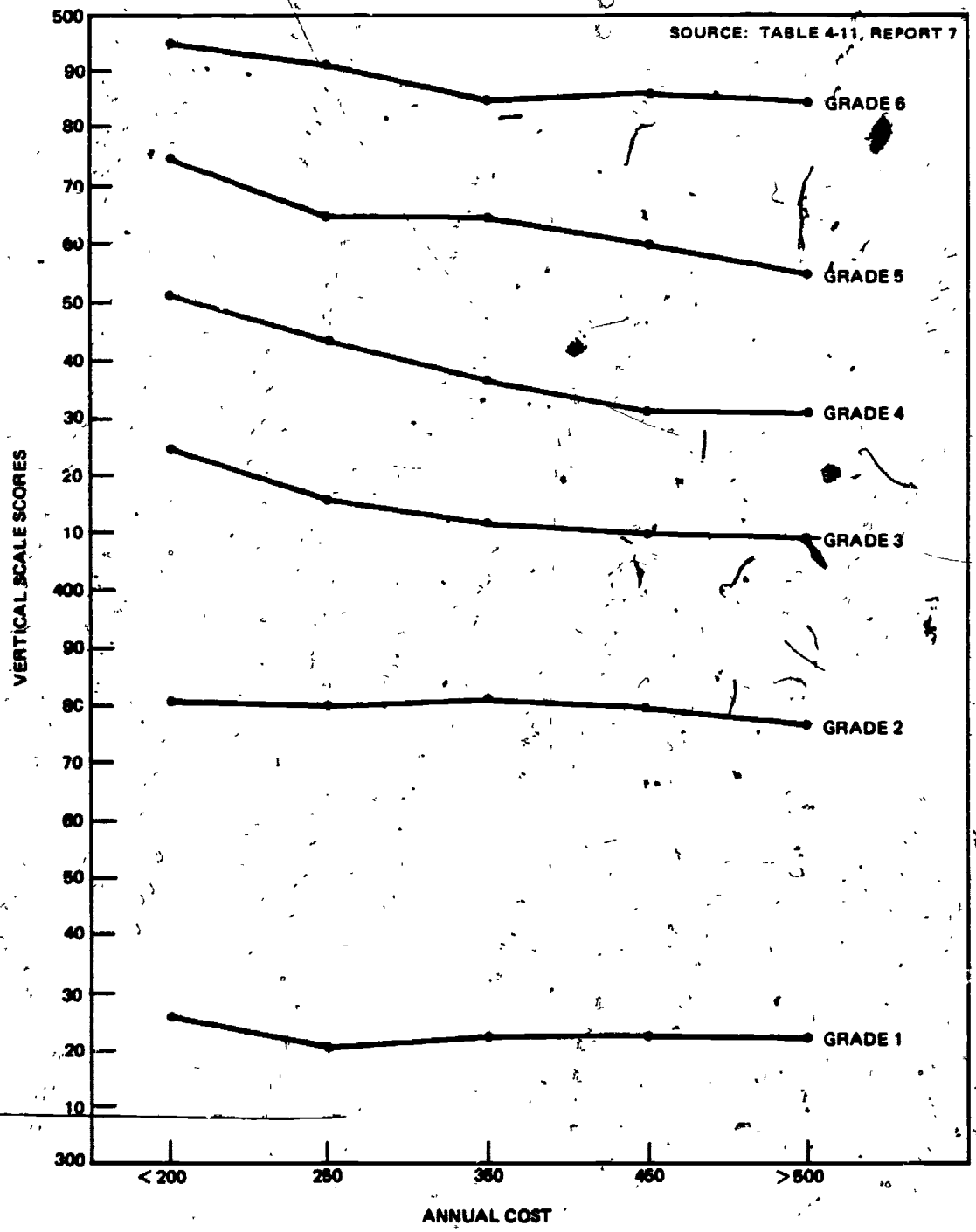

Figure VI-3. Fall Reading Vertical Scale Scores and Program Costs by Grade--Title I Students

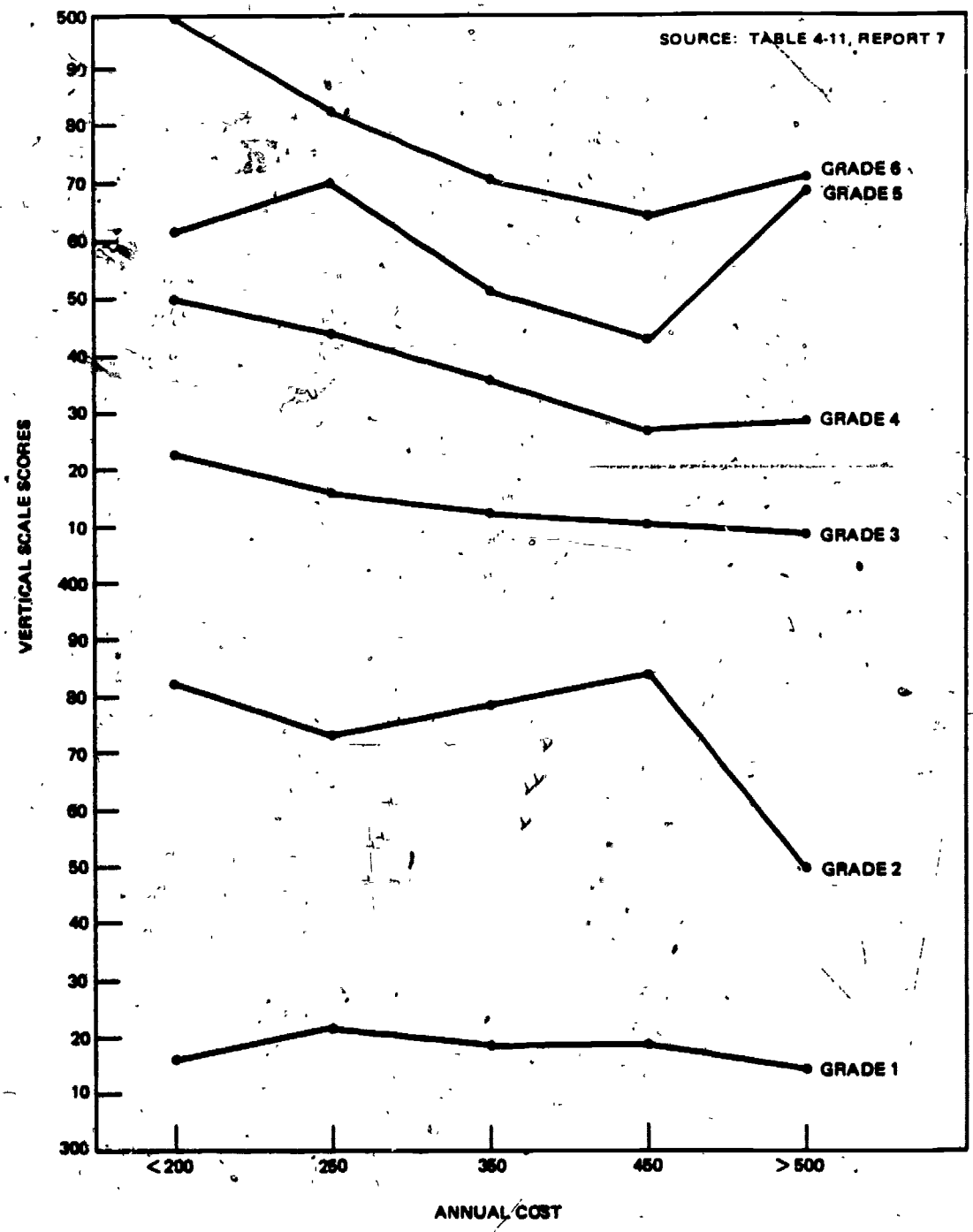

Figure VI-4. Fall Reading Vertical Scale Scores and Program Costs by Grade--Educationally Needy Students in Non-CE Schools

While it is possible to offer explanations for the negative relationship, it is still important to ask why a fairly strong positive relationship was not found in groups of students homogeneous in achievement level. The idea that increasing the funding, and thus services to needy students, will lead to increased achievement is so pervasive and fundamental to federally-funded programs that these findings must be most carefully examined for faulty analysis. One way of checking the possibility that the results are due to a faulty resource-cost model is to undertake the same analyses using total hours of instruction received by the student (instead of estimates of costs of the resources devoted to this instruction). The use of hours of instruction received is independent of any cost model and in a sense is more basic than a cost-effectiveness analysis. Yet the results are the same as those found with the resource-cost model. The authors say:

> "We are confident that our cost metric is not at fault. For example one might question their use in models with a single cost variable, since this assumes equal returns irrespective of the ways in which resources are deployed. We believe we have addressed this question in the analyses where the data are blocked by program configuration, and total cost is disaggregated into ten program component costs. Another possibility is that the utilization of resources has beneficial effects, but the benefits do not advance as rapidly as do the costs. We have addressed that question by substituting program component hours for program component costs in some of our trials; we still obtained negative regression coefficients for the individualized-instruction components and the special-teacher-instruction components. Therefore, the cause for the negative relationships is not in the cost metric alone."

The resource-cost model used has been criticized by some researchers as faulty. They say that the model does not take into consideration local economies that astute school superintendents may be able to achieve, and that it also improperly lumps together regional variations in costs. In our view these criticisms are irrelevant to the study of cost-effectiveness on a national level. Nevertheless, the importance of the relationship between the costs of services received and gains in achievement is such that we recommend that an independent analysis of the SES cost-effectiveness data be undertaken. It may be that there are some underlying logical flaws in the way the analysis was done, although we doubt this to be the case since the methodology was developed at one of the

most prestigious organizations in the cost-benefits analysis field. It is possible that an overall analysis in which all students are lumped together may mask relationships that would be found at the individual school level. When we have the results from our in-depth study of 55 high-poverty schools we will have more information on this subject. But based on the present results we believe an independent analysis would be worthwhile either to confirm the results reported here or to clarify the methodological problems in such analyses.

CHAPTER VII. WHAT HAPPENS TO THE ACHIEVEMENT OF STUDENTS WHEN THEIR COMPENSATORY EDUCATION SERVICES ARE DISCONTINUED?

Summary

This chapter examines the frequency of termination of CE services and the change in achievement growth that results when CE services are terminated. The results show that:

- *There is considerable turnover from year to year among the students receiving CE services. About 40 percent of the students receiving Title I in a given year will not be receiving it in the following year. The turnover is higher in other CE programs.*
- *There are three reasons for this turnover. About 60 percent of the CE students who are discontinued are 'promoted out' because their achievement increased enough to no longer place them among the most needy; 15 percent were promoted to grades which no longer had CE services, and 25 percent were in schools that lost CE funding in the second year (but this was not common for Title I students).*
- *When the instructional services received by the students who had lost CE were examined, it was found that the services of these former CE students had reverted to the same services as received by Regular students.*
- *During the year when CE services had been discontinued, the students who had been 'promoted out' continued to perform at higher levels and did not seem to revert to lower achievement levels.*

INTRODUCTION

The discontinuation of CE services became an important educational issue when it was reported (GAO, 1975) that districts and schools differently interpreted the Title I requirement to serve the most educationally deprived students. Under one interpretation, as long as the student is among the educationally deprived when entering the program, that student is to be retained until reaching an age-appropriate achievement level. Under another interpretation, a student has to remain among the most educationally deprived to be retained in the program;

otherwise, the student is replaced by a student who is more educationally deprived. Under a third interpretation a student is retained in the program even after reaching an age-appropriate level, in the belief that the extension of services is necessary to maintain achievement growth. Based on these GAO findings and on recommendations from states, districts, and the USOE, bearing both on student needs for stable programs and institutional needs for educationally sound guidelines, Congress clarified the law (Education Amendments of 1978). The amended law emphasizes that Title I funds must be used to meet the needs of students in greatest educational need, but it provides an exemption (among several) for students who were determined to be in greatest need in a previous year but no longer are, even though they are still educationally deprived. In effect, the amendment allows schools and districts to maintain Title I services for students who qualified in the previous year, so that students are not caught in a "revolving door" of alternating receipt and disqualification.

But the GAO findings were based on less than representative data and the recommendations from other sources tended to be based on impressions and anecdotal examples. In the Sustaining Effects Study it was possible to study the problem in detail and determine whether or not it was a serious problem. Three questions were studied:

1. What is the incidence of the discontinuation of CE services?
2. What educational services do students receive after their CE services are discontinued?
3. What happens to the achievement levels of students when their CE services are discontinued?

Data were available for the 1976-77 and the 1977-78 school years. Data from the 1977-78 school year were more reliable because we had positive records of each student's status in the previous school year. For the 1976-77 school year the students' statuses were reported as teachers remembered them and were thus subject to some error. The two data bases were analyzed separately and tend to support each other. Therefore, only the results from the 1977-78 school year will be reported here and are given in detail in Report #11.

WHAT IS THE INCIDENCE OF THE DISCONTINUATION OF CE SERVICES?

Three reasons for the discontinuation of CE services were available for study: first, discontinuation because the student had reached an achievement level that no longer qualified the student for CE services; second, discontinuation because a CE student was promoted to a grade which did not have CE services; and third, the student was in a school during the second year that lost funding in the second year even though it had funding in the previous year. About 60 percent of the students no longer receiving CE services had them discontinued because they were no longer qualified due to high achievement; 15 percent were no longer selected for CE because they were promoted to grades in which there was no CE program, and 25 percent were discontinued from CE because their schools lost CE funding (although this was not common for Title I students).

There are two ways of looking at the data. On the one hand we can ask what percentage of all the students in the school have their services discontinued; on the other hand we can be concerned about the percentage of students in a particular CE program who have services stopped. Table VII-1 shows the data both ways. When viewed from the perspective of all the students in the school, the problem does not seem particularly large. Depending on the CE program involved and the subject matter, the percentages vary, but about 5 percent of all the students have CE programs discontinued. The more important figures are the proportion of CE students who have CE services discontinued. For Title I about 40 percent of the students receiving Title I services in one year will not receive Title I services the next year. For both other federal programs and state/local programs, the turnover is considerably larger than in the Title I program. For Title I the students losing Title I services are mostly students who no longer qualify because their academic achievements place them above other more needy students. For the other federal and the state/local programs there is a much stronger tendency for the schools to lose funding or to have the students promoted to a grade without that category of funding.

Table VII-1

Percentage of Students Whose CE Was Discontinued, by Reason for Discontinuation, CE Funding Source, and Subject Matter

Title I	% of All Students		% of Title I Students in Year 1	
	Reading	Math	Reading	Math
Former Title I students no longer qualified	6	4	34	32
Former Title I students but school lost funding	0	1	0	7
Former Title I students but promoted to non-Title I grade	1	0	5	4
Title I students in both Year 1 and Year 2	12	7	61	57
New Title I students in Year 2	10	8		
Not Title I students in either Year 1 or Year 2	72	80		
Other Federal CE	**% of All Students**		**% of Other Federal CE Students in Year 1**	
Former Other Federal CE students no longer qualified	1	1	21	22
Former Other Federal CE students but school lost funding	2	1	41	33
Former Other Federal CE students but promoted to grade without Other Federal funds	1	1	20	25
Other Federal CE students in both Year 1 and Year 2	1	1	19	21
New Other Federal CE students in Year 2	2	1		
Not Other Federal CE students in either Year 1 or Year 2	93	96		

(Table VII-1 Cont'd)

State and Local CE	% of All Students		% of State/Local CE Students in Year 1	
Former State/Local CE students no longer qualified	2	1	21	18
Former State/Local CE students but school lost funding	4	2	36	32
Former State/Local CE students but promoted to class without State/Local funds	1	1	7	16
State/Local CE students in both Year 1 and Year 2	4	2	35	34
New State/Local CE students in Year 2	7	6		
Not State/Local CE students in Year 1 or Year 2	83	86		

Table VII-1 clearly demonstrates that there is considerable turnover among CE students. But is there evidence that there really is a difference in achievement levels between those whose CE is discontinued and those who continue in the CE program? Table VII-2 shows the average Comprehensive Tests of Basic Skills achievement percentiles for the different students in terms of their statuses in Year 2. The CTBS scores are for the spring of the first year because that period represents the time when achievement information would be available for decisions about assignment to the ensuing year's classes. The table shows that the regular students are slightly above the mean in achievement while all categories of previous and present CE students are considerably below the mean. Students who have had their CE services discontinued for one reason or another fall considerably below the regular students but considerably above those who continue in the CE programs from the previous year. Those continuing in the program have achievement means in the 25th percentile range, while those whose services have been discontinued tend to be in the 35th percentile range. Thus it is apparent that those whose CE is discontinued are those who are performing relatively well and that those who are retained in the programs are still performing poorly. These figures indicate that CE administrators are behaving appropriately in deciding which students to retain in the program and which ones

Table VII-2

Average CTBS Percentile Scores Over All Grades by Transition Category
(Percentile Scores for Spring of Year 1, Transition Categories for Year 2)

Transition Category	Mean CTBS Percentiles	
	Reading	Math
Regular students	55	51
Discontinued from CE in Year 2:		
Due to high achievement	34	38
Due to promotion to non-CE grade	30	35
Because school lost funding	34	37
CE Students:		
Continuing in program from Year 1	22	26
Started CE in Year 2	32	33

to 'promote out.' At the same time we should not forget that those who were 'promoted out' were not doing as well as the regular students.

Clearly for CE students there is a large turnover, with many students receiving CE services in one year and then having them discontinued the next year. How serious is this? One way of looking at it is to say that it is not serious at all. If in the second year the student is clearly not as needy as other students, then the other students should receive the services and, with limited funds, the less educationally needy student should be dropped from the program. But, if in the process the student whose services were discontinued drops back and again joins the most needy ranks, then a disservice has been done the student and we have a revolving-door process in which if a student is successful he is removed from the program only to fall back because the services have been withdrawn. But this is only a conceptual problem; what really happens to students who have been promoted out because they no longer qualify?

EDUCATIONAL SERVICES AFTER TERMINATION OF CE

The regulations for Title I, by far the largest of the CE programs, specify that CE services are to supplement rather than supplant regular instruction. Because the number of hours in the school day is usually not increased for CE students, the CE program usually consists of different instruction which is of greater intensity or higher quality than that for regular students, as we noted in Chapter IV. Or the CE program may emphasize instruction in reading and math at the expense of other subjects being taught to the regular students. When a student's CE services are discontinued, we would expect that the hours and costs of reading and math instruction would revert to approximately that of regular students. Is this actually the case?

Table VII-3 shows the hours and costs of reading and math instruction averaged over all grades by student category. The table shows that the number of hours and costs of instruction for continuing CE students are considerably higher than they are for regular students. The corresponding figures for students whose CE has been terminated are quite close to those for the regular students. There are wide variations in the services offered from grade to grade in reading, however,

Table VII-3

Average Hours and Costs of Instruction by Student Transition Category

Transition Category	Reading		Math	
	Hours	Cost*	Hours	Cost*
Regular students	239	250	175	135
Discontinued from CE in Year 2:				
Due to high achievement	246	280	174	151
Due to promotion to non-CE grade	225	266	169	144
Because school lost funding	244	288	171	154
Continuing CE students	258	426	206	305

*Standard resource dollars

so the average figures do not give the whole picture. Figure VII-1 shows the cross-sectional costs of instruction by grade. Again, we see for reading the marked decrease in the cost of reading instruction as grade increases, and we also see the much higher costs of the reading services offered to CE students. There seems to be a slight tendency for discontinued students to receive more costly services than regular students, but they are clearly differentiated from the continuing CE students. A similar figure for math would show the same picture as that for reading, except that math instruction costs are relatively constant across grades. From this material it is clear that when students are terminated from CE they really do stop receiving the services they would have been receiving if their CE status had not changed. When one looks at the nature of this change, it becomes apparent that the discontinued students are getting their instruction from regular teachers rather than from special teachers in small groups. This may not necessarily be bad. We have already seen that regular teachers tend to be associated with superior instructional results. What in fact happens to the discontinued students? Do their achievement levels drop as a result of the lack of more costly and intensive services?

ACHIEVEMENT AFTER TERMINATION OF CE

We now know that there are many students who are terminated from CE programs for a number of reasons, but high on the list is termination because they are achieving at a level that is relatively high. We also know that if a CE student is terminated, then the new instructional program takes on the characteristics of the program for regular students in contrast to the more costly program offered to CE students. The question now is whether the terminated CE students retain their relatively high levels of achievement or whether they revert to previous lower levels. There are two ways of looking at this question. One way is to determine the relative achievement status of the students at the end of the next instructional year to see if they still are achieving at relatively high levels. The other way of addressing the question is to look at rates of growth during the subsequent school year to see if they remain at the levels they were while the students were receiving CE. Both approaches will be examined. Table VII-4 gives the percentile achievement levels for students in the spring of the second year. This table is for Title I students. Similar data are available for other

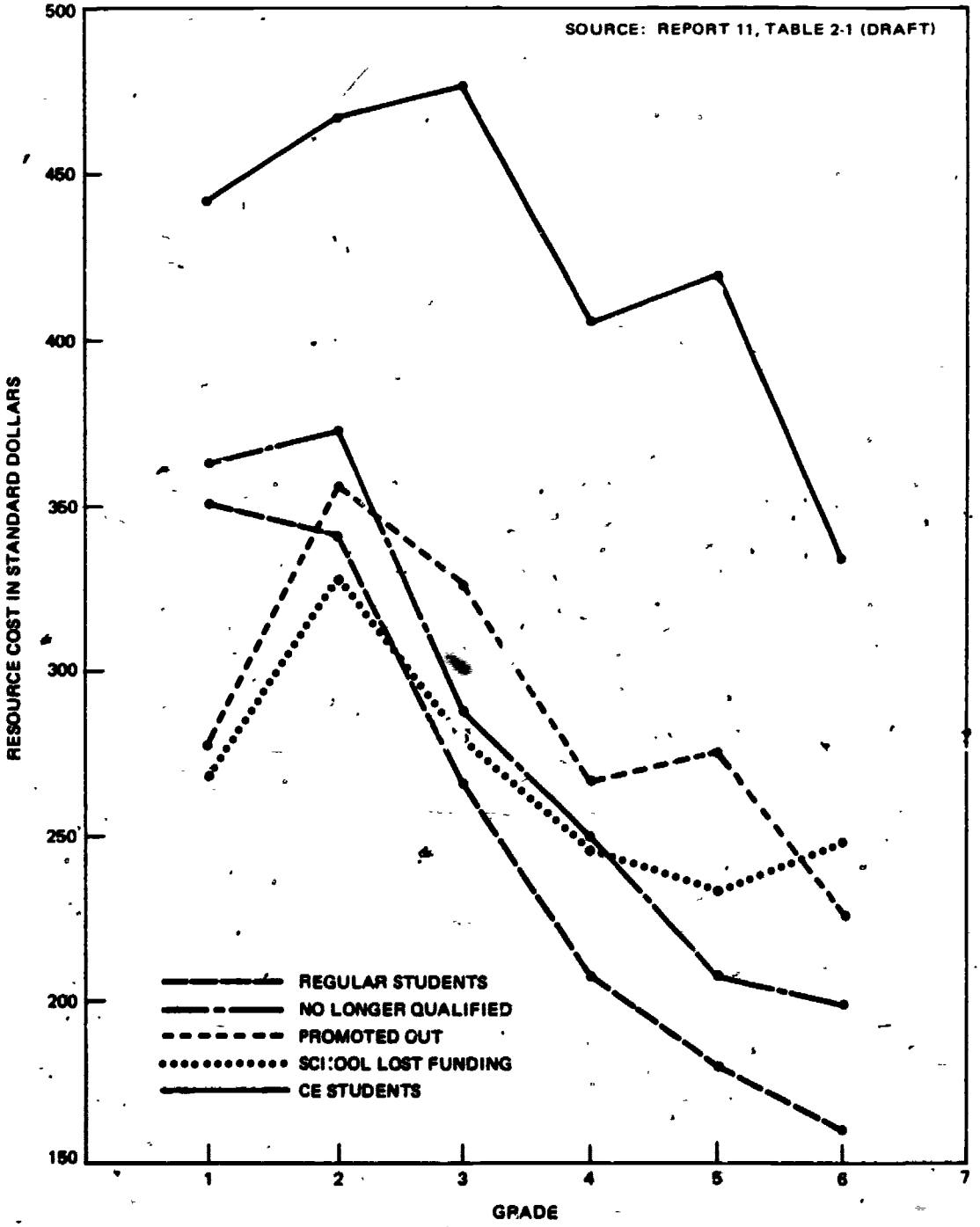

Figure VII-1. Resource Cost of Reading Instruction Offered

Table VII-4

Average Reading and Math Percentiles for Spring of the Year After CE Students Were Discontinued

Category	Grade				
	2	3	4	5	6
Reading					
Regular students	61	63	65	60	58
Continuing Title I students	24	26	17	20	17
Students Discontinued from Title I:					
Due to high achievement	26	42	37	28	30
Due to promotion to class without Title I	41	34	30	32	36
Because school lost funding	-	-	-	-	-
Math					
Regular students	59	59	56	59	58
Continuing Title I students	33	23	25	22	31
Students Discontinued from Title I:					
Due to high achievement	41	41	37	33	35
Due to promotion to class without Title I	48	48	30	22	24
Because school lost funding	39	45	30	38	36

federal programs and for state/local programs, and the interested reader can refer to SES Report #11 where it will be seen that the results are similar to those for Title . The table shows, for both reading and math, that the regular students are achieving in the spring of the second year at levels considerably above the average. Those Title I students whose CE program continued during the second year are still performing at quite low levels. However, those students,

who had been Title I students, and whose services were discontinued due to their higher achievement continued to perform at levels which, while not equal to the 'regular' students, are much higher than for those students who continued in Title I. It certainly appears that those students who had their services discontinued did not drop back to the general level of Title I students.

The second way of examining the question of whether the discontinued students have continued to grow at rates similar to rates while they were CE students is to examine growth curves. The general idea is to determine the rate of growth of the student during the year in which the student received CE and then to compare that growth rate with the growth rate in the next year when the student did not receive CE. This is a somewhat complex and inexact comparison due to several factors. First, we know that the measured rate of growth decreases for each successively higher grade and thus the second year's growth should be somewhat less than the first year's rate. A way to get around this difficulty is to form comparison groups and see if the growth of those whose CE services were discontinued is similar to the growth of those whose services were continued (or a similar comparison can be made with regular students). The problems with this method are that students of different achievement levels grow at different rates, and regression-to-the-mean effects are different, depending on achievement level. While bearing these problems in mind, we attempted to compare growth rates. The general method is to determine the growth that took place in the first year and from that growth to predict the growth that should take place in the second year. Then the actual growth in the second year is compared with the predicted growth in the second year. The difference between the predicted growth and the actual growth is called the difference score. If the student grew more than was predicted then there is a positive difference score, and if the student grew less than predicted there is a negative difference score.

Table VII-5 shows the difference scores during the second year for students who had been Title I students in Year 1 but those services were discontinued in Year 2. Similar scores are shown for regular students, and for students who received Title I services in both Year 1 and Year 2. (Similar results were obtained for the other funding categories and can be examined in Report #11.) Regular students

Table VII-5

Average Difference Scores in Reading and Math for Year 2
(Vertical Scale Scores)

	Grade				
	2	3	4	5	6
Reading					
Regular students	-22	-6	-14	-12	0
Continuing Title I students	6	4	18	3	12
Students whose Title I was discontinued	-6	-2	0	-8	1
Math					
Regular students	-12	-17	-14	-16	-9
Continuing Title I students	9	9	9	4	6
Students whose Title I was discontinued	27	11	10	-4	-7

tended to have actual scores which were below those predicted from the first year growth experience. This is what we would expect from the fact that actual growth rates are somewhat lower in each successive grade. The growth rates for the students who received Title I services in both Year 1 and Year 2 are positive. While this positive growth is encouraging and consistent with the general finding that Title I has a positive effect, the conclusions need to be tempered by remembering that these students come from the lower part of the achievement distribution and will exhibit higher regression effects than the other two groups. Finally, the students who had their Title I services discontinued in the second year fall between the regular students and those who continued to receive Title I services. In Year 2 the rate of reading achievement for these discontinued students didn't quite keep up with their growth rates during Year 1 when they were receiving Title I services. In math, the previous Title I students seem to surpass their expected Year 2 growth when they are in grades 2, 3, and 4, but not

to exceed expectations in grades 5 and 6. (In interpreting these figures we must remember that they are expressed in vertical scale scores and not percentiles. Generally, a gain of about six vertical scale scores is required to be significant at the .05 level.)

The conclusion drawn from this material is that those students who have had their Title I services discontinued continue to grow in the next year at about the rate that would be expected if they had continued to receive Title I services. The data supporting this conclusion are not as clear as would be desirable because they are contaminated by the fact that comparison groups come from different levels in the achievement distribution and thus grow at different rates, and also by the problem of differential regression rates. However, when we consider the results based on growth rates and the results based on the percentile scores achieved in the spring of the second year, we feel safe in concluding that the discontinuation of CE services for the higher of the low-achieving CE students does not result in an impairment of their achievement growth in the subsequent school year.

CHAPTER VIII. WHAT HAPPENS TO STUDENT ACHIEVEMENT OVER THE SUMMER, AND IS SUMMER SCHOOL EFFECTIVE?

Summary

This chapter examines two questions. The first concerns the amount of achievement loss or gain over the summer. The second bears on the effectiveness of summer school. The results are:

- *There is no absolute loss over the summer. There are quite large reading gains over the summer and there are smaller math gains.*
- *In comparing CE students with regular students, there may be a very slight, overall relatively smaller summer gain for CE students in reading, but not in math. The differences are so small that they have no practical significance.*
- *The relative changes of high achievers and high gainers were examined. The results are compounded by regression effects and show that high gainers tend to lose over the summer but low gainers tend to gain over the summer. Such changes as may exist do not seem to justify any special summer programs.*
- *In comparing the achievement gains of students who attended summer school with those who did not attend, no differences were found. It is emphasized that there is relatively little instruction in reading or math during summer school and that gains probably should not be expected.*

INTRODUCTION

All groups of students show achievement growth during the regular school year. But what happens to that growth over the summer? To what extent do students continue to grow academically even though they receive no formal instruction? We have already seen in Chapter V that during the regular school year the rate of growth for CE students is sometimes less than it is for regular students. It has been suggested that during the summer, regular students continue to improve their achievements due to informal learning experiences, but that CE students lack both the motivation and resources to engage in these informal learning activities. However, the evidence is less than clear-cut. As will

be discussed later, some have argued that, for all students, achievement suffers an absolute decline over the summer, while other evidence suggests that CE students suffer a loss relative to regular students. It has been further suggested that, among CE students, those who achieve the highest gains during the regular school year suffer the sharpest losses during the summer.

Based on these ideas, it has been suggested that summer school has an unusually important role to play. It has been argued that some CE students have regular school-year learning experiences which enable them to achieve exceptionally high gains, and that it is important that efforts be made to continue this high rate of achievement, summer school seeming like a reasonable way of doing it. Since summer school classes are available to only about half of all students, it has been argued that their availability should be increased, particularly for CE students.

The remainder of this chapter examines these ideas. First, we will discuss the extent to which there is a "summer drop-off" and then we will consider the availability and effectiveness of summer school.

THE NATURE OF ACHIEVEMENT GROWTH OVER THE SUMMER

In a 1972 review of the effectiveness of summer compensatory education, Austin, Rogers and Walbesser (1) conclude that students participating in CE summer programs show "modest achievement gains." However, they point out that the studies reviewed generally had no control groups, and it is possible that "maturation" could account for the gains reported. The same review indicated that school principals and teachers believed summer school to be an effective learning experience. However, starting in 1976 the Stanford Research Institute's (SRI) Educational Policy Research Center issued a series of reports that raised questions about whether or not there was any maturation over the summer and whether or not there were comparable growth changes for regular and CE students. Their studies were done within the context of studying the proper period for evaluating CE programs. It was argued that evaluations based on fall-to-spring achievement gains were less than adequate because there were significant changes during the summer. Thus CE students who showed impressive

gains during the fall-to-spring time period might lose much of the gain during the summer. If this were the case, it was argued, then the proper period for evaluation was from the fall of one year to the fall of the next year.

The series of SRI reports raised serious questions that influenced policy regarding whether the federal government was appropriately evaluating its CE-funded programs, as well as whether it should support efforts to increase federal funds available to summer programs. In light of the significant impact the SRI results were having, it was important to examine the NES data base relative to summer achievement change.

Is There an Absolute Summer Loss?

As we have already discussed, it was generally assumed that there should be some relatively modest gains over the summer. Test publishers assume a one-month summer growth, and the literature generally supported a summer gain. Thomas and Pelavin say, "However, existing research suggests that the disadvantaged student has no gain or a one-month loss over the summer" (19). It was suggested that CE students were given particularly intensive instruction during the regular school year and thus showed very significant growth. But this growth was thought to be ephemeral and much of it was lost during the summer. Thus CE students who had gained more than regular students during the regular school year lost more than regular students during the summer, and ended up the following fall further behind the regular students than they had been the previous fall. However, the 1976 SRI report was based on a compilation of state ESEA Title I evaluation reports and the data were admittedly less than satisfactory.

In 1977 Pelavin and David (16) published a report based on longitudinal data. They obtained data from a midwestern city, known as "City M," which had fall, spring, and ensuing fall test results on the Gates-MacGinitie reading test for a moderate number of CE students. The results are shown in Table VIII-1.

Table VIII-1

"City M" Grade Equivalent Means for Reading for Students with at Least Three Consecutive Test Points*

Grade	N	Fall	Spring	Fall
3	272	2.23	3.29	2.78
4	931	2.65	3.58	3.18
5	980	3.23	4.30	4.01
6	316	3.84	4.78	4.42
7	128	4.35	5.25	4.95

*Adapted from Pelavin and David (16), Table 1.

Similar results were available for two successive years. While the number of cases shrank considerably, the results were similar, with each fall grade-equivalent mean considerably below the mean for the preceding spring. They also report results for two California junior high schools participating in the Demonstration Programs in Intensive Instruction. The number of cases is quite small (from 47 to 153) and the results are reported in (often misleading) grade equivalents. Again, students were followed longitudinally for two years. Of six comparisons for reading, five showed summer losses and one a gain; for math, five showed losses and one no change. From these results they believe that ". . . achievement gains made during the school year are not sustained, even until the next fall"; and say:

> "In conclusion, we urge that districts administer achievement tests minimally each fall and preferably each fall and spring. These data would provide the capability for estimating the extent to which school year gains are sustained through the following summer. Both fall and spring tests have added advantage of allowing a separation of school-year and summer achievement. Although this information is not critical for estimates of annual gains, it is valuable for studying the extent and causes of summer losses. If, for example, the phenomenon is a function of the measures used, the standardized achievement tests, one would want to change the measures not the program. If it is a result of instructional techniques that mitigate against retention, then the techniques should be changed. Since there are no simple solutions (for example, there is little research to support the notion that summer

school would alleviate the summer losses), it is important to be able to determine why the losses occur in order to develop appropriate remedies."

These results received wide attention in the government and became known as the "summer drop-off phenomena." There are a number of reservations that can be made about the studies, which are discussed in Report #8.

In view of the somewhat unexpected results from the SRI study, others have investigated the summer drop-off phenomena. Recently, Hammond and Frechtling (5) reported on the results from a special study of the NIE Instructional Dimensions Study. Their results are shown in Table VIII-2.

Table VIII-2

Grade Equivalent Mean Achievement Gain Scores for CE Students*

Reading	N	Fall-to-Spring Gains	Spring-to-Fall Gains	Fall-to Fall Gains
Grade 1	395	1.2	0.0	1.2
Grade 3	565	0.7	0.2	0.9
Math				
Grade 1	143	1.0	0.1	1.1
Grade 3	314	1.2	0.0	1.2

*Adapted from Hammond and Frechtling (5), Table 1.

These results show no summer losses, and show summer gains in two of the four comparisons. Clearly these results are in contrast to the Pelavin and David findings of summer loss. Again, however, the results are based on a moderate number of cases, although it is said that the sample was representative of the original sample, which was "... purposively selected for their instructional features." The authors point out that the sample cannot be considered representative of Title I reading and math programs.

Heyns (7) studied summer school achievement changes in Atlanta, Georgia. She reports that Atlanta has a particularly vigorous summer school program. As a part of the study she analyzed data collected by the Atlanta school system, which is relevant to the summer loss question. Table VIII-3 shows typical results.

Table VIII-3

Mean Raw Scores in Basic Subjects by Test Dates and Subject Subtest.*
(N = 739, 7th Grade)

Subject Subtest:	Date of Test		
	Fall 1970	Spring 1971	Fall 1971
1. Word knowledge	17.3	21.9	22.8
2. Reading	15.3	17.5	18.0
3. Language	35.6	39.7	41.3
4. Language Study Skills	9.4	11.6	12.2
5. Arithmetic Computation	12.7	17.4	17.2
6. Arithmetic Problem Solving	15.6	18.8	19.5

*Adapted from Heyns' Table 2.3

The table shows that there are gains over the summer in all of the reading-related subtests. In the math area there is a small loss in one subtest and a larger gain in the other. Heyns presents data from several other grades which show similar results. These data have the advantage of being based on raw scores and thus there is no scaling problem. They have the disadvantage of involving only a small number of all Atlanta students and represent only one city. Nevertheless, they do not show the marked summer loss reported by SRI.

SES Report #8 contains data relevant to this issue. While the sample is not precisely representative of the nation's schools, it is close to a representative sample and includes large numbers of both regular and CE students. Figures 10-1 and 10-2 show the longitudinal achievement scores for a group of

about 39,000 students for the fall of 1976, the spring of 1977, and the fall of 1977. The number of students ranges from 7133 to 8412 per cohort. One can see rates of growth during the regular school year and compare them with levels of achievement in the subsequent fall.* Figure VIII-1 shows that, in reading, students continue to grow over the summer and, for the higher grades, at a rate which approximates the growth during the regular school year. The figure further shows that in reading there is an absolute gain over the summer. Figure VIII-2, shows the results for math. However, the change over the summer is different than for reading and, on the average, shows only smaller gains— gains in four comparisons and a loss in one comparison. It can be suggested that students get much more opportunity to practice reading in their everyday lives than they do to practice math. This is particularly true in the higher grades, and thus the rate of gain in reading during the summer approximates the rate for the regular school year. Finally, it seems clear that in these data there is not an absolute summer drop-off, instead, there is an overall gain. The data from the SES are of much higher quality than that available to Pelavin and David, and as mentioned, their data have a number of potential deficiencies. In contrast, the SES data were specifically collected for the study, were administered under known, controlled conditions, were based on large numbers of quite representative students, and the vertical scale scores are based on fall and spring testing points. In view of the results obtained, and their congruence with the NIE and Heyns data, we believe there is almost certainly an absolute reading gain over the summer, and that there is a similar, but smaller, absolute gain in math.

Is There a Relative Summer Loss?

Next it was suggested that there was a relative loss, namely that CE students showed more of an achievement loss than regular students. David and Pelavin (3) suggest this is the case and say (p. 4):

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*Strictly, these scores are not for the "summer." Tests were administered about four weeks before school ended and about 3 weeks after it started. Report #8 discusses what implications this may have, but it should be noted that this same characteristic is true of all the data reported by Pelavin and David, by Hammond and Frechtling, and by Heyns.

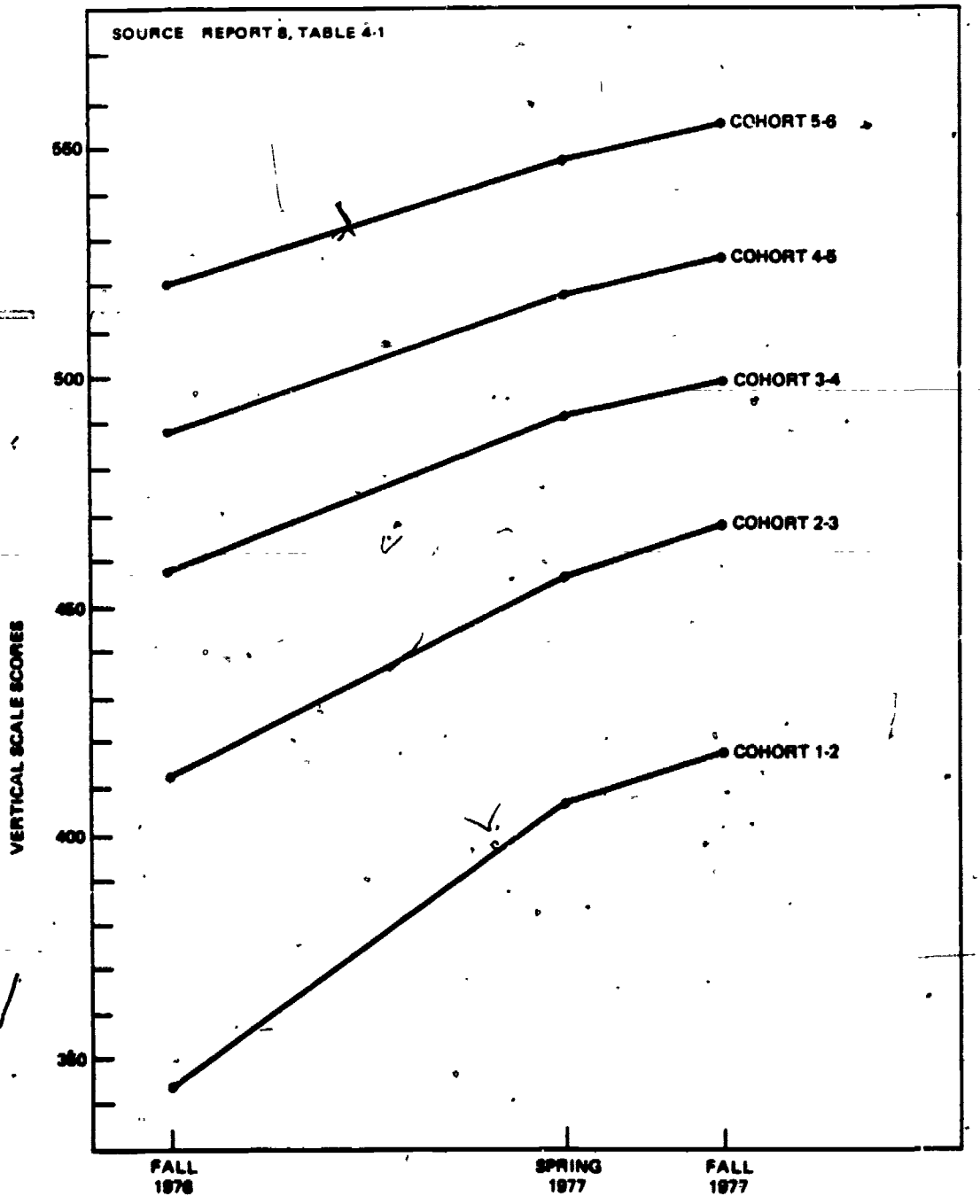

Figure VIII-1. Reading Achievement Scores

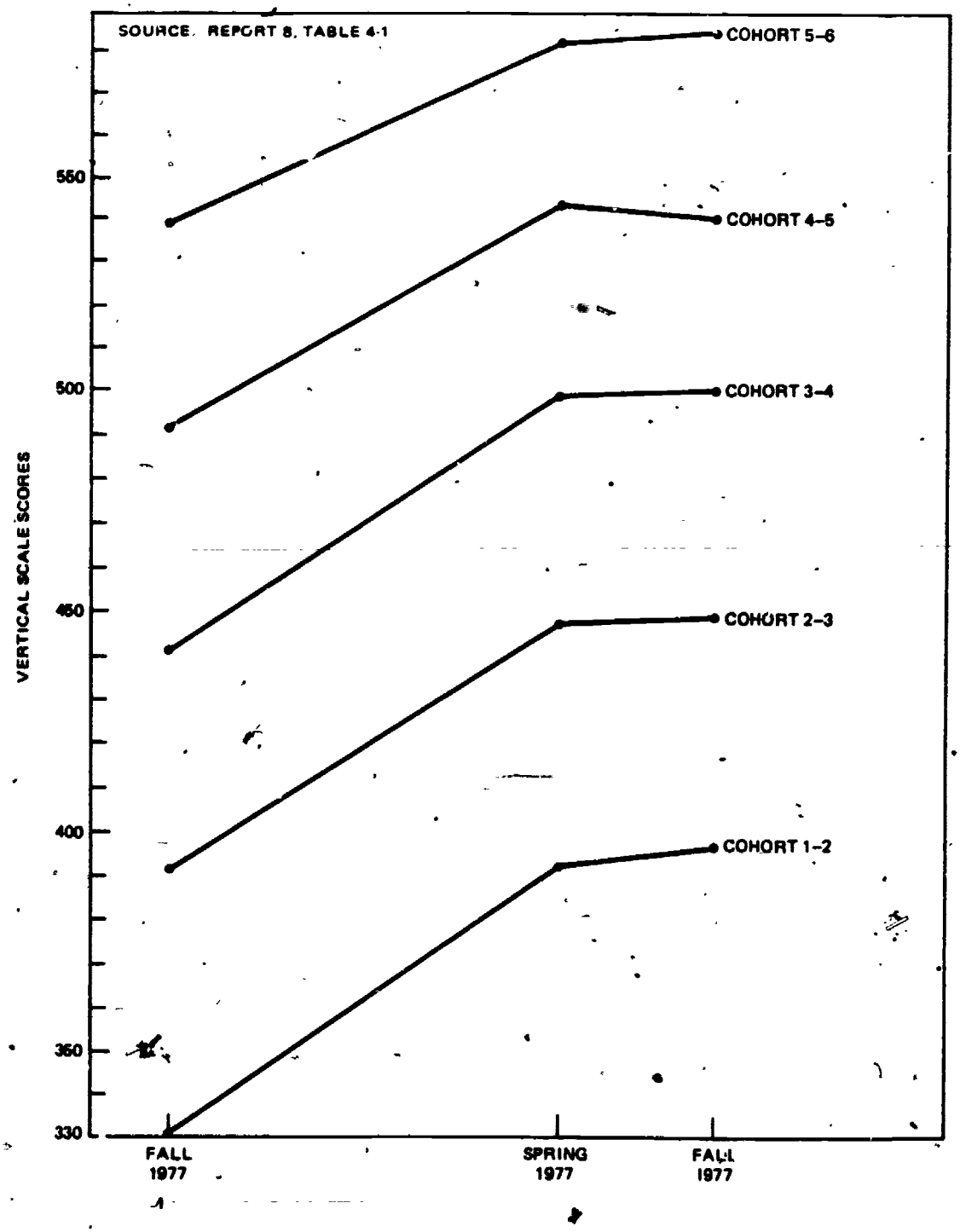

Figure VIII-2. Math Achievement Scores

"These studies, while extremely limited, present some evidence that disadvantaged students achieve at a slower rate than expected over the summer. Both conventional wisdom and the standardization procedure of achievement tests assume that the rate of achievement for all students is slower during the summer than during the school year... This pattern of achievement is presumed to be the same for both advantaged and disadvantaged students: all students are assumed to gain over the summer but at a slower rate than over the school year. The studies cited above suggest that this is not the case for disadvantaged students. In fact, disadvantaged students may have no gain over the summer or may even lose."

They then review their previous work and say, "Together, these findings suggest that large achievement gains produced by compensatory-education programs over the school year may be followed by corresponding achievement losses over the summer." David and Pelavin reexamine the data they reported previously and also include new data from the Alum Rock Voucher Study. The Alum Rock reading results show summer gains for three grades and no change for four grades. They conclude by saying, "Combined with questions raised by previous research, such as inconsistencies between school-year evaluation results and the results of annual state-wide testing programs, we suspect that the existence of summer losses is quite common for educationally disadvantaged students."

Again the NIE data are relevant. Table VIII-4 shows data for students who were above the 50th percentile and not recieving CE, and students who were below the 50th percentile and receiving CE.

Regarding these results, Hammond and Frechtling say: "When CE students whose pretest scores fall below the fiftieth percentile were compared to non-CE students whose pretest scores were at or above the fiftieth percentile, the low achievers lost ground over the summer to the high achievers. The difference was statistically signficant, however, only for the first grade. On a twelve-month basis the low achievers maintained their position relative to the high achievers because the CE students had higher rates of gain during the school year." There are several puzzling things about these data--particularly the wide variation in gains. It seems peculiar that non-CE first graders gained only 0.5 grade equivalents in both reading and math during the school year;

Table III-4

Mean Grade Equivalent Scores for Non-CE Students Above the 50th Percentile and CE Students Below the 50th Percentile*

Reading	N	Fall-to-Spring Gains	Spring-to-Fall Gains	Fall-to-Fall Gains
Grade 1				
Non-CE Students	296	0.5	0.1	0.6
CE Students	344	1.2	0.0	1.2
Grade 3				
Non-CE Students	305	1.0	0.6	1.6
CE Students	512	0.5	0.3	0.8
Math				
Grade 1				
Non-CE Students	435	0.5	0.1	0.6
CE Students	97	1.1	0.1	1.2
Grade 3				
Non-CE Students	178	1.6	0.2	1.8
CE Students	306	1.2	0.1	1.1

*Adapted from Hammond and Frechtling, Table 2.

similarly, why did the 3rd-grade CE reading students gain only 0.5 grade equivalents in reading but 1.2 grade equivalents in math? We believe that these data are equivocal regarding the existence of a relative summer loss for CE students.

The SES has extensive data on this problem. We can use the same data as presented before on the absolute summer drop-off question, but break it into two groups--those receiving CE and those not receiving CE. Figures VIII-3 and

VIII-4 show the results for reading and for math. The number of cases for reading varies from 1477 to 2344 for CE students and from 5400 to 6131 for non-CE students. The corresponding numbers for math are 1115 to 1499 and 6132 to 7061. It will be noted that for the non-CE students in reading there is a lessening in the rates of growth over the summer for the lower grade cohorts but very little, if any, for the higher grades. For the CE students there is a similar lessening in the lower grades, but, considering their slightly slower rates of growth during the regular school year, there may be a slight summer gain relative to non-CE students. In the higher grades the CE students in reading drop off slightly more than their non-CE peers. For math the picture is somewhat different. Both the CE and non-CE students show a lessening in rates of growth over the summer for all grade cohorts. The change for CE and non-CE students is very similar with, perhaps, a slightly larger drop for the non-CE students. Since the graphs have a number of overlapping lines and many may be difficult to follow, the same results are shown numerically in Table VIII-5. In evaluating these summer changes it should be remembered that the standard deviation of a vertical scale score is about 50. It is our position that there may be a very slight, overall relative summer drop for CE students in reading, but not in math. Because of the very large number of cases involved in each comparison it is possible to show a few statistically significant changes, but from a practical point of view the data do not support the idea of any important loss for CE students relative to their non-CE peers. Neither the SES data nor the NIE data give credence to any large or particularly significant relative summer loss.

Over the Summer, Do High Achievers Lose More than Low Achievers?

It has been suggested that CE students who are high achievers are the ones who lose the most during the summer. Achievement is defined here as the achievement level of the student, not the gain during the school year--which will be considered in the next section. It is thought by some that students with good academic potential profit from the increased services afforded by CE instruction, but that during the summer they are again placed in an impoverished intellectual environment and lose more of the school-year achievements than do non-CE students, who enjoy superior summer environments. It is

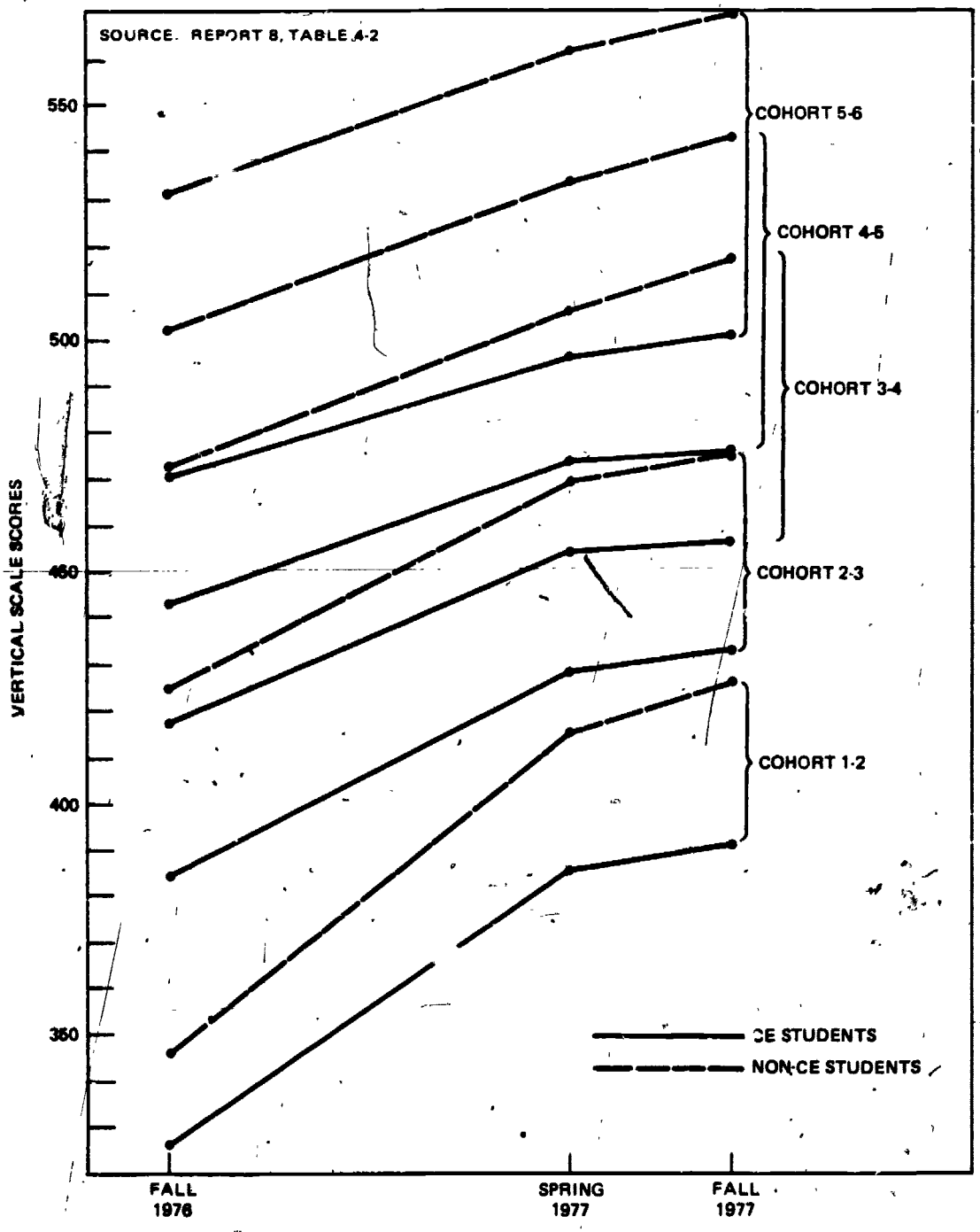

Figure VIII-3. Reading Achievement Scores for CE and Non-CE Students

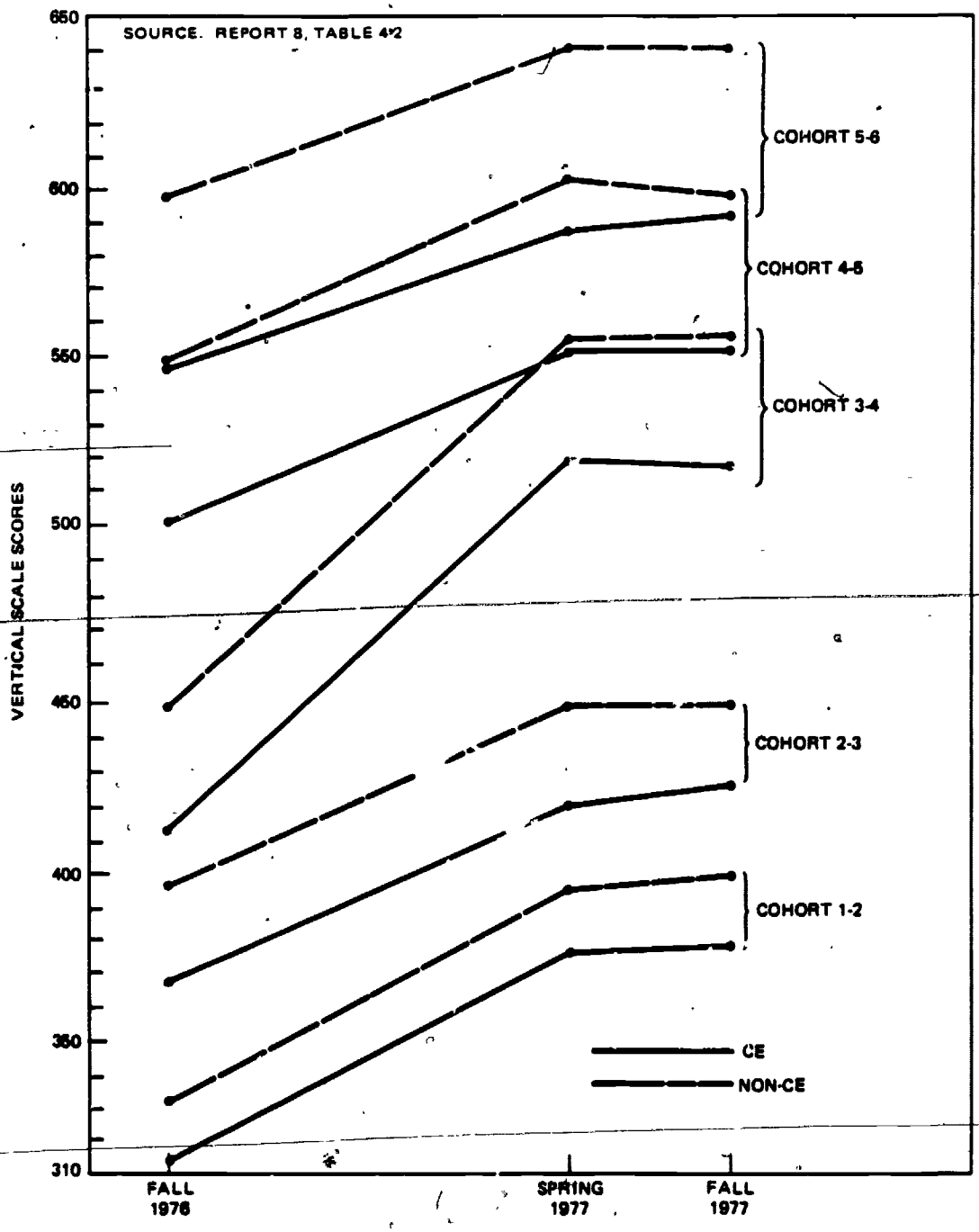

Figure VIII-4. Math Achievement Scores for CE and Non-CE Students

Table VIII-5

Summer Gain Scores for CE and Non-CE Students.
(Vertical Scale Scores)

Cohort CE Status	Spring 1977	Fall 1978	Summer Change
	Reading		
Cohort 1-2			
CE	385	391	6
Non-CE	416	427	11
Cohort 2-3			
CE	428	433	5
Non-CE	468	476	8
Cohort 3-4			
CE	455	456	1
Non-CE	507	518	11
Cohort 4-5			
CE	474	477	3
Non-CE	534	543	9
Cohort 5-6			
CE	497	501	4
Non-CE	561	571	10
	Math		
Cohort 1-2			
CE	376	377	1
Non-CE	395	400	5
Cohort 2-3			
CE	421	426	5
Non-CE	451	451	0
Cohort 3-4			
CE	469	468	-1
Non-CE	505	506	1
Cohort 4-5			
CE	502	501	-1
Non-CE	552	547	-5
Cohort 5-6			
CE	539	543	4
Non-CE	591	592	1

further suggested that children who are low achievers gain relatively little during the regular school year, and likewise lose relatively little during the summer.

The graphical presentation here is more complicated than in the previous graphs because for each cohort two concepts are presented simultaneously, namely, CE status and level of achievement. Level of achievement was defined as the average of the fall and spring (recommended level) test scores for the previous school year. This averaging was done to achieve as much stability as possible in specifying the level of achievement for each child. The graphs show the results for the first quartile, that is, the quarter of students having the lowest achievement test scores, and for the third quartile. The third quartile was selected rather than the fourth quartile for two reasons. First, the number of cases of CE students in the fourth quartile, by grade cohort, became quite small and the results were rather unstable. Second, the fourth quartile results, while unstable, were consistent with those for the third quartile where the number of cases was reasonably large (not less than 114 for the smallest cell-by-cohort, by CE status). Table VIII-6 shows the gains and losses in achievement test scores over the summer for students in the first and third achievement quartiles. Figures VIII-5 and VIII-6 are quite complicated but are included here because they show the basic growth data for the school year and the summer. A number of interesting results follow from these data:

1) For reading, the growth rate for the first quartile during the school year is quite similar for each cohort and between cohorts, and the growth continues at approximately the same rate over the summer. A portion of the measured summer growth is undoubtedly due to regression, but, surprisingly, the amount of growth and/or regression is similar for both CE and non-CE students.

2) For reading, the rate of growth of third quartile students during the school year is considerably higher than that for first quartile students. There is a tendency during the

Table VIII-6

Changes in Test Scores Over the Summer for Low- and High-Achieving Students by CE Status.

Cohort	CE-Q1	Non-CE-Q1	CE-Q3	Non-CE-Q3
		Reading		
1-2	11	16	3	13
2-3	8	13	0	7
3-4	3	10	-1	13
4-5	6	11	-4	6
5-6	7	8	-3	11
		Math		
1-2	16	21	-9	0
2-3	7	7	-4	7
3-4	9	9	-9	1
4-5	9	9	-12	-9
5-6	12	15	-5	-1

regular school year for CE students to grow at a higher rate than non-CE students.

Over the summer, third quartile non-CE students continue to grow, while, particularly for the higher grade cohorts, the third quartile CE students show a loss. The third quartile students should show less regression toward the mean than first quartile students, but there should still be some regression for third quartile students. In spite of this, non-CE students continue to grow over

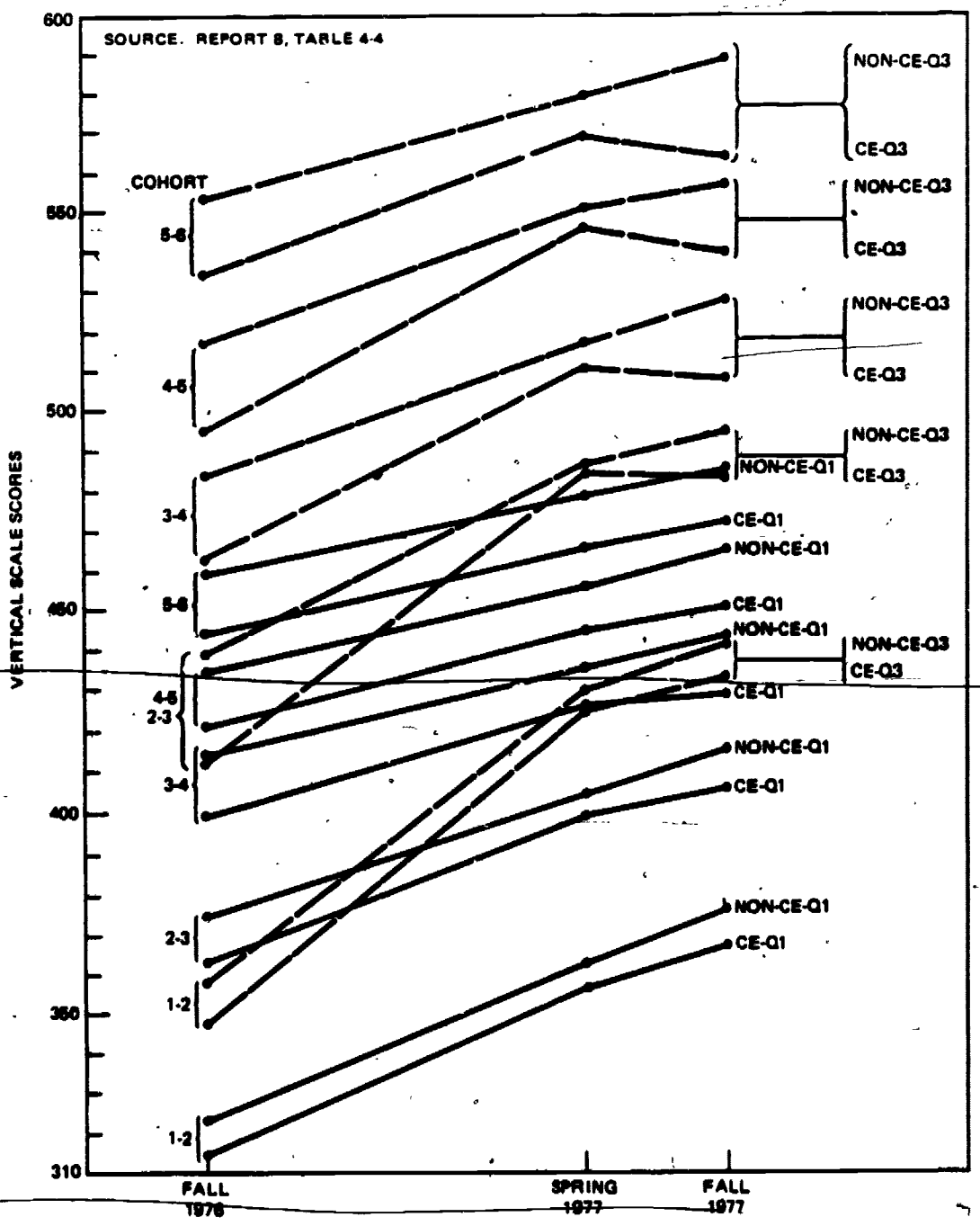

Figure VIII-5. Reading Achievement by CE Status and Quartile of Achievement Level

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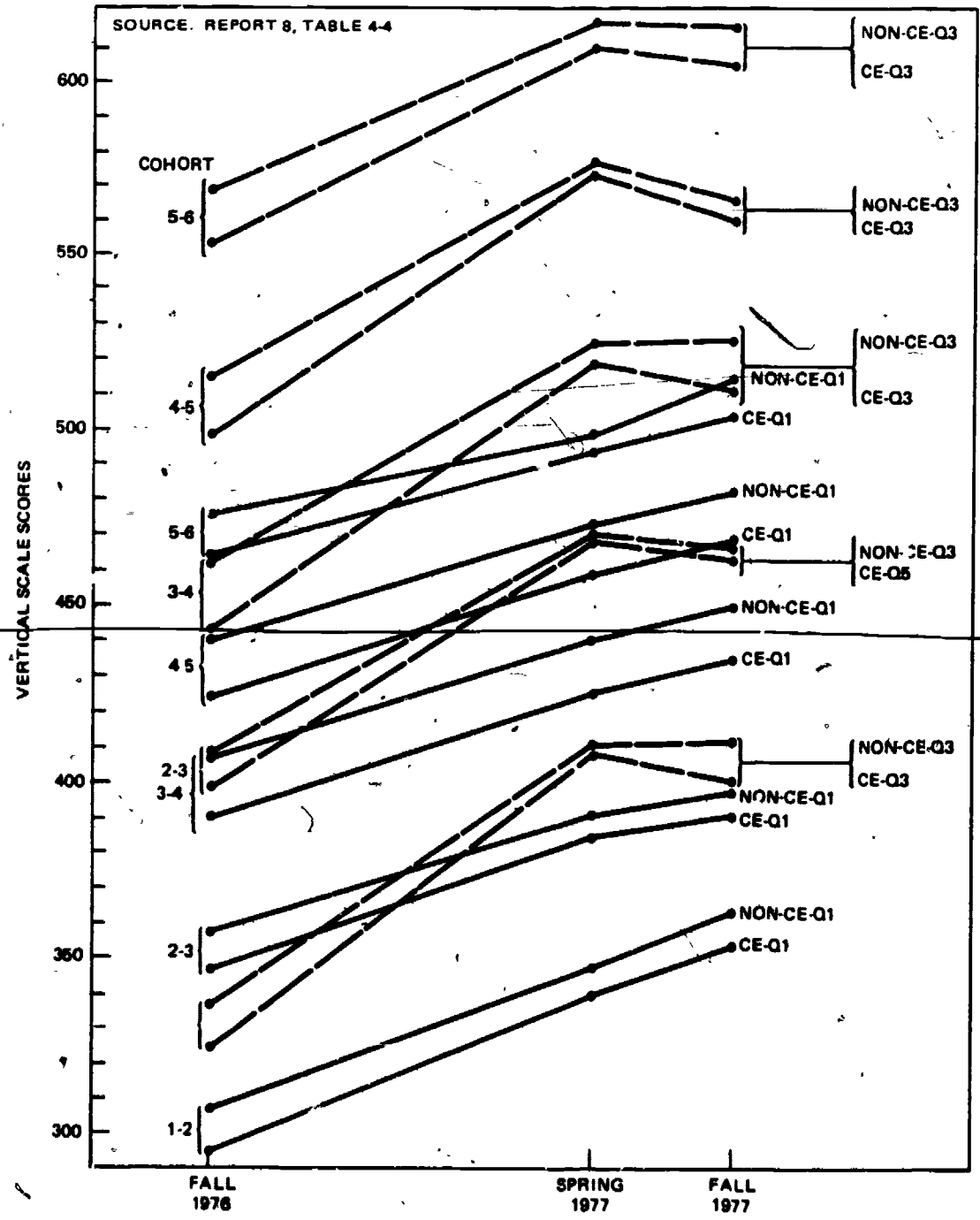

Figure VIII-6. Math Achievement by CE Status and Quartile of Achievement Level

the summer. Certainly for reading, the CE students in the third quartile show a relative loss, while the first quartile CE students do not--rather they show about the same gain as first quartile non-CE students.

3) For math, the first quartile students behave in much the same way as they do for reading; that is, they have gains over the summer that are about the same as school year gains, and there is little difference between CE and non-CE students.

4) For math, for the third quartile students, the picture is somewhat different than it is for reading. Again the third quartile students grow at a more rapid rate than first quartile students, but both CE and non-CE math students show losses over the summer. Also, there is evidence that the CE students lose at a greater rate than the non-CE students, but the difference is not as great as for reading.

From the above we conclude that low-achieving students continue to grow over the summer and at about the same rate as during the school year, and there is no significant difference between CE and non-CE students. On the other hand, high-achieving students grow at a higher rate during the school year. For reading, non-CE high-achieving students continue to grow over the summer, but CE students show a loss, and a relative loss. For math, both CE and non-CE high-achieving students show a loss over the summer, but the CE students show a larger loss.

Just how important this relative loss for high-achieving students is depends upon where the emphasis for CE resources should be placed. There are about six times as many CE students below the median in achievement as there are above it. If the goal is to help the vast majority of CE students, can one justify allocating exceptional resources to high-achieving CE students on the grounds that they lose more over the summer than their non-CE peers? On the other hand, low-achieving CE students gain over the summer. Perhaps they would gain more if they had special summer services.

Over the Summer, Do High Gainers Lose More than Low Gainers?

The final variation on the summer loss question revolves around the relative loss of high and low gainers. It has been argued that during the regular school year, particularly for CE students, those who gain an exceptional amount lose the gain during the summer. It is thought that these students need the stimulation of intensive instruction to achieve these gains and that lacking such stimulation over the summer they lose more than those achieving smaller gains.

First, we studied the gains and losses of individual Title I students who had experienced the largest and the smallest gains during the regular school year. The students were divided into four equal-sized groups based on the amount of gain experienced from the fall to spring in the regular school year. Then the arount of summer gain or loss associated with each group was determined. Table VIII-7 shows the results.

Those students having the highest measured gains during the school year show quite sizable losses over the summer. On the other hand, those students showing the lowest gains during the school year show equally large gains over the summer. These data are an almost perfect example of the regression-toward-the-mean phenomenon. It is well known that test scores at the extremes of a distribution are less reliable than those near the mean. Gain scores are generally less reliable than individual test scores, and thus even more subject to regression. As would be predicted by regression effects, those students who show very little gain during the school year show a relatively large gain over the summer, while those students showing high gains during the school year show relatively large losses over the summer. These gains and losses are almost certainly artifacts attributable to measurement error and show how difficult it is to generalize about a trend unless both ends of the distribution are considered (or one has extremely reliable measures).

Table VIII-7

Mean Spring 1978 to Fall 1978 Test Score (VSS) Changes for Title I Students by Quarter of Achievement Gain in the 1976-77 School Year

Cohort	Total Number of Students	Quarter of 1976-77 School Year Gain			
		Lowest	Second	Third	Highest
		Reading			
1-2	1583	22	2	1	-8
2-3	1606	17	7	2	-12
3-4	1646	18	2	-4	-16
4-5	1303	22	6	-5	-19
5-6	1066	23	11	1	-12
		Math			
1-2	854	22	5	-9	-24
2-3	864	30	10	-3	-18
3-4	1023	17	0	-9	-24
4-5	850	22	1	-11	-27
5-6	758	24	8	0	-22

There is still the possibility that students associated with the more successful CE projects experience greater losses than those in less successful projects. To investigate this possibility we determined the gains over the school year for each grade in each school that contained Title I students. With the SES data we were not able to associate each student with a particular "project" (which is a very hard to define entity in actual school practice), but since particular grades having Title I students were a well defined unit, where the Title I students were probably receiving quite similar instruction, we used grade in lieu of project. The regular school year gain of each student in a grade was determined and from it the average grade gain was computed. Again, there were four equal groups of grades formed, depending on the average gain of the students in grade. Table VIII-8 shows the gains and losses associated with each group of grades.

Table VIII-8

Mean Spring 1978 to Fall 1978 Test Score (VSS) Changes by Four Levels of 'Project' 1976-77 School Year Gains

Cohort	Average Number of Students at Each Quarter of 'Project' Gain	Quarter of 'Project' School-Year Gains			
		Lowest	Second	Third	Highest
		Reading			
1-2	375	12	6	2	0
2-3	346	8	1	10	-2
3-4	360	9	2	0	-9
4-5	277	4	7	2	-7
5-6	223	8	7	4	2
		Math			
1-2	186	9	0	-2	-9
2-3	190	17	13	-5	-9
3-4	232	-4	-1	1	-11
4-5	181	1	2	-9	-9
5-6	156	13	11	0	-7

Again we see the same trends that were seen for individual students. Grades are made up of students having a considerable dispersion in their scores and thus, on the average, we would expect less regression towards the mean when grade averages are used for categorization rather than individual scores. Also, group data are more reliable than individual data and thus there is less change. It can be seen that those grades whose students had high gains during the regular school year had losses over the summer, while those grades whose students had low gains over the school year had summer gains which were similar to the losses of the high-gain group. As before, the results are almost certainly artifactual. It is our conclusion from these data that high-gainers do not really experience losses over the summer, nor do low gainers really experience unusual gains over the summer.

From this wealth of data we conclude that there is no absolute summer drop-off, but that there may be a slight, but not particularly significant, relative loss for CE students in comparison to non-CE students. The more detailed analyses of high and low gainers, and of members of high-gain and low-gain projects, lead us to believe that reported relative summer drop-off is more of a measurement artifact than a reality.

SUMMER SCHOOL AND ITS EFFECTIVENESS

The place of summer school in the general scheme of elementary education is not well defined. Some have suggested that students who have not performed well during the regular school year should go to summer school as an additional learning experience that would help them in the coming school year. It has been thought that this might be particularly important for CE students who are having difficulty in keeping up with their peers. Also, if high-achieving CE students lost a large amount of their school-year gain, it would be particularly important that they attend summer school to help mitigate such losses. Of course, summer school serves functions in addition to instruction in basic subjects. There are recreational and special-interest classes that many students find attractive. Summer school can also serve as a safe haven for children whose mothers are working or need to be away from the home. Summer school serves many purposes in addition to instruction in reading and math.

What Is Summer School and How Available Is It?

In the SES, we surveyed the principals of 52 summer schools in the second-year SES sample. The average length of these summer schools was five to six weeks, which means 25 to 30 school days. There were slight tendencies for large districts to offer a few more days of instruction than for small districts, and for medium-poverty districts to offer a few more days of school than high- or low-poverty districts. But these trends were slight and it is appropriate to think of summer school as lasting five or six weeks (see Table 3-12, Report #8). The amount of reading and math instruction is not large. On the average there are about 17 hours of reading instruction and about 14 hours of math instruction. There is no difference in the amount of instruction as grade level increases, nor do Title I students receive more instruction than others (see Table 3-15,

Report #8). However, there is a clear tendency for CE students to attend summer school more than non-CE students. By grade cohort, the percentage of CE students who attend ranges from 2_ to 32, while the percentage of non-CE students who attend ranges from 7 to 20. In terms of teachers' judgments of need for CE services, twice the percentage of 'needy' students attend summer school than the 'not needy.' In terms of achievement test scores, those attending summer school score considerably lower than those not attending, and this is true both among CE students and non-CE students (see Table 3-7 and D-1 through D-5, Report #8).

About half of all students have summer school available either at their regular-year school or elsewhere in the district, with larger schools more frequently having summer school. There is a slight tendency for schools having high concentrations of minority students to have summer school more frequently. About two-thirds of all summer schools are supported by Title I funds, but only a quarter are completely supported by Title I funds.

The previous figures are all derived from the SES study and they are quite consistent with other reports. David (4) intensively studied the Title I summer programs in three states, and she found that "The programs average five or six weeks in length and generally run two to four hours per day." She reports that fewer than 15 percent of all Title I districts have Title I summer programs. At first glance this appears inconsistent with our findings that about half of all students have summer school available. It must be remembered that there are many small and rural districts and that there is a tendency for large schools in large districts to have summer school more frequently. She also reports "...that the summer school program tends to be staffed by non-Title I teache[illegible] resulting in a staff unfamiliar with participating students." She repor[illegible]t personnel believe summer school to be [illegible]ademically effective, but also points out that she has no objective data to support such a supposition. We have already cited Austin, Rogers and Walbesser's (1) review of summer studies. They come to the same conclusion.

How Effective Is Summer School?

In judging the effectiveness of summer school it is not sufficient to show that students who attend summer school increase their performances over the summer. To measure the effectiveness of summer school, one must compare students who attended summer school with similar students who did not attend.

Figure VIII-7 shows the reading growth of summer school attendees and non-attendees for the regular school year and for the summer, while Figure VIII-8 shows the same material for math. These curves show that, for reading, both attendees and non-attendees continue to grow over the summer, and also that the summer growth for the two groups is similar. For math, there is growth over the summer in the lower grades but a leveling off or decline in the higher grades, but again there is no greater achievement for those who attended summer school.

These figures lump CE and non-CE students together. It can be argued that, over the summer, CE students may perform differently. Figures VIII-9 and VIII-10 show a comparison between CE students who did and didn't attend summer school. For reading it should be noted that in the first two grades the attendees and non-attendees start the school year quite close together, while in the higher grade cohorts the attendees are the lower achievers. Almost all groups gain over the summer; the attendees do not gain more than the non-attendees. While at first glance one may think there is a trend for attendees to gain more--for example for cohort 1-2--it is contradicted by another cohort--like 2-3. For reading there is no statistically significant advantage as a result of attending summer school. For math there is a suggestion that those who attend summer school gain more than those who do not, but the trend is not statistically significant.

The previous data can be criticized on the grounds that attendance at summer school is voluntary, and that when volunteers are compared with non-volunteers from the same school a biasing element is introduced. It can be seen from Figures VIII-7 and VIII-8 that it is the lower-achieving students who attend summer school and it can be argued from the evidence in Figures VIII-5 and VIII-6 that lower-achieving students will seem to gain more than higher-achieving students

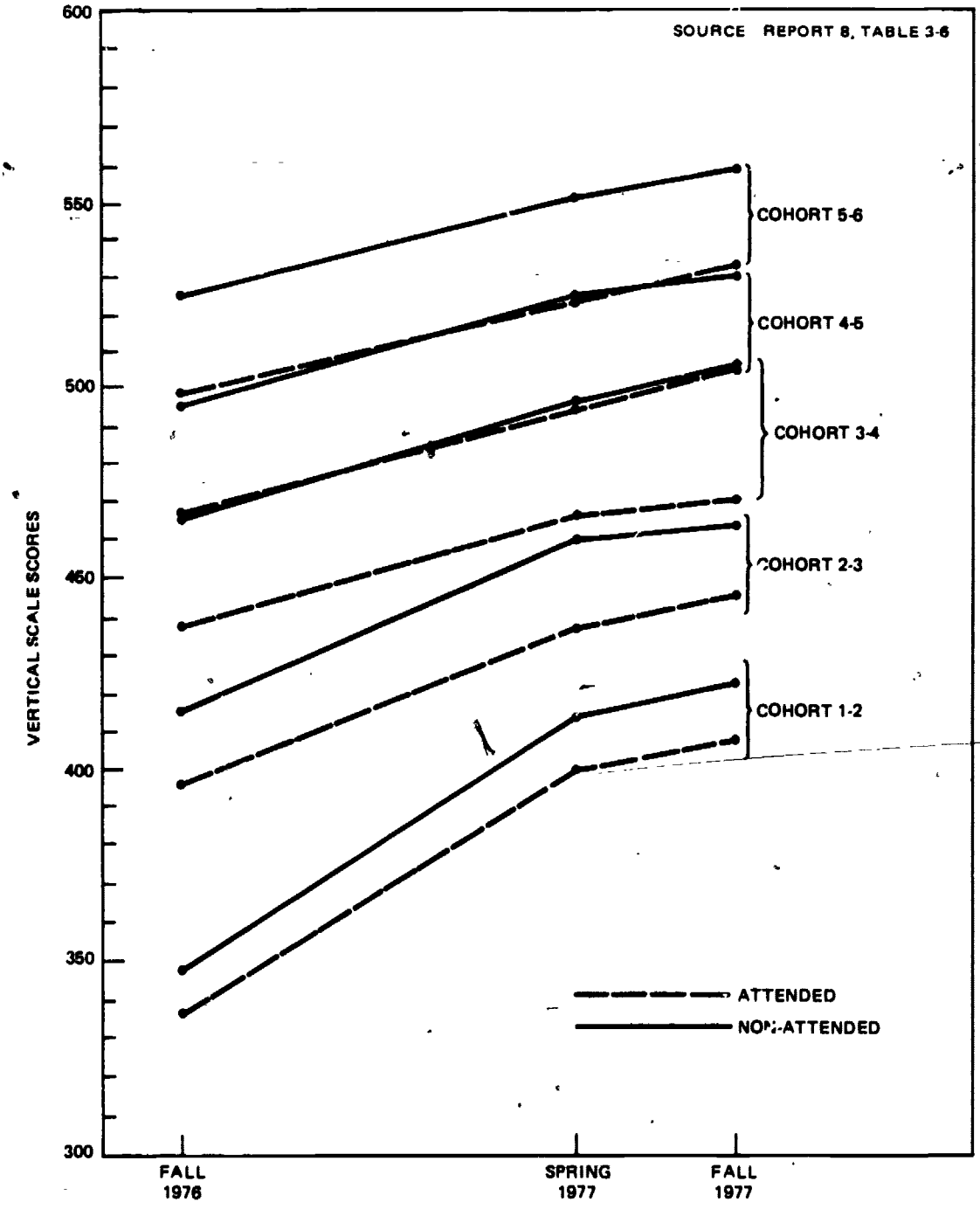

Figure VIII-7. Reading Achievement by Summer School Attendance

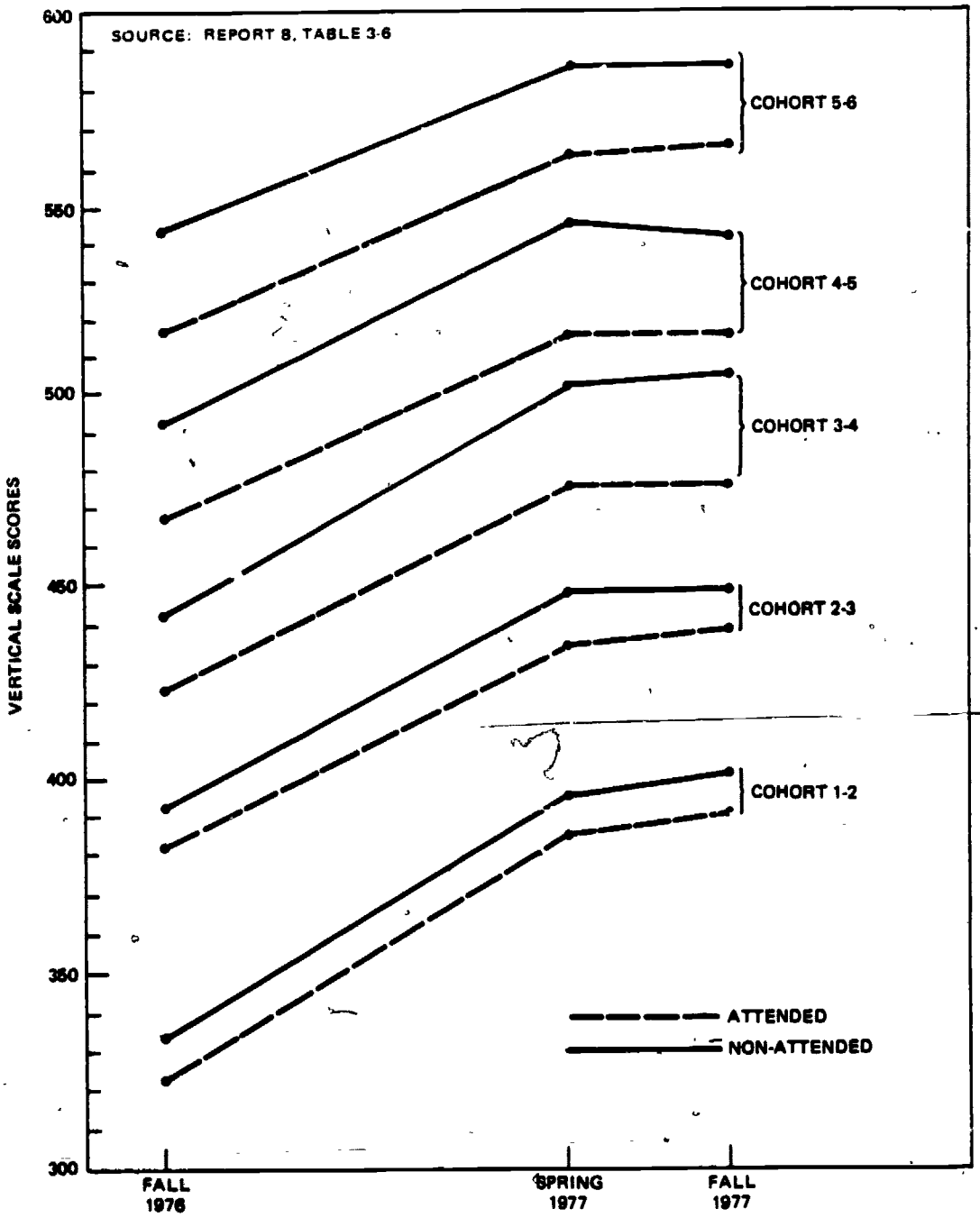

Figure VIII-8. Math Achievement by Summer School Attendance

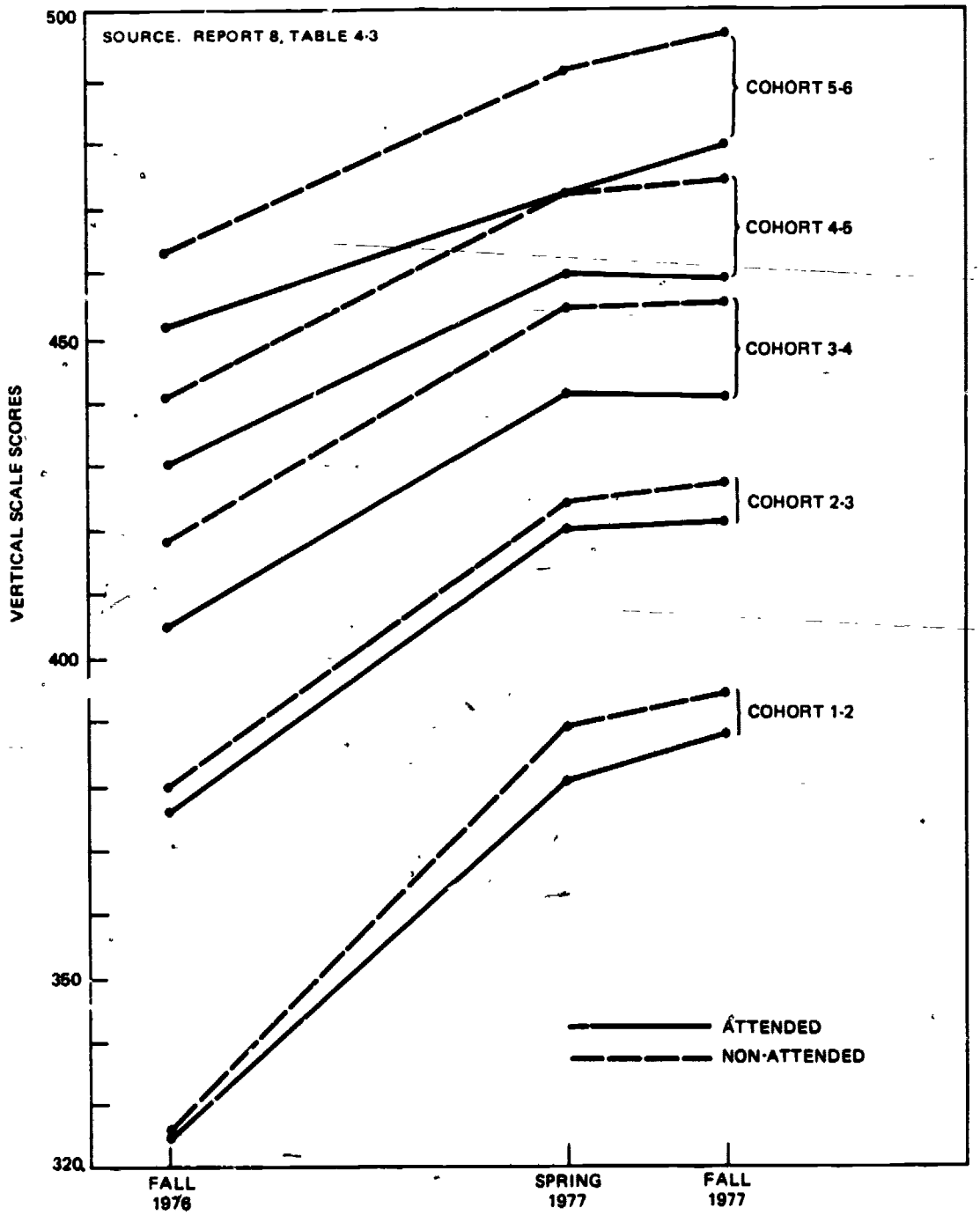

Figure VIII-9. Reading Scores for CE Students Who Attended and Did Not Attend Summer School

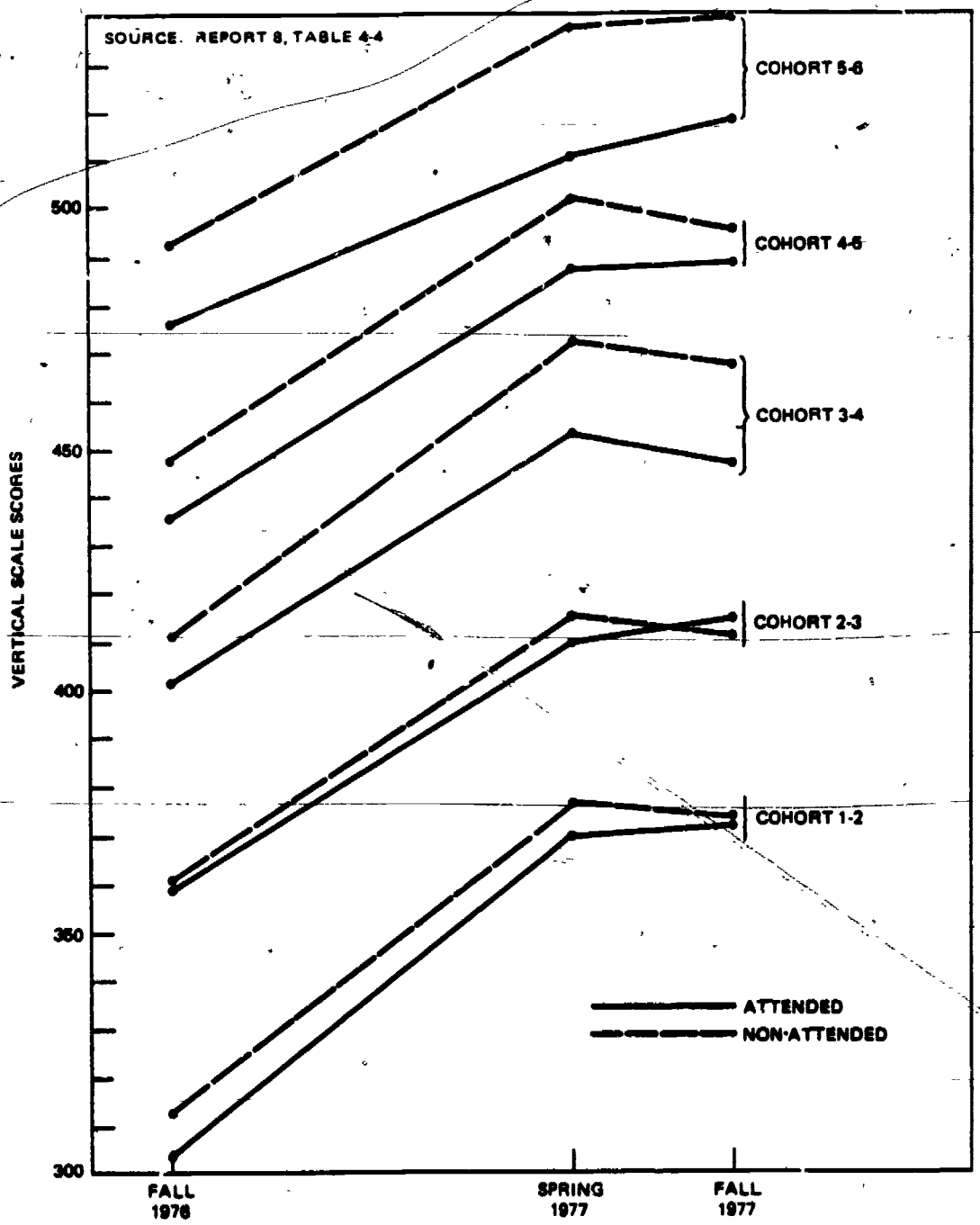

Figure VIII-10. Math Scores for CE Students Who Attended and Did Not Attend Summer School

due to regression effects. In an effort to overcome some of these possible limitations in the analysis, another comparison group was formed. Title I students from schools that did not have summer school available were compared to students from Title I schools offering summer school. The groups of students were matched on initial levels of achievement. Thus two groups were formed that were matched on achievement and on being Title I students, but one group attended while the other could not attend summer school. Again the statistical tests showed no significant difference in growth between those who attended and those who did not.

All the analyses from the SES data discourage the idea that summer school, as it is now conducted, is an effective mechanism for improving the performances of CE students.

As we compare students who attended summer schools with those who did not, we simply find that present summer schools are not effective in raising basic-achievement test scores. But what effect should be reasonably expected from four or five weeks of instruction of less than an hour a day for reading or math? When children are rapidly maturing in their reading skills and can have summer reading experiences without summer school, should we expect summer-school-related reading gains? In the data there is a hint that summer school in the higher grades may be effective in math, and, in comparison to reading, there is less summer growth in math in higher grades. Probably there is less opportunity for math-related experiences during the summer. We should not extrapolate these results by concluding that summer school cannot be effective. If summer school were longer and had more hours per day devoted to basic subjects, it might result in achievement gains for attendees--but that is still to be demonstrated.

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