DOCUMENT RESUME

ED 237 277 RC 014 450

TITLE Academic Performance, Attendance, and Expectations of Indian Students in Public Schools. Monograph 1.

INSTITUTION Development Associates, Inc., Arlington, Va.

SPONS AGENCY Department of Education, Washington, DC. Office of Planning, Budget, and Evaluation.

PUB DATE 30 Jun 83

CONTRACT 300-80-0862

NOTE 269p.; For related documents, see RC 014 449-452.

PUB TYPE Reports - Research/Technical (143) -- Statistical Data (110)

EDRS PRICE MF01/PC11 Plus Postage.

DESCRIPTORS *Academic Achievement; Administrators; *American Indian Education; American Indians; Aspiration; *Attendance; Dropout Rate; Elementary Secondary Education; *Expectation; Opinions; Parent Attitudes; *Program Effectiveness; Public Schools; Research Methodology; School Holding Power; Scores; *Student Attitudes; Teachers; Tutoring

IDENTIFIERS *Indian Education Act 1972 Title IV

ABSTRACT

First in a series, the monograph provides a detailed description of the variety of data collected concerning student achievement and attendance during a 1980-1983 evaluation of Indian Education Act Title IV Part A programs. Data included the results of standardized achievement tests; anecdotal evidence from parents, project staff, and others; ratings of project-related academic gain by parents, teachers, and LEA (local education agency) staff; tutor ratings of tutored students; and student ratings of project assistance. The monograph presents the data in three major parts. Part A, Academic Performance in Public Schools, includes separate sections concerning a meta-analysis of achievement test scores; a description of the formal project academic activities; a detailed analysis of 1981 achievement test scores of Indian students at Part A projects; and ratings by tutors, parents, teachers, students, and staff of the impact of Part A projects on student achievement. Part B, Public School Attendance and Retention, includes separate sections on results of longitudinal analyses of data for student attendance from 1976-1980; analyses of teacher, staff, and parent ratings of project impact on student attendance; and Indian student retention. Part C presents two sections addressing the post-secondary knowledge, aspiration, and experiences of Indian students. (SB)

MONOGRAPH 1:

ACADEMIC PERFORMANCE, ATTENDANCE, AND EXPECTATIONS OF INDIAN STUDENTS IN PUBLIC SCHOOLS

Contract No. 300-80-0862

Submitted To:

Office of Planning, Budget and Evaluation
U.S. DEPARTMENT OF EDUCATION
Washington, DC 20202

Submitted By:

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June 30, 1983

The study reported herein was performed pursuant to a contract with the United States Department of Education. However, the opinions, conclusions, and recommendations expressed do not necessarily reflect the position or policy of the Department of Education, and no official endorsement by the Department of Education should be inferred.

This report is made pursuant to Contract No. 300-80-0862. The project produced various technical papers, monographs and interim reports which, along with the study's Final Report, have been submitted to the Education Research Information Clearinghouse (ERIC). The names of the persons employed or retained by Development Associates, Inc., with managerial or professional responsibility for this project and this report are listed below. The amount charged to the U.S. Department of Education for the work resulting in this report (inclusive of the amounts as charged for several related reports also submitted under this contract) is approximately $1,472,418.

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CHAPTER 1: INTRODUCTION TO THE STUDY

Blair Rudes and Paul Hopstock

A. Background

In recognition of the special educational needs of American Indians and Alaska Natives, the Indian Education Act (P.L. 92-318, Title IV) became law on June 23, 1972. The Part A Program represents that part of the Indian Education Act providing entitlement grants to public school districts enrolling American Indian and Alaska Native students. The number of school districts participating has increased from 435 in fiscal year 1973 to more than 1,000 in fiscal year 1983. The percentage of Indian children residing in school districts served by Part A grants has grown from 59 percent in 1973 to approximately 85 percent in 1983.

In September of 1980, Development Associates, Inc., was awarded a contract through the U.S. Department of Education to evaluate the operation and effectiveness of the Title IV, Part A Program. The study was conducted under the authority of the Secretary as provided for in Section 417 of the General Education Provision Act (20 USC 1226C). It represented the first comprehensive evaluation of the program since its inception, and was in response to requests from the Senate Interior Committee for systematic information concerning Part A Program operations, impacts, and costs. The House Interior Subcommittee and the House Education and Labor Subcommittee have also frequently requested similar information.

To accomplish the study's purpose, data were collected during fall and spring visits in 1981-82 to 115 Part A projects. These projects were a stratified random sample of all Part A projects in public school districts which had been operating three or more years and with 30 or more American Indian/Alaska Native students in 1981 (i.e., 85% of the Part A projects in public schools). Data were collected from the following groups of respondents: (a) local school administrators, (b) project directors, (c) project staffs, (d) parent committee members, (e) public school principals, (f) teachers, (g) leaders in the Indian community, (h) Indian students, and (i) parents of Indian students. The project staffs, parent committee members, teachers, and

students completed self-administered questionnaires; other respondents were interviewed. In addition, data were gathered from project and local education agency (LEA) files. A total of 19 data collection instruments was used in the study. The objectives of the study were to describe the range of Part A projects, determine the nature and extent of Part A Program impacts, and to identify and examine potential legislative and regulatory changes that might help achieve the goal of meeting the educational needs of American Indian children. More specifically, the study was designed to address eight major research questions. They were as follows:

- What are the organizational, fiscal, and human resources available to Part A projects, and how do projects utilize these resources?
- To what extent do the objectives of projects funded under the Part A Entitlement Program address the special educational and/or culturally related academic needs of American Indian/Alaska Native children?
- How have Part A project activities been implemented?
- What are the impacts of Part A projects on American Indian/Alaska Native students?
- What impacts do Part A projects have on the parents of American Indian/Alaska Native children and on the American Indian/Alaska Native communities that projects serve?
- What impacts do Part A projects have upon their LEAs?
- How do federal-level activities, especially those of the Office of Indian Programs, affect Part A projects?
- What is the total amount of federal education funds expended by local school districts on Indian students in grades K-12 and how many of these students are receiving various types of special services?

The overall results of the study are reported on in the study's Final Report and companion volumes. In the Final Report, as well, are presented a brief description of the history of Indian education in the U.S., the history of the Title IV, Part A Program, and the theoretical and methodological framework within which the evaluation was conducted.

B. Purpose and Content of this Monograph

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A major objective of the Title IV, Part A Program as envisaged by its sponsors was to provide a mechanism for improving the academic achievement and school

attendance of Indian students. Congressional reviewers of the Title IV, Part A Program have consistantly sought information on the impact of the Program on student achievement and attendance. Gathering and analyzing information on student achievement and attendance thus became major focuses of the Development Associates evaluation.

This monograph provides a detailed descripton of the data which were collected concerning student achievement and attendance. As will be noted, a number of parallel measures of achievement and attendance were collected, and the monograph thus attempts to integrate information from diverse sources. It was our belief that on issues as complex as achievement and attendance, multiple data sources were highly desirable.

The monograph consists of three major parts. In Part A, we present the detailed analyses of information on academic achievement. Part A includes separate sections on analyses of previously existing data, cross-sectional analyses of test scores, indicators of student achievement reported by project personnel, ratings of gains by parents, teachers, and staffs, tutor ratings of the effectiveness of tutorial programs, and ratings by students of their academic gains. Part B describes the results on school attendance and retention. Part B includes data collected from school records, project staffs, principals, teachers, parents, and students. Part C presents data on knowledge and expectations for post-secondary education by Indian students. Also, in Part C, data concerning the post-secondary experiences of Indian students are presented.

Conceptual and Methodological Issues Relating to Measures of Student Achievement

During the design phase of the evaluation, consideration was given to a variety of different approaches to assessing the impact of Title IV, Part A projects on student academic achievement. In reviewing the experience of evaluation researchers, it was found that each approach posed certain difficulties for this evaluation. The most common type of evidence used by evaluators in assessing academic achievement consists of the results of standardized achievement test scores. These, however, posed the following problems:

- Such tests do not necessarily test students on what they have been taught (they are not normed to a given curriculum);
- Such tests may contain hidden bias, either in wording or format, against various subpopulations being tested; since, for this evaluation, test scores of students from a large number of different cultural, linguistic, regional and economic backgrounds were to be compared, hidden test bias could be a problem.
- Different states, districts, and, in some cases, individual schools may use different standardized achievement tests; while there exist various approaches to equating results across different tests so that they are comparable, each approach has its weakness, and not all standardized tests are amenable to these approaches.
- Different states and school districts may administer achievement tests to students at different grade levels and at different times of the school year; where such differences exist, cross-site comparison is extremely difficult.

Another type of evidence which is widely used in assessing the impact of educational programs on student achievement consists of student class grades. Again, however, there are a number of problems for a nationwide evaluation.

- Different school districts use different systems for reporting grades (letter grades, grade point equivalences, etc.); while approaches exist for standardizing these different systems, each has weaknesses not unlike those noted above.
- Grades are considered to be more subjective evidence than test scores, since factors such as teacher judgment and school policy enter into the awarding of grades.
- Data on student grades are more difficult to access than are data on achievement test results. Student grade data may not be recorded on central school or district files until the end of a semester; thus collecting this data in mid-semester entails requesting it from each teacher. And the grades which the teacher has during mid-semester may not be cumulative (averaged) at that point. In any case, schools and teachers tend to maintain confidentiality of students' grades more strenuously than confidentiality of test score results.

Other types of evidence which have been used to a greater or lesser extent in evaluating the effects of educational programs on student academic achievement include ratings of students by teachers, parents, and LEAs staffs, and anecdotal data on student accomplishments as a result of participation in a project.

The advantage of both of these types of evidence is that the data are more easily collected (there is no conflict of confidentiality involved), the assessments can be more directly attributed to project effects than is the case with standardized test score results, and this type of data can reveal gains in areas not normally assessed by standardized tests or class grades (e.g. classroom participation, study habits). The weakness of this type of evidence is that it is highly subjective, and, in the case of anecdotal evidence, relatively unsystematic.

As outlined above, each of the various types of evidence which could be used in assessing the impact of educational programs on student achievement provided a different perspective on the phenomena and posed certain drawbacks - particularly for an evaluation which is national in scope. In formulating the final design for the evaluation of the Title IV, Part A Program, it was decided to capitalize on the different perspectives provided by these types of evidence to the greatest extent possible, and in the process, hopefully, to minimize the drawbacks which each has when used independently. Thus, the study was designed to collect and analyze data from: results of standardized achievement tests; anecdotal evidence provided by parents, project staff members, and others; ratings of project related academic gains by parents, project staff members, and others; ratings of project related academic gains by parents, teachers, and LEA staffs; tutor ratings of tutored students; and student ratings of assistance provided by projects. Data were not collected on student grades because of the difficulties entailed in collecting such data uniformly across sites.

Each of these types of evidence has been analyzed independently, and is reported on in Chapters 3 through 8. In addition, the data have been analyzed collectively, in a sense to "triangulate" in on project effects on student achievement. A summary of all of the data is presented in Chapter 9.

D. Conceptual and Methodological Issues Relating to Measures of Student Attendance

School and district attendance figures are generally taken to be the primary source of data in assessing student attendance. In the Development Associates evaluation, data on attendance of Indian students were collected whenever possible over a five-school-year period. An analysis of these data is reported in Chapter 10. There were a number of difficulties associated with the use of such data, however. Among these were:

- The absence of individual student attendance data, because in certain districts only data on average daily attendance for pre-selected days were collected;
- The difficulty of collecting longitudinal data on students who move from one school to another;
- The failure to compensate for late admission and/or transfer with in semester in computing students' average daily attendance;
- The failure to distinguish consistently between absences and tardies; and
- The failure of attendance figures to distinguish between absences due to natural causes (weather, medical, etc.) versus truancy.

In addition, the number of days in the school year varied somewhat among school districts, in particular where a teachers' strike, adverse weather conditions, or other factors forced the entire school to be closed for a period of time. This, in turn, made cross-site comparison of attendance figures problematic.

In order to provide a more complete picture of student attendance patterns, therefore, the Development Associates evaluation was designed to gather ratings by parents, teachers, principals, and other school staff members regarding student attendance, and effects of the Title IV, Part A projects on encouraging more frequent attendance. This, together with other qualitative information, was collected to help differentiate among the various causes of absences, and to more directly assess project effects on improving attendance. This information is reported in Chapter 11, in Part B.

In addition to the information on student attendance, data were collected from a variety of sources on changes in the rate of student dropout and school completion. The results of the analyses of this material is provided in Chapter 13, in Part B.

Information on the knowledge of post secondary options and the post high school educational and employment activities of samples of Indian high school students are presented in Part C as a supplement to the academic achievement and attendance data presented in this report.

PART A: ACADEMIC PERFORMANCE IN PUBLIC SCHOOLS

The purpose of the Title IV, Part A Indian Education Program as defined in the legislation is to meet the "culturally related academic needs" of Indian students. Most (80%) Title IV, Part A projects have formed academic or tutorial components to meet the culturally related academic needs of Indian students, but other components as well are designed to meet those ascademic needs (cultural programs, counseling, home-school coordination, etc.).

In this part of the monograph, the results of the Development Associates evaluation of the Title IV, Part A Program relevant to academic performance are presented. As discussed in Chapter 1, there is no single measure of academic pesrformance which is without weaknesses, so information was collected from a variety of sources concerning this topic.

Chater 2 presents a meta-analysis on achievement test scores in which the results from the Development Associates evaluation are integrated with previously existing studies. Chapter 3 provides a description of the formal academic activities being conducted by projects, including the types of tutoring being performed, characteristics of tutors, and characteristics of Indian students receiving tutoring. Chapter 4 presents a detailed analysis of 1981 achievement test scores of Indian students at Part A projects and relates those scores to project activities.

Chapters 5 through 8 present the rating by various types of respondents of the impact of Part A projects on student academic achievement. Chapter 5 describes information provided by key project staff members (usually project directors) to document the academic impact of their projects. Chapter 6 presents ratings by Part A project tutors of the academic gains experienced by their students. Chapter 7 provides information on the ratings given by parents of Indian students, regular classroom teachers, and Part A staff of the impact of projects on math and language arts performance and student grades. Finally, in Chapter 8, ratings by students of the helpfulness of the projects in the areas of math and reading are presented.

A summary of findings and a statement of conclusions concerning academic achievement are provided in Chapter 9.

CHAPTER 2: TRENDS IN ACADEMIC ACHIEVEMENT AMONG INDIAN STUDENTS IN PUBLIC SCHOOLS

Harry Day

A. Introduction

This chapter is a review of the existing research literature concerning levels of academic achievement among Indian students prior to the enactment of the Title IV, Part A Indian Education Program, compared with subsequent levels of achievement. A primary purpose of the Part A Program has been to address "the special educational and culturally related academic needs" of Indian children. Since the Title IV Program has been the national-level intervention of the 1970s most likely to affect the academic performance of Indian public school students, the improvement in Indian student performance, as reported in existing research data, should constitute an indication of program impact. More directly, these findings reflect the academic status of Indian students, both at the time of the Act and at present, and provide an indication of current academic needs.

Previous reports issued by the Federal government, notably the Menriam Report (1929) and the "Kennedy Report" (1969), highlighted the poor conditions under which Indian students were educated and, consequently, the low levels of academic skills developed. Prominent among the evidence cited were low scores on standardized achievement tests.

The cultural biases inherent in academic achievement tests, intelligence tests, and other assessments of intellectual aptitude are well known and need not be discussed in detail.[1] The thrust of the criticism of these measurements is that they underestimate the intellectual ability of the minority student, and provide a poor assessment of his ability to function in the real world. Their biases notwithstanding, achievement test scores provide relevant information regarding academic needs and their changes over time.

[1] See the October 1981 issue of the American Psychologist for detailed discussions of these and related issues.

Thus, the specific purpose of this review is to establish the relative levels of academic achievement and trends among Indian students, as reflected by the reported standardized achievement test results of four time periods:[2]

- The 1950s -- prior to any large-scale federal programs likely to benefit Indian students in public schools;
- The 1960s -- prior to and at the start of federal aid programs, such as ESEA Title I, which potentially benefitted public school districts with Indian enrollment;
- The 1970s -- prior to and at the start of the Title IV, Part A Program, which provided funds to school districts for special academic and related activities for Indian students, supplementing the special programs begun in the early to late 1960s; and
- The 1980s -- when the Part A Program could be expected to have achieved its greatest impact to date.

The focus here is mainly on Indian students attending public schools, where Part A funds are primarily directed.

B. Choice of Approach

In this review, available standardized achievement test results in reading and mathematics have been analyzed through the use of recently developed "meta-analysis" techniques (Glass, 1976, 1978). Reading and mathematics scores were selected because they represent basic academic skills necessary for most academic courses and careers. A meta-analysis approach was used to reduce the author bias inherent in traditional research literature reviews. The approach is explicit, systematic, and replicable in its methodology: other researchers should attain like findings, although interpretations may vary.

A meta-analysis approach involves the application of a standard procedure to the results from a variety of sources, to translate these to a common standard and thereby render them directly comparable. When study sample sizes are small, resulting in relatively low statistical power, there is less likelihood of detecting a true difference in statistical tests for a treatment effect.

[2]It was hoped to obtain sufficient data to analyze early versus late 1960s and early versus late 1970s, but such were not available.

The "box score" procedure of tallying statistically significant findings across studies exacerbates this problem, and may fail to detect effects when sample sizes or treatment effects (or both) are small (Hedges and Olkin, 1980, as cited in Giaconia and Hedges, 1982). A meta-analysis approach determines an "effect size" for each study or set of findings, as a measure of the strength of the treatment effect. These are calculated by converting diverse scores or measures, such as grade equivalents, raw scores, and percentile ranks, to differences between treatment and comparison group means expressed in standard score units; the differences between groups thereby represent some proportion of a standard deviation, and can be contrasted directly.

Furthermore, the conversion of scores to an effect size eliminates problems inherent in certain types. For example, differences among grade equivalent scores usually widen with increasing grade because these overstate the actual differences between two groups. The use of an effect size score based on the standard deviation difference between the groups provides a more accurate picture of their relative differences, and therefore of the estimated magnitude the treatment effect.

The meta-analysis approach developed by Glass (Smith and Glass, 1977) was deemed most appropriate for this study, since the concern here is with the level of achievement of Indian students, not their statistical position relative to other samples.[3] This approach also has the advantage[4] of maximizing the amount of acceptable data. In addition to research reported in professional journals, the Glass method allows the inclusion of data from

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[3]The formula used for calculating effect sizes is the following:

$$\frac{\bar{X}_E - \bar{X}_C}{S_C}$$

where $\bar{X}_E$=sample mean of the experimental (Indian student) group, $\bar{X}_C$=sample mean of the control (non-Indian student or all students) group, S_C=standard deviation of the control group.

[4]Unlike other approaches considered, such as Cooper and Rosenthal, 1980; Pillemer and Light, 1980; Light, 1980; Light and Smith, 1971; Cook and Gruder, 1978; Cohen et al., 1982; Willson and Putnam, 1982; Krathwohl, 1982; Hedges and Olkin, 1980; Giaconia and Hedges, 1982.

dissertations, theses, and other sources where the data are reported in considerable detail.

C. Sources of Achievement Data

A comprehensive effort was made to identify all relevant research literature concerning academic achievement among Indian students since the 1950s, as well as to obtain achievement test scores directly from state and local education agencies. The following strategies were used to locate references and test data:

- ERIC Search: A search using relevant descriptors was made of the ERIC system. Over ninety articles were located and examined for possible use, out of a much larger set of articles related to Indian education. This source provided good coverage for the late 1960s and 1970s time periods.

- Native American Research Information System (NARIS): A search in the University of Oklahoma's new information system produced over 800 abstracts that were examined for relevance. This source was a useful supplement to ERIC and provided additional coverage, particularly for the 1970s.

- Indian Education Experts: The Technical Advisory Panel to the impact evaluation, as well as other knowledgeable individuals, suggested references and sources of data. Key among these were: the literature reviews conducted by the National Indian Education Association (1977), Berry (1969), Havighurst (1970), the Kennedy Report and Senate Special Subcommittee on Indian Education Hearings (1969), and the Coleman Report (1966). Relevant references from the literature reviews and Congressional reports were located, and the Coleman Report findings were incorporated directly into the analysis. These were the primary sources of information for the mid-1960s and earlier periods.

- Surveys of State and Local Education Agencies: Each of the 50 state education agencies and all local school districts that reported 500 or more Indian students were contacted, by telephone and mail, for achievement test data on Indian students and other comparison groups for the past several school years. This was a major effort, but yielded only twenty reports or data sources. Of these, there were only four potentially usable reports, of which only two had sample sizes sufficient and appropriate for presentation in this chapter.[5] Most state agencies and school districts did not break down results by ethnic or racial groups or did not have a separate breakdown for Indian students; of those that did, most contained insufficient data for analysis. This source provided late 1970s and early 1980s data.

[5]One of the other two, Phoenix, was subsumed under the larger report for the State of Arizona, which was used. The other, Portland, involved very small numbers of Indian students in contrast to the Arizona and New Mexico samples and was clearly atypical, and thus was not combined with these other samples.

- Results from the Study Sample: Achievement test results for the spring of 1981 for Indian students were sought from each of the 115 school districts included in the impact evaluation sample. Data were gathered from 6,425 students in 78 school districts. (Chapter 4 presents a cross-sectional analysis of these data.) This provides a robust source of 1980s data for comparison with the historical data from the 1950s, 1960s, and 1970s.

From this extensive set of sources, almost 100 promising studies were located and examined. Whenever possible, data from these studies were used by applying such techniques as:

- The conversion of percentile scores to z-score equivalents, using normal curve conversion tables;
- The use of the standard deviation from the Indian student group, if the comparison group standard deviation was not available; and
- The use of test norms (mean scores of the sample on which the test was standardized) when a local comparison group was not included in a study. Local comparison groups were typically used as a first choice. Generally, the local comparison groups comprised either "whites" or the overall school district mean.

Thus, every effort was made to retain any possible source of data, if only for one or two grades. However, of the studies examined, only 16 proved to have usable data. The remainder were summaries of other works, were lacking in statistical detail, or were too flawed methodologically. The sources used are outlined in Table 2-1.

D. Results

Table 2-2 presents the results of the meta-analysis using the Glass approach for four periods of time, with two separate samples for the 1980 period, as discussed above. The data are reported in terms of z-scores relative to the comparison samples (either local norms, national norms, or "whites," in that order when more than one source of normative data were available). This table also provides an indication of the size of the Indian student sample for each grade level for which data were available, and is summed across grade levels for each of the time period data sets. Data for every grade level were not regularly available for the time period data sets, but at least seven of the twelve grade levels (1-12) were covered in each set. There is thus a good basis for plotting the results across grade levels for all the data sets.

TABLE 2-1

SUMMARY OF DATA SOURCES USED IN THE META-ANALYSIS OF READING AND MATH ACHIEVEMENT TEST SCORES OF AMERICAN INDIAN PUBLIC SCHOOL STUDENTS (1960-1982)

Data Sources	Date of Data Collection	Number of Indians		Grade Levels	Location/Sites
		Reading	Math		
For 1950's					
Coombs (1958)	1951-54	3,054	3,054	4-12	Phoenix, Albuquerque, Aberdeen, Billings, Anadarko, Muskogee
For 1960's					
Coleman (1966)	1965	5,500*	5,500*	6, 9, 12	National
Bass (1971)	1967-69	1,882	1,882	10-12	Aberdeen, Juneau, Muskogee, Navaho, Phoenix School Districts
Merz (1970)	1969	108	108	1	New Mexico, Arizona, Oklahoma, Texas
Albert (1971)	1967-69	600	600	3, 6	New York state
Sanders (1972)	1967-69	51**	0	1-3	Adair County, Oklahoma
For 1970's					
Maynor (1970)	1970	127	127	6-12	North Carolina
Bass (1971)	1970	475	435	11-12	Aberdeen, Juneau, Muskogee, Navaho Phoenix School Districts
Sanders (1972)	1970-71	51**	0	4-5	Adair County, Oklahoma
Glass (1972)	1975	50	49	4, 6	Detroit, Michigan
Talley (1975)	1975	60	0	9-12	South Dakota
Jackson (1978)	1978	54	0	7-8	Arizona
For 1980's					
New Mexico Department of Ed. (1980)	1980	3,962	3,962	5, 8, 11	New Mexico
Arizona Department of Ed. (1981)	1981	25,242	25,179	1-12	Arizona
Development Associates, Inc. (1983)	1981	6,341	6,340	3-11	National
Takai & Huddleston (1982)	1980	495	495	10, 12	National

*Estimated, exact numbers not provided.
**Longitudinal.

TABLE 2-2

SUMMARY TABLE OF READING AND MATHEMATICS ACHIEVEMENT Z-SCORES FOR INDIAN STUDENTS BY GRADE LEVEL AND TIME PERIOD

ACHIEVEMENT TEST TYPE AND TIME PERIOD		GRADE LEVELS 1	2	3	4	5	6	7	8	9	10	11	12	Total Indians
Reading	1950's Z-scores	-	-	-	-.24	-.40	-.36	-.35	-.22	-.38	-.25	-.59	-.50	
	Number of Indians	-	-	-	480	443	435	471	349	316	246	180	130	3,064
	1960's Z-scores	-.69	-.72	-1.60	-	-	-.88	-	-	-.64	-.90	-1.17	-1.08	
	Number of Indians	159	51	391	-	-	2,260*	-	-	2,000*	807	590	2,485*	8,743*
	1970's Z-scores	-	-	-	-1.08	-1.21	-1.17	-1.03	-1.21	-1.70	-1.36	-1.13	-1.49	
	Number of Indians	-	-	-	82	51	43	48	54	34	26	261	214	813
	1980's (Sample) Z-scores	-	-	-.21	-.28	-.19	-.36	-.36	-.34	-.34	-.57	-.55	-	
	Number of Indians	-	-	891	968	848	831	892	566	499	464	382		6,341
	1980's (AZ and NM) Z-scores	-.50	-.61	-.77	-.64	-.60	-.61	-.58	-.60	-.64	-.64	-.72	-.67	
	Number of Indians	2,175	2,141	2,135	2,183	3,356	2,102	2,290	3,740	2,468	1,967	3,063	1,584	29,204
Mathematics	1950's Z-scores	-	-	-	-.21	-.31	-.46	-.42	-.34	-.47	-.43	-.63	-.45	
	Number of Indians	-	-	-	480	443	435	471	349	316	246	159	130	3,029
	1960's Z-scores	-.81	-	-1.54	-	-	-1.40	-	-	-.67	-1.05	-1.02	-.81	
	Number of Indians	308	-	340	-	-	2,260*	-	-	2,000*	807	590	2,485*	8,590*
	1970's Z-scores	-	-	-	-.70	-	-1.00	-1.07	-1.14	-1.04	-1.30	-1.07	-1.04	
	Number of Indians	-	-	-	30	-	43	24	24	22	14	244	193	594
	1980's (Sample) Z-scores	-	-	-.25	-.27	-.23	-.39	-.39	-.57	-.42	-.48	-.47	-	
	Number of Indians	-	-	893	969	848	829	893	567	497	464	382	-	6,340
	1980's (AZ and NM) Z-scores	-.21	-.50	-.67	-.52	-.44	-.47	-.36	-.48	-.47	-.47	-.55	-.50	
	Number of Indians	2,171	2,110	2,151	2,184	3,349	2,083	2,262	3,726	2,461	1,975	3,033	1,576	29,081

*Includes estimates for Coleman study (1966) to be approximately 2,000 Indian students in both the grade 6 and grade 9 samples and 1,500 students in the grade 12 sample, given 1.6% Indian students reported in the grade 1 sample.

At least a sizable (N=600+) up to very impressive (N=25,000+) number of Indian students are represented by these data sets. However, the 1970s data are the least complete in terms of numbers of Indian students (and in terms of school districts), and are likely the least reliable. It is unfortunate that so little analyzable data for the 1970s are available: research published during this time focused on the 1960s, and the 1970s has thus far been largely unreported.[6]

Figure 2-1 plots the reading achievement data from Table 2-2 to provide a picture of how the four time period data sets compare with each other and how each varies across grade level. Surprisingly, the 1980s evaluation sample data and 1950s data nearly coincide. Both data sets show a pattern of relative decline in reading achievement with grade level, as often noted in the educational literature (e.g., Berry, 1968; Coombs et al., 1958). However, both are substantially more favorable than the 1960s or 1970s data, and not far below the normative comparison group.

The Arizona/New Mexico 1980s reading data, in Figure 2-1, are somewhat below the study sample data and the 1950s data, but, like the other, are generally above the 1960s and 1970s. As the slope of the data trend line across grade level is quite flat, these data do not show the "classic" widening divergence from the norm or overall decline with increased grade level.

The patterns of the 1960s and 1970s reading data, in Figure 2-1, are more erratic than the other time period data sets, but clearly are substantially lower than either the period immediately before (1950s) or after (1980s). Furthermore, the 1970s data generally are lower than the 1960s data.

Table 2-3 provides additional perspectives on the effect size data for reading achievement. The mean effect sizes by time period samples range from -.36 to -1.26. All are below the comparison group mean and range from what is

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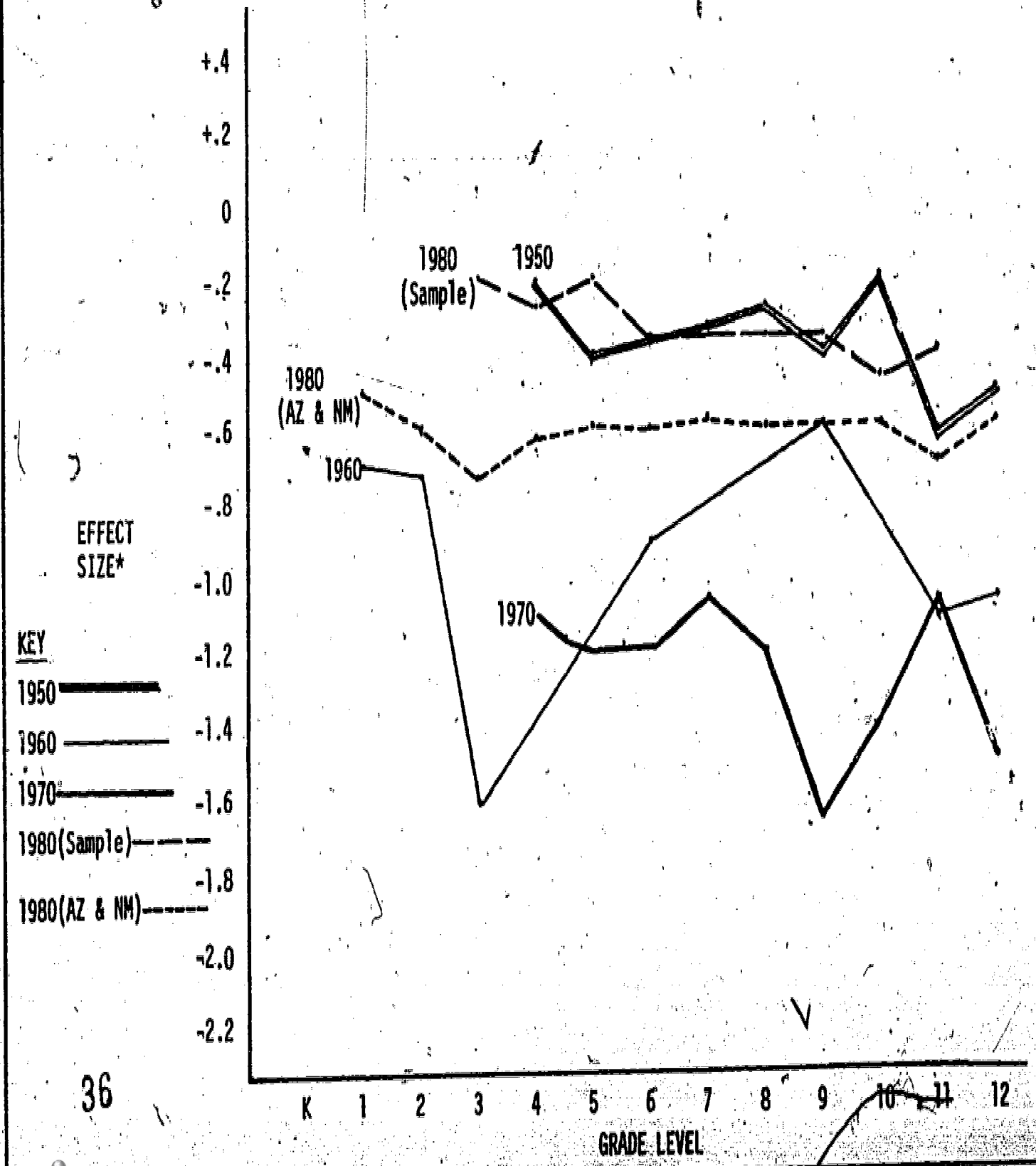
[6]Many studies with report or publication dates in the 1970s had collected the data in 1960s (e.g., Albert, 1971).

FIGURE 2-1

READING ACHIEVEMENT EFFECT SIZES OF INDIAN STUDENTS COMPARED WITH GRADE LEVEL NORMS FOR FIVE TIME PERIOD DATA SETS



*All figures in this Chapter are plotted in terms of effect sizes, a form of Z-score.

TABLE 2-3

REPRESENTATIVE INDICES OF EFFECT SIZES BY TIME PERIOD

Achievement Test Types and Time Period	Mean Effect Size (Z-score)	T-Score Equivalent	Percent of Indian Students Scoring Below Comparison Group Mean	Mean Grade Level Sample Size
Reading				
1950s	-.37	46	64%	339
1960s	-.96	40	83%	1,030
1970s	-1.26	37	90%	90
1980s (Study Sample)	-.36	46	64%	704
1980s (AZ and NM)	-.63	44	74%	2,434
Mathematics				
1950s	-.42	46	66%	337
1960s	-1.04	40	85%	1,084
1970s	-1.03	40	85%	74
1980s (Study Sample)	-.38	46	65%	704
1980s (AZ and NM)	-.47	45	68%	2,423

SELECTED ESTIMATED t-TESTS FOR DIFFERENCES IN REPRESENTATIVE EFFECT SIZES BY TIME PERIOD

READING ACHIEVEMENT

Comparison	t-Test	Significance
1950s vs 1980s	0.17	N.S.
1950s vs 1960s	-9.49	$p<.001$
1960s vs 1970s	-2.73	$p<.01$
1980 (Study) vs 1980 (AZ and NM)	-6.43	$p<.001$

MATHEMATICS ACHIEVEMENT

Comparison	t-Test	Significance
1950 vs 1980	0.52	N.S.
1950 vs 1960	-9.87	$p<.001$
1960 vs 1970	0.09	N.S.
1980 (Study) vs 1980 (AZ and NM)	-2.00	$p<.05$

considered moderate size (the 1950s and 1980s samples) to relatively large effects (the 1960s and 1970s samples). These effect sizes can be assessed in terms of T-score equivalents (Table 2-3), whereby the 1950s and 1980s samples are not far below the comparison group standard of 50, but the 1960s and 1970s samples appear substantially lower. However, in terms of percentage of Indian students, these range from 64% scoring below the comparison group mean (for 1950s and 1980s study samples) to the sub-standard performances of the 1960s (83% were below the comparison mean) and the 1970s (90%). Also in Table 2-3 are approximate estimates of statistical significance of the differences between the representative effect sizes for selected time periods.[7] The estimated t-test data yield no significant differences in reading achievement for 1950 versus 1980, but show highly significant differences between all other time period samples (1950s vs 1960s; 1960s vs 1970s; and the 1980s study sample the vs 1980s Arizona and New Mexico sample). Further, it is safe to assume that all other time period comparisons would be significant beyond the $p < .01$ level. Finally, taking the effect size value closest to the comparison group (grade 5 reading achievement in the 1980s study sample, Z=-.19, N=848: Table 2-2) an estimated $t=5.53$, $p < .001$ is obtained. Thus, all grade level reading achievement sizes for all time periods can be expected to be significantly below the comparison group, to approximately the $p < .001$ level or beyond.

Table 2-4 indicates the representative effect sizes for reading achievement (and mathematics - discussed later) for grades 8 and below and for grades 9 and above. The difference between these provides a basis for measuring the extent to which Indian student scores are comparatively less favorable as grade level increases. The drop relative to the comparison groups ranges from zero, for 1960s reading achievement data (difference = +.02), to -.28, for the 1970s. While four of the five differences are statistically significant, given the large sample sizes, and represent a relative decrement with grade as

[7] Generally, precise statistical tests cannot be readily calculated from the effect sizes using the Glass approach or from the information available. However, the values calculated (by using the mean effect size across grades and the mean sample size per grade) are sufficient for an overall, approximate estimate of statistical significance across time periods, when all data are readily available and more elaborate methods used (e.g., via Hedges, 1982; Giaconia and Hedges, 1982; Rosenthal & Rubin, 1982).

TABLE 2-4

CONTRASTS OF GRADE 8 AND BELOW VERSUS GRADE 9 AND ABOVE EFFECT SIZES FOR ALL TIME PERIOD SAMPLES OF STUDENTS

Achievement Type and Sample	Mean Effect Size for Grade 8 & Below (z-score)	Mean Effect Size for Grade 9 & Above (z-score)	Difference	Estimated t-Tests and Significance
Reading				
1950s	-.31	-.43	-.12	t=-3.00, p<.01
1960s	-.97	-.95	+.02	N.S.
1970s	-1.14	-1.42	-.28	t=-3.78, p<.001
1980s (Study Sample)	-.29	-.49	-.20	t=-6.50, p<.001
1980s (AZ and NM)	-.61	-.66	-.05	t=-3.97, p<.001
Mathematics				
1950s	-.35	-.51	-.16	t=-4.00, p<.001
1960s	-1.25	-.89	+.36	t=+15.65, p<.001
1970s	-.98	-1.10	-.12	N.S.
1980s (Study Sample)	-.35	-.47	-.12	t=-3.91, p<.001
1980s (AZ and NM)	-.46	-.50	-.04	t=-3.15, p<.01

typically reported in the literature (e.g., Coleman et al., 1966), they are either very small (-.05 and -.12) to relatively small (-.20 and -.28) by usual standards for effects sizes. Further, one (1960s reading achievement) can be considered flat; that is, the relative disadvantage of Indian students appears to be essentially constant across grades (by this trends test) in the 1960s.

Figure 2-2 presents the reading achievement mean scores collapsed into four grade ranges: lower elementary (grades 1-3), upper elementary (4-6), junior high (7-9), and senior high (10-12), for a clearer picture of time period data sets by "smoothing out" the data variation present at individual grade levels. The similarity of the 1950s and 1980s data becomes more readily apparent, as does the tendency for Indian reading achievement to diverge from the norm with increased grade level. The flatness or lack of trend of the Arizona/New Mexico 1980s data is also more readily seen. Finally, the relative position of the 1960s and 1970s data, with the relative decline in 1970s performance, becomes more clear. Also, the 1970s data show a modest "classic" slope (divergence) downward with increased grade, while the 1960s data show a tendency to converge toward the comparison group mean, from lower elementary to junior high, and then to diverge again. This latter pattern, found in 1960s data, appears quite unusual and is different from the traditional picture of Indian student achievement declining across grade levels portrayed in educational literature (e.g., Havighurst, 1971).

When the present meta-analysis began, it was expected that a steady improvement would be found in Indian achievement with the addition of, first, Title I and other programs generally targeted to the disadvantaged (1960s), followed by the Title IV Program targeted to Indian students (1970s), culminating in the institutionalization of these programs (1980s). Instead, the progress has been irregular. It appears that the relatively favorable situation of the 1950s deteriorated somewhat in the 1960s and further in the 1970s, but that the 1980s results again approach the level of 1950s. This is essentially true for each grade range. This picture of change over time is depicted in Figure 2-3, where curves for each collapsed grade level (lower elementary, upper elementary, junior high, and senior high) are plotted across the four time periods (1950s, 1960s, 1970s, and 1980s).

FIGURE 2-2

MEAN READING ACHIEVEMENT
EFFECT SIZES OF INDIAN STUDENTS BY GRADE LEVEL RANGE

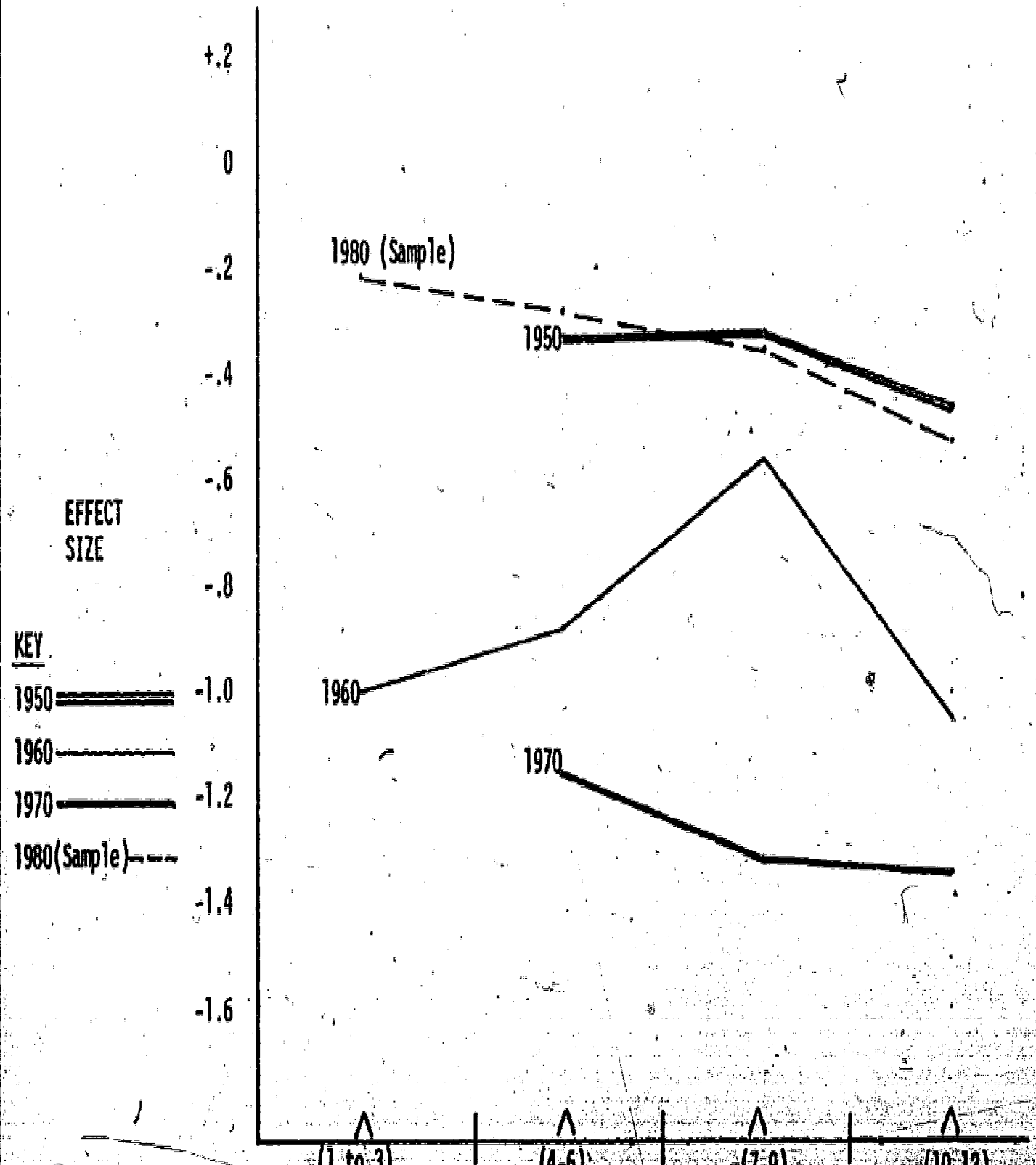
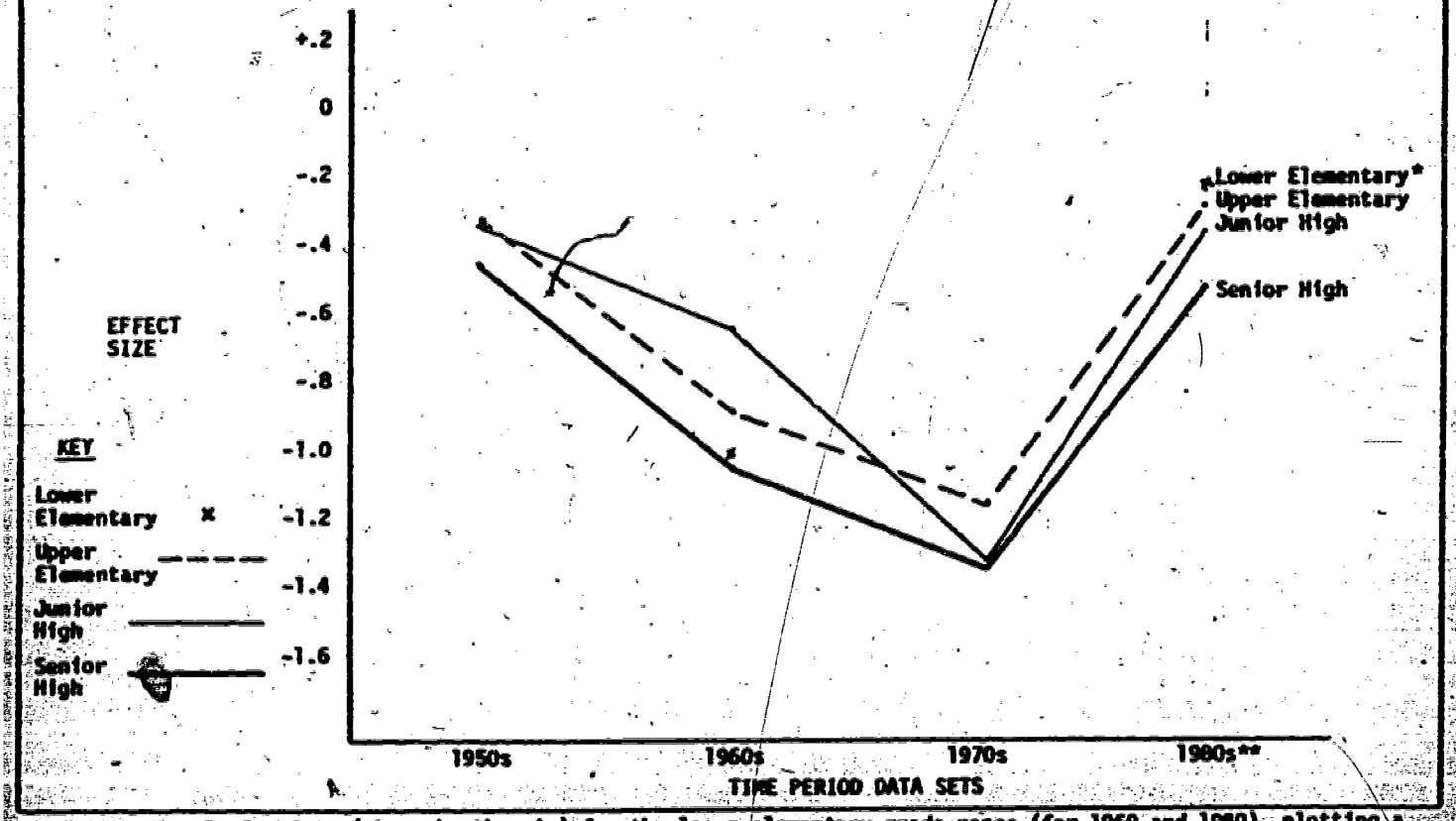


FIGURE 2-3

MEAN EFFECT SIZES OF READING ACHIEVEMENT FOR INDIAN STUDENTS AT FOUR COLLAPSED GRADE LEVELS AND ACROSS TIME*



*There are only 2 points (shown by the x's) for the lower elementary grade range (for 1960 and 1980), plotting a line between these points would probably be misleading but they are included because they are about where expected, given the other grade level curves.

**1980 data only from the evaluation sample, not Arizona/New Mexico.

The mathematics achievement scores of Indian students, plotted in Figure 2-4 show both similarities to and some differences from the reading achievement data of Figure 2-1. This should be expected as the same studies usually supplied both reading and math, and these variables are correlated. As in the reading scores, the 1950s and 1980s mathematics data virtually overlap; they are relatively close to the norm, and decrease gradually with increased grade. The 1980s Arizona/New Mexico data pattern is again relatively flat across grades, but more favorably so, essentially overlapping the study data and the 1950s mathematics data from grade six on. The 1960s and 1970s mathematics data are again well below both 1980s and the 1950s levels. In this case, however, the 1970s data are more favorable than the 1960s data for the upper elementary grades.

Returning to Table 2-3, all the representative indices of effect sizes by time period for the mathematics achievement data are found to show roughly the same pattern as the reading achievement data. This is not surprising, as reading achievement and mathematics achievement are generally correlated, but it does provide some cross-validation of the reading achievement results previously reported. Similarly, the estimated t-tests provide the same pattern of results, except that the overall 1960s versus 1970s mathematics achievement data, it appears, are <u>not</u> significantly differept statistically.

Examining Table 2-4, the effects for the mathematics achievement data also are found to show generally the same patterns as the reading achievement data, with two exceptions. The 1960s data show <u>a moderate and highly significant improvement</u> between the lower and upper grades, and the 1970s data are <u>not statistically significant</u> between the lower and upper grades. The remaining three time period samples, while highly significant statistically, show very small drops between lower and upper grades by the usual effect size standards.

As with the reading data, the mathematics data are clearer when grade levels are collapsed into grade range, as shown in Figure 2-5, and are similar to the reading data plotted in Figure 2-2. The plot of mathematics data over time periods, in Figure 2-6, is also generally similar to the reading data in Figure 2-3, but the upper elementary 1960s data is lowest, while the 1970s

FIGURE 2-4

MATHEMATICS ACHIEVEMENT EFFECT SIZES OF INDIAN STUDENTS COMPARED WITH GRADE LEVEL NORMS FOR FIVE TIME PERIOD DATA SETS

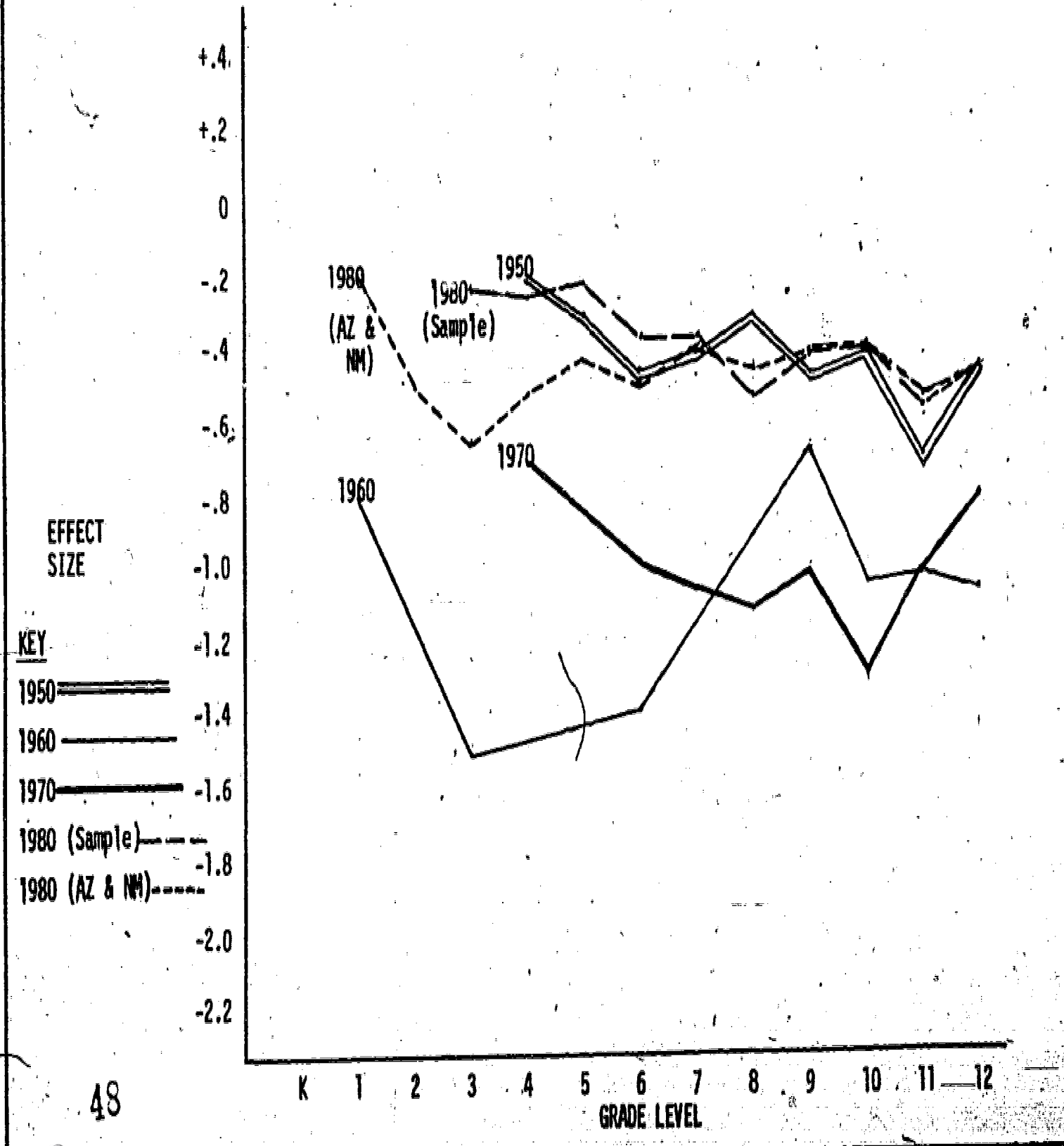


FIGURE 2-5

MEAN MATHEMATICS ACHIEVEMENT
EFFECT SIZES OF INDIAN STUDENTS BY GRADE LEVEL RANGE

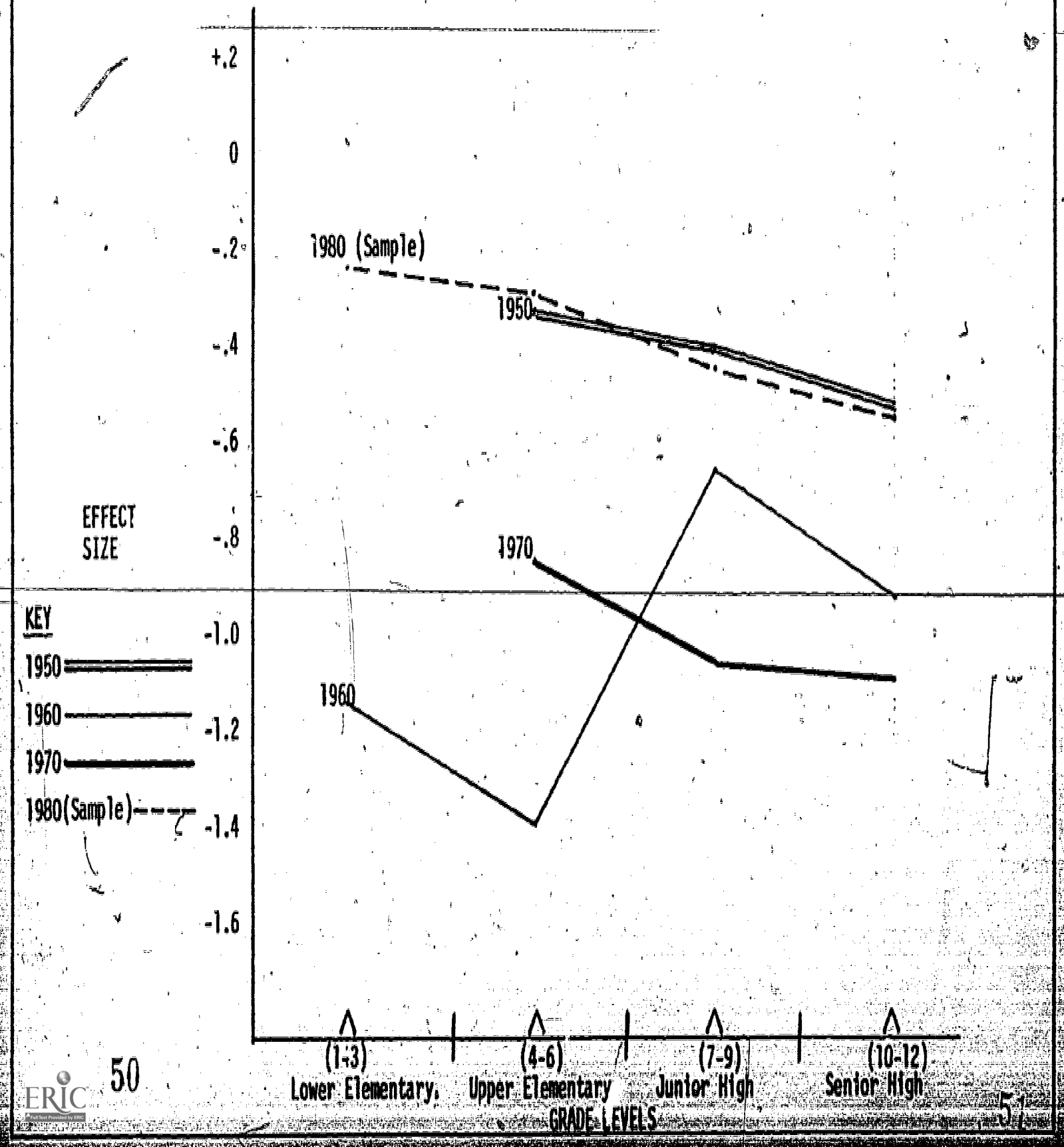
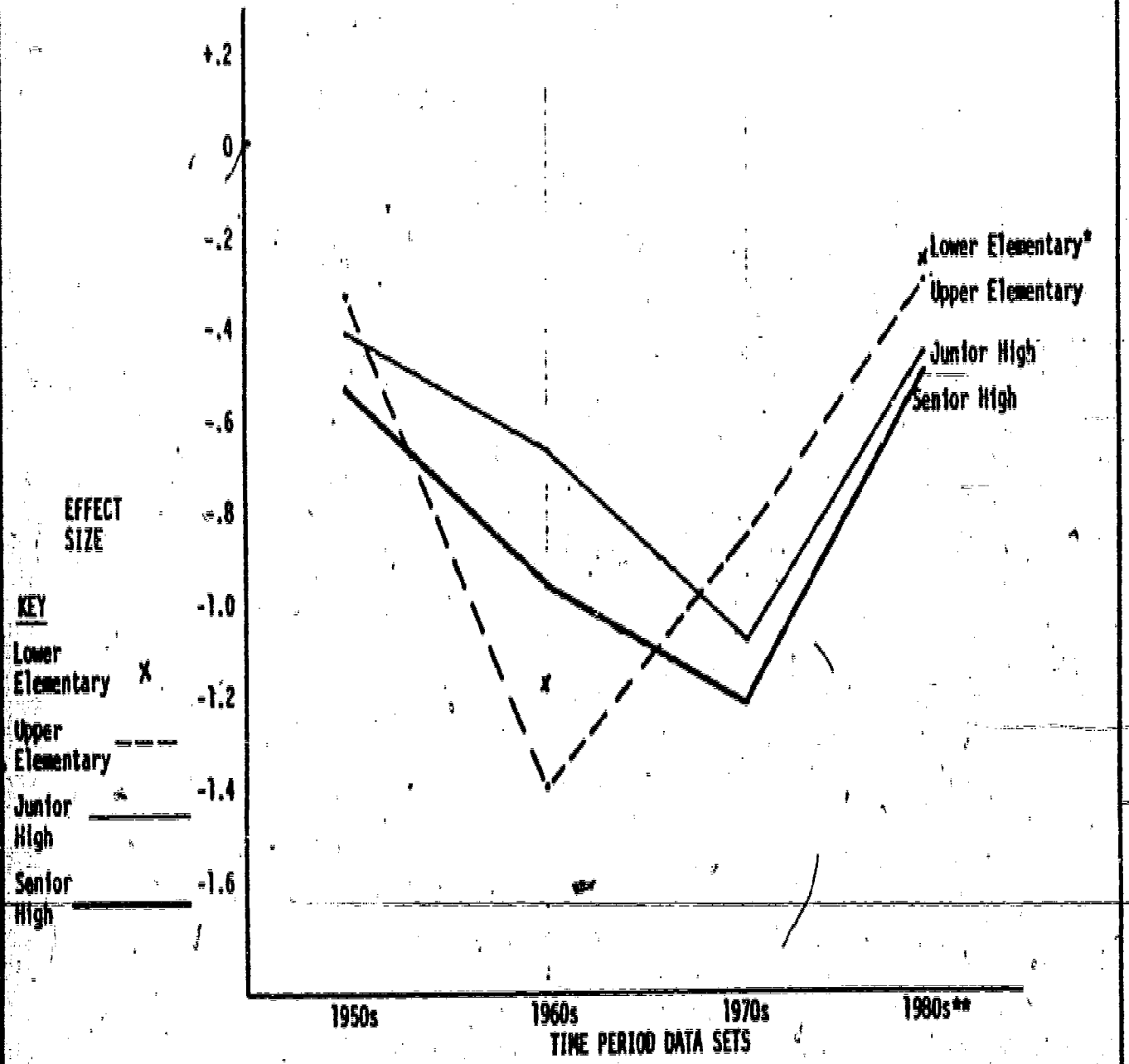


FIGURE 2-6

MEAN EFFECT SIZES OF MATHEMATICS ACHIEVEMENT FOR INDIAN STUDENTS AT FOUR COLLAPSED GRADE LEVELS AND ACROSS TIME



* There are only 2 points (shown by the x's) for the lower elementary grade range (for 1960 and 1980), plotting a line between these points would probably be misleading but they are included because they are about where expected, given the other grade level curves.

**1980 data only from the evaluation sample, not Arizona/New Mexico.

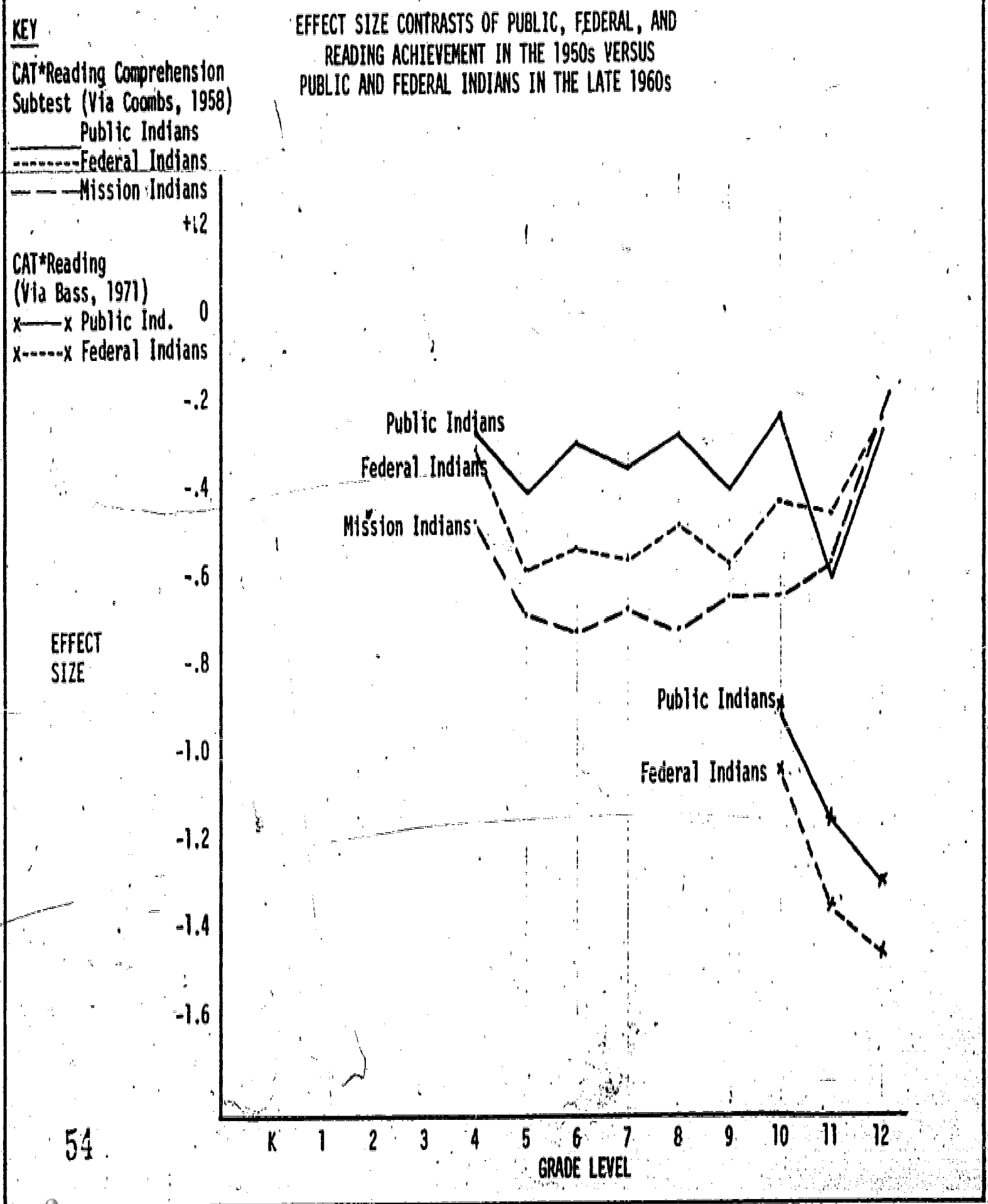
junior and senior high school data are somewhat lower than the 1960s data. The pattern of most favorable Indian achievement data occurring in the 1950s and in the 1980s is repeated in the mathematics data.

One possible explanation for the drop during the 1960s and 1970s, compared with the 1950s, is that Indians in public schools in the 1950s were self-selected (e.g., high SES) and academically superior to their non-public school counterparts. With the advent of the entitlement programs of the 1960s and the closing of BIA schools in the 1970s, greater numbers of the less academically able Indians from mission and federal (BIA) schools entered public schools, thereby depressing average achievement levels. This hypothesis is supported by the data presented in Figure 2-7. The three upper curves, from the Coombs et al. (1958) study, show public school Indians generally superior to their federal school counterparts, with both generally superior to mission school Indians. However, the lower two curves, from the Bass (1971) study, show public school Indians superior to Indians attending federal schools in the tenth, eleventh, and twelfth grades, and both dramatically lower than any of the three Coombs et al. samples. It should be noted that three of the five geographically dispersed school districts represented in the Bass study were the same as three of the six geographically dispersed school districts in the Coombs study, making the two studies acceptably comparable.

Another, more complex, explanation is that the influx of Indian children into the public schools not only lowered the average academic level, but consisted of students who floundered in their new environment. The public schools, the theory contends, were not prepared to deal with the influx of a culturally different group. This may have delayed the impact of Title I, Title IV, and other federal programs in helping the public schools better serve this group. Moreover, Title IV, Part A may have ultimately encouraged the entrance of a larger, more representative sample of Indian students (closer to academic achievement norms) into the system - ergo the 1980s results.

FIGURE 2-7

EFFECT SIZE CONTRASTS OF PUBLIC, FEDERAL, AND READING ACHIEVEMENT IN THE 1950s VERSUS PUBLIC AND FEDERAL INDIANS IN THE LATE 1960s



*California Achievement Test, 1957 version.

Finally, it should be noted that, as this meta-analysis was nearing completion, an additional set of data points on American Indians in the 1980s for tenth (N=278) and twelfth (N=217) grades was obtained and included. These are from the "High School and Beyond Study" (Takai & Huddleston, 1982). As this study is based on a national probability sample, it yields data very similar to that of the Development Associates national study of Title IV-served students.[8] These findings lend additional support to the conclusion that American Indian reading and mathematics achievement, particularly in the upper grades, is as high or higher than it has been at any time in the last thirty years. Nevertheless, these remain well below national norms, and the academic needs of Indian students have not been met.

[8]The effect sizes represented by reading scores for tenth and twelfth grades in the High School and Beyond Study (-.38 and -.34, respectively) are very similar, although somewhat more positive, to the tenth and eleventh grade reading scores obtained by Development Associates (-.57 and -.55). The effect sizes represented by mathematics scores in the High School and Beyond Study for tenth and twelfth grade (-.46 and -.41, respectively) are even more similar (-.42 and -.57 for Development Associates).

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CHAPTER 3: DESCRIPTION OF TUTORIAL AND RELATED ACTIVITIES DIRECTED TOWARD BASIC ACADEMIC SKILLS

Aurora Martinolich, Robert Russell, And
Paul Hopstock

A. Introduction

An important purpose of the Indian Education Program has been to improve the academic skills of Indian children. According to the Part A regulations, a wide variety of supplemental academic activities may be provided to Indian children, including individual or group instruction in basic academic skills, accelerated training for "gifted" students, and remedial instruction.

While there are a variety of ways in which Part A projects provide assistance to Indian students to improve their academic achievement, the most widely employed approach is through tutorial or related academic services. An estimated 80% of all Part A projects provide some form of tutorial or special academic assistance services.[1]

This chapter describes the nature of academic/tutorial services which are provided to Indian students under the Part A Program. Evidence concerning the impact of academic/tutorial services is presented in Chapters 4 - 8.

B. Procedures

During the fall site visits to each of the 115 projects in the study sample, project directors were asked whether or not their projects provided tutoring or other special academic activities. If tutoring or related special academic activities were a component of the project, four data collection

[1] A somewhat smaller proportion (73%) of school districts on or near reservations and a somewhat higher proportion (90%) of metropolitan school districts had Part A tutorial/academic activities than did the overall proportion. Virtually the same proportion of districts in other rural areas (81%) or in urban, non-metropolitan areas (82%) supported tutorial/academic activities as did the overall proportion (80%).

instruments were left with the project director for completion. The "Overview of Tutorial/Special Academic Activities," which asked for a description of the tutorial activities within the project, was to be completed by the project director or person supervising the tutorial activities (N=90). The other three were to be completed by the tutors themselves. The "Tutor Characteristics" questionnaire requested background information on each tutor and their project activities; 329 tutors completed this form. The remaining two instruments focused on the characteristics of the tutored students. The "Characteristics of Tutored Students" form was to be completed for each student to be tutored at the beginning of the school year or upon entrance into the tutorial program. Another, the "Post-Tutorial Follow-Up" form, was to be completed for each tutored student either at the time tutoring was completed or discontinued, or during the spring visit by the field staff, whichever came first. The latter two forms were completed for 2,899 students. In addition, the "Characteristics of Tutored Students" form, alone, was completed for 405 students, while the "Post-Tutorial Follow-Up" form alone was turned in for 224 students.

C. Findings

Purpose and Scope of Academic Activities

The tutorial and related academic programs which are provided by the Part A Program were almost entirely supplementary in nature. Only 5% of projects reported designing academic activities to take the place of regular school classes, with the remaining 95% designing programs solely to supplement existing classes.

Academic and tutorial activities were perceived as extremely important relative to other activities in Part A projects. These activities were rated as extremely important by 82% of respondents in projects with academic components, and as moderately important by an additional 14%. The main purpose of tutorial and other academic activities was perceived to be the improvement of academic skills by students, although there were a number of perceived secondary purposes, such as the enhancement of student self-concepts, the improvement of student attitudes toward school, and the

provision of support and encouragement to students. The average tutorial program was reported to have been in operation for approximately five years.

Tutoring Sessions

Tutorial and other supplemental academic activities were generally held in school during school hours, and were oriented to regular classroom instruction. Two-thirds (66%) of the tutoring projects focused tutoring directly on classroom material. However, one-third (31%) of these projects provided tutoring which, although in the same content areas as those being covered in regular classrooms, was not linked directly to classroom materials. Most of the tutoring projects offered tutoring in "basic" subject areas, including mathematics (90%), reading (89%), writing (62%), and other academic areas (48%). Over two-thirds (67%) of the tutoring projects held tutoring sessions during school hours.[2] Seventy percent of the academic projects held tutoring sessions in schools; the remainder of the tutoring projects held sessions in community centers (17%), churches (7%), or in students' homes (6%).[3]

The scope of tutoring activities was usually determined by someone other than the tutor -- by the project director in nearly half of the tutoring projects (46%) and the student's teacher in over a quarter (27%). A variety of materials were used in the sessions: class assignments, texts, or workbooks (87%); tutor-prepared materials (75%); materials purchased by the project or school (58%); games or other informal materials (56%); and programmed materials provided by the project or school (43%).

[2]Tutoring programs located in metropolitan (40%) or in urban, non-metropolitan (41%) areas were more likely to hold tutoring sessions outside regular school hours than were programs on or near reservations (16%) or in other rural areas (3%).

[3]A greater proportion of projects in urban, non-metropolitan areas (61%) held tutoring in locations outside the school than was the case for projects located on or near reservations (26%), in other rural areas (12%), or in metropolitan areas (37%).

The tutoring programs appear to have been relatively intense, given their supplemental nature. Most (81%) programs operated throughout the school year. The typical student attended a median of four sessions per week, with a median duration of 35 minutes per session. Students received a mean of 66 hours of tutoring during the school year.[4] According to the tutors, most (88%) of the students attended regularly.

Over two-fifths (44%) of the tutoring projects assigned tutors primarily on a one-to-one basis. Nearly half (47%) relied upon small group instruction (one tutor with several students). A small proportion (9%) of the tutoring projects used both methods interchangeably.

Tutors, students, and the students' families often developed relationships beyond tutoring. In 75% of the tutoring projects, tutors had informal contacts with students outside the sessions. One-third (32%) of the tutors took students on outings and field trips as a regular part of the tutoring program; 21% took students on informal outings. In 56% of the tutoring projects, tutors were acquainted with the students' parents; in 15%, frequent tutor-family contacts were reported.

Student Recruitment, Assignment, and Termination

In 52% of the tutoring projects, students were typically referred for special help by teachers or other school staff on the basis of their informal assessment of the student's academic progress. Achievement test scores were used as the primary basis for referral in one-third (31%) of these projects, while in only 6% of the projects did students enter tutoring primarily on their own initiative. Tutoring projects assigned students to tutors on the basis on an informal judgment of compatibility by the teacher or tutor coordinator (36%), as tutors became available (33%), or on the basis of

[4]The mean number of hours of tutoring received throughout the school year, by students on or near reservations (71 hours) and in other rural areas (79 hours) was higher than that received by students in urban, non-metropolitan (48 hours) or metropolitan (38 hours) areas.

specific criteria (28%), such as matching the specialty of the tutor with the needs of the student.

Tutoring projects monitored student progress by one or more methods (see Table 3-1). Most (86%) of these projects terminated tutoring when a student reached an acceptable level of academic achievement, although 26% also terminated tutoring if a student was irregular in attendance.

TABLE 3-1

METHODS USED TO MONITOR ACADEMIC PROGRESS OF TUTORED STUDENTS
(Weighted N=690)*

Methods	Percentage of All Academic Projects
Tests	50%
Informal interviews with tutor/teacher	49
Periodic write-ups of student progress by tutor/teacher	47
Formal interviews with tutor/teacher	25
Tutor/teacher grading system	19
Daily log books or records	6
No monitoring was done	5

*The actual number of projects with tutoring in the sample was 90. Data were weighted to make the findings representative of all academic projects.

Characteristics of Tutors and Tutor Training

Tutors had an average age of 33 years and were predominantly female (84%) and Indian (68%). Nearly half (46%) tutored at the elementary level (grades K-6), 32% at the secondary level (grades 7-12), and 22% at both levels. Cultural sensitivity and awareness, special academic abilities, and sensitivity to student needs were most often cited by tutors as the special abilities they possessed which were useful in tutoring (see Table 3-2).

TABLE 3-2

SPECIAL ABILITIES OF TUTORS
(N=311)

Abilities Cited by Tutors	Percentage of Tutors
Special ability in academic area	35%
Cultural sensitivity and awareness as an Indian	32
Sensitivity to student needs; relating well to students	29
Teacher certification or former teacher	18
Knowledge of Indian heritage and culture	18

In most (94%) projects, tutors were paid as hired employees; only 6% of the projects used volunteers as their primary source of tutors. Project directors selected or hired tutors in 60% of the projects, although others such as the parent committee or district administrators also may have been involved in the hiring or approval of tutors in some projects. One-third (34%) of the tutors became aware of the tutoring position because they worked for the school or district. Other tutors learned of the opening through advertisements (10%), were recruited by the parent committee (10%), were referred by a teacher (8%), volunteered (7%), or found out in other ways. Nearly three-fifths (57%) of the projects provided training for tutors in a variety of areas (see Table 3-3).

TABLE 3-3

TOPICS COVERED IN TUTOR TRAINING SESSIONS
(Weighted N=394)*

Topic	Percentage of Academic Projects with Training Which Cover Topic
Subject matter content (review of area to be tutored)	58%
Cultural sensitivity	58
Techniques of teaching subject matter	56
Use of tutoring materials	56
Methods for motivating and maintaining student interest	54
Administrative procedures	52
Social skills (how to build rapport with student)	49

*The actual number of projects providing training was 44. The data were weighted so the findings are representative of all academic projects.

Description of Students

Students from all grade levels received tutoring, although the bulk of children receiving tutoring were at the elementary level. Nearly three-fifths (57%) of tutored students were in grades K-6, while one-third (35%) were in grades 7-9. Only 7% were in grades 10-12. Slightly over half (52%) of the tutored students were male. Two-thirds (66%) of the students were in their first year of tutoring; 23% were in their second year. One-third of the students were tutored on a one-to-one basis; two-thirds were instructed in small groups.

A majority of students were tutored in reading (57%), or math (65%), while a minority were tutored in writing (21%), social studies (15%), or in other areas (18%). In reading and mathematics, tutors rated two-thirds or more of their students as "low" or "below average" relative to their peers at the start of the tutoring sesions (see Table 3-4). A majority of students were also rated "low" or "below average" in other subject areas. Fewer than 10% the tutored students were rated as "above average" or "superior" in any subject area. From the perspective of the tutors, then, most of these students were in need of remedial instruction at the start of the tutoring sessions.

Tutors also rated students regarding their school conduct, self-confidence, and interest in school (See Table 3-5). Roughly half of the tutored students were rated as "average" in all three areas. In school conduct, roughly even numbers were rated "above average" or "superior" as were rated "below average" or "low." However, a much larger proportion of tutored students were rated "low" or "below average" in self-confidence and interest in school than were rated "above average" or "superior". Thus, at the start of the tutoring sessions, the tutored students were probably typical of students in their districts with respect to school conduct, but may have been somewhat lower in self-confidence and interest in school.

TABLE 3-4

ACADEMIC LEVELS OF TUTORED STUDENTS AS RATED BY TUTORS AT THE START OF TUTORING SESSIONS IN 1981-82 (N=3528)

Subject Area	N	Mean	Percent of Students Tutored in Area	Low (1)	Below Average (2)	Average (3)	Above Average (4)	Superior (5)
Reading	2023	2.02	57%	27%	47%	22%	3%	1%
Mathematics	2293	2.16	65%	21%	48%	26%	4%	1%
Writing	753	2.26	21%	24%	34%	35%	6%	1%
Social studies	518	2.29	15%	23%	36%	33%	5%	3%
Other	646	2.09	18%	32%	37%	22%	8%	1%

TABLE 3-5

SCHOOL CONDUCT, SELF-CONFIDENCE, AND SCHOOL INTEREST OF TUTORED STUDENTS AS RATED BY TUTORS AT THE START OF TUTORING SESSIONS IN 1981-82 (N=3258)

	Mean	Low (1)	Below Average (2)	Average (3)	Above Average (4)	Superior (5)
School conduct	3.07	8%	19%	45%	14%	14%
Self-confidence	2.70	7%	29%	51%	10%	3%
Interest in school	2.68	10%	26%	53%	9%	2%

D. Summary

Four-fifths of the Part A projects provided tutorial or related academic programs which were almost entirely supplementary in nature. Most tutoring programs offered tutoring in readi (89%) and mathematics (90%). Tutoring sessions were generally held in school during school hours and oriented to regular classroom instruction. Tutoring activities were relatively intense, with a typical student attending four sessions a week throughout most of the school year.

Most tutors were adults, female (84%), and Indian (67%). Most (94%) academic projects paid tutors. The majority (57%) provided tutor training in a variety of areas.

The majority (57%) of students receiving tutoring was at the elementary level. Tutored students were generally in need of remedial help; at the beginning of tutoring, tutors rated two-thirds or more of the students tutored in reading or mathematics as low or below average. Students were generally rated as average in school conduct, but were rated somewhat lower than average in self-confidence and interest in school.

CHAPTER 4: READING AND MATHEMATICS ACHIEVEMENT TEST SCORE PATTERNS OF INDIAN STUDENTS SERVED BY TITLE IV, PART A PROJECTS IN PUBLIC SCHOOLS

Milton Goldsamt and Earl Jones

A. Introduction

Improvement of the academic performance of Indian students has been a major thrust of the Title IV, Part A legislation. As part of assessing the Title IV, Part A Program, data were collected concerning the achievement test scores of Indian students in school districts with Title IV projects. The study thus offered insights into the ongoing basic academic needs of Indian/Alaska Native students.

Title IV projects are addressing academic needs, as over three-quarters of the sampled projects were found to have a basic skills emphasis of either increasing student academic abilities or the ability to communicate in the English language. For example, 60% of sampled Indian students in grades 7-12 stated that they had worked with a teacher or tutor from the project in reading or English language arts, while 67% cited help from a project-supplied teacher or tutor in mathematics. Projects are stressing both remedial and enrichment instruction. Close to three-fifths of sampled students in grades 7-12 reported receiving tutoring for purposes of eliminating skills deficiencies, and one-quarter of the students stated that they had learned additional material to put them ahead of their classmates.

The variables and dimensions included in this study represented extensions of a number of ongoing investigations in the literature on the correlates of academic performance. Such investigations included research on the magnitude of relationships between academic achievement and socioeconomic status (White, 1982) and self-concept (Hansford and Hattie, 1982).

In examining the results of this chapter, however, care should be taken in viewing achievement test data as the dominant measure of academic impact. Academic components of Part A projects are almost exclusively supplementary in nature, and they are directed at subpopulations of Indian students. Part

A projects, therefore, should not be expected to produce major improvements in the achievement test scores of the overall Indian student population. The data were analyzed, however, to see if the existence of specific program components or levels of student contact with Part A projects were related to achievement test scores.

B. Methodology

Overview

A cross-sectional design was used in this phase of the Indian Education Evaluation Study. That is, the study focused on determining whether there were differences across comparison groups of students and projects. Standardized achievement test scores were used as dependent measures. The time frame for the evaluation precluded the longitudinal data collection to ascertain if students' academic performance had significantly shifted. Time and cost factors also dictated a file search procedure rather than systematic student testing. Field study teams were therefore trained to collect reading and mathematics scores from LEA files, based on the spring 1981 testing programs conducted by those districts in the sample. Data recording forms were used to obtain scores of students in the evaluation sample. Where possible, summary data were also collected for all students in the district tested at the same grades included in the evaluation study. Individual students' scores were uniformly transformed to T-score formats. Analyses of these scores were subsequently conducted to determine which of several student, local program, and contextual characteristics were significantly associated with reading and mathematics scores.

Use of Test Score Information

Based on information gathered during the fall visit to sample projects, a series of criteria was developed for determining what type of tests would be used as sources of reading and mathematics test scores. The criteria for selecting types of reading and math scores from student files were the following:

- Scores represented testing administrations conducted in the spring of 1981, that is, no earlier than January of that year;
- Students for whom scores were collected were currently in any of the grades 4-12, thus likely were in grades 3-11 when the spring 1981 testing was conducted;
- Tests were not state-developed, locally-developed, criterion-referenced, or objectives-based (since these would have no direct psychometric basis for comparison with standardized instruments);
- Tests were not diagnostic reading and math standardized instruments; and
- The district tested a range of grades rather than a limited range or scattered ones (thus permitting across-grade comparisons among a common set of projects if desired).

These criteria were provided to study field staff and explained to them during formal training sessions.

All reading and mathematics test scores[1] available on the sample students, from tests considered suitable for study purposes, were collected. The test's name, form, level and grade in which administered was recorded. Most tests were represented by more than one edition. Each alternative form having distinct means and standard deviations was recorded. Although districts did not always maintain form-type information in their files, these were usually identified from the level designations and from the range of scores. When such an identification was not possible, the person heading the testing program was contacted to obtain the needed information.

Most districts administered the level of the test designated for each grade. A few utilized the level suitable for the performance level of the student (i.e., "out-of-level" testing). Norms had been created for almost all of the tests for at least one grade above and one below the designated grade. If those norms were published, then the level was accepted. When norms for a grade were not available, the collected scores were disregarded.

[1] In the case of a test battery, the most relevant subtest was used, based on a series of criteria supplied field staff. This usually was the comprehension subtest for reading, and the quantitative or computation subtest for mathematics.

The scores were found in district and school files in a variety of formats. Raw scores were preferable since they reduced the difficulties with subsequent transformation (to T-score) activities. The other frequent formats encountered included grade equivalents, percentile ranks, scale scores, normal curve equivalents, and occasionally standardized T-scores. Most of the test publishers provided the tables necessary to convert these formats to raw scores for individual students. A few, however, did not furnish their formulas for special group scores and those could not be processed. Stanines were also found in a few districts, but it was very difficult to convert them, so those scores were not used.

The percentage of test scores which could not be used because of difficulties in transformation was about 5%, not an unusually large proportion. The total of reading and/or mathematics scores considered usable was 6,425, which represented approximately 48% of the 13,480 students in grades 4-12 included in the sample. Almost all of the loss was occasioned by districts that did not test students, and districts that did not test every grade or a wide range of them. Even though some grades were not available from some districts, the overall sample included substantial numbers of students from grades 4 through 12, the levels included in the study.

The extent, if any, of bias present from using data from approximately half of the sample students was analyzed in terms of project and student characteristics. A total of 77 (67%) of the 115 projects contributed student test scores to the data pool. Series of analyses were conducted to determine if the characteristics of the 77 projects and districts differed significantly from those of the remaining projects not included in the subsample of test score sites. Geographic location, proportion of Indian students to all students (a density measure), geocultural region (12 categories), and Title IV Technical Assistance Region (5 categories) were used. For none of these variables did the 77 retained projects differ significantly from the remaining projects. (Chi-square "goodness of fit" tests of significance and examination of percentages were used for these purposes.)

At the student level, the characteristics of the 6,425 students were compared with a group of 12,539 students who had completed the spring set of student instruments, and thus included the vast majority of the full student sample from all 115 projects. Again "goodness of fit" statistical tests and visual inspection approaches were applied to detect any large-scale or meaningful differences between those contributing test score data and the full student sample. These comparisons were made on the basis of geographic region of the projects serving these students, grade level, and location of the projects. Again, no sizable differences were found in what types of students had usable test score information.

Finally, most analyses of between-group differences were conducted on a large data base having fewer than the 12,539 Indian students, although it did number 7,644. This group consisted of those students having attitudinal and/or attendance and/or achievement information (a merged-file data base widely used for a variety of analytic purposes). A check on the similarity of data for this group and the full student sample was therefore deemed advisable. Socioeconomic status (i.e., whether or not the student received free or subsidized lunch), age, sex, and grade were used for these comparisons. Again there was a high degree of similarity on virtually every category of each variable examined.

In summary, it seems highly likely that in terms of the demographic and contextual variables used, the students contributing test score information were quite similar to the full student sample. No measurable bias that would make the findings unrepresentative of the full sample was introduced simply on the basis of using available data.

Test Score Conversion

The extensive and ongoing literature on how best to equate or convert scores from different tests and forms at differing or identical grade levels to a common metric for comparison purposes does not provide a definitive answer regarding which approach is most defensible.[2] Different tests have varying

[2]See for example: Goldsamt and Higgs (1980); Linn (1981); or Skaggs and Lissitz (1982).

numbers of items, and those items represent some differences in content, compatibility with the curriculum, and examinee appropriateness. The much-quoted Anchor Test Study (Loret et al., 1975) compared reading scores across five tests for three grades and found few important differences. A later publication (Jaeger, 1977) reexamined some of the findings based on normal curve equivalents (NCEs), and disagreed with some of the premises and with the validity of using the NCE conversion procedure.

A recent review by Thompson and Novak (1981) reported varying results when scores from several tests were used. Their own research, using very large numbers of students, found many consistent normal curve equivalent shifts or gains across years and tests, and relatively few inconsistencies. Similarly, Buckley (1981) found only minor differences across tests. Earlier, Silverberg and Silverberg (1977) had found generally comparable data across standardized reading tests.

Early in the National Institute of Education-funded evaluations of the Experimental Schools Programs, seminars were held to determine the most viable test score conversion approach for data from students in that program (Cervantes, 1975). Testing experts chose the standard T-score as the conversion approach to use, even though they found some weaknesses in it. During the early stages of data analyses for Development Associates' evaluation of California's services to limited and non-English speaking students (Jones et al., 1980), a special panel was invited to examine the score conversion alternatives. Theimer (1979) reviewed these alternate procedures and also recommended T-scores. Gabriel (1979) concurred, noting that of the several tests studied, the differences from one level to another within a test were as great as the differences among the tests. Several other researchers have come to approximately the same conclusion (Berman and McLaughlin, 1978; Mayeske and Beaton, 1975; Stallings, 1975). Many of the studies with very large numbers of students have used T-score conversion procedures (Jones and Davis, 1977; Jones et al., 1980; Gabriel, 1979).

The California Department of Education (1977, 1979) utilized this same system for the state evaluation of consolidated application programs, and for their combined early childhood education, Title I, and economically deprived youth evaluation study. In each of these publications, some problems with differences among tests were discussed. However, the final conclusion was that across-test variations arising from score conversions were relatively minor.

Development Associates therefore chose standardized T-scores as the test score conversion procedure for the present study. The conversion formula employed was:

Raw score minus test mean, divided by test standard deviation times 10 plus 50 = T-score (rounded to the nearest whole number)

The large number (23) of test forms found in LEA files together with the need for absolute identification of students for each set of scores, led Development Associates to conduct the conversions manually. Development Associates' California office staff had considerable experience performing such transformation, and a library of conversion tables amassed from other studies. Quality control procedures were employed to minimize recording error. The T-scores were then added to computer-designed data collection sheets that already had the unique student identification numbers and several student-level variables that were anticipated as possible differentiating factors. The data were merged with other files that contained relevant student and project data.

Adequacy of the Test Score Conversion Approach

A detailed study of the psychometric adequacy of tests utilized by the districts and the effects of converting scores from them was not within the purview of this evaluation. Nevertheless, Development Associates conducted certain analyses to furnish insights into possible test and/or conversion biases. The first of these is contained in Table 4-1, in which the district-level means on all students on the test or tests used were compared with the means for Indian students who were part of the evaluation sample.

TABLE 4-1
SPRING 1981 READING AND MATHEMATICS T - SCORES FOR THE OVERALL DISTRICT AND STUDY SAMPLE OF GRADE 3-11 STUDENTS

District Code	Reading		Mathematics	
	District Report	Study Sample	District Report	Study Sample
007	48.4	50.2	46.5	48.8
010	54.6	47.0	56.3	47.4
019	46.1	46.0	46.8	47.5
021	55.2	57.3	53.8	51.8
059	48.1	46.8	49.3	45.5
061	50.0	43.8	49.4	36.6
062	53.6	44.3	55.2	45.6
063	47.8	46.0	49.2	49.0
064	44.1	43.9	44.2	45.1
065	42.1	41.6	43.8	45.3
066	47.8	44.5	48.6	45.8
067	42.6	43.2	45.2	45.3
069	43.6	46.1	43.4	46.4
070	41.6	43.4	43.8	45.4
071	53.4	54.6	54.6	54.4
072	54.6	55.5	55.7	54.7
073	45.2	44.5	46.4	46.0
074	64.0	51.3	52.3	51.8
076	51.8	44.1	49.0	41.9
079	47.2	48.5	45.0	51.2
080	49.1	47.2	47.6	48.7
086	47.8	52.0	47.8	52.2
087	47.0	44.0	46.1	41.0
093	47.1	44.7	45.2	35.8
094	42.1	39.0	47.6	47.6
095	50.2	49.2	51.1	53.9
096	49.3	48.7	48.4	47.4
097	50.2	50.6	46.6	47.4
099	49.5	49.1	50.7	53.7
100	51.1	51.0	47.3	45.9
102	47.3	46.5	47.1	46.7
103	50.7	51.0	47.4	44.3
105	34.1	26.5	58.6	60.8
108	48.2	47.9	48.7	50.6
109	50.4	49.8	48.8	48.7
110	48.3	47.4	47.4	46.1
112	50.2	48.1	49.6	48.6
113	49.1	45.6	48.4	45.2
114	48.9	48.7	47.3	45.1
116	45.2	44.3	31.2	37.0
117	58.6	59.1	45.8	45.9
118	49.1	48.0	50.2	48.9

Note: Means calculated only for the grades included in the samples. Students per district is 10 or more; district #105 had both the lowest reading and highest mathematics mean scores of any district, and although the district was unaware of any biasing effects, it was excluded from between-project statistical analyses.

The data show that 76% of the reading score means (overall district versus Indian sample) and 78% of the mathematics means fell within three T-score points of each other. Table 4-1 does indicate that there were only a few unusually varying score patterns within districts. These generally occurred in districts with a small number of tested students.[3]

The second procedure was to compare the means resulting from all the tests combined with those of the test most widely used by sample districts, the 1978 edition of the California Achievement Test (CAT).[4] Tables 4-2 and 4-3 contain the means for both reading and matnematics, as analyzed by grade and socioeconomic status.

The difference between the two sets of mean scores was 2.5 T-score points or less for both reading and mathematics. Indeed, the differences were usually less than one point. Overall, the means for all students in the two groups were similar for reading and almost identical for mathematics.

In addition, one aspect of the data presented in Table 4-2 should not go unnoted, although it is not central to the present discussion (and is discussed more fully later in this chapter). That is, that both the All-Sample and CAT78 reading and mathematics T-scores significantly differed across grades ($p < .001$). In all instances, there was a declining pattern of academic performance as the grade increased. The implication that the performance of Indian students in reading and mathematics declines as they continue in school is a serious one.

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[3]These districts were excluded from analyses at the project level.

[4]One-fifth of the districts supplied scores either solely or predominantly from this test; one-third of all students had 1978 CAT scores.

TABLE 4-2

THE ALL-SAMPLE AND THE 1978 VERSION OF THE CALIFORNIA ACHIEVEMENT TEST (CAT78) SAMPLE READING AND MATHEMATICS T-SCORE MEANS, BY GRADE (SPRING 1980-81 ADMINISTRATIONS)

Grade*	Reading				Mathematics			
	All-Sample		CAT78		All-Sample		CAT78	
	N	Mean	N	Mean	N	Mean	N	Mean
Three	886	48.16	201	46.68	882	48.01	204	46.67
Four	963	47.41	337	45.35	958	47.88	340	45.92
Five	844	48.31	226	45.79	837	48.32	226	46.89
Six	825	46.74	266	45.59	821	47.08	259	47.76
Seven	883	46.92	317	47.09	881	46.74	322	47.48
Eight	564	47.10	163	46.40	532	47.19	162	47.52
Nine	496	46.89	177	45.73	484	47.02	176	47.68
Ten	456	45.11	159	45.73	456	46.54	161	46.80
Eleven	378	44.94	130	43.87	374	45.23	130	44.42
All Grades	6,302	46.73	1,976	45.90	6,222	46.38	1,980	46.86

Note: The focus of this evaluation was on those students in grades 4 through 12 in 1981-82; the achievement data were from the spring 1981 administrations and therefore were for the same students when they were in grades 3 through 11.

Table 4-3 displays comparisons by socioeconomic status of T-score means for reading and mathematics, both based on all tests and on solely the 1978 California Achievement Test. Less than two T-score points separates pairs of score means for the same socioeconomic status level. No test conversion bias was therefore apparent from these comparisons.

TABLE 4-3

THE ALL-SAMPLE AND THE 1978 VERSION OF THE CALIFORNIA ACHIEVEMENT TEST (CAT78) SAMPLE READING AND MATHEMATICS T SCORE MEANS, BY SOCIOECONOMIC STATUS (1980-81 ADMINISTRATIONS)

Socio-economic Status	Reading				Mathematics			
	All-Sample		CAT78		All-Sample		CAT78	
	N	Mean	N	Mean	N	Mean	N	Mean
Receiving free/ subsidized lunch ("low")	3,234	45.84	873	44.29	3,233	45.77	873	46.01
Not receiving free/subsidized lunch ("high")	1,644	48.94	402	47.50	1,646	47.83	402	47.68
Both Levels	4,878	46.89	1,275	45.30	4,879	46.46	1,275	46.54

Note: Reading scores differed significantly at the .001 level in both the All-Sample and the CAT78 data sets; the mathematics level was significant at .001 for the All-Sample and at .01 for the CAT78 data.

In summary, the scope of this evaluation did not provide for extensive research to be conducted on the underlying differences among tests, nor on the psychometric adequacy of the transformation procedures. Nevertheless, Development Associates was able to perform three sets of analyses to discover whether there were apparent differences among tests, and whether Indian students in the sample differed dramatically from their school district peers: These results of these analysis did not show any consistent pattern of biases in tests or in transformation procedures.

Analytic Methodology

The methodology used to analyze differences in achievement test scores consisted of two phases: descriptive and explanatory.

The descriptive phase consisted of preparing summary statistics, such as means, standard deviations, percentages, etc., for the reading and mathematics scores, now converted to a T-score format, and for several project-level and student-level variables. This helped to determine the distribution of the scores and how various factors interrelated. Thus their overall usefulness for subsequently analyzing achievement measures could be gauged.

The explanatory phase of the analyses focused on testing a series of hypotheses to determine: (a) what factors were most related to academic performance and (b) to what extent was Part A Program participation associated with standardized achievement test scores. The variables used as predictors of reading and mathematics test scores are listed in Table 4-4.

Two units of analysis were used to test these hypotheses: student-level and project-level. That is, the analytic approach first dealt with detecting what student-level factors and contextual or programmatic variables might be associated with differences in test scores of Indian and Alaska Native students. The project-level analyses were based on aggregated student scores and focused on determining whether test score differences existed across groups of projects and were associated with project characteristics, programmatic emphases, or certain types of students more prevalent in some projects than in others.

The primary analytic approach used was on the general linear model (PROC GLM, as contained in the SAS computer package, SAS institute, 1979). This approach uses the principle of least squares to fit linear models and was considered appropriate since the descriptive phase of the analyses clearly indicated extensive numbers of disproportionate-sized comparison groups. These would have produced misleading estimates of between-group differences if usual analysis of variance techniques had been used, whereas the GLM procedure could more readily and accurately handle unbalanced data sets.

TABLE 4-4

VARIABLES USED AS PREDICTORS OF STUDENT AND PROJECT-LEVEL DIFFERENCES IN READING AND MATHEMATICS ACHIEVEMENT TEST SCORES

Contextual Variables

*Technical Assistance Center Geographic Region (5 categories)
*Number of Indian students in project (5 categories)
*Geographic location of project (on or near Reservation, other rural area, urban area, metropolitan area)
*Proportion of Indians to total students in district (4 categories)
*Whether or not Indians in projects represented a single tribe

Program Characteristics

*Cultural Emphasis (yes, no)
*Counseling Emphasis (yes, no)
*Basic Academic Skills Emphasis (yes, no)

Student Characteristics

*Language Spoken at Home: English only, Indian language only, both English and an Indian language, another combination of languages
*Receiving Free or Partially Free Lunch (SES measure)
Sex
Grade
*Tutorial Emphasis in Reading: none, remedial, or enrichment
*Tutorial Emphasis in Mathematics: none, remedial, or enrichment

*Also used to test project-level differences.

Note: For student-level analyses, actual information on each student was used, such as grade level; for project-level analyses, it was averaged across students in each project.

A series of model-building terms was therefore included in each statistical test conducted with student-level achievement data. These usually included: the variables that were part of the hypothesis as main effects, certain specified interaction terms (which were known to have sufficient numbers of cases and cell combinations so that the interaction could be estimated), and three variables which served as covariates. These three variables were included so that the effects of participant-nonparticipant differences in

demographic and contextual characteristics could be controlled for, and thus be ruled out as a plausible rival hypothesis for test scores differing across groups. The three variables on which participants and non-participants most differed were: geographic region (represented by the five Technical Assistance Center categories), home language, and grade level. These were entered into the model as interaction terms (rather than main effects) since the proportion of participants and non-participants had differed on each. The analytic procedure used these interaction terms as classification factors in dummy variable format. Since these covariates were included in the analytic model, Type IV sums of squares were interpreted, so that the relationship of each main effect and interaction with the dependent measures would be adjusted for all other sources of variation, including covariates. (This has been considered the preferable approach in dealing with unequal and disproportionate comparison group sizes; Spector, 1980.)

A multivariate analytic model was used. Initial analyses indicated that reading and mathematics scores were moderately correlated (.55 at the grade 4-6 level and .61 at the grade 7-12 level). It therefore seemed sensible to incorporate the correlation between dependent measures into the analysis. Findings were analyzed further when the multivariate F-ratio was statistically significant. When this occurred, the pattern of findings for each dependent measure was also examined to understand which of the two dependent measures (reading or mathematics) might have a greater relationship with the independent variables and their interactions.

In addition to using statistical significance as a criterion for judging whether certain predictors were related to dependent measures, two other criteria were used. This was a necessity, since the large number of cases used in the analysis made it likely that rather small differences between cell means could become statistically significant. However, such differences would be unlikely to have practical or programmatic significance for future Title IV programming. Therefore, the analysis also examined:

- The pattern of least-squares means (i.e., cell means adjusted for the unbalanced and unequal number of cases per cell) so that relevant interactions and/or main effects and their direction were clear; and

- The proportion of explained variance (based on the multivariate analogue of Hayes' omega squared, a measure developed by Sacheva, 1968).[5] Since using such measures can overlook the importance of the obtained difference to the subject area being investigated and the instructional intentions of the program (O'Grady, 1982; Porter et al., 1978), the study also used the magnitude of the difference between least square cell means. A difference of greater than 3 T-score points, or approximately 1/3 of a standard deviation of the full sample's score, was used as a meaningful measure of effect size.[6]

Two sets of analyses were conducted with student-level and project-level data. One set included students in grades 4-6 and the other students in grades 7-12. These educational ranges were considered sufficiently distinct; they received different attitudinal instruments and were usually separately analyzed throughout the evaluation study. Doing so here further controlled for between-grade differences between participants and non-participants which might have confounded findings. It also represented a form of replication across the two sets of analyses so that significant findings found in both analyses strengthened the meaningfulness of the results.

[5]The formula for this is: Omega-squared = 1 - [(N x L)/(N - K + L)] where N = the total number of students, L = Wilks' Lambda Criterion, and K = the number of comparison groups (Sacheva, 1968).

[6]In the present study, greater than 5% of explained variance was considered meaningful, although admittedly such considerations as: how much variance could be explained by a particular relationship, the precision of the significance test, and the number of groups being compared, tended to mediate the determination of how strong an effect actually was present. (See Sechrest and Yeaton, 1982, for a thoughtful discussion of this issue, which has policy-making implications.)

Analyses similar to those for the student level were conducted with project-level data. The latter analyses consisted of using either student data aggregated to the project level or information that already represented project descriptors. To ensure that project means were based on a reliable number of cases per project, any project having fewer than 10 students with test scores was excluded from both the 4-6 and 7-12 student data base analyses. Thus, of 77 projects having test score information, 47 (61%) were included in the project level analyses. This excluded only 4.1%, or 133, of the grade 4-6 students, and 1.8%, or 80, of the grade 7-12 students. Only a small proportion of sampled students was thus excluded from the project-level analyses.

C. Characteristics of Test Scores

The findings in this study are based on test scores gathered on 6,425 students in grades 3 through 11 in the spring of 1981. The reading and mathematics standardized achievement test scores come from 13 tests and 10 forms or levels of those tests, representing a total of 23 sources of test scores. Table 4-5 indicates that the 1978 edition of the California Achievement Test (CAT) was the test most often administered, to 32% of Indian and Alaska Native students who were part of the evaluation sample. The 1978 edition of the Science Research Associates (SRA) test was administered to 21%, followed by the 1973 Stanford Achievement Test (SAT), which was used with 14%, and the 1973 Comprehensive Test of Basic Skills (CTBS), used with 10% of the evaluation sample. Together, these tests were used with over three-quarters (76%) of the evaluation sample.

Table 4-6 contains summary statistics on the test scores obtained. Both reading and mathematics mean scores were approximately 2.8 T-score points below the national mean of 50, based on converting scores from all tests to that standardized T-score format. This corresponds to study test scores being .3 of a standard deviation below the national level (since T-scores have a standard deviation of 10 points). Related to this, the standard deviations of the scores obtained in this study were slightly less than the national level of 10 points; both reading and mathematics scores had standard deviations of 9.5.

TABLE 4-5

READING AND MATHEMATICS TESTS INCLUDED IN STUDY

Test	No. of Students	Percentage
1970 CAT	30	0.5 %
1978 CAT	2,006	31.6
CTBS-K FORM	37	0.6
1968 CTBS	61	1.0
1973 CTBS	650	10.2
1975 CTBS	105	1.7
1965 GATES-MacGINITIE	20	0.3
1978 GATES-MacGINITIE	6	0.1
1971 ITBS	159	2.5
1978 ITBS	376	5.9
1970 MAT	163	2.6
1978 MAT	268	4.2
1979 STEP	1	0.0
1971 SRA	8	0.1
1978 SRA	1,323	20.8
1973 SAT	870	13.7
1965 WRAT	2	0.0
1978 WRAT	39	0.6
1972 TASK	105	1.7
1981 TASK	15	0.2
1978 ITED	22	0.3
1981 ITED	63	1.0
1976 METROPOLITAN	26	0.4
Name of Test Unknown	70	--
Total	6,425	00.0

The grade level distribution of students has previously been presented in Table 4-2. That table indicates that each of the grades 3 through 11 supplied 6% or more of the data. Each grade supplied between 382 and 969 cases. As such, all grades were well-represented in the pattern of data, although the percentage of students in grades 8 through 11 decreased steadily. This simply may be because districts focus more on their testing program efforts on the elementary and middle school grades.

TABLE 4-6

CHARACTERISTICS OF READING AND MATHEMATICS ACHIEVEMENT TEST SCORES CONVERTED TO T-SCORE FORMATS

	Characteristics	Reading	Mathematics
a.	Mean	47.11	47.89
b.	Standard deviation	9.49	9.46
c.	Range	4-86	6-87
d.	Mode	44.00	46.00
e.	25th percentile	40.00	40.00
f.	Median (50th percentile)	46.84	46.67
g.	75th percentile	54.00	53.00
h.	Number of students	6,374	6,293

Table 4-7 presents this distribution for reading and mathematics test scores in terms of the number of standard deviations (or 10-point intervals) above and below the national mean of 50. The table indicates that in the area of reading, 3.4% of American Indian and Alaska Natives are exactly at the national level (T-score = 50), while 37.4% are above that level, and 59.2 are below that level. Similarly, in mathematics, 4.3% are at the national level, 34.6% are above it, and 61.1% are below it. Slightly over 97% of Indian student scores fall within the range of ±2 standard deviations from the population mean. This is very similar to the normal distribution result of 95% of the population's scores falling within that range. It therefore appears that the academic performance of Indian and Alaska Native students in reading and mathematics is lower than that of all students in public school settings, but distributed in approximately the same manner.

TABLE 4-7

DISTRIBUTION OF READING AND MATHEMATICS
STANDARDIZED ACHIEVEMENT SCORES AMONG INDIAN STUDENTS
BY STANDARD DEVIATION RANGE

Standard Deviation Distance From Mean Score of 50; Score Range in T-Scores	Reading Test Scores	Mathematics Scores
More than 4 S.D. below mean (6-9)	0.08%	0.06%
4 S.D. or less below mean (10-19)	0.28	0.13
3 S.D. or less below mean (20-29)	1.71	1.26
2 S.D. or less below mean (30-39)	20.10	20.42
1 S.D. or less below mean (40-49)	37.05	39.31
At national mean level (50)	3.36	4.26
1 S.D. or less above mean (51-59)	27.47	23.15
2 S.D. or less above mean (60-69)	9.40	10.49
3 S.D. or less above mean (70-79)	0.52	0.78
More than 3 S.D. above mean (80-87)	0.03	0.14
TOTAL SCORES (100%)	6374	6293

D. Factors Associated with Academic Performance

A series of linear model multivariate analyses was conducted to determine if certain types of project contextual characteristics, project characteristics, program variables, and student characteristics were associated with student reading and mathematics scores. Two sets of analyses were conducted, those for students in grades 4-6 or 7-12 during the study year (i.e., grades 3-5 or 6-11 in the year the tests were administered). A similar pair of analyses was conducted at the project level by aggregating student data in those projects. Additional analyses were conducted at the student level by using bivariate correlation coefficients to determine which of a series of attitudinal measures was related to either reading or mathematics test scores.

The overall conclusion from conducting these analyses was that virtually all of the factors hypothesized as having a relationship with achievement (including program participation) were not related to academic performance any meaningful way, either at the student or project level. Some relationships were statistically significant, an expected finding in view of the large number of cases present at each set of grades. However, the relationships found were not strong ones, and comparison groups did not differ widely from each other in terms of actual test score differences.

A discussion of the specific findings is presented below.

Project Contextual Factors and Student Academic Performance

These analyses checked if any of the following contextual factors were significantly and meaningfully related to students' reading and mathematics levels:

- The number of Indians in the school district;
- Whether one or more tribes were represented by the Indian students in the project (a measure of tribal homogeneity); and
- The geographic region of the Title IV Technical Assistance Center in which the project was located.

Analyses were conducted for these main effects. Certain interactions were also tested when it was considered important and when there was variation on each factor so that interaction effects could be tested.

Format of Statistical Tables. These findings are presented in Table 4-8, which has a format common to other tables which will be subsequently discussed. Table 4-8 contains: the hypothesized source of variation in test scores, the degrees of freedom and multivariate F-ratio, the probability level of obtaining the corresponding F-ratio, and the proportion of explained variance (i.e., omega-squared) resulting from testing for a relationship between a particular source of variation and the two dependent measures of reading and mathematics scores. Since parallel analyses were conducted for the grade 4-6 students and 7-12 students (i.e., students in those grades during the evaluation school year of 1981), these two sets of analyses are presented side-by-side.

The first three sources of variation in the general multivariate linear model tables of findings represent covariates. That is, they represent certain differences between program participants and non-participants which were controlled for by including them in the analysis. These covariates are then followed by main effects and interactions that were part of testing the hypotheses.

It should be noted that although each of these statistical tables contains three sources of variance relating program participation to academic performance, these factos were not included in the particular analyses to assess program participation per se. Rather, these factors were included in most analyses as covariates, as just explained. Table 4-9 and the relationships it includes provides the strongest basis for determining if program participation was significantly and meaningfully related to student test scores.

It should also be noted that 3,280 students in grades 4-6 and 4,364 students in grades 7-12 provided attitudinal, achievement, and/or attendance information. However, the analyses being reported here had samples sizes approximately three-fifths that size. This is because the multivariate

analyses called for complete data on all variables, and thus cases without complete data were dropped from the analyses. As described earlier, this procedure introduced no apparent biases into the student data.

Results. Table 4-8 indicates that the three covariates used were statistically significant and therefore contributed to improving the quality of testing the hypotheses of interest. However, they only explained a very small amount of variation in test scores. This was true for both the elementary and the middle/high school results. All other interactions and main effects were statistically significant for both grade ranges, except for the interaction of TAC region and tribal homogeneity among students within a particular project, which was non-significant for 7-12 grade students. Although statistically significant, none of the interactions and main effects explained any meaningful amount of variation in test scores (i.e., 2.1% or less), except for the interaction of the TAC region and the number of Indian students found in projects in particular regions. About five to six percent of explained variance was found by using that source of variation, depending on which grade range of students was involved. The pattern of findings when only considering reading or mathematics test scores is very similar to that from using both measures of academic performance, and is not presented separately here. (For example, the univariate F-ratios associated with reading scores, independent of mathematics scores being predicted from the interaction of TAC region and the number of Indian students in each project, was 6.28 and 5.81 for each grade range, respectively. The multivariate F-ratios were approximately 6.35 for each grade range.)

It thus appears that academic performance of Indian students was unrelated to contextual factors such as the number of Indians, TAC region, and tribal homogeneity of the projects that served them.

Project Characteristics and Academic Performance

Table 4-9 presents statistical tests on whether or not student reading and mathematics scores were related to project geographic location and the proportion of Indian students in the total student body. The home language

TABLE 4-8

GENERAL LINEAR MODEL MULTIVARIATE RESULTS RELATING PROJECT CONTEXTUAL CHARACTERISTICS TO READING AND MATHEMATICS SCORES IN GRADES 4-6 AND 7-12

Source of Variation	A. Grades 4-6 (N=2090)				B. Grades 7-12 (N=2460)			
	Degrees of Freedom*	Multivariate F-Ratio*	P	Omega-Squared	Degrees of Freedom*	Multivariate F-Ratio*	P	Omega-Squared
TAC Region X Participation	16,4072	2.06	.008	.009	8,4822	2.42	.013	.004
Home Language X Participation	18,4072	3.12	.000	.024	12,4822	5.09	.000	.023
Grade X Participation	12,4072	2.49	.003	.012	20,4822	2.54	.000	.016
Number of Indians	8,4072	2.68	.006	.009	8,4822	2.58	.008	.000
Tribal Homogeneity	2,2036	10.96	.000	.010	2,2411	4.78	.008	.004
TAC Region	8,4072	6.01	.000	.021	8,4822	1.96	.048	.005
Number of Indians X Tribal Homogeneity	4,4072	8.10	.000	.011	4,4822	3.87	.004	.003
TAC Region X Number of Indians	24,4072	6.46	.000	.066	24,4822	6.35	.000	.051
TAC Region X Tribal Homogeneity	2,2036	4.94	.007	.000	2,2411	1.24	.290	**

*Based on Wilks' Lambda Criterion.

**Not computed since $p > .05$ (non-significant).

TABLE 4-9

GENERAL LINEAR MODEL MULTIVARIATE RESULTS RELATING PROJECT CHARACTERISTICS TO READING AND MATHEMATICS SCORES IN GRADES 4-6 AND 7-12

	A. Grades 4-6 (N=2090)				B. Grades 7-12 (N=2460)			
Source of Variation	Degrees of Freedom*	Multivariate F-Ratio*	P	Omega-Squared	Degrees of Freedom*	Multivariate F-Ratio*	P	Omega-Squared
TAC Region X Participation	24,4040	2.99	.000	.028	16,4782	4.49	.000	.026
Home Language X Participation	12,4040	1.67	.067	**	6,4782	0.92	.476	**
Grade X Participation	12,4040	2.17	.011	.009	20,4782	2.45	.000	.000
Project Location	6,4040	2.18	.042	.005	6,4782	2.34	.029	.005
Density	6,4040	1.69	.120	**	6,4782	0.93	.474	**
Home Language X Project Location	18,4040	1.43	.105	**	18,4782	0.54	.939	**
Home Language X Density	18,4040	0.45	.974	**	18,4782	1.16	.289	**
Project Location X Density	12,4040	1.65	.071	**	12,4782	0.69	.763	**
Home Language X Project Location X Density	18,4040	1.01	.441	**	24,4782	0.33	.999	**

*Based on Wilks' Lambda Criterion.

**Not computed since $p > .05$ (non-significant).

of students also was included in the statistical analysis, to control for the possibility that Indian students might use English predominantly at home, depending on project location or the proportion of Indian students.

Findings indicate that none of the hypothesized factors were meaningfully related to patterns of academic performance, either at the 4-6 or 7-12 grade ranges, after controlling for participant-nonparticipant differences in three characteristics. The location of projects (either on or near a reservation, other rural area, urban area, or metropolitan area) was the only variable that was statistically significant. However, the proportion of explained variation in test scores was only .005 for each of the grade ranges. Project location was statistically related to reading scores but not to mathematics scores in the grade 4-6 analysis; the reverse was true in the grade 7-12 analysis. However, in each of these sets of analysis, the spread of test score means was less than 3 T-score points, the criterion used as a measure of effect size.

In essence, the findings indicate that the project characteristics of project location and proportion of Indian students in the project were unrelated to academic performance. Inclusion of student home language as a control variable for the hypothesized relationship of these two project characteristics with student test scores made no difference.

Local Program Emphases and Academic Performance

This phase of the analyses focused on establishing whether Title IV programs with certain features were relatively more likely to also have Indian and Alaska Native students with higher reading and mathematics test scores. The program features included in the analyses were:

- Presence of a cultural program;
- Presence of a counseling program; and
- Presence of an academic component having either: (a) a basic academic skills emphasis of increasing student abilities in reading, mathematics, or language arts, or (b) an emphasis on improving students' abilities to communicate in the English language.

Whether these factors were independently or jointly related to student test scores were included in the analytical model for both grade ranges. Thus, programs having both a cultural and a basic skills emphasis were included for analytic purposes, and data from students in such projects could be compared with students in projects having only one of these emphases. Findings are presented in Table 4-10. For the most part, statistically significant relationships were found for each grade range, but the findings did not reflect practical and meaningful relationships.

Certain interactions[7] were statistically significant at the 4-6 grade range, and not at the 7-12 grade range. This represented the following factors: culture and counseling components, and culture and academic skills.

The pattern of least squares means for student data, relative to the types of projects they were in, was the following:

Culture	Counseling	Mean Reading	Mean Mathematics
No program	No program	44.52	49.85
No program	Program	44.78	46.18
Program	No program	46.52	47.55
Program	Program	47.54	48.31

Thus, students in projects having both cultural and counseling components had the highest reading scores. Students in projects with neither component had the highest mathematics scores. These differences are somewhat difficult to interpret.

[7]For interpretation purposes, significant interaction effects are usually the focus since main effects need to be qualified if both are significant (Kirk, 1968).

TABLE 4-10

GENERAL LINEAR MODEL MULTIVARIATE RESULTS RELATING PROGRAM CHARACTERISTICS TO READING AND MATHEMATICS SCORES IN GRADES 4-6 AND 7-12

Source of Variation	A. Grades 4-6 (N=2090) Degrees of Freedom*	Multivariate F-Ratio*	p	Omega-Squared	B. Grades 7-12 (N=2460) Degrees of Freedom*	Multivariate F-Ratio*	p	Omega-Squared
TAC Region X Participation	24,4104	3.65	.000	.034	16,4852	3.83	.000	.021
Home Language X Participation	18,4104	3.57	.000	.025	12,4852	7.30	.000	.033
Grade X Participation	12,4104	2.65	.002	.012	20,4852	3.11	.000	.021
Culture	2,2052	7.58	.001	.007	2,2426	5.17	.006	.004
Counseling	2,2052	5.18	.006	.005	2,2426	3.07	.047	.002
Basics	2,2052	11.69	.000	.011	2,2426	1.41	.245	**
Culture X Counseling	2,2052	5.82	.003	.004	2,2426	1.43	.240	**
Culture X Basics	2,2052	6.98	.001	.005	2,2426	0.23	.794	**
Counseling X Basics	2,2052	0.98	.377	**	2,2426	0.73	.481	**
Culture X Counseling X Basics	2,2052	1.46	.233	**	2,2426	1.52	.219	**

Note: $p < .05$=statistical significance.

*Based on Wilks' Lambda Criterion.

**Not computed since $p > .05$ (non-signifcant).

The least squares means based on the presence of cultural and basic academic skills project emphases are as follows:

Cultural	Basic Academic Skills	Mean Reading	Mean Mathematics
No program	No program	44.25	48.36
No program	Program	45.04	47.66
Program	No program	48.34	51.00
Program	Program	45.72	44.87

Students in projects having a cultural program but no academic program had the highest scores in both reading and mathematics. These data appear to suggest that projects having students who need less academic help are more likely to focus on cultural programs.

Program Participation and Academic Levels

One quite important aspect of the study was to determine if test score levels were associated with student participation on Part A project activities. One measure that has consistently been shown to be related to achievement levels is "exposure" to academic assistance (also known as learning time, intensity of instruction and interaction: Stallings, 1975; Jones et al., 1980; Wiley and Harnischweger, 1974). The scope and resources of the present study did not permit detailed classroom observation measurement. Instead, two types of approaches to estimating student participation in Part A-sponsored activities were used. Project personnel were asked to estimate the degree of program participation during 1980-81 for each student. Three levels of participation (low, middle, high) were defined and then associated with academic performance. This information was obtained from program personnel on only 3,106 (48%) of the 6,425 students having test scores because many school staff members had difficulty in assessing the extent of participation on a student by student basis.

[redacted]

[8] Two other types of students were excluded from these analyses: those with no participation in 1980-81 (8% of the test score sample) and those in other schools in 1980-81 (2%).

The staff members might have had difficulties "fitting" the somewhat global participation rating scale categories to the actual program activities. Participation in a tutoring or gifted and talented program, for example, may have been easier to rate than participation in cultural activities (including some in which attendance is not recorded, such as cultural assemblies).

Analyses of variance results did not indicate that participation levels as described by staff were significantly associated with either reading or mathematics test scores. In fact, less than one T-score point separated mean scores for the three levels of participation.

Another approach to determine the degree of participation was to categorize students based on their pattern of answers to five questions administered to them during the spring 1982 data collection period. These questions dealt with whether or not students had participated in program activities (field trips, potlucks, museums, ceremonies, games, or tournaments), had received tutoring instruction or counseling, or had had other forms of contact with local Indian education project personnel. On the basis of these questions, students in grades 4-6 were categorized into those who had not received project services in 1980-81, those who were in their first year or more of receiving services, and those who were unsure of their status. Students in grades 7-12 were categorized into similar groups, although, due to the grade range involved, students were more readily able to supply clear-cut responses on participation, and no "unsure" category was used.

Table 4-10 indicates that each of the three variables analyzed in conjunction with participation (TAC Region, Home Language, and Grade Level) was statistically related to reading and mathematics scores, for each of the two grade ranges. However, no more than 3.4% of variance of those scores was explained, thus indicating fairly weak relationships. Thus, it did not appear that program participation, as defined in these analyses, was a major factor affecting the pattern of test scores.

This pattern was also indicated by the mean scores for the groups being compared. For example, with respect to the statistically significant home

language by participation interaction which was found, the pattern of mean scores for 7-12 students (the larger of the two effects) was the following:

Language Used at Home	Participation Status	Mean Reading	Mean Mathematics
English only	Not in program	47.06	48.11
	First year or more	46.40	48.27
Indian only	Not in program	40.34	43.67
	First year or more	39.61	41.20
Both English and Indian	Not in program	44.05	47.16
	First year or more	44.43	45.49
Other languages	Not in program	45.23	47.25
	First year or more	46.56	45.33

The pattern of least squares means indicates that 7-12 students using only English at home had the highest scores, and those students using only Indian languages at home had the lowest scores. Furthermore, in five of the eight comparison groups, 7-12 students not in the program had higher mean scores than those in the program for one or more years. This may indicate that Part A projects are more likely to be working with students who require academic assistance.

Student Characteristics and Academic Performance

This analysis used the three covariates of TAC Region, Home Language, and Grade Level to control for participation-nonparticipation differences, and tested for whether or not students' age, sex, or grade were significantly related to reading and mathematics scores (see Table 4-11).

As with other analyses, the three covariates were effective and related to reading and mathematics scores. However, the factors being tested were not always significantly related. More specifically, sex was not related to test scores in either grade range. Age was related to test scores in grades 4-6, but not in grades 7-12.

TABLE 4-11

GENERAL LINEAR MODEL MULTIVARIATE RESULTS RELATING STUDENT CHARACTERISTICS TO READING AND MATHEMATICS SCORES IN GRADES 4-6 AND 7-12

	A. Grades 4-6 (N=2090)				B. Grades 7-12 (N=2460)			
Source of Variation	Degrees of Freedom*	Multivariate F-Ratio*	P	Omega-Squared	Degrees of Freedom*	Multivariate F-Ratio*	P	Omega-Squared
TAC Region X Participation	24,4100	2.87	.000	.026	16,4820	3.36	.000	.018
Home Language X Participation	18,4100	3.42	.000	.025	12,4820	4.63	.000	.020
Grade X Participation	8,4100	2.70	.006	.008	10,4820	2.49	.006	.006
Age	6,4100	3.91	.010	.010	12,4820	1.01	.434	**
Sex	2,2050	1.39	.248	**	2,2410	2.17	.114	**
Grade	4,4100	3.77	.005	.006	10,4820	0.70	.729	**
Grade X Age	10,4100	2.07	.024	.008	32,4820	1.24	.164	**

*Based on Wilks' Lambda Criterion.
**Not computed since $p > .05$ (non-significant).

The grade by age interaction and the main effect of grade were related to test scores in grades 4-6, but not in grades 7-12. This factor has received special attention in the literature. Reviews of the literature have suggested that in recent years, the academic performance of Indian elementary pupils was near the norm but that a decline in scores, when compared with the norm, occurred roughly progressively thereafter. The pattern found in the present evaluation (see the All-Sample means for reading and mathematics, in Table 4-2 presented earlier) indicates the existence of such a decline. The third graders' means were slightly over 48 (the norm is 50) for both reading and mathematics; the eleventh graders' means were 44.94 for reading and 45.23 for mathematics.

The reading T-score mean for all the students in grades 3-11 was 47.11 and for mathematics was 47.29. These are less than three points below the norm of 50. These are not substantially different from the means reported in the data from those reported for California (1981) and North Carolina (1981), nor from some of the districts with large Indian populations such as Dallas (1981), Durant (1981), and Grand Rapids (1980, 1981). However, these means place the sample above those for the State of Arizona (1981a, 1981b), New Mexico (1981), and the Bureau of Indian Affairs schools (BIA, 1981).

In general, the means for all the students in this evaluation sample were similar to those found in research and evaluation reports conducted elsewhere for the past three or four years, and were near the norm for the entire group.

As Table 4-11 indicates, despite the statistically significant relationships, age and grade were not strongly related to academic performance levels. That is, no more than 1% of variance in test scores was explained by either of these two student variables.

It thus appears that age, sex, and grade were not strongly related to reading and mathematics scores, especially at the upper grades (7-12). At the lower grades, none of these variables was strongly related to test scores, although there were statistically significant differences based on age and grade.

Socioeconomic Status and Academic Performance

Studies of achievement test differences by socioeconomic status (SES) have consistently produced significant and usually substantial differences. In the state of California bilingual education evaluation study (Jones et al., 1980), for example, this was the second most influential variable (after English fluency) with "low" SES students scorings six points lower than other students in reading, and five points lower in mathematics. Mayeske & Beaton (1975) found similar differences among Indian students. In the present evaluation, only two SES levels were included: "low" for those certified as eligible for subsidized school lunch, and "other" for those not eligible (the same criterion as used in the California bilingual study and in many other recent studies).

The number of students classified as "low" was twice that of those in the "other" category, although no information was available on another quarter of the students. Nonetheless, that ratio is substantially larger than that found in most of the cited studies. In addition, some school personnel estimated that the "other" group would predominantly fall near the income criterion for subsidized lunch. If that was true for the sample as a whole, it might account for the somewhat smaller T-score differences found between the two groups, as indicated by the low amounts of explained variance presented in Table 4-12.

Socioeconomic status was found to be significantly related to reading and mathematics scores. However, it only accounted for less than 1% of variance in the dependent measures for each of the two grade ranges studied.

Data included in the White (1982) extensive meta-analysis of relationships between socioeconomic status and academic achievement were used as a baseline for examining similar relationships in the present study. Table 4-13 was developed by using the Coleman et al. (1966) data included in the meta-analysis. In both studies, socioeconomic status and reading and mathematics achievement were related less as grade level increased. However, five of the six correlation coefficients in the present study indicated lower relationships between SES and academic achievement than did the Coleman

TABLE 4-12

GENERAL LINEAR MODEL MULTIVARIATE RESULTS RELATING SOCIOECONOMIC STATUS TO READING AND MATHEMATICS SCORES IN GRADES 4-6 AND 7-12

Source of Variation	A. Grades 4-6 (N=1668) Degrees of Freedom*	Multi-Variate F-Ratio*	P	Omega-Squared	B. Grades 7-12 (N=1927) Degrees of Freedom*	Multi-variate F-Ratio*	P	Omega-Squared
TAC Region X Participation	24,3266	3.49	.000	.041	16,3792	3.84	.000	.027
Home Language X Participation	12,3266	1.46	.133	**	6,3792	1.40	.212	**
Grade X Participation	12,3266	1.97	.023	.011	20,3792	2.74	.000	.023
Socioeconomic Status	2,1633	6.93	.001	.008	2,1896	3.43	.032	.003
Home Language X Socioeconomic Status	6,3266	1.01	.414	**	6,3792	1.54	.159	**

*Based on Wilks' Lambda Criterion.
**Not computed since $p > .05$ (non-significant).

study. This may be because the SES measure used in the present study (free lunch status) is a less sensitive measure than that used in the Coleman study.

TABLE 4-13

RELATIONSHIP BETWEEN GRADE LEVEL AND THE MAGNITUDE OF THE CORRELATION BETWEEN SOCIOECONOMIC STATUS AND ACADEMIC ACHIEVEMENT (PRESENT STUDY VS. COLEMAN ET AL., 1966)

	Present Study		Coleman	
Comparable Grade*	Reading r	Mathematics r	Verbal Achievement r	Math Achievement r
6	.207	.167	.207	.209
9	.152	.102	.176	.161
11	.128	.108	.175	.131

*Correlations for grade 3 are not compared here because Coleman et al. did not use the same SES measure throughout their study; thus the correlation was not reported by White (1982).

Notes: (1) All correlations in the present study were based on 278 or more students.

(2) All correlations in the Coleman study were based on 20 students.

(3) Source: White (1982).

(4) Coleman et al. reported correlations for grade 12; the present study used grade 11 as a proxy.

White (1982) reported from his meta-analysis of 489 studies, that SES and achievement were correlated -.243 when correlating that relationship with grade level. That is, SES and achievement were less related to each other as grade level increased. In contrast, the present study found consistently low reading - SES correlations ranging from .159 in grade 3 to .128 in grade 11, and a similar pattern of mathematics - SES correlations ranging from .102 in grade 3 to .108 in grade 11. Both sets of correlations tended to rise until grade 7, when they peaked ($r = .232$ for reading and $r = .216$ for mathematics);

they then declined thereafter. The correlation of reading SES relationships with grade level (across grades 3-11) was -.443, indicating even more vividly than White's 1982 meta-analysis finding that SES affects reading even less for Indian students as grade level increases. However, for mathematics, the correlation betwen the same two variables was -.053. Mathematics and SES apparently held the same relationship which was unrelated to grade level shifts.

Tutoring and Academic Performance

Linear models were developed to determine if students who did not receive tutoring, compared with those who did receive it for remedial or enrichment purposes, had significantly different levels of test scores. One analysis was conducted for students receiving assistance in reading and another analysis for those receiving mathematics assistance. Student grade level was also used, since those receiving assistance in one grade might have been different from those receiving assistance in another. These analyses were only conducted for the 7-12 grade range. The three covariates used in other analyses were also used here.

Findings indicate very few statistically significant relationships. The three covariates were not effective, nor was grade level, either as a main effect or as an interaction with reading or mathematics assistance. What was significantly related to test scores were the main effects of reading, and mathematics assistance, which had identical patterns. For reading, those not receiving tutoring had a mean score of 47.00, while those receiving tutoring for enrichment purposes were significantly lower (43.62) and not different from those receiving remedial assistance (41.48). For mathematics, these means were 47.36, 45.17, and 43.10, respectively. Those who received tutoring thus had lower levels of academic achievement than those not receiving tutoring.

Attitudes and Academic Performance

A series of bivariate correlation coefficients were computed to determine if certain types of attitudinal measures were significantly related to reading and mathematics test scores. Table 4-14 indicates that low, although statistically significant, relationships were found between students' attitude toward school, their perceived value of education, their academic self-concept, their global self-esteem, and each of the dependent measures. These relationships held for students in grades 4-6 and in grades 7-12.

The strongest relationships were obtained when correlating academic self-concept with reading and mathematics scores, as might be expected. Relationships at the 7-12 grade range were higher than at the 4-6 level. The obtained correlations of reading and mathematics scores with either academic self-concept or global self-esteem were lower than those found in other studies (Revicki, 1982; Bryne and Carlson, 1982; Hansford and Hattie, 1982). For example, the latter meta-analysis study computed an "average" correlation of self-concept of ability with performance/achievement of $r = .42$ (S.D. of that correlation = .22) and .22 with self-esteem (S.D. = .17). However, the present finding that reading and mathematics achievement were more related to academic self-concept than to global self-esteem is fully consistent with the causal modeling approaches used by Bryne and Carlson to obtain the same results, using Canadian secondary school students.

The only attitudinal measure which was not significantly related to reading or mathematics scores was students' identification with being Indian. The latter scale was found in another phase of this study to actually be part of a dimension having three components. Thus, a higher correlation might have resulted from using all three components in a multiple regression approach to predict academic levels.

TABLE 4-14

CORRELATIONS BETWEEN ATTITUDINAL MEASURES AND READING AND MATHEMATICS OUTCOMES BY GRADE RANGE

	Grades 4-6 (N=2129-2202)		Grades 7-12 (N=2454-2559)	
Attitude Measure	Reading	Math	Reading	Math
Attitude toward school	.083	.055	.057	.111
Value of education	.151	.112	.199	.210
Indian identification and pride	.006*	.039*	.021*	.015
Academic self-concept	.190	.200	.354	.355
Global self-esteem	.095	.108	.204	.172
Mathematics	.555	--	.607	--

Notes: (1) Attitude measures were created for each student by summing a series of four point rating scale items in which 1=very much agree and 4=very much disagree, and dividing by the number of items to which the student responded. Because of the direction of scoring, attitude-test score correlations have a negative sign which has been dropped in this chapter.

(2) *=Not statistically significant ($p > .001$); all other correlations presented here are statistically significant.

(3) Correlations are based on slightly varying sample sizes, as indicate

(4) Academic self-concept and global self-esteem correlated .392 for Grades 4-6 (N=3174) and .501 for Grades 7-12 (N=4315).

Project-Level Differences in Academic Performance

A series of analyses was conducted which was similar in style to those for student variables, and was based on the 47 projects having more than 10 students. Relatively few of the project-level analyses indicated statistically significant relationships with reading and mathematics scores. It appears that most of the relationships found between certain factors and test scores were due to variations in individual student levels of academic performance, rather than to students being served differently by particular projects. The following is an overview of the findings which resulted from conducting linear model analyses by grade range, using student data aggregated to the project level:

Students in Grades 4-6

- The number of Indian students in the project was related to reading but not mathematics score differences across projects; the larger the project in terms of the number of Indians, the lower was the mean reading score (the scores ranged from 51.5 for the two projects having 31-99 Indians to 46.2 for the nine projects having 300-500 Indian students).
- Projects having a cultural emphasis had significantly but not meaningfully higher mean student scores in mathematics than those projects which did not (48.8 compared to 47.4).
- Socioeconomic status (SES) did differ across projects, as did the proportion of students in each project only using the English language at home. SES was strongly related to academic achievement in the project-level analyses (appearing for both grade ranges), and had an omega-squared level of .187. The relative use of English at home was even more associated with academic performance (omega-squared = .229).
- Grade level was negatively related to academic performance, as the student-level analyses also indicated.

Students in Grades 7-12

- SES was not significantly related on a multivariate basis to reading and mathematics achievement scores. However, SES was significantly related to reading and mathematics outcomes, separately. For reading scores, those projects with fewer than 50% of their 7-12 students receiving free or subsidized lunches had slightly higher scores than projects with more than 50% of their students in a free lunch category (46.98 compared to 46.05).

- The tribal homogeneity of the students being served was associated with project-level differences, as was the interaction of the number of Indians in the project and its tribal homogeneity. Projects serving more than one tribe had higher mathematics scores[9] than did projects only serving one tribe (50.12 compared to 46.40).

E. Conclusions

The findings presented in this chapter indicate that Indian students in public school districts score below the means on standardized achievement tests in reading and mathematics. The Indian mean scores in these subjects were less than a third of a standard deviation below the mean, however, showing that the differences between Indians and other students are not dramatic.

There were no clear findings concerning the impact of Part A projects on achievement test scores. There was a slight tendency for Indian students who had contact with Part A projects to have lower achievement test scores than students who had not participated in Part A activities, but this finding probably indicates that Part A projects are more likely to be working with students who require academic assistance.

In fact, very few of the project or student characteristics which were studied served as meaningful predictors of Indian student test scores. There was a large number of statistically significant relationships, but few of those relationships accounted for meaningful proportions of the variation in student scores. It would thus appear either that: (a) the variables which were selected for study in this evaluation are not those which are related to Indian student achievement test performance; (b) the measurement of those variables was imprecise or inaccurate; or (c) there are few project or student variables which are meaningful predictors of Indian student achievement test scores.

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9 This finding is based on actual rather than least squares adjusted cell means, which were unavailable.

There were, however, three findings which appear to have potential program implications:

1) The achievement test scores appeared to decrease slightly with increasing grade level. Indian students are thus apparently falling farther behind their peers as they continue through school. This finding would appear to suggest that continuing emphasis should be placed on the academic achievement levels of Indian students in grades 6-12.

2) As is true in the general population, Indian achievement test scores were correlated with socioeconomic status. The results show that Indian students who received free or subsidized school lunches scored lower than other Indian students. A very large percentage (66%) of the Indian students for whom data were available received free or subsidized lunches. These data illustrate that economic factors are related to the lower achievement levels of Indian students.

3) There were significant and meaningful correlations between reading and mathematics achievement test scores and a measure of academic self-concept. Several recent studies (Calsyn and Kenny, 1977; Revicki, 1982; Byrne and Carlson, 1982) have used causal modeling approaches to show that academic achievement is more likely to predict academic self-concept or global self-esteem than are self-concept measures to predict academic performance. The timing of the measurements of academic achievement (spring, 1980) and self-concept (fall, 1981) in the present study supports the causal conclusions of those earlier studies. Positive academic self-concepts in Indian students appear to be the result of efforts to improve academic performance, and they are probably not the cause for improvement.

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CHAPTER 5: EVIDENCE OF STUDENT ACADEMIC ACHIEVEMENT PROVIDED BY PROJECT PERSONNEL

Blair Rudes

A. Introduction

In the previous chapter, information on achievement test scores was presented as evidence of Indian student academic performance. However, the design of the Title IV, Part A evaluation recognized that multiple measures of academic performance were desirable because all types of measures (including test scores) have both strengths and weaknesses. Thus, in addition to test score information, the evaluation collected information concerning student academic performance from project staff, teachers, tutors, parents, and the students themselves, so that a more reliable and accurate assessment of student performance could be made.

This chapter presents the results of open-ended questions to project staff concerning the impact of Part A projects on student academic performance. Ratings from project staff, teachers, tutors, etc., using close-ended questions are presented in the three chapters which follow.

B. Procedures

To supplement the structured surveys and interviews during the spring data collection, data collectors were instructed to seek information from project directors and other staff concerning specific evidence(s) of the impact of their Part A projects on academic achievement. Such evidence could come from project evaluation reports, data used in writing the program plan, staff analysis reports, district reports and evaluations, or other sources. Where project directors made reference to the existence of such evidence, the data collectors were told to obtain copies and provide these to Development Associates for analysis. Where the evidence cited by the project directors was anecdotal in nature, the data collectors were instructed to use their judgment in deciding whether to pursue the matter further. They were told, for example, that they might seek documented evidence such as grades, or

corroboratory opinions from teachers, parents, students, etc., from school files. At the end of each site visit, the field data collection teams wrote narrative descriptions of:

- The impacts which the Part A project had upon academic achievement of Indian students, both present and past, as cited by the project director; and
- The written evidence of this impact from site documents, and/or the names of individuals who provided corroboratory opinions where only anecdotal information was provided.

In writing these reports, the data collectors were instructed to provide exact quotes of comments by project directors and other respondents, and to provide specific numbers of students evidencing a particular impact. This approach increased the likelihood of gaining accurate impressions from these respondents.

C. Results

For six of the 115 projects visited, no information pertaining to this portion of the study was provided by the data collectors concerning the impact of the project on academic achievement. In ten projects, the project directors and others contacted in this regard reported that they did not know whether or not there had been any impact. In an additional 17 projects, those interviewed stated explicitly that their projects were having no impact on academic achievement. Thus, no further information was obtained for these 33 (29%) projects.

At the remaining 82 (71%) projects, those interviewed indicated that their projects were having some form of positive impact on academic achievement.[1]

[1]Ninety of the 115 Part A projects visited indicated that they had formal tutorial/academic assistance components, and 75 are included among the 82 projects discussed above. These 75 projects ascribed their academically-related achievements to the tutorial/academic component of their project; the remaining seven projects explicitly or implicitly ascribed their positive impacts on academic achievement to the activities of their cultural or counseling components. Those contacted at 15 of the 90 projects having a formal tutorial/academic achievement assistance component reported either that they were unsure if any impact had occurred (e.g., because of lack of test score data) or that no impact had yet occurred in this area.

A wide variety of different types of evidence was cited and collected in support of these statements. Table 5-1 summarizes the types of evidence reported and the number of projects reporting each type. It should be noted that a number of projects cited more than one type of evidence for their claims.

In 20 cases, those interviewed made generally positive statements about the impact of the project on academic achievement, but nothing more specific was provided. The greatest proportion (42) of projects, however, cited the results of standardized achievement tests as evidence that their projects were having an impact. Of these projects, 32 supplied documentation for their claims in the form of actual test score data, and the cited evidence substantiated their claims of project impact. These data were included in the analysis of test scores that was described in the prior section. The remaining ten projects cited test score results from project evaluations or other project/school documents which were not available to the data collectors.

Twenty-one projects cited improved student grades as evidence of project impact on academic achievement. In only four of these cases, however, was documentation provided. Of these four, three projects cited the information collected by the pre/post-tutorial instruments used in this study. (For the analysis of these data, see Chapter 6.) The other project provided the pre- and post-tutorial grade point averages for nine students, showing an average increase of .9 grade point after six months of tutoring. For each of the four projects, the evidence provided substantiated their claims of project impact. The remaining 17 projects provided undocumented citations of improved grades, but differed widely in the form in which they reported their evidence. Their evidence may be divided roughly into three categories: those citing group statistics on improved grades (5 projects), those citing group anecdotes on improved grades (3), and those citing individual anecdotes on improved grades (9). Typical of those citing group statistics were statements such as:

"...Of the 117 students tutored, 88% were at grade level--overall 1.3 grade level improvement in subjects tutored."

TABLE 5-1

TYPES OF EVIDENCE CITED IN SUPPORT OF PROJECT IMPACT ON ACADEMIC ACHIEVEMENT

Type of Evidence	Number of Projects
1. Standardized test score results:	
• Documentation provided to data collectors	32
• Documentation not provided	10
2. Improved classroom grades:	
• Documentation provided to data collectors	4
• Documentation not provided	
a. Isolated anecdotes	9
b. Group statistics	5
c. Group anecdotes	3
3. Awards, honors, scholarships (all undocumented):	
a. State and local awards	6
b. Scholarships	3
c. Honor Roll	3
d. National Honor Society	1
e. Student Council	1
4. Classroom assignment (all undocumented):	
a. Transfers to gifted/talented class	2
b. Decreased numbers of placements in remedial class	2
5. Decreased dropout (all undocumented)	9
6. Improved discipline (all undocumented)	3
7. Generic positive statements	20
8. No impact	17
9. Don't know	10
10. No response	6

Group anecdotes lacked the statistical format of the above example, and are typified by the following quote:

"...75-85% improvement in the grades of the 150 students served by tutoring."

Individual anecdotes generally consisted of reports by parents or teachers such as:

"...one 7th grade student who had Fs last year, this year has [redacted] Bs as a result of tutoring." (resource teacher)

"One parent reported her child's grade of D in math going to B within the same semester because of tutoring."

"One student was a C student before tutoring; afterward an A student."

Increases in the number of Indian students receiving awards, scholarships, honors, and/or other types of recognition for academic achievement were cited as evidence of project impact on academic achievement at 14 of the projects.

Changes in the classroom assignment of Indian students were cited by four projects. Increases in the numbers of Indian students assigned to gifted and talented classrooms had occurred as a result of the project, according to respondents in two projects. The interviewees in two other projects reported that fewer students had been assigned to remedial classrooms since their Part A projects began.

In addition, nine projects reported a lowered dropout rate among Indian students as evidence of the impact of their projects on academic achievement. Also, three projects cited improved classroom discipline on the part of Indian students as evidence of impact in the area of achievement.

D. Summary

In approximately 70% of Title IV, Part A projects, project staff indicated that they thought that the project had had a positive impact on the academic achievement of Indian students. In support of their conclusions, project staff cited such evidence as test results, classroom grades, awards and

honors, and classroom assignment. Although the results cited could be documented in only approximately half of the cases, they do suggest that Title IV, Part A projects are having positive impacts on Indian student academic achievement.

CHAPTER 6: TUTOR RATINGS OF ACADEMIC IMPACT

Aurora Martinolich and Paul Hopstock

A. Introduction

An important source of information concerning the impact of academic/tutorial programs were the individuals who provided tutoring to students. As described in Chapter 3, tutors were asked to complete three types of data collection instruments: (1) a Tutor Characteristics questionnaire, in which the tutors described themselves and their experiences; (2) a Characteristics of Tutored Students questionnaire, which was completed for each student either in the fall of 1981 or when tutoring began; and (3) a Post-Tutorial/Special Program Follow-up, which was completed for each student when tutoring ended or when the spring data collection occurred.

There were a number of items on the second and third instruments which served as pre- and post-measures of academic impact. Tutors were asked to rate each student in those areas of academic performance which were relevant to the tutoring. Ratings were made in reading, mathematics, writing, and social studies, although the focus of this chapter is primarily on the reading and mathematics ratings. Ratings were made on five-point Likert-type scales, ranging from "low" to "superior."

Tutors were also asked to provide pre- and post-ratings for each student on the variables of self-confidence, interest in school work, classroom attendance, and conduct in school. These variables were rated on a similar scale as described above. Selected findings concerning self-confidence and interest in school work are presented in this chapter as well.

The major impact variables (ratings on reading and mathematics) were analyzed using a very broad range of project, tutor, and student variables. Simple cross-tabulations and breakdowns were first performed, and then academic ratings were analyzed through multiple regression techniques. The purpose of

these analyses was to determine which factors were significant predictors of tutor ratings of academic impact.

B. Procedures

Data from the Tutor Characteristics and Pre-Post Tutoring Improvement forms plus selected project level cross-break variables (such as geographic location of the project, ratio of Indians to total students, and geocultural region) were placed into a common analysis file. This occurred after each of the separate files had been examined to gain insights into the nature of the tutoring program and characteristics of tutors. There were 3,528 students for whom either a pre or post form was available. In terms of grade levels, 24 percent were in grade 3 and below, 33 percent in grades 4-6, 35 percent in grades 7-9, and 7 percent in grades 10-12. However, since not all students were receiving tutoring in the same subject area, and because pre- and post-ratings were unavailable on all students, the impact analyses presented here are based on considerably fewer cases. That is, analyses of mathematics improvement are based on 1,756 students, and those of reading progress are based on 1,495 students.

Reviewing the patterns of data, it appears that no major biases or shifts in the findings were introduced by using only those students having pre- and post-tutor ratings in reading and/or mathematics for analysis purposes. Those being tutored in any one of four other areas amounted to fewer than one-quarter (23%) of the students, whereas over three-fifths of the students were being tutored in reading and/or math (61% and 70%, respectively). The pre-distributions of tutor ratings of all students in reading (N=1863) and math (N=2141) were also examined and compared with the pre-distributions of tutor ratings for those students having both pre- and post-tutor ratings (N=1495 and 1756, respectively). For both subject areas, the distributions of pre-ratings were extremely similar, differing by no more than two percentage points, and then only in one of the five rating scale positions. The proportion of students in various grade ranges was also quite similar. Thus, no apparent biases were introduced by using those students who had both sets of tutor ratings.

However, the possibility does, of course, remain that the ratings made by tutors are not fully valid. The tutors were paid by the Part A projects and were effectively being asked to rate the result of their own work. Thus, some self-serving response bias may have been introduced, although it would have required tutors to coordinate their fall and spring ratings on individual students. Also, it is possible that the single item rating scale formats used were too "global" to indicate the full extent of student improvement over the time they received tutoring.

The major analytic approaches used were frequencies, breakdowns, and multiple regressions. A series of regressions was performed, first with a composite dependent variable which combined the post-test scores of all rated subject areas, and then separate analyses using post-test mathematics and reading scores as dependent variables. In all regression analyses, the corresponding academic pre-test measure was forced into the regression equation first, to act as a type of covariate and control for initial levels of academic performance. Throughout the regression analyses, pairwise rather than listwise deletion of cases was used in order to maximize the number of cases.

C. Findings

Pre-test and Post-test Ratings

Almost three-quarters (74%) of the students overall were rated by tutors as having shown specific academic improvement attributable to tutoring. The basis of assessment included informal observation of daily work (52%) and improved grades (25%), as well as test scores. Over half of the gains were measured by performance on tests of various types, 24% based on classroom tests, 13% based on achievement tests; 7% on curriculum-based pre- and post-tests, and 10% on other pre/post-tests.

Examination of the two distributions of ratings (pre and post) made by the tutors indicated some overall improvement. The mean rating for reading increased from 2.0 to 2.5, and the mean rating for math increased from 2.1 from 2.7. (The standard deviations for each set of ratings were the same, 0.8.) The patterns of pre- and post-rating scale shifts in reading and math

contained in Tables 6-1 and 6-2 confirm this improvement. Just over one-half (51%) of the students tutored in reading demonstrated academic improvement, while slightly fewer than half (46%) remained at the same relative level of performance. Only a small percentage (3%) declined in relative academic level. The ratings for those tutored in math were quite similar; 48 percent improved, 48 percent performed at the same relative level, and 4 percent declined in performance.

Furthermore, most of the gains registered were made by those at the lowest initial levels of performance. Collapsed over subject areas, almost three-quarters (71%) of those initially rated as low in performance improved, while only half (53%) of those rated as below average demonstrated a gain in performance. These differential improvements are far greater than could be expected by a regression to the mean effect.[1]

Similarly, the tutors also noted improvement in the students' interest in school work and self-confidence, as presented in Tables 6-3 and 6-4, respectively. However, here too some regression effects are evident, especially in the "average" category on the self-confidence pre-measure, some proportion of these students being rated as below average on the post-measure.

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[1]The apparent improvement in ratings is not entirely associated with program effectiveness. Part of the improvement is due to "regression toward the mean" statistical artifacts (i.e., low scores tending to improve and high scores tending to decline, as a purely statistical phenomenon). This occurs because of the imperfect bivariate correlations of pre- with post-ratings which exist for reading (r= .60), math (r= .57) and the composite index formed across all tutored subject areas (r= .92). As a result of these "test-retest" correlations being fairly high, yet substantially less than 1.00, such patterns as the following occur, found in Tables 6-11, and a similar one in Table 6-12:

- 27 percent of those above average on the pre-reading measure declined to either below average or low (or at least two rating scale points away); and
- 45 percent of the 11 students rated as superior on the reading measure declined to average.

TABLE 6-1

PRE- AND POST-TUTOR RATINGS OF STUDENTS' RELATIVE ACADEMIC LEVELS IN READING (N=1495)

Pre**		Post** Low	Below Average	Average	Above Average	Superior	Row Totals* N	%
Low***		28%	50%	20%	0.5%	0.2%	406	27
Below average		2	45	50	3	0	737	49
Average		1	6	70	21	2	311	20
Above average		0	7	20	70	3	30	2
Superior		0	0	45	9	46	11	1
Column Totals	N	129	559	682	113	12	1495	
	%	9%	37	46	8	1	100	

*All cell percentages are based on the number of students having the corresponding "Pre" rating in that row.

**"Pre" represents the beginning of tutoring for the school year, "Post" when tutoring ended or - when the spring data collection visit occurred.

***For the purpose of computing means, Low = 1 and Superior = 5.

TABLE 6-2

PRE- AND POST-TUTOR RATINGS OF STUDENTS' RELATIVE ACADEMIC LEVELS IN MATH (N=1756)

	Post**						
Pre**	Low	Below Average	Average	Above Average	Superior	Row Totals* N	%
Low***	27%	48%	23%	2%	0.5%	373	21
Below average	3	43	48	6	0.4	857	49
Average	1	6	72	20	1	447	26
Above average	0	1	28	65	6	71	4
Superior	0	0	25	0	75	8	1
Column Totals N	128	577	837	193	21	1756	
%	7%	33	48	11	1	100	

*All cell percentages are based on the number of students having the corresponding "Pre" rating in that row.

**"Pre" represents the beginning of tutoring for the school year, "Post" when tutoring ended or when the spring data collection visit occurred.

***For the purpose of computing means, Low = 1 and Superior = 5.

TABLE 6-3

PRE- AND POST-RATINGS OF TUTORED STUDENTS' INTEREST IN SCHOOL WORK AS RATED BY THEIR TUTORS

Rating*	Pre (N=1863)	Post (N=1814)
Low	27%	10%
Below average	47	37
Average	22	45
Above average	3	7
High	1	1
Mean Rating	2.0	2.5

*1 = Low; 5 = High

TABLE 6-4

PRE- AND POST-RATINGS OF TUTORED STUDENTS' SELF-CONFIDENCE AS RATED BY THEIR TUTORS

Rating*	Pre (N=3246)	Post (N=3071)
Weak	7%	3%
Below average	30	22
Average	51	59
Above Average	10	13
Strong	3	3
Mean Rating	2.7	2.9

*1 = Weak; 5 = Strong.

Factors Associated with Changes in Ratings

In order to investigate the relationship between certain project, tutor, and student characteristics with changes in tutor ratings of reading and mathematics, further analyses of variance of those ratings were performed. Raw difference scores were calculated between fall and spring ratings of performance in reading and mathematics, and the difference scores were used as dependent variables in analyses of variance.[2] Because the initial scores ranged from 1 to 5, the difference scores had theoretical ranges from -4 to +4, with positive numbers meaning improvement. The actual distributions of difference scores are presented in Table 6-5.

TABLE 6-5

DISTRIBUTION OF 1981-82 SPRING MINUS FALL DIFFERENCE SCORES IN READING AND MATHEMATICS

Difference Score	Reading (N=1495)	Mathematics (N=1757)
-2	1%	0%
-1	3	4
0	46	48
1	43	40
2	7	8
TOTAL	100%	100%

[2] As Linn (1979) quite correctly put it, (p. 86): "there is . . . a fairly general awareness that there are problems associated with the measurement of change." Indeed, there have been articles and entire books written about the topic for the last 20 years. The main purpose here for using this technique was to assess the overall direction of reading and/or math scores over the school year and to determine if overall shifts in scores were related to program participation. Thus, another of Linn's comments is also relevant in referring to one of the often-cited weaknesses of difference scores, low reliabilities.

> Low reliability of a difference score is a serious problem where difference scores are used to make decisions about individuals. But . . . for groups, the reliability problem is a much less serious concern. Thus, this feature of difference scores, for which they are most frequently maligned, is not fatal flaw within the context of educational evaluation studies. (1979, p. 87)

See also Kanouse et al. (1980, Appendix A) for an application of difference scores to predicting Indian and other graduating high school students' post-secondary experiences.

Reading difference scores varied based on the location of the project, the race of the tutor, and the total number of tutoring hours in the year (weeks x hours per week). Students in urban projects had lower reading difference scores (mean=.37) than did students in projects on or near reservations (.58), in other rural areas (.56), or in metropolitan areas (.55) ($F=3.48$, $df=3/1491$, $p<.05$).

Students with Indian tutors had higher reading difference scores (mean=.58) than students with non-Indian tutors (.42) ($F=11.89$, $df=1/1310$, $p<.001$). Also, as the total number of tutoring hours per year increased, the reading difference score also tended to increase (see Table 6-6).

TABLE 6-6

MEAN READING DIFFERENCE SCORES BY TOTAL HOURS OF TUTORING

Number of Hours of Tutoring in Year	N	Mean Reading Difference Score
1-25	343	.43
26-50	304	.58
51-99	386	.55
100 or more	330	.62
Not given	132	.58
$F=3.63$, $df=4/1490$, $p<.01$		

Math difference scores were related to the location of the project and the total number of tutoring hours per year. Students in projects on or near reservations had higher math difference scores (mean=.61) than did students in metropolitan (.54), urban (.50), or other rural areas (.48) ($F=3.36$, $df=3/1753$, $p<.05$). As shown in Table 6-7, students who had had moderate amounts of tutoring had higher math difference scores than did students who either had a little or a great deal of tutoring.

TABLE 6-7

MEAN MATH DIFFERENCE SCORES BY TOTAL HOURS OF TUTORING

Number of Hours of Tutoring in Year	Mean Reading Difference Score
1-25	.42
26-50	.69
51-99	.53
100 or more	.47
Not given	.50

F=3.56, df=4/1752, $p < .001$

Although these differences between groups reached levels of statistical significance, they failed to explain much of the variation in terms of reading and math difference scores. The eta squared values for the differences presented ranged from .0057 to .0148. Multiple regression approaches were thus employed to determine which factors were more strongly related to tutor ratings of performance in reading and mathematics.

Regression Results

Stepwise multiple linear regressions were performed separately on math and reading post-test scores, using as potential predictors a broad range of variables from the Characteristics of Tutored Students form (the pre-test), the Post-Tutorial Follow-up form (the post-test), and the Tutor Characteristics questionnaire, along with selected project variables such as location of the project, ratio of Indian to total students, and geocultural region. In each regression, the pre-test measure (either math or reading) was forced into the equation first, to control for initial rating levels. Since the pattern of results was similar for both math and reading outcomes, only the results for math outcomes are presented below. The math results are presented because they were based on more cases, and thus are statistically more reliable.

Three criteria were used to select variables for inclusion in the prediction equation. The criteria were: (1) the statistical significance of the overall F-ratio for each step in developing the equation; (2) an increase of at least 1 percent of additional explained variation (or change in R^2); and (3) a beta weight size of at least $\pm$ .1. The use of these criteria reduced the number of predictors by more than one-half.

The summary table reflecting the sequence of variables' entry into the regression equation and what improvement they made to predicting post-test math performance are presented in Table 6-8. As can be seen, it was possible to predict post-test not performance quite well; however, the pre-test of math performance and a post-measure of interest in school work were the only variables which increased R^2 by more than .05. No tutor or project variables entered the predication equation. Also surprisingly, the number of hours per week of tutoring and number of weeks of tutoring did not enter the equation.

TABLE 6-8

STEPWISE MULTIPLE REGRESSION SUMMARY WHEN USING THE POST-TEST MEASURE IN MATHEMATICS AS A DEPENDENT VARIABLE

Predictor Variables	Change in R	Beta (Standardized Regression Coefficient)	Simple Correlation
Pre-test math rating	.329	.439	.574
Post-test rating of interest in school work	.105	.259	.508
Post-test rating of self-confidence	.024	.217	.515
Tutor rating of overall academic improvement	.024	.164	.287
Pre-test measure of interest in school work	.010	-.140	.360

Multiple R=.70, R=.49, F=218.47, df=5/1129, $p < .001$ (N=1135).

The negative standardized regression coefficient associated with the pre-test measure of interest in school work was an artifact, caused by a high correlation with the post-test measure of interest. The high correlation (.673) of these two items meant that whichever entered the regression equation first would mask the effects of the other item. A similar situation affected the post-test ratings of interest in school and self-confidence, which were also highly correlated (.663). In fact, in the regression of post-test reading scores, the post-test measure of self-confidence entered the equation right after the pre-test of reading, and thus accounted for 10.9% of the variance, while the post-test of interest in school work accounted for only an additional .73% of variance.[3]

The failure of measures of intensity of tutoring to enter the regression equations was very surprising. The simple correlations between post-test math ratings and hours per week of tutoring and number of weeks in the program were .152 and .090, respectively. These results show, therefore, that although the amount of tutoring is related to outcome ratings, other factors are considerably more important in explaining those ratings.

D. Summary

Individuals who tutored students reported that approximately three-quarters of those tutored had improved their academic performances as a result of the tutoring. When tutors gave fall and spring ratings of performance in reading and mathematics, half of the students rated in each subject were given higher ratings in the spring than in the fall, and almost all of the remaining students were given the same rating. Almost three-quarters of those who were given the lowest rating in the fall were given higher ratings in the spring, indicating that those most in need had been most likely to improve their academic performances.

[3]The colloquial term "bouncing beta" has been used in the statistical literature to indicate a variable's tendency to be a strong predictor in one set of data, and to be a substantially poorer predictor variable in another sample drawn from the same population.

CHAPTER 7: RATINGS OF PROJECT-RELATED ACADEMIC GAINS BY PARENTS, TEACHERS, AND STAFF

G. Mike Charleston

A. Introduction

As part of the evaluation of the impact of the Part A Entitlement Program, data were collected on the academic gains of Indian students as assessed by teachers of the Indian students, project staff, and parents of Indian students. The data were collected by survey items which asked how much the project had helped to improve student performance in reading, language arts, and mathematics, and how much the project had helped to improve student grades. The same scale of 1 (No impact), 2 (A little impact), 3 (Some impact), and 4 (A great deal of impact) was used in all items. The scores on reading and language arts were combined to produce an overall language arts score. For analytic purposes, the scale was assumed to be an interval scale.

There were three respondent groups: regular classroom teachers of Indian students, parents, and staff of the project. The teachers and staff were asked to assess the impact of the project on language arts (including reading) and mathematics. Additionally, teachers were asked to assess the impact on student grades. Parents were asked about the projects' impact on grades.

The impact measures were analyzed by project location and amount of effort spent on basic skills (instruction in language arts and mathematics). Those projects formally spending effort to improve performance in basic skills were compared with projects reporting no hours of effort on basic skills. Projects were also categorized by the ratings of level of impact on student grades. The projects in each category of impact on grades were compared on the amount of effort spent on basic skills and other academic instruction.

B. Procedures

Data were provided by respondents in each project about the impact of their projects on Indian student academic performance. The responses of teachers,

staff, and parents were averaged within each project to provide a mean rating per project from each of the three respondent groups. Additional information concerning the extent of effort expended by the project was merged with the impact measures.

The Statistical Analysis System (SAS) Summary procedure was used to calculate the means of various classification variables. The relationships among variables were assessed through the use of the SAS General Linear Model and Correlation procedures. The means of the classification variables were graphed by computer to illustrate the relationships among the classifications of projects. There were 101 projects in the sample with valid data for these analyses.

C. Findings

Analysis of Academic Impact by Location

The ratings of teachers, staff and parents with respect to academic gains first were analyzed by location of the school district. These were four location groups: on or near reservation, other rural, urban, and metropolitan.

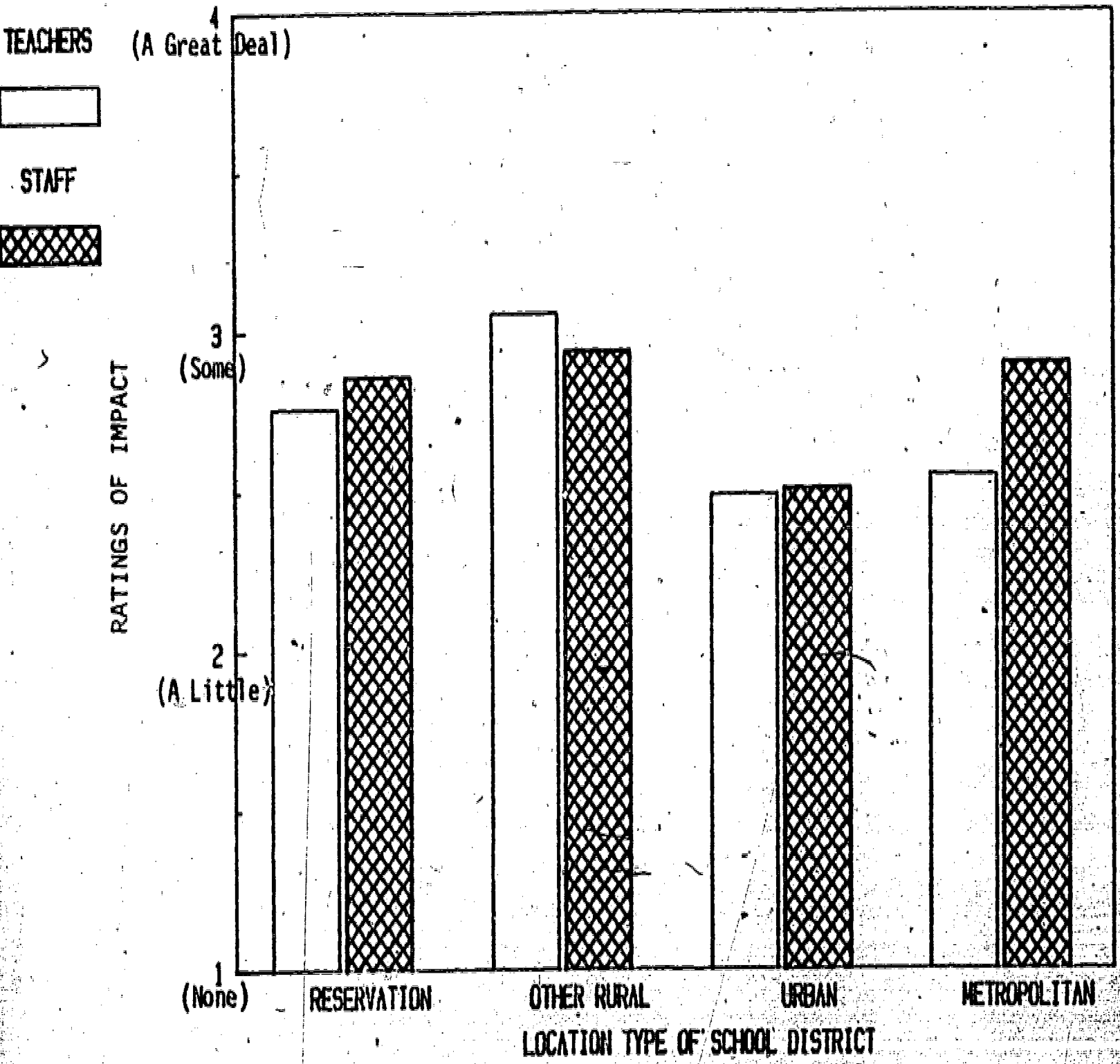
The projects' impact on performance of Indian students in mathematics was reported by teachers of Indian students and by staff members of the Part A projects. Overall, the classroom teachers in the 101 projects rated the project impact on mathematics at 2.8 on the scale of 1 to 4. The project staff rated the impact 2.8 also. The ratings of teachers and staff varied somewhat by location type. Figure 7-1 illustrates these differences. In urban projects, both the teachers and the staff rated the impact on mathematics lower than in other types of locations. The teachers and staff in other rural locations gave the highest ratings, at 3.0, some impact. The difference between urban and other rural projects was statistically significant at the $p < .05$ level.

Both teachers and staff reported relatively high levels of impact of the projects on language arts (including reading) performance of Indian students. The teachers rated the projects at 2.9, on the average, while the staff rated

FIGURE 7-1

PROJECT IMPACT ON MATH

BY LOCATION TYPE OF PROJECT



the projects at 3.0. The ratings of the two groups tended to be close in all locations as show in Figure 7-2. The urban respondents rated the projects slightly lower than those in other locations, although there were no statistically significant differences.

Project impact in terms of grades was reported by teachers and parents. On the average the teachers and the parents both rated the impact on grades at 2.8. A breakdown of these ratings by project location appears in Table 7-1.

TABLE 7-1

MEAN RATINGS OF IMPACT ON GRADES BY PROJECT LOCATION
(N=101 projects)

Location	N	Teachers	Parents
On or near reservations	38	2.84	2.96
Other rural	29	3.01	2.79
Urban	13	2.57	2.81
Metropolitan	21	2.58	2.52
F(Location)=4.20, df=3/194, p <.01			

The analyses by location show that projects in metropolitan locations had the lowest ratings in terms of impact on grades, significantly lower than projects on or near reservations or in other rural locations. Projects in urban locations received intermediate ratings, with parents rating them near average, while teachers rated them well below average.

Analysis of Impact by Hours of Project Effort on Basic Skills

The projects varied in the number of hours of effort per student per year which they spent on special instructional activities in basic skills (language arts and mathematics). Table 7-2 shows the distribution of projects by hours of effort on basic skills.

FIGURE 7-2

PROJECT IMPACT ON READING

BY LOCATION TYPE OF PROJECT

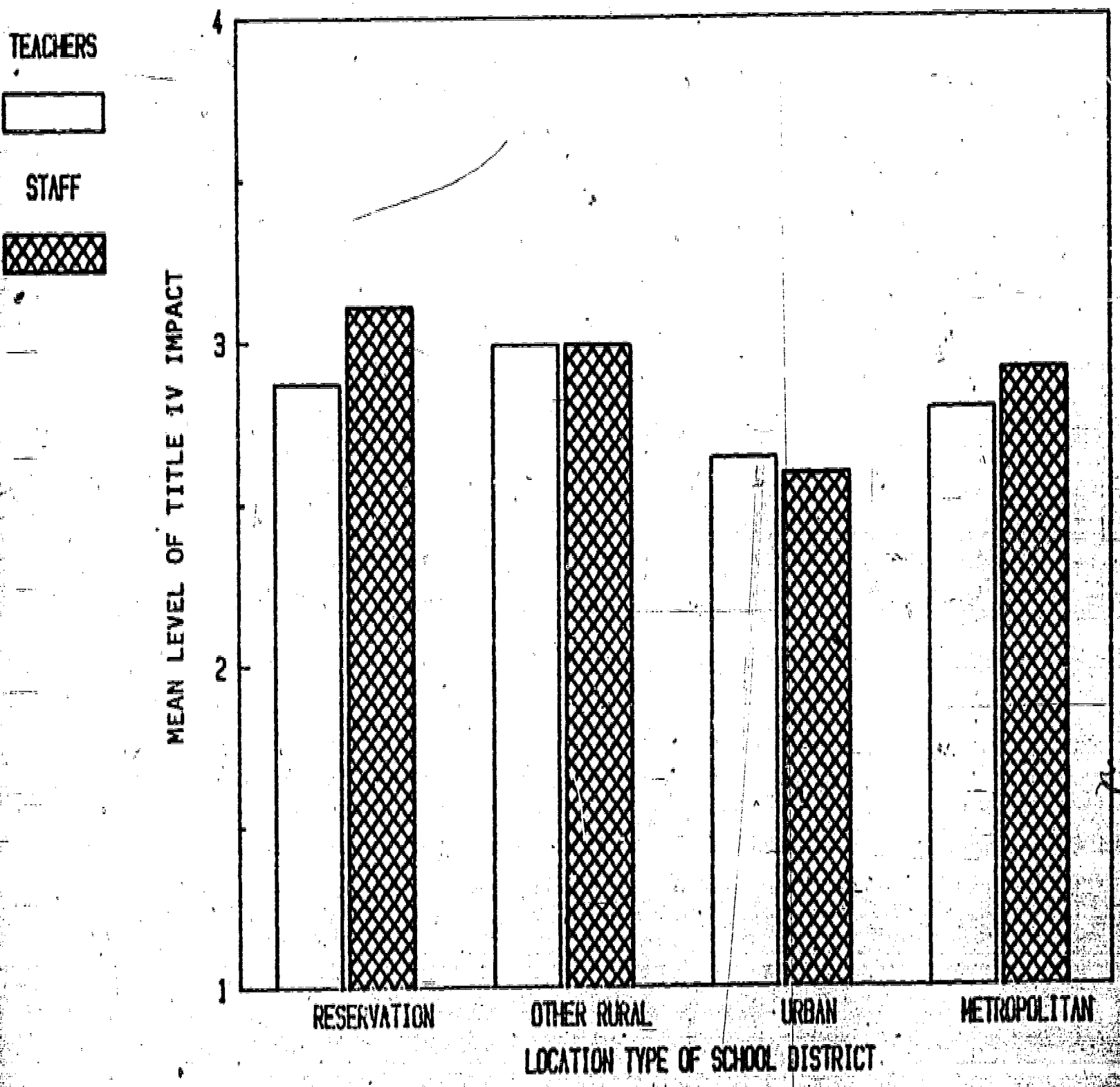


TABLE 7-2

DISTRIBUTION OF PROJECTS BY HOURS OF EFFORT ON BASIC SKILLS

Hours of Effort on Basic Skills	Number of Projects
0 Hours (reference group)	26
1 to 20 hours	2
21 to 40 hours	11
41 to 80 hours	13
81 to 160 hours	29
160 or more hours	20
Total projects	101

Of the 101 projects from which data were available, 26% spent zero hours on special instruction in language arts and mathematics. These projects served as a reference group for comparisons with the 74% (N=75) of the projects expending effort on instruction in basic skills. These comparisons permitted an analysis of the relationship between increases in hours of effort on basic skills and the ratings by the various respondent groups assessing the impacts of the projects.

The ratings of project impact on Indian student performance in mathematics broken down by hours of effort are shown in Table 7-3.

TABLE 7-3
PROJECT IMPACT ON MATHEMATICS BY HOURS OF EFFORT IN BASIC SKILLS
(N=101 projects)

Hours of Effort*	Teachers	Project Staff
0	2.45	1.96
1 - 20	3.21	2.00
21 - 40	2.62	3.36
41 - 80	2.85	3.37
81 - 160	2.90	3.14
161 or more	2.96	3.04

F(Hours of effort)=8.80, df=5/190, $p < .001$.

The data indicate that ratings on mathematics in projects expending effort on basic skills instruction were higher than ratings in the reference group. The

number of hours expended, however, was not related to the ratings of impact on mathematics. It should be noted that the means in the group with 1-20 hours in basic skills instruction were relatively unstable, because that group contained only two projects.

The ratings of project impact on language arts (including reading) broken down by hours of effort in basic skills are presented in Table 7-4. Ratings for projects which devoted zero hours per student per year to basic skills instruction tended to be lower than for projects which devoted at least some hours to such instruction. There were no statistically significant differences between groups, however, and there was no clear pattern of relationship between the number of hours of effort devoted to basic skills and the ratings of impact on language arts.

TABLE 7-4
PROJECT IMPACT ON LANGUAGE ARTS BY HOURS OF EFFORT IN BASIC SKILLS
(N=101 projects)

Hours of Effort*	Teachers	Project Staff
0	2.68	2.54
1 - 20	3.25	2.25
21 - 40	2.80	3.43
41 - 80	2.89	3.35
81 - 160	2.97	3.06
161 or more	2.89	2.96

*The number of projects in each category is presented in Table 7-2.

Teachers and parents rated the impact of projects on improving grades of Indian students (see Table 7-5). The ratings of both teachers and parents were extremely close. Both groups of respondents in projects expending effort on basic skills instruction tended to rate their projects higher than the respondents in the reference group. There was no clear pattern of relationship, however, between the number of hours of effort devoted to basic skills and ratings of impact on grades.

TABLE 7-5

PROJECT IMPACT ON GRADES BY HOURS OF EFFORT IN BASIC SKILLS
(N=101 projects)

Hours of Effort*	Teachers	Parents
0	2.53	2.58
1 - 20	3.21	2.91
21 - 40	2.75	2.72
41 - 80	2.91	2.90
81 - 160	2.89	2.84
161 or more	2.92	3.00

F(Hours of effort)=3.00, df=5/190, $p < .05$
*The number of projects in each category is presented in Table 7-2.

Level of Impact on Grades by Hours of Project Effort on Basic Skills and Other Academic Components

The projects reported the average number of hours of effort spent per student per year for the components of basic skills (math and language arts) instruction and instruction in other academic areas. The ratings were analyzed to compare the extent of effort expended on these two components by level of reported impact on grades. The projects were categorized by rounding their mean impact ratings on grades by the respondent groups to integers. The number of projects in each reported level of impact is presented in Table 7-6.

TABLE 7-6

DISTRIBUTION OF PROJECTS BY REPORTED LEVEL OF IMPACT ON GRADES
(N=101 projects)

Level of Impact*	Categorized Mean Project Ratings As Reported By: Teachers	Parents
No impact	4	4
A little	16	17
Some	71	72
A great deal	10	8
TOTALS	101	101

*The number of projects in each category is presented in Table 7-2.

The average number of hours per component were then calculated over all 101 projects and graphed to serve as reference points for the comparisons. As shown in Figure 7-3, the projects rated at no impact on Indian student grades by teachers had a mean of 21 hours of effort expended in basic skills instruction and in instruction in other academic areas. Projects rated by the teachers as having a little impact had a higher number of hours of effort in basic skills than projects rated at no impact, but they had fewer hours of instruction in other academic areas. Projects rated at some impact on grades and a great deal of impact had increasingly larger numbers of hours of effort expended in both basic skills instruction and instruction in other areas. The correlations between mean teacher ratings of impact on grades and hours of effort on basic skills and other academic areas were .23 ($p < .05$) and .12, respectively.

The projects which were rated as having no impact on Indian student grades by parents had a mean of 23 hours of effort in basic skills instruction and a mean of zero hours for instruction in other academic areas (see Figure 7-4). The parent ratings tended to increase as the number of hours of instruction in basic skills and other academic areas increased. However, the projects rated by parents at a great deal of impact on grades had fewer hours of instruction in other academic areas than the projects rated at some impact. The parent ratings apparently reflected the increase in effort in basic skills instruction rather than changes in hours of effort in other academic areas. The correlations between mean parent ratings of impact on grades and hours of effort on basic skills and other academic areas were both .16.

D. Summary

The overall ratings of Title IV, Part A project impact on academic gains as reported by teachers, staff, and parents were relatively high for all measures. The distribution of ratings for the 101 projects show that most projects were rated as having some impact on grades, mathematics, and language arts skills. The impact measures varied somewhat by the location of the project. In general, urban projects were rated lower than the other location types on impact on improving student performance in mathematics and language arts.

FIGURE 7-3

TEACHERS' GENERAL RATINGS
BY HOURS OF PROJECT EFFORT

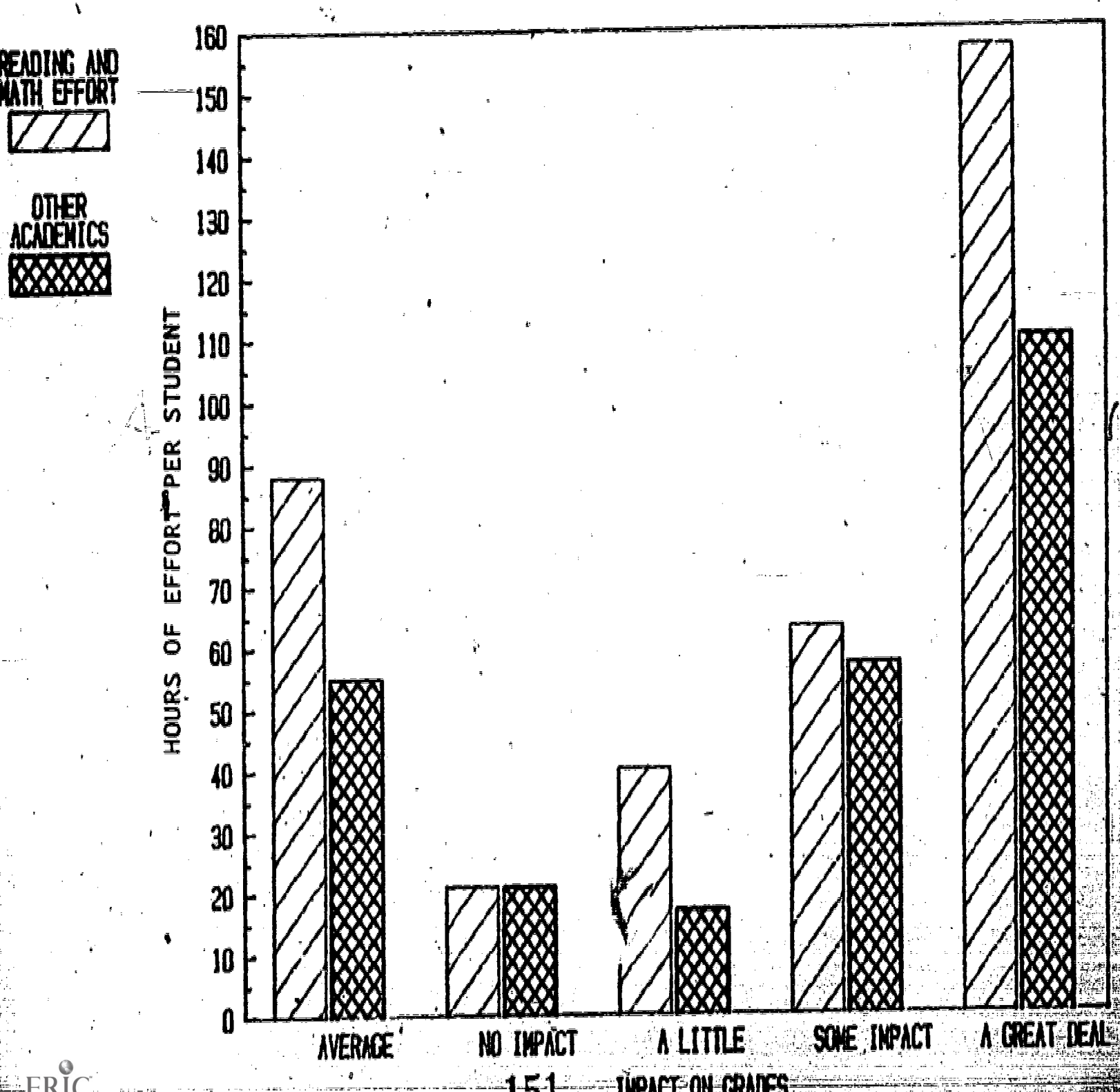
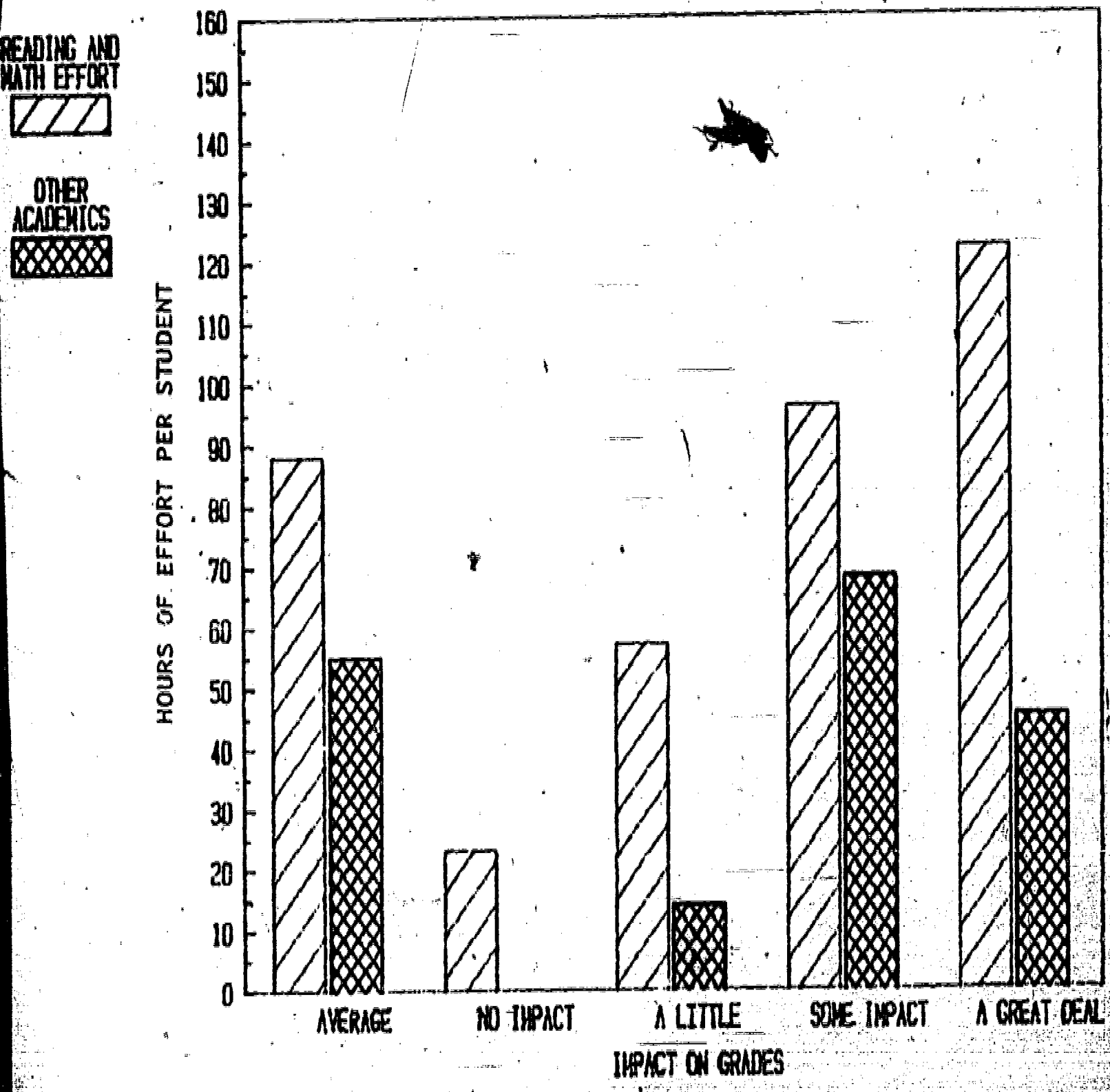


FIGURE 7-4

PARENTS' GENERAL IMPACT RATING

BY HOURS OF PROJECT EFFORT



The projects expending effort to improve math and language arts were rated higher than were projects which expended no hours of effort for these purposes. The number of hours expended, however, was not consistently related to ratings of project impact on mathematics and language arts. The number of hours spent on instruction in math and language arts and other academic areas was somewhat related to ratings of impact on grades.

CHAPTER 8: RATINGS BY STUDENTS OF THEIR PROJECT-RELATED ACADEMIC GAINS

G. Mike Charleston

A. Introduction

The Part A impact study collected data from Indian students in grades 7 to 12 on the extent to which the Title IV, Part A project in their school districts had contributed to their learning in (1) mathematics and (2) reading or English language arts. The students were asked to rate how much they had learned from the project teacher or tutor who taught each of the two subjects. The students responded on a scale of 1 to 5 on which a 1 indicated that they had learned nothing at all 1 and 5 indicated that they had learned very much. The students could also indicate that they did not have a Part A project tutor or teacher during the year.

The data collected from the secondary students provided a means of assessing the impact of Part A academic instruction in reading and math from the viewpoint of the students receiving the instruction. The student impact ratings were analyzed by location of the school district and hours of project effort on reading and math. They were also compared with the impact ratings of teachers and staff on gains in reading and math in the same school district. Thus, the impact of Part A on academic gains could be considered from the distinct viewpoints of students, teachers, and staff.

The students were grouped by the level of their ratings for additional analyses. For the various levels of the student ratings, the average numbers of hours of effort to improve reading and math performance and performance in other academic areas were compared. Also, the extent to which the students attributed learning to other sources (reading and math teachers, other classroom teachers, other tutors) was compared with the amount of learning attributed to Part A teachers or tutors.

B. Procedures

Data were provided by secondary school (grades 7—12) Indian students in each project participating in the Part A impact study. The unit of analysis was a secondary school Indian student. The data were merged with data from teacher and staff survey instruments, as well as data concerning specific project characteristics. In some of the analyses, the responses of the students were averaged within analytic categories using the Statistical Analysis System (SAS) procedure Summary. The SAS General Linear Model was used to test differences between groups. In all of the analyses, the scale of the ratings was shifted from a 1 to 5 scale to a 0 to 4 scale. The shift simply allowed 0 rather than 1 to equal the rating of Nothing at all.

The analyses used various numbers of cases. Analyses involving only student data could be performed on more cases than could analyses that included project, teacher, or staff data.

C. Findings

Extent of Learning in Math and Reading Attributed by Students to Part A

The students rated the extent to which Part A contributed to what they had learned during the year in math and in reading. Of the students who responded, 954 rated the impact on math and 1,084 rated the impact on reading. Table 8-1 illustrates the percentage of students in each subject area who rated the Part A project at each level from 0 = nothing to 4 = very much. Overall, the students rated the projects relatively high in impact for both math and reading.

Student Impact Ratings by Location of the School District

The student ratings of the impact on math and reading varied by the location of school district (see Table 8-2). The highest ratings were given by students in rural (non-reservation) schools, who rated the impact on both math and reading equally high. The students in the urban schools rated the impact on reading considerably lower than did students at other locations.

TABLE 8-1

STUDENT RATINGS OF PROJECT IMPACT ON MATH AND READING

Rating	Math (N=954)	Reading (N=1084)
0 (Nothing)	9%	6%
1	9	11
2	24	24
3	29	32
4 (Very Much)	29	27
Total	100%	100%
Mean Rating		

TABLE 8-2

MEAN STUDENT MATH AND READING IMPACT RATINGS BY GEOGRAPHIC LOCATION
(Scale: Nothing At All = 0, Very Much = 4)

Location	Math* (N=954)	Reading** (N=1084)
On or near reservation	2.49	2.59
Other rural	2.86	2.83
Urban	2.44	2.30
Metropolitan	2.66	2.61

*F = 4.70, df = 3/950, p < .01
**F = 4.05, df = 3/1080, p < .01

Student Impact Ratings by Hours of Project Effort on Reading and Mathematics

The students responding to the survey items attended schools which had Part A projects that varied in the number of hours of effort expended per student per year on improving student performance in reading and math. Of the 739 students with valid data, 16% were in projects that reported zero hours of effort on improving reading and math performance as a formal component of the project, and 84% were in schools that reported formal effort to improve reading and math performance. The students in projects which reported zero hours of formal effort were used as a reference group for comparison with projects expending various levels of effort. Even in projects where there was

no formal tutoring in reading and math, many students did receive informal assistance, so the reference group could not be considered a "no treatment" group.

The students in the reference group rated the projects relatively high in impact on their learning in both math and reading (2.4 in math and 2.6 in reading), even though they were in projects that focused on areas other than reading and math (see Figure 8-1). As a result of other efforts by these projects, there was perceived impact in reading and math from the viewpoint of the students involved.

There were only eight students from projects that reported between 1 and 20 hours of effort per student per year on reading and math. The very small number of students in this classification produced unstable means for the student ratings, and the results from this group should not be over interpreted.

The mean ratings of students in projects formally expending effort on improving reading and math were slightly higher than the ratings of students in the reference group for both math and reading (with the exception of the unstable means discussed above). Within projects expending formal effort, the ratings were very similar across projects with differing hours of effort expended. Projects expending 160 or more hours of effort were rated at about the same level as projects expending 21 to 40 hours of effort.

Student Ratings of Impact Compared with Teacher and Staff Ratings

The teachers and Part A project staff at the schools were asked to rate the impact of the Part A projects on academic gains of Indian students in reading and math during the school year. These ratings were reported on a scale of 1 to 4, with 1 representing no impact and 4 representating a great deal of impact. The scale of impact used by the teachers and staff differed from the scale used by the students only by the absence of a central score position for the teacher and staff scale. A comparison of the ratings of the teachers, staff, and students is presented in Figure 8-2 for project impact on math and in Figure 8-3 for project impact on reading.

FIGURE 8-1

STUDENT'S IMPACT RATINGS BY HOURS OF PROJECT EFFORT

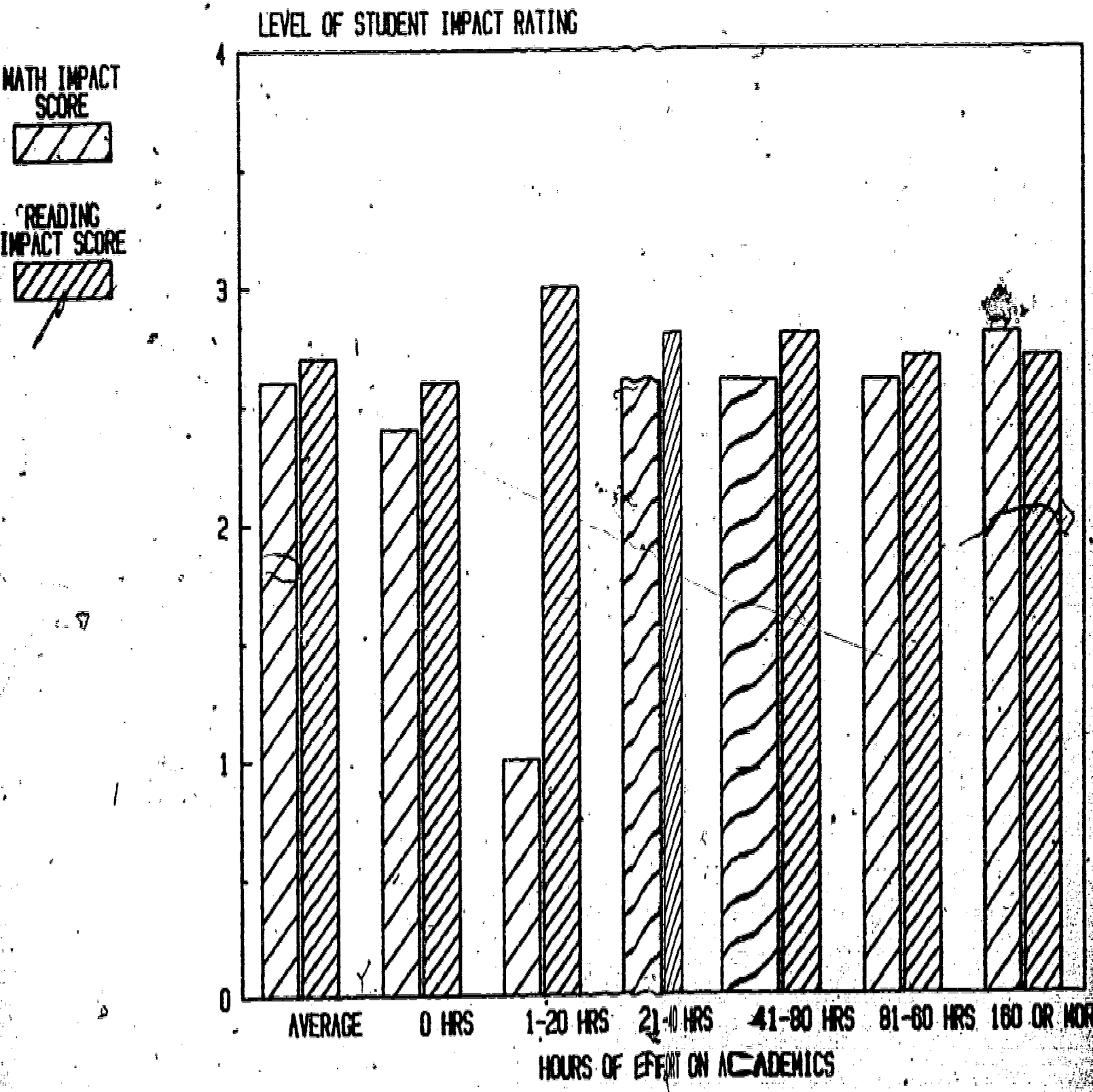


FIGURE 8-2

STUDENTS' RATING FOR MATH BY TEACHER & STAFF REPORTED IMPACT

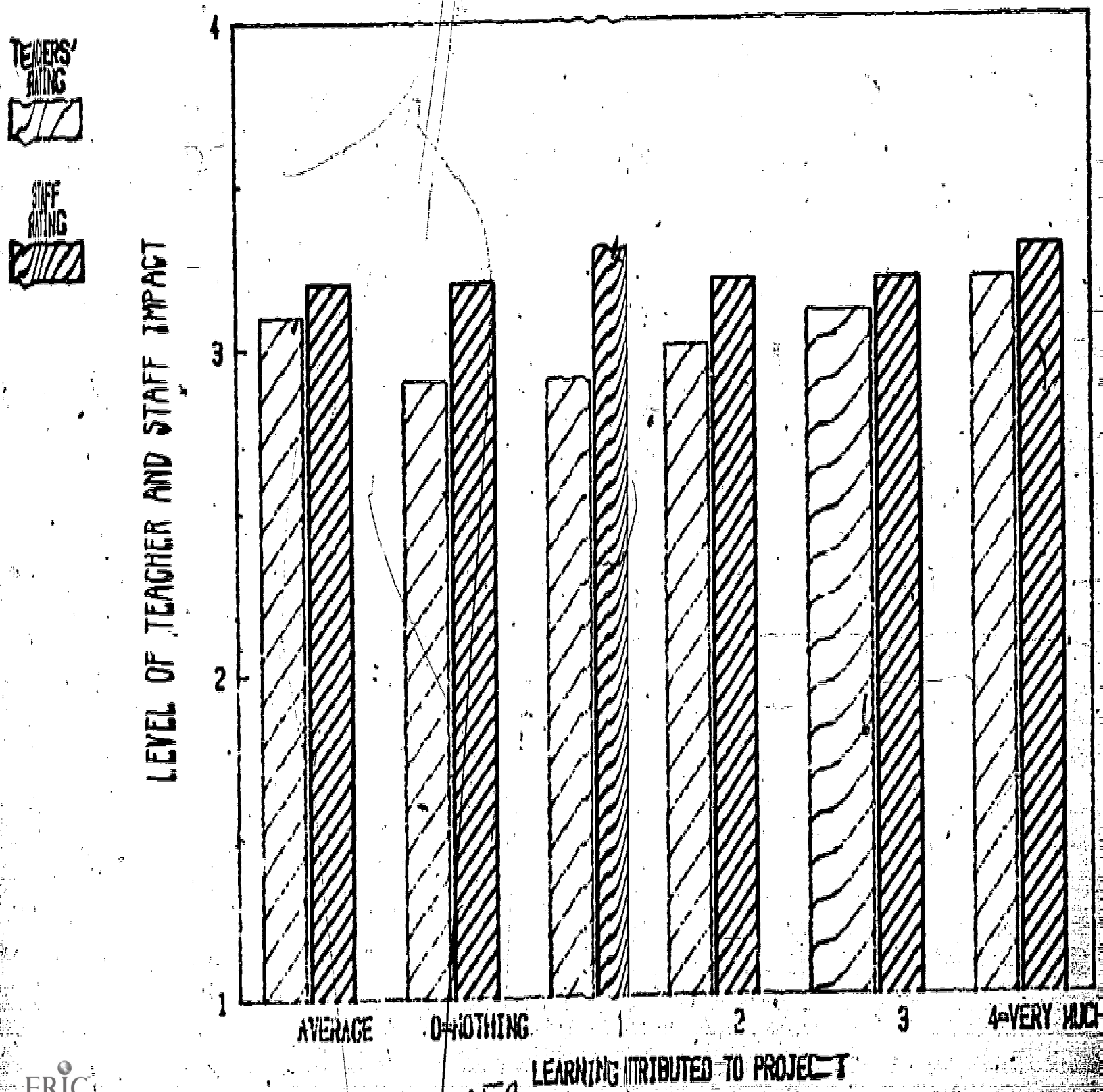
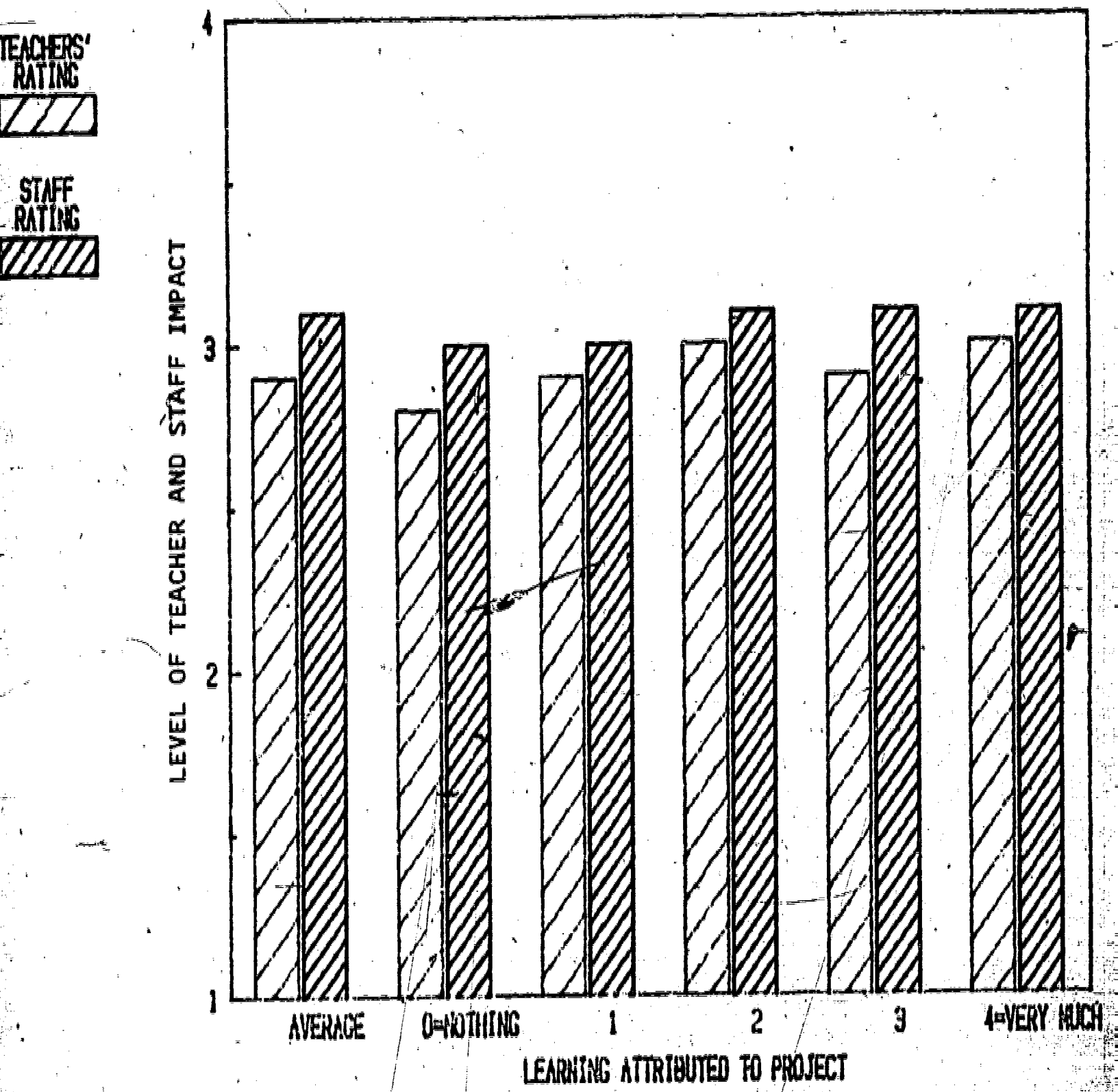


FIGURE 8-3

STUDENTS' RATING OF READING BY
TEACHER & STAFF REPORTED IMPACT



Overall, the teacher ratings of project impact on math averaged 3.1 on the scale of 1 to 4. The staff ratings averaged 3.2. For those students who rated the impact of the project on their math learning at 0 (nothing), the mean rating of teachers in the projects of those students was 2.9 and the mean rating of staff was 3.2. The impact ratings of the teachers were below average, while the ratings of the staff were at their average for projects in which the students reported no impact on their learning. As the level of the student reports of impact increased, the level of the teacher reports of impact also increased at a gradual rate. The level of the staff reports of impact was fairly consistent for all levels of student-reported impact. For project impact on math, the student and teacher reports tended to agree to a greater extent than student and staff reports.

Overall, the teacher ratings of project impact on reading averaged 2.9 on the scale of 1 to 4. The staff ratings averaged 3.1 on the same scale. For students who rated the impact of the projects on their learning in reading at 0 (nothing), the mean ratings of both teachers and staff in the projects of those students was slightly lower than their respective average ratings. As the level of the student report of impact increased from 1 to 4, teacher ratings remained relatively stable, while staff ratings increased slightly.

The comparisons of the ratings of teachers, staff, and students showed a relatively weak positive relationship between the ratings of teachers and staff and those of the students in the same projects. The lack of strong relationships may have been due to the fact that students were rating their personal experiences, while teachers and staff members were rating project-wide effects.

Hours of Project Effort by Student Reports of Impact Levels

The projects expended various amounts of effort in reading and math instruction and in instruction in other academic areas. The extent of effort in these two components was compared across the five levels of impact reported by the students for math learning (Figure 8-4) and for reading learning (Figure 8-5). The average number of hours of effort per student per year for each component was calculated and plotted on the graph as a reference point.

FIGURE 8-4

STUDENTS' REPORT OF IMPACT ON MATH BY HOURS OF EFFORT

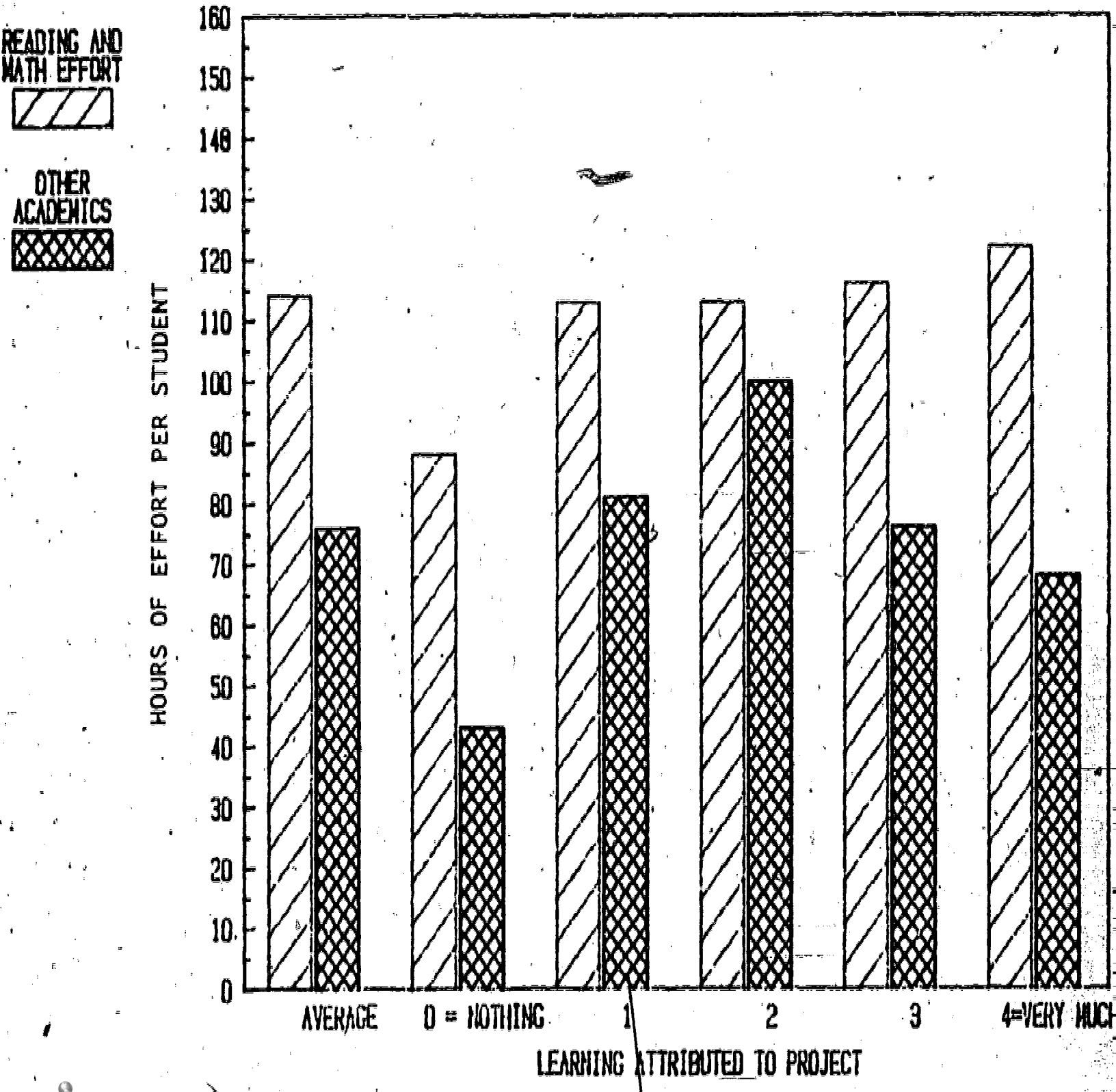
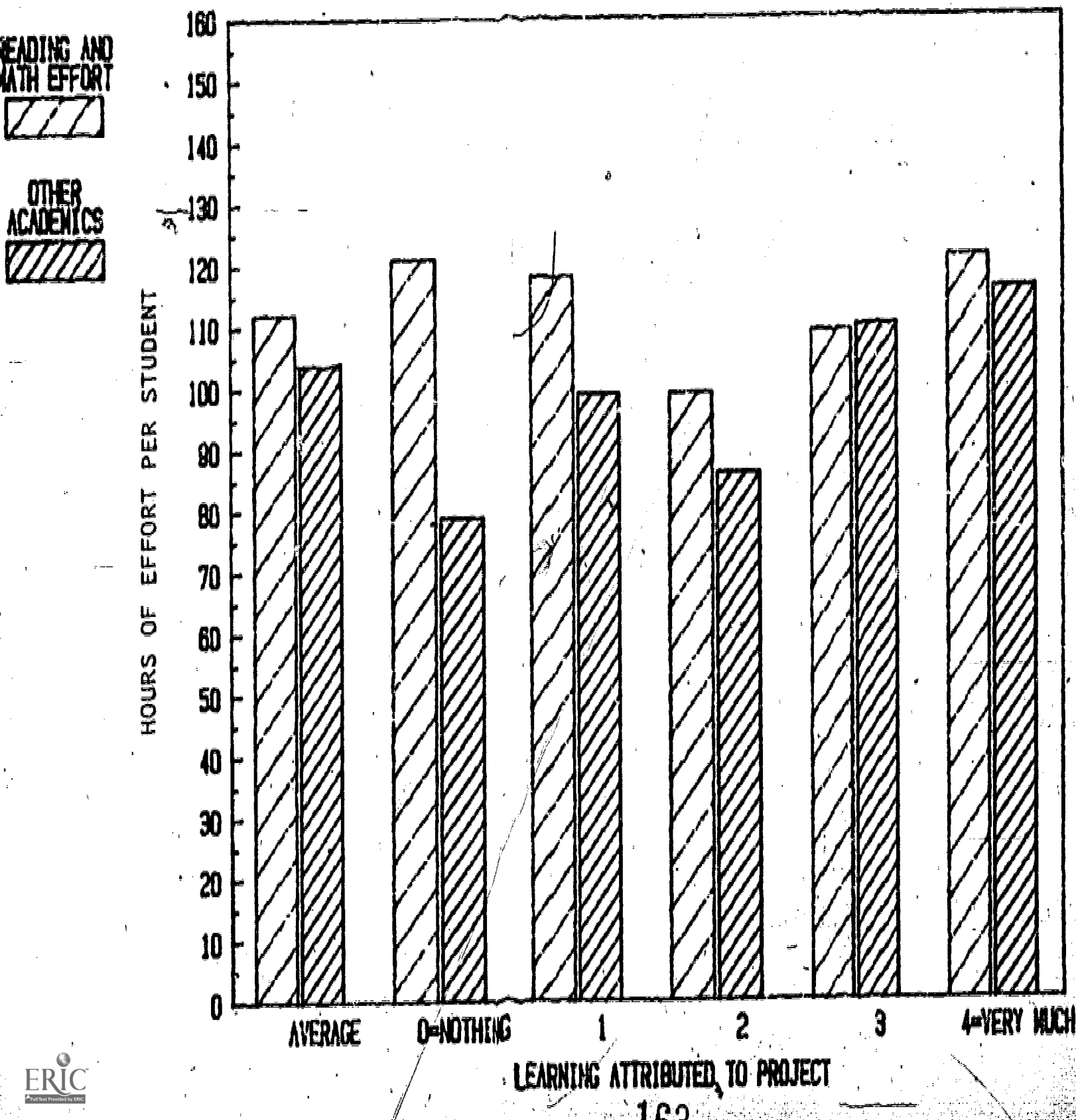


FIGURE 8-5

STUDENTS' REPORT OF IMPACT ON READING BY HOURS OF EFFORT



The averages vary for the two graphs because the graphs represent two different groups of students.

The students reporting on the impact of the project on their math learning were in projects that, on the average, had spent 114 hours per student per year on reading and math and 76 hours on other academic areas. As the impact ratings by these students increased, the number of hours of effort in reading and math tended to increase. The number of hours of effort in other academic areas tended to increase to a high at the student rating of 2, the central score, and then decline with continued higher student ratings.

The students reporting on the impact of the project on their learning in reading were in projects that had spent an average of 112 hours on reading and math efforts and an average of 103 hours on other academic areas. For these students, increases in their ratings of project impact on their learning in reading reflected increased hours of effort in other academic areas better than project effort in reading and math.

Comparison of Learning Attributed to the Title IV Project with Learning Attributed to Other Sources

The students were also asked to rate the extent of their learning in math and reading which was contributed by sources other than Part A teachers and tutors. The other sources were regular math or reading teachers, other classroom teachers, and non-Part A tutors. The ratings of these other sources in comparison to Part A ratings are presented in Table 8-3. The table shows that those students who had Part A teachers or tutors rated their impact on math and reading as approximately equal to the impact of regular classroom teachers.

TABLE 8-3

MEAN RATINGS OF INSTRUCTOR EFFECTIVENESS
(Scale: Nothing At All = 0, Very Much = 4)

Source of Learning	Math		Reading and Language Arts	
	Respondents	Mean	Respondents	Mean
Reading or math teacher	1,638	2.48	1,748	2.78
Other classroom teacher	1,672	2.69	1,603	2.45
Part A teacher or tutor	954	2.59	1,084	2.63
Other teacher or tutor	1,523	2.35	1,456	2.26

D. Summary

Secondary grade-level Indian students rated the impact of the Part A projects on their learning in math and reading and English language arts at a relatively high level. The majority of the students rated the projects above the central score both in impact on math and in impact on reading. These ratings were approximately the same as the ratings they gave to their regular English and math teachers. Students in rural, non-reservation schools gave the highest ratings.

Students rated projects moderately high in impact even when the project had not formally expended effort for the purpose of improving reading and math performance. However, the students in projects that did formally expend effort on reading and math tutoring rated their projects slightly higher in impact than did students in the projects where formal tutoring efforts were not provided. The ratings by the students were not strongly related to the ratings by the teachers and staff in the same projects.

The ratings by students of project impact on their math learning tended to increase as the number of project hours of effort spent on reading and math increased. Student ratings of impact on their learning in reading were positively related to the extent of effort expended on academic areas other than reading and math.

The student ratings are somewhat difficult to interpret, because they are not strongly related either to the extent of project efforts or to teacher or staff ratings. The results could therefore be attributed to general positive feelings concerning the project. However, the fact that ratings of Part A tutors were as high as those given to regular math and English teachers, whereas ratings of non-Part A tutors were lower, does suggest that students believe that Part A projects are having positive impacts.

CHAPTER 9: SUMMARY AND CONCLUSIONS CONCERNING ACADEMIC PERFORMANCE OF INDIAN STUDENTS IN PART A PROJECTS IN PUBLIC SCHOOLS

Paul Hopstock

In the preceding seven chapters, a large number of findings concerning the academic performance of Indian students has been presented. In this chapter, a summary of those findings is presented, and an attempt is made to draw conclusions concerning the academic performance levels of Indian students, and the impact of Part A project on those performance levels.

In reviewing the findings and conclusions, it should be kept in mind that although the Development Associates evaluation did collect a fair amount of data concerning the academic performance of Indian students, the evaluation had as its focus a broader concept of impact of Part A project than would be provided through simple pre and post measures of academic achievement. Part A project are designed to meet the academic, cultural, and other personal needs of Indian students, so an overemphasis on academic achievement scores or ratings would fail to acknowledge breadth of Part A project objectives.

Summary of Findings

Existing data on the academic achievement levels of Indian students present a very complicated picture. A meta-analysis of studies using standardized achievement tests in reading and mathematics showes that among the Indian students tested, test scores were higher in the decades of 1950s and 1980s than in the 1960s and 1970s. In all cases, however, the data show the scores of Indian students to be below national means. The explanation for the differences in test scores within decades is almost certainly based on the nature of the sample groups tested, but the data in all cases illustrate the special academic needs of Indian students.

In response to their students' academic needs, the Development Associates evaluation shows, approximately 80% of all Title IV, Part A projects provided some form of tutorial or special academic assistance services. Almost all

academic programs were designed to supplement classroom activities rather than to replace a part of the regular school program. Programs were generally held in school during school hours, and were designed to facilitate regular classroom instruction.

Tutoring was most frequently provided in the subject areas of mathematics (90% of projects with some tutoring) and reading (89%). Tutoring was relatively intense, with a typical student attending four sessions a week through most of the school year.

Most tutors were adult, female (84%), and Indian (67%). Almost all (94%) project paid tutors. A majority (57%) provided training for tutors in such areas as subject matter content, cultural sensitivity, teaching techniques, and use of tutoring materials. Among the students who were tutored, two-thirds were rated as low or below average in reading and mathematics. Tutored students were rated as average in school conduct, but lower than average in self-confidence and interest in school.

An examination of the achievement test scores of Indian students at Part A project sites in spring 1981 indicated that their reading and math scores were, on the average, one-third of a standard deviation below the population mean. Achievement test scores were not strongly or consistently related to measures of Part A project contact or to the extent of Part A activities to improve reading or mathematics performance. Achievement test scores were positively related to a measure of student academic self-concept.

When Part A project staff were asked in an open-ended fashion whether they believed that their project were having a positive impact on student academic achievement, respondents in almost three-quarters of the project answered affirmatively. In support of their conclusions, respondents cited such evidence as test results, classroom grades, awards and honors, and changes in classroom assignments.

Ratings by Part A project tutors supported the conclusions of the project staff. Tutor ratings of individual students indicated that approximately 75% of students were rated to have improved their academic performance as a result of tutoring.

Tutors rated students' math and reading performances in both in the fall and the spring, and in half of the cases in each subject, performance ratings had improved; in only 4% of cases had performance ratings worsened. Performance rating gains were particularly likely among those students who had the lowest initial ratings.

Ratings by Part A project staff, teachers, and parents indicate that projects have had some impact on students' performances in language arts and mathematics, and on student grades. Ratings were generally lower in urban project than in project in other locations. Those project devoting formal project hours to improving math and language arts skills were rated more positively than project that did not devote formal efforts, but the number of hours of effort was not consistently related to parent, teacher, and staff ratings.

Secondary-level Indian students also gave relatively high ratings of the imapct of Part A project on their performances in math and reading. Project tutors were rated as having as much impact on math and reading as their regular math and English teachers. Moderately high ratings were given, however, even in those project which said they did not devote formal efforts to improve reading and mathematics, so the student ratings may simply reflect positive feelings about Part A project in general.

Conclusions

The results of the Development Associates evaluation and other studies have underscored the academic needs of Indian students. Indian student samples have consistently fallen below the means on standardized achievement tests, although the pattern of such scores appears to have varied across decades.

Most Title IV, Part A project include a formal component to improve the academic performance of Indian students. The Development Associates evaluation did not provide definitive evidence that Part A project have improved Indian student academic performance. Achievement test scores were not found to be strongly related to program participation by students or the extent of academic programming by project.

The nature of almost all Part A programs is supplementary, however, and their impacts, therefore, should be expected to be limited in size and focused on subpopulations of Indian students. Thus, analyses of student achievement test results, either of all Indian students or even of only those engaged in Part A activities, are likely to be too gross measures on which to base judgments of project effectiveness.

Individuals with knowledge of Part A project (project staff, tutors, classroom teachers, parents, and students) believe that Part A project have had at least some impact. The ratings of these sources could be questioned on an item-by-item basis, but the cumulative effect of generally positive ratings leads to the conclusion that academic impact is occurring. The positive ratings of disinterested parties such as classroom teachers are particularly meaningful. Also, as shown in Chapter 5, staff members in most project which reported academic gains were able to cite specific evidence to support their conclusions.

The data also suggest that if academic impact is occurring, the major beneficiaries are those with low initial levels of performance. Given the limited Part A resources, it would appear that this emphasis on assisting low achievers is warranted.

PART B: PUBLIC SCHOOL ATTENDANCE AND RETENTION

The need for more precise data on trends in Indian student attendance and retention has been expressed by a number of different parties, in both Congress and the general education community. Such information is needed to determine the nature of the problems that exist in this area, and what the Title IV, Part A Program has done to improve the situation. To address these concerns, a number of different types of data on attendance and retention were collected and analyzed: school and district attendance figures; dropout rates across the nation and at the sites visited for the study; and ratings, from parents, teachers, and project staff, of the role of local Title IV, Part A projects in improving attendance and decreasing school dropouts. What follows is a presentation of the findings.

In the area of student attendance, school and district attendance figures alone are generally taken to be the primary source of data for assessment. However, as discussed in Chapter 1 of this report, a number of difficulties are associated with the use of such: the difficulty of collecting longitudinal attendance data for students who move from one school to another; the failure to compensate for late admission or transfer; and the failure to differentiate, with consistency, absences and tardies. In the area of student retention, shifts over time in the overall dropout rate are usually seen as the main indicator of program impact. However, these data are problematic as well. Operational definitions for a dropout used by school districts vary, as do those reported in the literature by researchers and national agencies. The data problems are especially acute for mobile groups such as Indians, especially those living in areas with BIA and Mission schools as well as local public schools they might readily attend. These data sources have therefore been supplemented with other types of data to provide a comprehensive picture of the problems with Indian student attendance and dropout and a through assessment of the impact of the Title IV, Part A projects.

Each of the following chapters addresses the subjects of Indian student attendance and retention from a specific perspective. In Chapter 10, the results of longitudinal analyses of data for Indian student attendance over the four year period from 1976-80 are presented. Included are comparisons of Indian student

attendance data with known and estimated national data and comparisons between data for subgroups of Indian students and the overall Indian student population; breakdowns of the Indian student attendance data by a series of variables, including geographic and geocultural regions, elementary and secondary grade groups, grade level, and sex; an analysis of the 1980 Indian student attendance data in terms of standardized math and reading scores for a portion of the students; and an examination of the 1980 attendance data in terms of Indian parents' general satisfaction with the Indian project and their perception of school personnel sensivity. Chapter 11 presents the analyses of teacher, project staff, and parent ratings of project impact on student attendance. Chapter 12 focuses on the subject of Indian student retention, incorporating a literature review and an analysis of the Indian student dropout rates, over the past decade, at public schools receiving Title IV, Part A funds. The results of direct Title IV, Part A project involvement in reducing dropout, and project staff, teachers and parent committee ratings of the role which these projects have played in improving Indian student retention, are presented. Chapter 13 summarizes these findings, and establishes the study's conclusions regarding the Title IV, Part A impact on Indian student attendance and retention.

CHAPTER 10: ANALYSES OF LONGITUDINAL ATTENDANCE DATA

G. Mike Charleston

A. Introduction

The Part A impact study collected data on the attendance of Indian students in school districts having Part A Indian education projects. The school districts were requested to supply the attendance and grade level data on Indian students for the school years 1977-78 through 1981-82. Data were provided by the districts at different points of time during 1981. Therefore, the last full school year for which attendance data were available was 1980-81. The longitudinal analyses of attendance data thus used the reported attendance data for the years 1977-78 through 1980-81.

The longitudinal analyses examined trends in attendance of Indian students over the four years. The mean attendance of the Indian students was compared with known and estimated national attendance data. The mean attendances of various subgroups of Indian students were analyzed for trends over the four years and compared with the overall Indian mean days of attendance trend. The Indian student attendance trends were analyzed by:

- Geographic and geocultural region;
- Elementary and secondary grade group;
- Grade level of students;
- Location type of school district;
- Population density of Indians in the school district;
- School district size;
- Sex of the student;
- Socioeconomic status of the student;
- Hours of project effort per student per year in improving attendance; and
- Proportion of the effort expended by the project during the school day to improve attendance.

In addition, the 1980-81 attendance of the Indian students was analyzed in relation to the Spring 1981 standardized math and reading test scores available for a portion of the students. The 1980-81[1] attendance was also

[1]For convenience, in the remainder of this chapter school years will be referred to by the calendar year in which they began (i.e., 1980-81 will be referred to as 1980).

analyzed using the Indian parents' general satisfaction with the Indian project and the Indian parents' perception of school personnel sensitivity toward Indians.

B. Procedures

The study sample of students was constructed by taking a probability sample of the Indian students in grades 4-12 who were enrolled in the 115 school districts visited, and who attended schools and grades within those schools where Part A project activities were available. The 13,737 included in the sample were those who filled out questionnaires during the fall 1981 visit to each school district. Attendance data were sought only for those students, since some of the analyses involved determining relationships between student questionnaire items and attendance levels. Of the 13,737 students who filled out fall questionnaires, attendance data for at least one year were obtained for 8,376 students (61% of those who filled out questionnaires).[2]

Since objective attendance data were available for only a "subset" (61%) of the students who filled out questionnaires, the data bases used for the attendance analyses were reviewed to determine whether attendance levels in the subset of students varied from the total student sample. Three data bases were examined in this regard:

[2]District-level and student-level factors were about equally associated with the unavailability of attendance data. Attendance data were simply unavailable in 17 of the 115 school districts included in the sample, which included 2,473 students who filled out questionnaires. Attendance data were not obtained in these districts because the data: (1) could not be released without violating school district policies concerning confidentiality; (2) were inaccessible or impractical to retrieve (e.g., records were kept in individual student files by the student's teacher, often in several schools); (3) had been destroyed due to fire; or (4) on individual students for past years were not retained (i.e., only aggregated data were available). Attendance data were unavailable for the remaining 2,888 students who filled out questionnaires because: (1) individual student records were missing or had been misplaced or (2) students had transferred or moved out of the school district.

(1) Fall Questionnaire File: Includes program participation, attitudinal and related information based on responses to the Fall 1981 Student Questionnaire by 13,337 students.

(2) Complete Attendance File: Includes available attendance, grade level, and school district background (e.g., size, location, etc.) data obtained from school records for 8,376 Indian/Alaska Native students for the school years from 1977-78 to 1981-82. These students are a subset of the 13,337 who filled out fall questionnaires. As the largest body of attendance data, this file was used to calculate mean attendance rates for Indian students for comparisons with national norms.

(3) Merged Attendance File: Includes attendance, attitudinal, standardized reading and mathematics achievement test scores, demographic characteristics, and school districts characteristics (size, location, etc.) on students who completed both the fall and spring student questionnaires. Almost all of the analyses presented in this chapter (except those involving comparisons with national norms) used the Merged Attendance File.[3] The 6,597 students in this file are a subset of this file are a subset of the two files previously described.

In the Merged Attendance File, students who attended 75 or fewer days of school were excluded from the analyses for that year. This was done because such low attendance suggested a transfer during the school year or other factor which could have introduced an artifact into the measurement of school attendance.

To determine whether the subset of students used for the attendance analyses varied in attendance levels from the total student sample, the students in the Fall Questionnaire File were compared with the students in the Merged

[3]It should be noted that certain analyses which were performed on the Merged Attendance File for this monograph were done instead on the Total Attendance File for the Final Report of this project. Although the overall mean on the Merged Attendance File is higher, the pattern of findings on the two files is nearly identical.

Attendance File on a self-report, five-point scale item which asked "How often do you attend school?" by selecting one of five categories.[4] Mean scores for both data files are quite similar. For grades 4-6, the mean is 1.84 for both files. For grades 7-12, the means for the Fall Questionnaire File and Merged Attendance File are 1.68 and 1.58, respectively. In addition, frequency distributions for the two files show a similar pattern for both grades 4-6 and grades 7-12. Thus, no meaningful bias seems to have been introduced at either grade range when using a subset of all sampled students.

Students in the Complete Attendance File (N=8018) were also compared for possible differences in attendance rates with the subset of these students in the Merged Attendance File (N=6597) on the number of school days attended during the 1980-81 school year. The mean number of days attended by students in the Complete Attendance File was 162.4, compared with a mean of 165.2 for the subset of students in the Merged Student File. Thus, the mean attendance figures for the Merged Attendance File are slightly higher than the Total Attendance File. Most of the difference can be accounted for by the exclusion from the Merged Attendance file of students who attended 75 of fewer days (N=137). The mean for the Complete Attendance File when these same students are excluded is 164.1.

The attendance data were analyzed using Statistical Analysis System (SAS) procedures. The trend lines were produced using the Summary procedure of SAS, with various variables being used as the classification variable over which the days of attendance in the years 1977 through 1980 were averaged. The result was the mean days of attendance per year for the levels of each classification analyzed. This procedure allowed maximum use of the available data per student, and represented the actual number of students at each level of the classification. The means for each classification per year were plotted by computer to produce the actual trend line. The analysis of 1980 attendance

[4]The scale was as follows: 1 = attend all of the time; 2 = attend most of the time; 3 = miss about one day a week; 4 = miss about two days a week; and 5 = miss more than two days a week.

data incorporated the use of the SAS procedures General Linear Model, Correlation, and Regression to determine the relationship of selected variables with 1980 attendance of Indian students.

The number of students represented in the various trend lines are presented on a graph illustrating the trend. These student data were assumed to be weighted appropriately by the sampling procedures used in the Part A impact study. All analyses in this chapter used an Indian student as a unit of analysis. The large number of cases provided very high statistical power for finding statistically significant differences between means. In many instances, the metric difference could be very small while technically being statistically significant. For this reason, the findings in this chapter will focus on the trends and the metric differences existing in these data, rather than on the calculated level of statistical significance.

C. Findings

The results of the analyses are presented in sections containing a description of the findings and, generally, an illustrative graph. In each case, the graphs have the same vertical scale representing the number of days of attendance per student. Except for the findings comparing Indians with the national mean, all students referred to are Indian students. Where multiple graphs are used to show all classifications, a reference line is presented to allow comparisons among the graphs.

National Versus Indian Attendance Trends

Indian student average attendance levels were compared with national average attendance figures reported by the National Center for Education Statistics (NCES).[5] The NCES attendance averages have also been quite stable over the years. From 1960 to 1980, during which time NCES published average attendance figures for several (but not all) of the years, the average ranged from a low

[5]An attempt was made to collect district-wide data on average daily attendance from the districts included in the sample. Many of the districts had not compiled attendance data in a manner suitable for such analyses, however, so district-specific comparisons were not made.

of 159.5 days in 1974 to a nigh of 163.5 days in 1966. There was no particular trend in these data either upward or downward.

Although there are some differences in methodologies used by NCES and this study, and some problems inherent in the data collected for both efforts, the principle used for calculating average attendance figures is the same. Both studies divide an aggregate days of membership figure (i.e., total number of school days attended) by the number of students. There are two differences in methodologies. First, NCES uses aggregated data reported by states, whereas this study uses individual student data. However, the data collected by NCES are ultimately based upon individual students within the states. Second, NCES averages are based, in part, on estimates of enrollment or aggregate days membership whenever states do not report data in the standard form. Any estimates calculated by NCES are based upon their past experience in gathering enrollment and attendance data over many years. In brief, the NCES data appear to be comparable to the data in the study, since the principle used in calculating average attendance is the same in both.

An examination of mean Indian student attendance levels, shown in Table 10-1, shows little change, varying from a low of 162.0 days in 1977-78 to a nigh of 163.5 days in 1979-80. These figures are about the same as, or slightly above, the national average of 161.6 days for 1975-76 and 160.7 reported for 1980-81.

Another attendance "norm" was calculated to provide a more accurate comparison of Indian student attendance levels with non-Indian norms. This norm was calculated by: (1) multiplying the number of Indian students within each state for whom attendance data were available by the state average number of days attended, as reported by NCES; (2) summing the resulting numbers; and (3) dividing the sum by the total number of students. This norm provides a more accurate comparison because: (1) the only states included in this norm are those where attendance data were gathered on Indian students and (2) state averages were represented proprotionally in the calculations according to the number of Indian students for whom data were available. The norm (mean number of days attended) calculated using these procedures was 161.7 for 1980-81, about one day above the national average reported by NCES. The

TABLE 10- 1

AVERAGE DAYS OF ATTENDANCE REPORTED PER INDIAN STUDENT BETWEEN 1977-78 AND 1980-81

School year	Number of Days Attended by Enrolled Indian Pupils			Estimated National Mean Days of Attendance**
	N*	Mean	Standard Deviation**	
1980-81	8018	162.4	21.4	161
1979-80	6930	163.5	19.2	161
1978-79	6507	162.7	20.6	161
1977-78	5463	162.0	20.8	161

*There was considerable attrition in the number of students for whom data were available from 1979-80, 1978-79, and 1977-78. This attrition resulted from data missing from school records for individual students for these years, due to student transfers, and from the unavailability of data for all students from several districts for earlier years.

**The standard deviations associated with the Complete Attendance File are larger than might be expected. This is because of the inclusion of a number of students with very low members of attendance days. When students with fewer than 176 days of attendance are excluded, the standard deviations are considerably reduced (1980-81, 15.7; 1979-80, 14.2; 1978-79, 13.8; 1977-78, 14.6).

***The most recent national average number of school days attended per pupil was 160.7 for 1980-81; the average for 1975-76 was 161.6. An examination of previous years' national average figures published by NCES since 1966 shows little variation from those reported above. National attendance figures are presented in annual reports published by the National Center for Education Statistics, entitled Digest of Education Statistics.

Indian student averages, shown in Table 10-1, are about the same or slightly above this norm.

As a final comparison, average attendance rates for Indian students within each district were compared with the relevant state average. Districts were categorized according to how many days their Indian attendance rate varied from the state average. In more than half (51%) of the districts, the Indian student average attendance rate was higher than the relevant state average (see Table 10-2). In 37% of the districts, the average attendance rate was lower.

TABLE 10-2

COMPARISON OF INDIAN STUDENT ATTENDANCE AVERAGES WITHIN SCHOOL DISTRICTS WITH STATE AVERAGE ATTENDANCE RATES

Difference in Days When Overall State Attendance Average Compared with Indian Student Average within Each School District	Number of School Districts	Percent of School Districts
Indian student attendance average more than five days below state average.	27	28%
Indian student attendance average one to five days below state average.	9	9
Indian student attendance average from one day less to one day more than the state average.	11	11
Indian student attendance average one to five days above state average.	25	26
Indian student attendance average more than five days above state average.	24	25

Given the methodological issues involved in data collection and analysis, it is difficult to draw firm conclusions concerning relative attendance levels of Indian students and the population as a whole. It does appear, however, that Indian attendance is in the same range as that of the general population, and that Indian attendance rates remained relatively stable from 1977-78 to 1980-81.

These findings contradict the widely-held belief that attendance rates of Indians fall far below those of white students. Efforts were made to locate other research studies at the national level which compared attendance rates of Indian and non-Indian students. The most comprehensive recent study which was located (Coleman, 1966) found attendance rates for Indian students to be

identical to those for the population as whole (95% for elementary students and 93% for secondary students). The results of the present study plus those of Coleman thus bring into question the belief that Indian students have much lower attendance rates than other students.

Indian Attendance Trends By Geographic and Geocultural Region

There are five geographic regions used by the Indian Education Program for administrative and functional purposes. These were divided by the impact study into 12 geocultural regions. Data on attendance by Indian students were analyzed using these geocultural regions.

Table 10-3 shows the mean number of attendance days for Indian students in each of the geocultural regions. Reported attendance was higher than average in the following regions: The Southeast, the Northeast, Alaska, Oklahoma, and the Midsouth (Texas, Louisiana, Arkansas, Missouri, Kansas). Attendance was lower than average in the Dakotas, California, the Northwest, the Southwest (Arizona, New Mexico, Nevada, Utah, Colorado), and the Midwest (Wisconsin, Iowa, Minnesota).

Indian Attendance Trends By Grade Level

The longitudinal attendance data were analyzed by grade level using two approaches. First, the data were analyzed by categorizing the Indian students into two grade level groups: an Elementary Grade Level Group covering grades 4-6 in 1981, and a Secondary Grade Level Group covering grades 7-12 in 1981. The grade level groups used in the first of these analyses were used throughout the Part A impact study for comparison purposes. Since the attendance data were from 1977 to 1980, the grade level of the students was adjusted back to coincide with the attendance data being analyzed, while maintaining the same students in the groups. Therefore, the students in the Elementary Grade Level Group were in grades 3-5 during 1980, grades 2-4 in 1979, grades 1-3 in 1978, etc.

Secondly, the data were analyzed for changes in attendance by grade levels over the years where a grade level comprised a different set of students in

TABLE 10-3

MEAN INDIAN STUDENT ATTENDANCE BY GEOCULTURAL REGION

Region	N	Mean Number of Days (1977-1980 Average)
1. Illinois, Michigan, Indiana, Ohio, Pennsylvania, New York, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, Maine	561	166.6
2. Kentucky, Virginia, West Virginia, Maryland, Delaware, New Jersey, District of Columbia, Tennessee, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Florida	771	169.4
3. Wisconsin, Iowa, Minnesota	415	162.9
4. North Dakota, South Dakota	174	159.1
5. Nebraska, Wyoming, Montana	133	164.2
6. Alaska	187	165.5
7. Washington, Oregon, Idaho	306	160.3
8. California	305	159.4
9. Arizona, New Mexico	767	161.9
10. Nevada, Utah, Colorado	43	162.9
11. Oklahoma	1,567	165.4
12. Texas, Louisiana, Arkansas, Missouri, Kansas	169	165.1
Total	5,996	164.5

each successive year. These analyses focus on changes in attendance of a particular grade level over the years, given that the students in that grade change each year.

The grand mean for Indian students in all these analyses was calculated for each year, using attendance data for 6,597 Indian students reported by the school districts.

Grade Level Groups - The Elementary Grade Level Group consisting of 3,289 Indian students improved in attendance between 1977 and 1979, from a mean of 162.2 to 165.7 days (see Figure 10-1). Between 1979 and 1980, mean attendance declined slightly to 165.5 days. As this group of students increased in grade level, from 1977 to 1979, their attendance improved. As the group increased a grade level between 1979 and 1980, the mean attendance dropped slightly.

The Secondary Grade Level Group consisted of 3,317 Indian students in 1980 grades 6-11. These students were in grades 7-12 during the data collection of the Part A impact study in 1981. This group maintained a virtually level attendance between 1977 and 1979, at about 166 days. Between 1979 and 1980, the secondary group mean dropped about 1 day.

Attendance may vary within individual groups of students, as shown by the above analyses. However, attendance also may vary between the various grade levels over the years. The next four sections address changes in attendance trends by grade level, with various students representing each grade over the years. The analyses will be discussed in groups of grades, with the grand mean used as a common point of reference (see Figures 10-2 to 10-5).

Kindergarten to Grade 2 - The only year in which data were available for kindergarten students was 1977, the earliest year reported for 1980 third grade students. In 1977, the kindergarten students had a mean attendance of 158.3 days. This level was more than 5 days below the grand mean of Indian students.

Grade 1 data were available for the years 1977 and 1978. There was no change in the attendance trend between students in grade 1 in 1977 and those in grade 1 in 1978. Grade 1 student attendance, on the average, was slightly over 4 days higher than that of kindergarten students. Grade 1 mean days of attendance was 1 day below the grand mean in 1977 and more than 2 days below the mean in 1978.

The attendance trend for students in grade 2 was level over the three years of available data, 1977, 1978, 1979, at slightly over 165 days for each year. This level was above the 1977 grand mean by about 1 day, but below the grand

FIGURE 10-1

ATTENDANCE BY 1980 GRADE GROUPS

GRAND MEAN N=6597 — GRADES 3-5 N=3289 — GRADES 8-11 N=3317

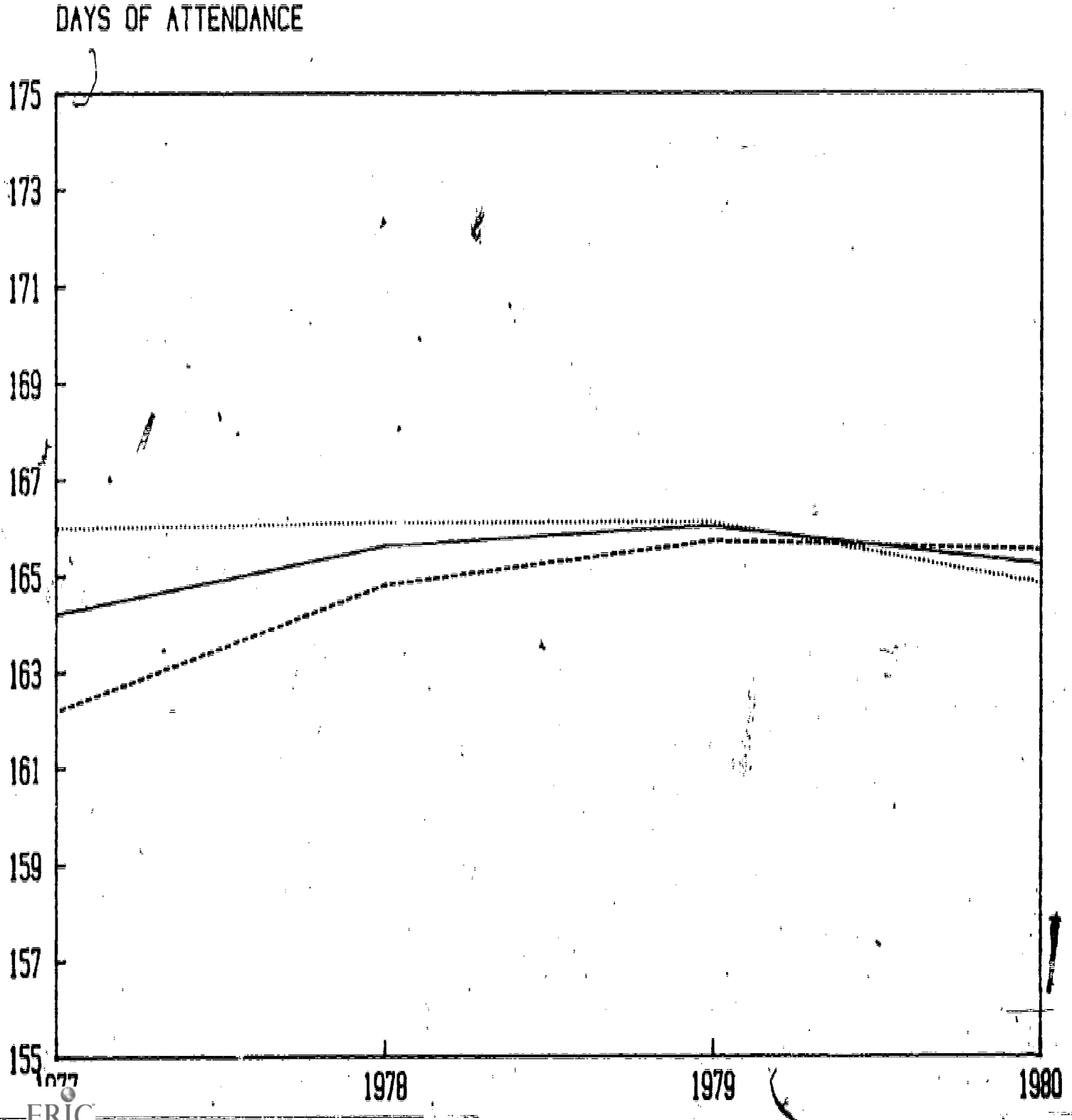


FIGURE 10-2

MEAN DAYS OF ATTENDANCE BY GRADE

FOR YEARS 1977, 1978, 1979, 1980

GRAND MEAN N=6597

KINDERGARTEN STUDENTS

GRADE 1 STUDENTS

GRADE 2 STUDENTS

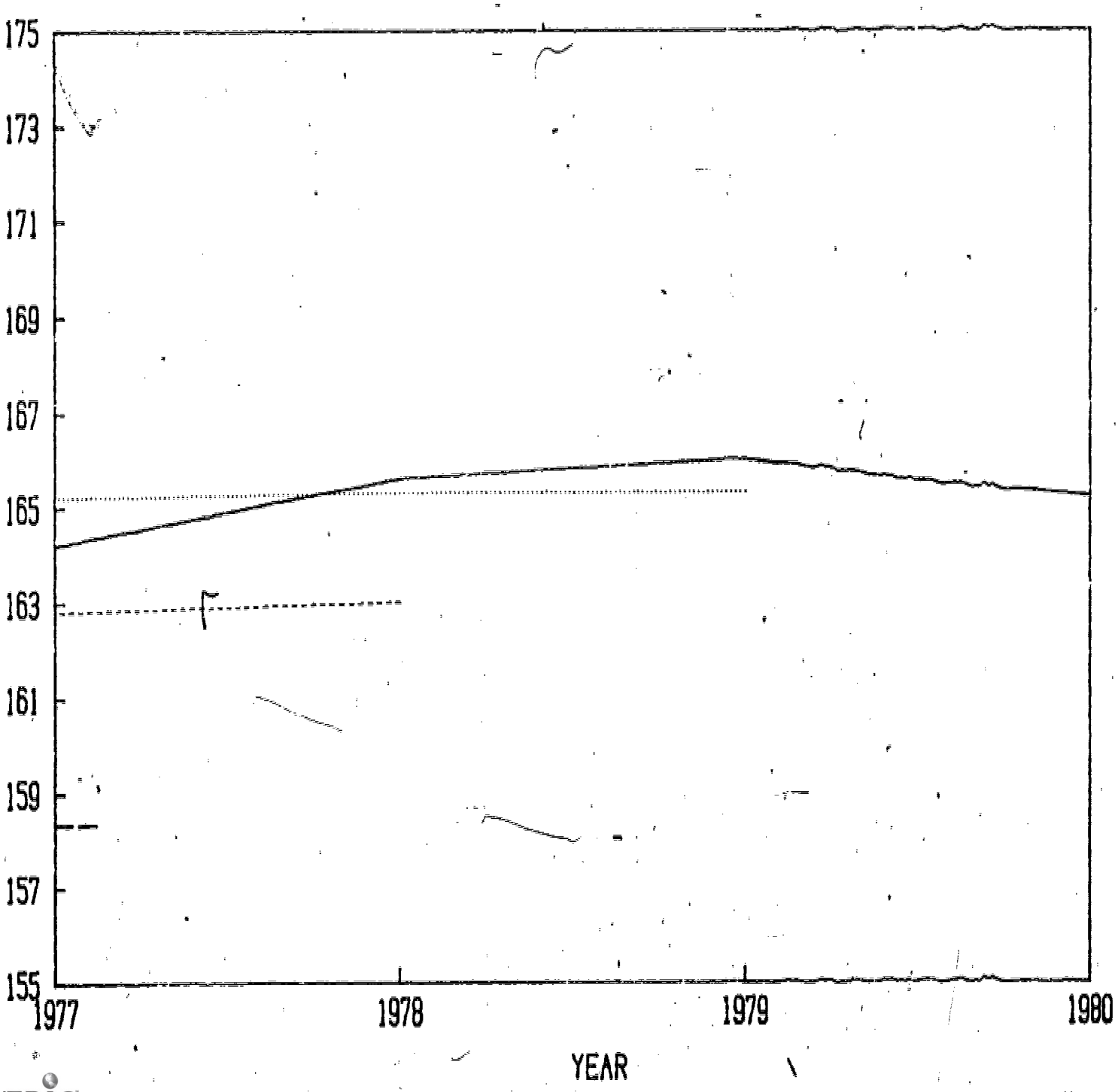


FIGURE 10-3

MEAN DAYS OF ATTENDANCE BY GRADE

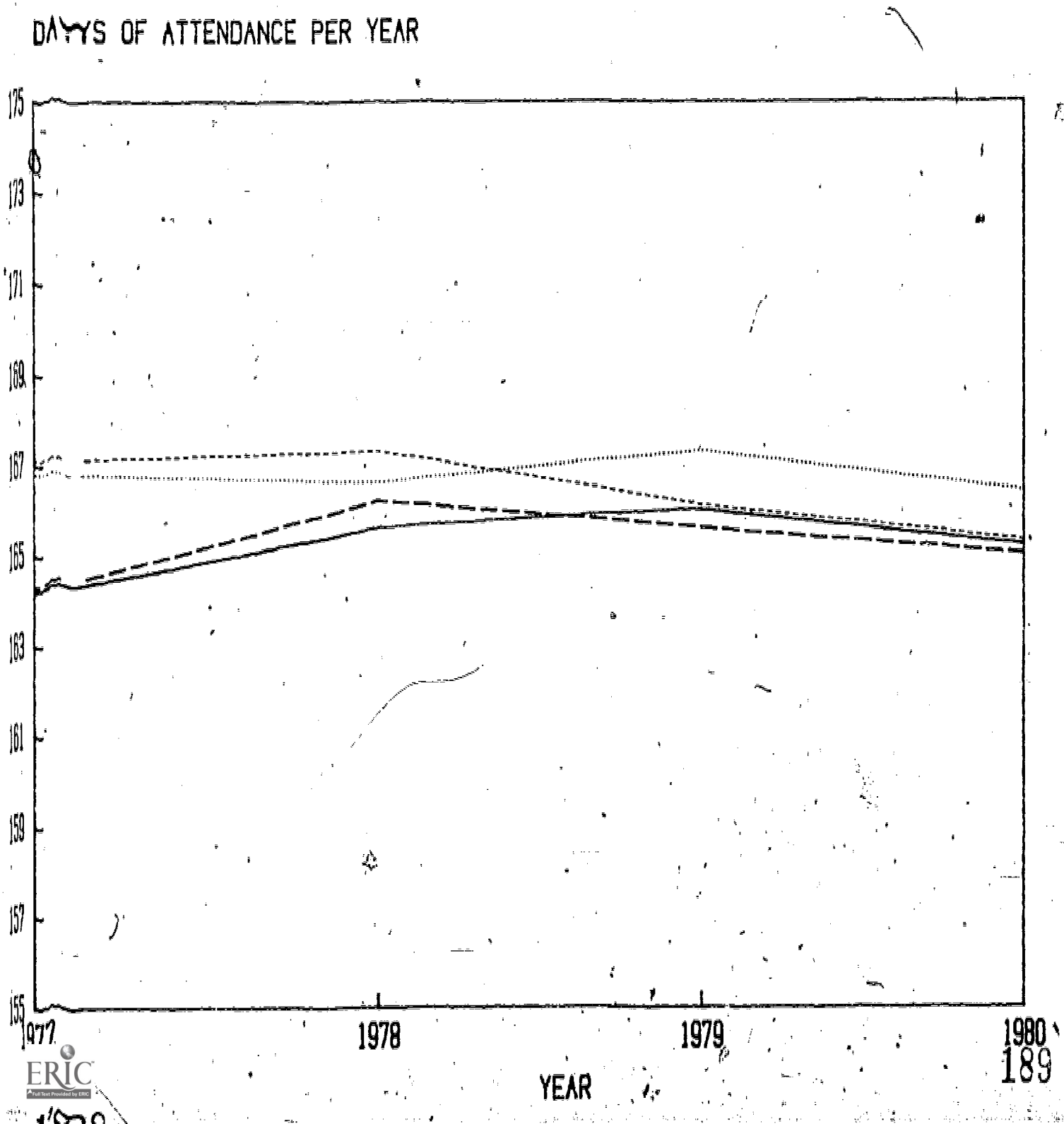
FOR YEARS 1977, 1978, 1979, 1980

GRAND MEAN N=6597

GRADE 3 STUDENTS

GRADE 4 STUDENTS

GRADE 5 STUDENTS



MEAN DAYS OF ATTENDANCE BY GRADE

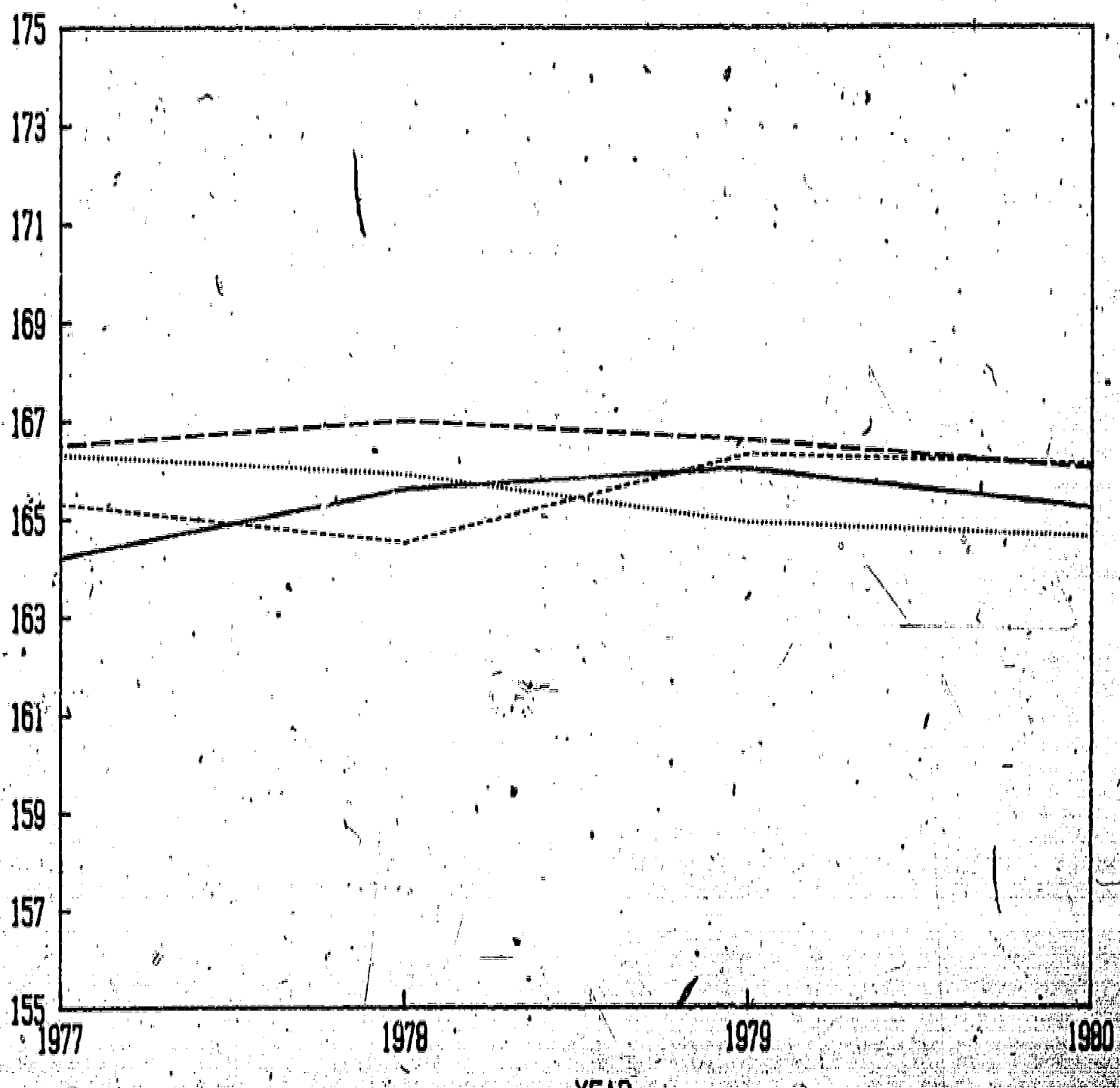
FOR YEARS 1977, 1978, 1979, 1980

GRAND MEAN
N=6597

GRADE 6
STUDENTS

GRADE 7
STUDENTS

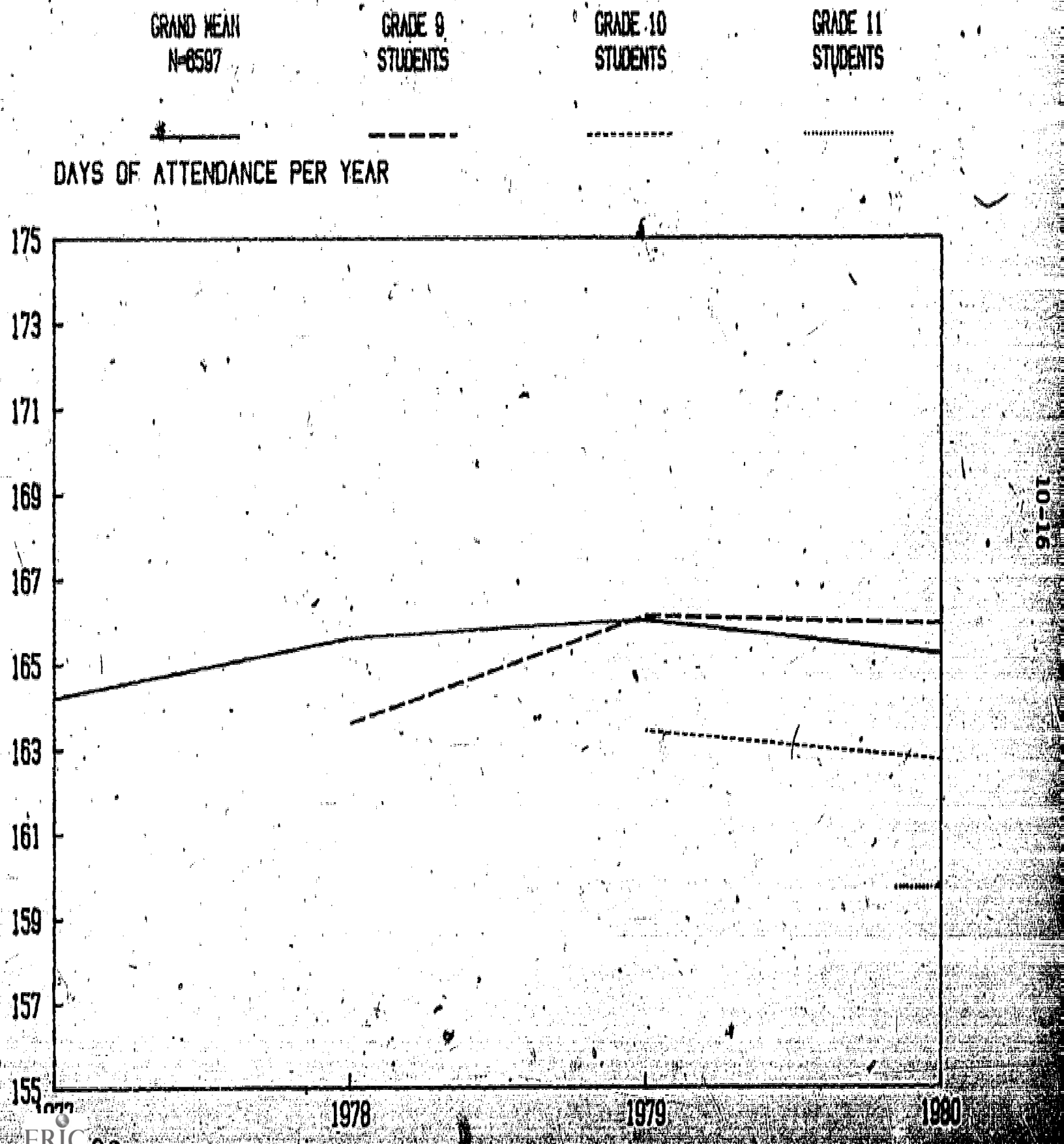
GRADE 8
STUDENTS



10-15

FIGURE 10-5

MEAN DAYS OF ATTENDANCE BY GRADE FOR YEARS 1977, 1978, 1979, 1980



mean in the years 1978 and [illegible]. The grand mean had increased slightly in those years, while the mean for grade [illegible] was level.

Grades 3 to 5 - The attendance trend for grade 3 students increased from 1977 to 1978 by almost 2 days. From 1978 to 1980, there was a steady but slight decline in mean attendance for students in grade 3. The level of attendance was very close to the grand mean, being 165.3 days in 1980.

Students in grade 4 were almost 3 days above the grand mean in 1977. They maintained a mean of about 167 days in 1978. From 1978 to 1980, grade 4 students declined in attendance to a point virtually identical with the grand mean in both 1979 and 1980.

Grade 5 students maintained a level attendance above the grand mean, at about 167 days for all years between 1977 and 1980.

Grades 6 to 8 - The students in grade 6 in 1977 through 1980 maintained an almost level attendance trend, just below 167 days for each year.

The attendance of grade 7 students in 1978 was lower than grade 7 students in 1977 and in 1979. In 1980, the attendance of grade 7 students leveled at just over 166 days.

In 1977, the grade 8 students were above the grand mean by 2 days. In 1978, they were barely above the grand mean, having declined about 1 day while the grand mean had improved. Grade 8 students in 1979 declined slightly more, to a point 1 day below the grand mean. The 1980 grade 8 students also declined slightly from the 1979 level, to 164.5 days in 1980, about one-half day below the grand mean.

Grades 9 to 11 - Three years of data were available for grade 9 students. In 1978, these students were 2 days below the grand mean. The grade 9 students in 1979 had a higher level of attendance, being on the grand mean at 166 days. In 1980, grade 9 students were almost 1 day above the grand mean, at 165.9 days.

There were two years of data available for the grade 10 students. In both 1979 and 1980, the grade 10 students were about 2 days below the grand mean. The 1980 grade 10 students had a sightly lower mean attendance than did their counterparts in 1979, having declined at the same rate as the grand mean trend line.

There was a single year of data available for the grade 11 students; these students were in grade 12 during the data collection in 1981. The mean days of attendance for grade 11 students in 1980 was 159.7. This level was 5 days below the grand mean for 1980.

Summary - The attendance of Indian students generally increased from kindergarten through the fifth and sixth grades. The rate of increase was greatest in the lower grades, and decreased with successive grades through grade 6. Attendance was fairly stable and high from grade 6 through grade 7. There was a loss in attendance of about 1 day in grade 8, which was recovered in grade 9. Then, from grade 9 to grade 11, there was a loss of about 3 days per grade level.

Indian Attendance Trends by Location Type

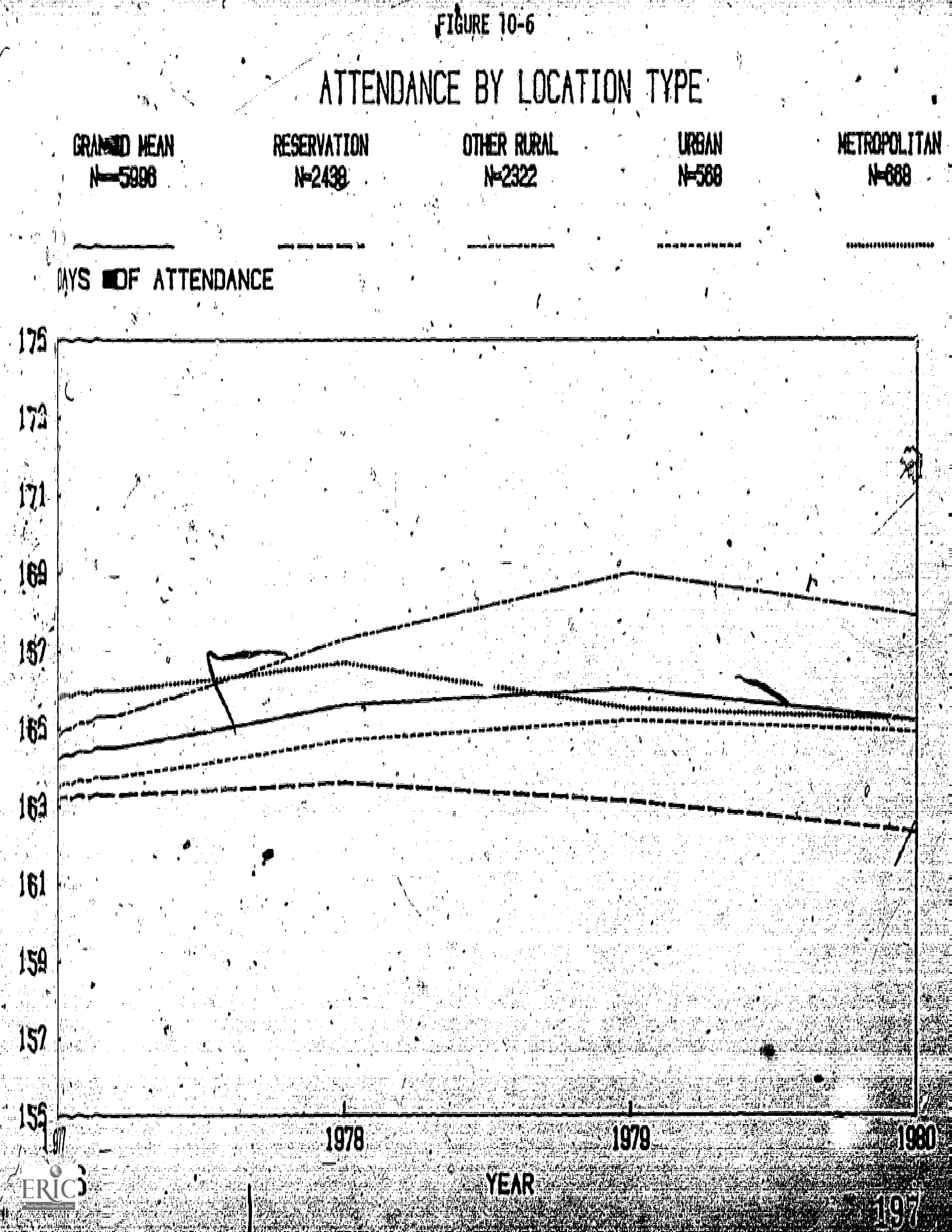
The school districts included in the Part A impact study were in various types of locations: on or near reservations, a rural location; other rural locations; urban locations; and metropolitan locations, large urban areas. The attendance trends of Indian students were calculated and analyzed for each of these location types.

Figure 10-6 illustrates the trend lines for each of the location types across the four years of 1977, 1978, 1979, and 1980. The grand mean of the Indian students is plotted on the graph as a reference line.

The other rural, non-reservation rural school districts had the highest overall attendance across the years. Only in 1977 was a higher attendance level found in another location type. In 1977, the metropolitan locations had the highest mean attendance, about 1.5 days above the grand mean. In 1977, other rural schools were about one-half day above the grand mean. Both

FIGURE 10-6

ATTENDANCE BY LOCATION TYPE



Nonmetropolitan and other rural school attendance means increased in 1978, as did the grand mean. But other rural increased at the greater rate, and exceeded the attendance level of the Metropolitan schools by about one-half day. Other rural schools were about 1.5 days above the grand mean. Other rural schools continued to increase from 1978 to 1979, at a slightly reduced rate, to a level 2.5 days above the grand mean. They declined slightly between 1979 and 1980, but maintained their relatively high position.

The metropolitan schools declined in mean attendance from 1978 to 1979, to a point slightly below the grand mean. The metropolitan schools were at the grand mean in 1980.

The urban school locations had an attendance trend that closely followed the grand mean trend and was approximately 1 day or less below it for all four years. In 1980, the urban attendance level was just below the grand mean. Overall, the students in urban schools had a very gradual increase in attendance between 1977 and 1980.

The Indian students attending schools in districts on or near Indian reservations had a 1977 mean days of attendance slightly below their urban counterparts, at just above 163 days per year. They were 1 day below the grand mean of Indian students. The attendance trend increased very slightly from 1977 to 1978, at which point the on or near reservation schools were almost 2 days below the grand mean. From 1978 through 1980, the on or near reservation school attendance trend declined to a point 2.5 days below the grand mean of 1980.

Indian Attendance Trend by School Population Density of Indian Student

The schools in the sample varied by the degree of density of the Indian student population. Density, the proportion of Indian students to the total population in the school, ranged from less than 1% to 100% Indian population.

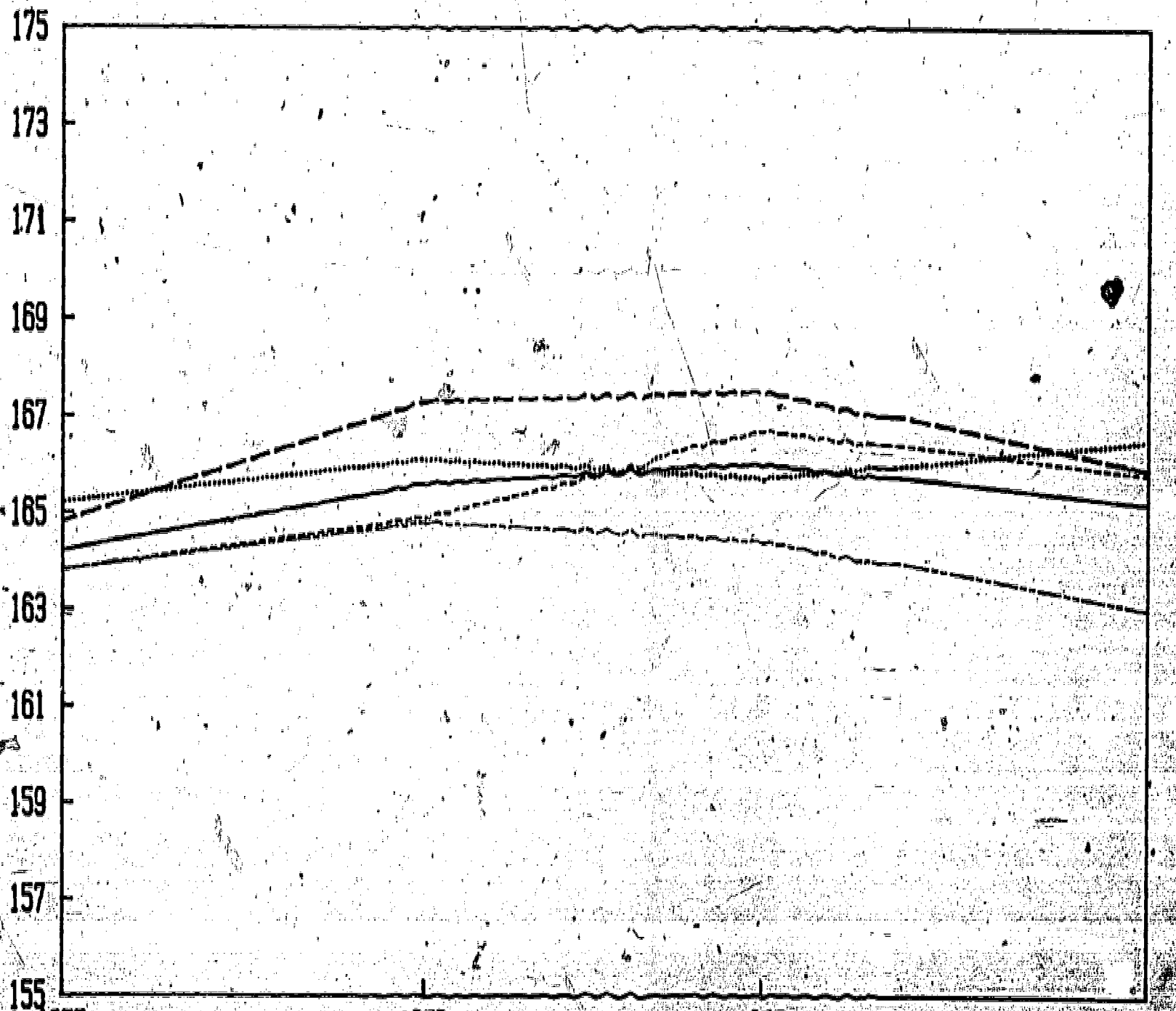
Figure 10-7 illustrates the attendance trends for four categories of density of Indians in the schools over the years 1977, 1978, 1979, and 1980. The pattern of the trends for the four categories for 1980 is shaped as a valley.

FIGURE 10-1

POPULATION DENSITY OF INDIANS

GRAND MEAN	UNDER 5%	5% - 20%	20+% - 70%	OVER 70%
N=5998	N=1184	N=1572	N=1926	N=1314

DAYS OF ATTENDANCE



The schools with low density, under 5%, and those with high density, over 70%, had the highest mean days of attendance. The schools with intermediate density, 5-20%, had lower mean days of attendance than did schools with either lower or higher densities. This overall valley pattern existed during all years.

The schools with low density, under 5%, had attendance levels consistently above the grand mean by about 1 day, and generally followed the pattern of the grand mean.

The schools with high density, over 70%, also were above the grand mean, except for 1979 when they were slightly below the grand mean. Between 1979 and 1980, these schools increased in mean attendance level, while the schools under 5% density declined in mean attendance.

The schools with 5-20% density and those with 20-70% density each had mean attendance slightly below the grand mean in 1977 and 1978. Their trends coincided during these years. The trends diverged in 1979, with schools with the higher density, 20-70%, increasing in mean attendance to a point above the grand mean, and schools with lower density, 5-20%, declining to a level 1.5 days below the grand mean. Both types of schools declined in attendance between 1979 and 1980, but maintained their relative positions. In 1980, only schools with 5-20% Indian density remained below the grand mean at a level of 163 days attendance per student.

Indian Attendance Trends by School District Size

The school districts varied by overall student population from very small districts to those with over 200,000 students. The attendance trends of Indian students were calculated for five categories of school district size.

The pattern of trends for school size was similar to that of density of Indian students: a valley with both very small and very large school districts having had higher mean attendance than did school districts of intermediate size. For all years, the small school districts, fewer than 573 students, and those with 3,246+ children (two categories) were above the grand mean. School

districts with 574 to 3,245 students (two categories) were below the grand mean.

Indian Attendance Trends by Sex of Indian Student

There was almost an equal number of male and female Indian students for whom attendance data were reported by the school district: 48% male and 52% female. Male Indian students were slightly above the female students in attendance level for all four years. The difference in attendance levels of the two groups is less than 1 day per year.

Indian Attendance Trends by Socioeconomic Status of Indian Student

The socioeconomic status (SES) of the Indian student was estimated by whether or not the student's school lunch was subsidized. SES and attendance data were reported for a total of 3,143 students. Of these students, 70% had subsidized school lunches; 30% did not.

The attendance trends for these students were compared with the grand mean calculated on all students with available attendance data, 6,597 students. Figure 10-8 illustrates the relationships among the trend lines. The students with subsidized school lunches, low SES, were consistently lower in attendance than were students with unsubsidized lunches, high SES. The difference was less in 1980 than in earlier years.

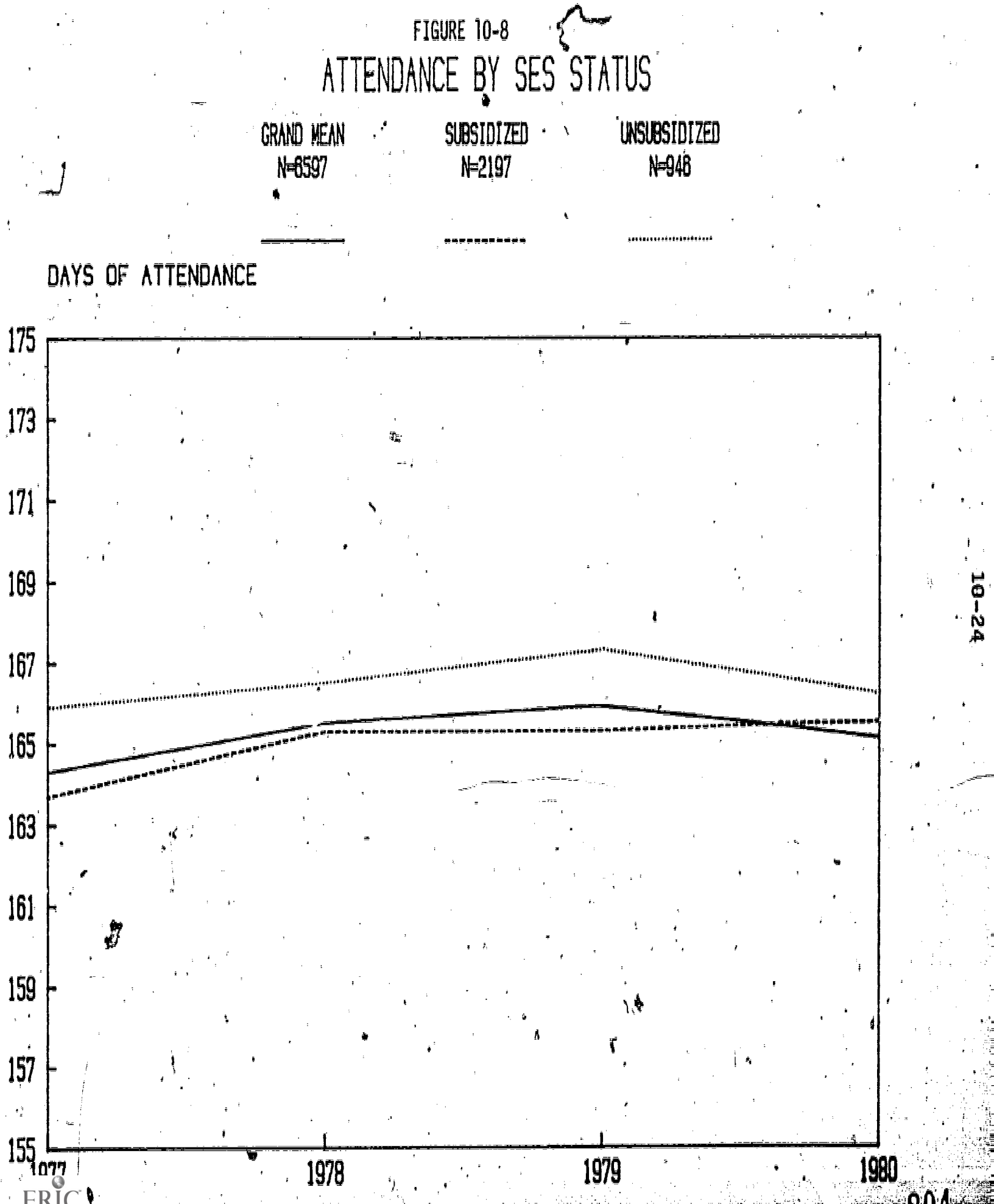
The students with unsubsidized lunches were 1 to 1.5 days above the grand mean in all four years. Students with subsidized lunches were slightly below the mean in 1977, 1978, and 1979. In 1980, these low SES students were slightly above the 1980 grand mean calculated on all available Indian student attendance data for 1980.

Indian Student Attendance Trends by Hours of Project Effort Per Student Per Year in Improving Attendance

The Part A projects varied in the extent of effort expended, in the year 1981, in attempting to improve the attendance of Indian students. The extent of

FIGURE 10-8

ATTENDANCE BY SES STATUS



effort was measured by the reported average number of hours per student per year applied in improving school attendance. These data were merged with the attendance data for the individual Indian student. The mean attendance trend for students with zero hours of attendance effort was calculated and used as a reference line, rather than using the grand mean trend line. Using the zero line permitted comparison among student attendance in projects with various levels of effort and students in the projects with no effort applied.

There were 2,926 Indian students in projects with zero effort applied. The attendance trend of these students over the four years was plotted on Figure 10-9 as a solid line. The trend line for these students follows the grand mean trend very closely. The trend lines virtually coincide in 1980 and 1979. The grand mean is about one-half day lower in 1978, and 1 day lower in 1977.

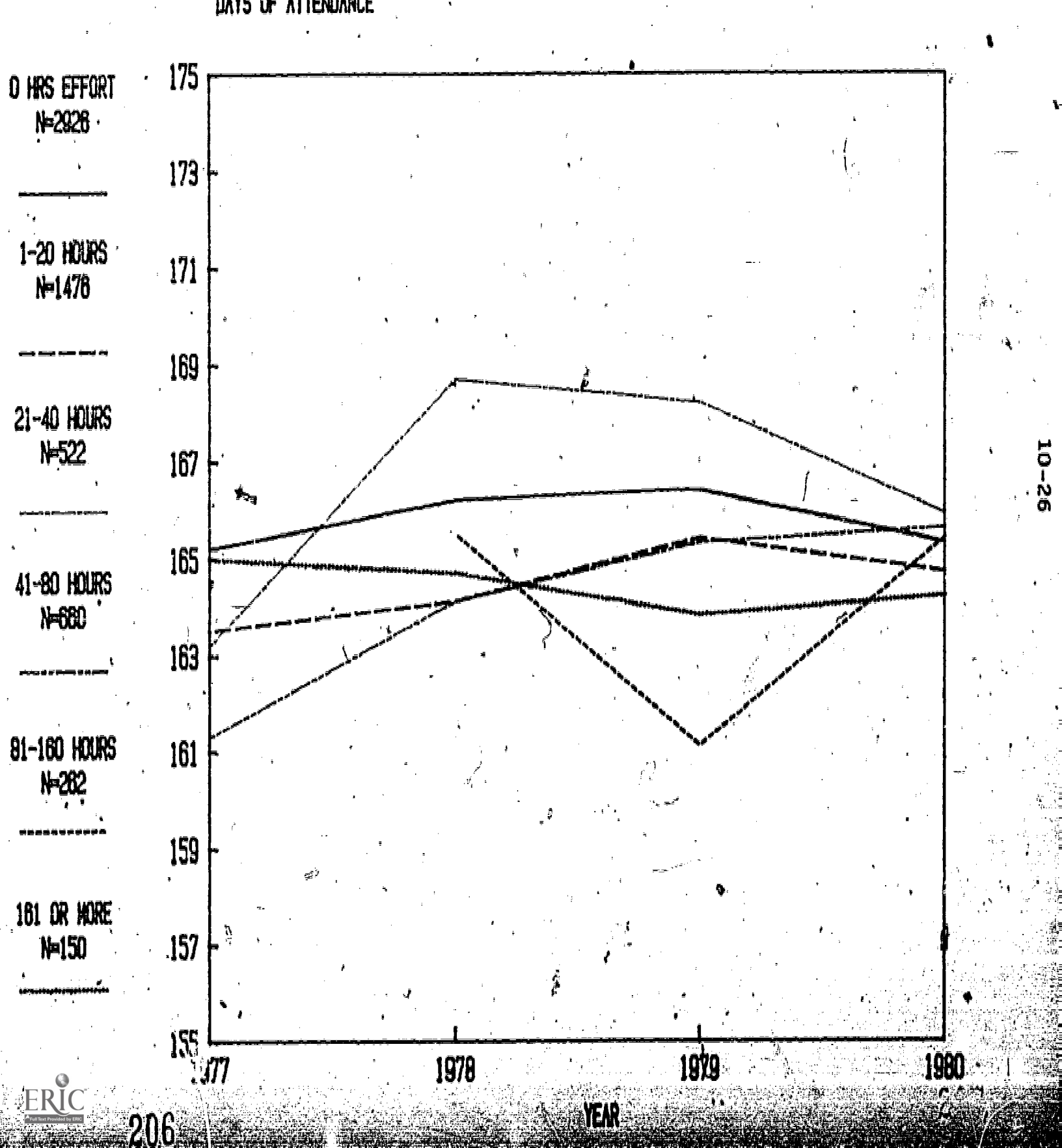
The projects were categorized by the number of hours of effort applied per student per year in improving attendance. The trend lines for the categories were plotted in Figure 10-9.

The students in projects in all but one category of hours of effort had attendance trends indicating a lower level of attendance in the years 1977 through 1979 than did the students in projects expending zero effort on attendance. In other words, projects that had students with relatively low attendance in the years 1977 through 1979 expended effort on improving attendance; projects with relatively high and stable attendance (mirroring the grand mean) expended zero effort.

The projects reporting 21-40 hours of effort per student deviated from the pattern. The students in these projects had attendance levels higher than did students in projects applying zero effort. However, these students had a trend of declining attendance from 1978 through 1980, although the actual level was relatively high in all three years. These projects seemed to respond to the decline in attendance with an application of 21-40 hours of effort per student, on the average, to bring attendance back up to the level of earlier years.

FIGURE 10-9

HOURS OF EFFORT PER STUDENT PER YEAR IN IMPROVING ATTENDANCE



Among the projects with low attendance levels in the years before 1980, projects expending 1-20 hours of effort had students who had tended to increase attendance between 1977 and 1979, but had declined in attendance between 1979 and 1980. In 1980, the students in these projects were about 1 day below the reference line and the grand mean.

Projects that expended 41-80 hours of effort on improving attendance had students who tended to improve their attendance each year, at a slightly decreasing rate, from a level 4 days below the reference group in 1977 to just above the reference group and the grand mean in 1980.

Projects that devoted 81-160 hours had students who had declined sharply in attendance from 1978 (the earliest data available for these students) to 1979. Their 1979 level was 6 days below the grand mean and reference group. Between 1979 and 1980, there was a sharp increase in the attendance of these students, to the level of the grand mean and of the reference group.

Projects that expended 161 or more hours (up to several hundred hours reported per student per year) had students who had steadily declined in attendance, from a point just below the reference group in 1977 to a level about 3 days below the reference group in 1979. These students showed a very slight improvement between 1979 and 1980, but were still a full day below the reference group and the grand mean.

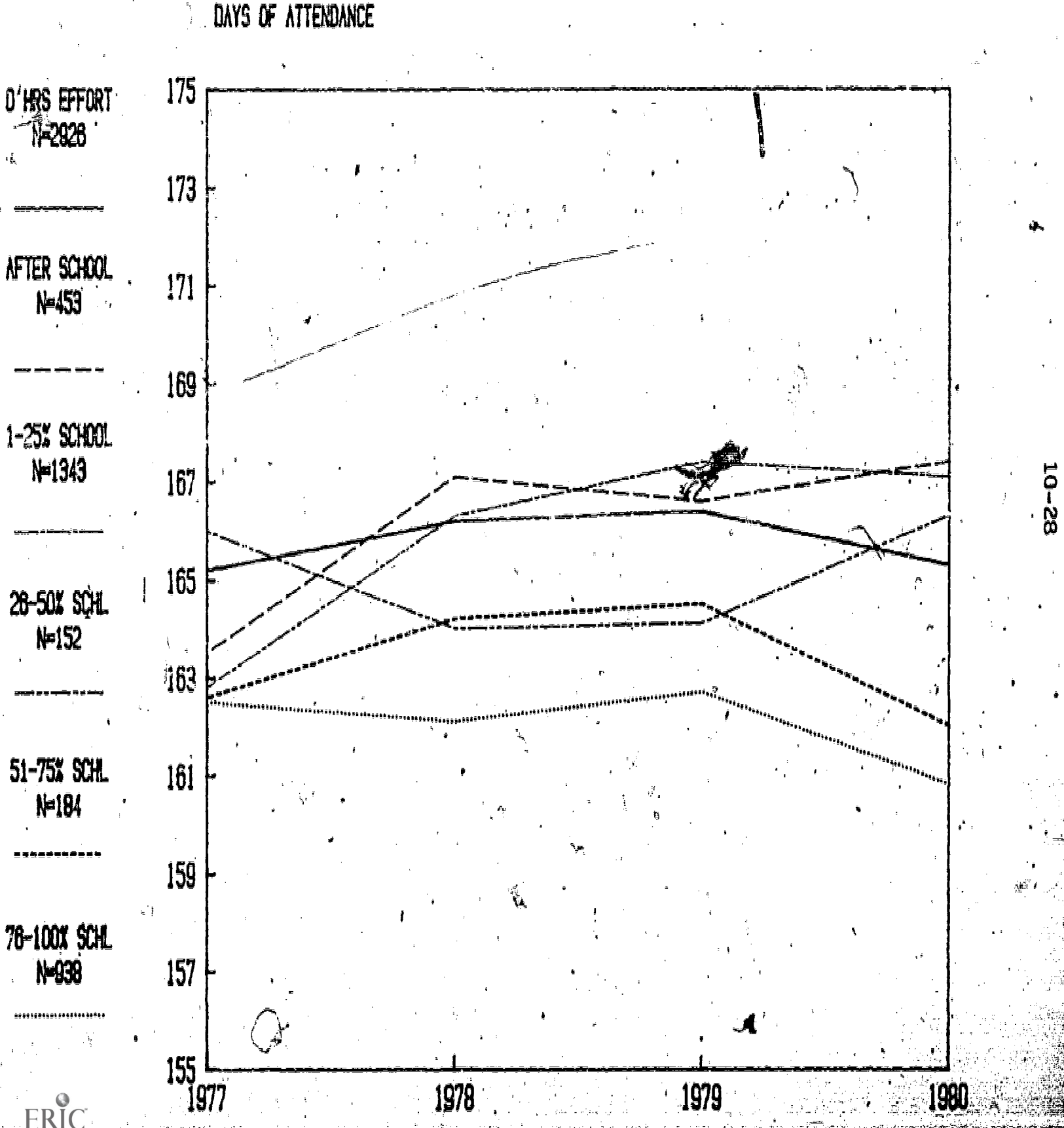
Attendance Trends by Proportion of Project Effort to Improve Attendance Expended During the School Day

The Part A projects varied in the proportion of the effort to improve attendance of Indian students that was expended during the school day. The proportion expended during the school day was reported by the projects reporting more than zero hours effort in improving attendance.

There were 2,926 Indian students in projects with zero effort expended. The attendance trend of these students over the four years was plotted on Figure 10-10 as a solid line.

FIGURE 10-10

PORTION OF EFFORT TO IMPROVE ATTENDANCE SPENT DURING SCHOOL



The remaining projects were categorized by the proportion of the effort expended during the 1981 school day. The categories included projects that expended all of the effort after school hours. The remaining categories represented proportions of effort expended during the school day.

Projects that worked 100% after school had students with the highest 1980 attendance level, 2 days above the reference group and the grand mean. These students had been above the reference group since 1978. They had increased their attendance from 1.5 days below the reference group in 1977 to about 1 day above the reference group in 1978.

Projects which expended a small amount of the total effort during the school day, 1-25%, had students who were very similar to the projects that worked exclusively after school. These students had been above the reference group since 1979. In 1978, they coincided with the reference group, having improved sharply in attendance between 1977 and 1978. Overall, these students had improved their attendance between 1977 and 1979 and had maintained a level attendance between 1979 and 1980. In 1980, they were almost 2 days above tne reference group.

Projects that worked 26-50% during the school day had students who had declined sharply from a relatively high attendance level in 1977 to a point 2 days below the reference group in 1978. These students remained at least 2 days below the reference group in 1979. Between 1979 and 1980, they improved to a point about 1 day above the reference group.

The projects that worked on improving attendance 51-75% during school had students who were consistently two or more days below the reference group in all four years. In 1980, these students were 3.5 days below the reference group and had declined about 2 days from their 1979 attendance level.

The projects that worked between 76% and 100% of the time during school on improving attendance had students who were 4 to 5 days below the reference group and the grand mean. These students had maintained the lowest level of attendance of all categories through all four years. In 1980, these students were 5 days below the reference group and the grand mean.

The pattern of these trend lines indicates that projects expended more of their effort to improve attendance during the school day as the severity of the attendance problems increased. When students attended at a relatively high level over a period of years, the project expended effort after school to maintain or improve attendance levels. When student attendance trends were low over a period of years, the projects tended to work during school in efforts to improve attendance. The percentage of time spent during school increased as the attendance level of the students decreased.

Parent Reports of General Satisfaction with the Project

The Part A impact study interviewed parents of Indian children who participated in the Part A project in the school districts. The parent responses in regard to general satisfaction with the project were averaged by project and merged with the individual Indian student data. The relationship between the Parents' Report of General Satisfaction with the Part A Project and 1980 days of attendance was analyzed for 5,363 Indian students. There was a small but statistically significant positive correlation of .11 ($p < .001$). As the parents' general satisfaction with the project increased, the 1980 days attendance of Indian students also increased. Although there was only a weak relationship between the parental variables and the days of attendance in 1980 ($R^2 = .013$, $F = 37.4$, $p < .001$), the parents' report of general satisfaction was found to be higher for students with high attendance in 1980 than for students with low attendance in 1980.

Parent Perceptions of School Personnel Sensitivity Toward Indians

The parents interviewed were asked about their perception of the level of sensitivity displayed by various school personnel toward Indians. As the perception of sensitivity increased, the days of attendance in 1980 also increased ($r = .06$, $p < .001$). However, changes in the level of perceived sensitivity of school personnel were associated with a lesser change in 1980 attendance than were the changes in parents' general satisfaction. Schools in which parents perceived high sensitivity and in which the parents were very

satisfied with the Part A project tended to have students with high levels of 1980 attendance.

Indian Student Standardized Math Test Scores

Standardized test scores were made available and collected for 2,794 of the students for whom there was attendance data reported. There was a small positive relationship between the standardized math test scores and 1980 days of attendance of the Indian students ($r = .07$, $p < .001$). The math scores were analyzed in a multiple regression procedure that controlled for the effects of reading test scores and SES of the student. The net effect is an increase of .07 days of attendance for each standardized unit increase in math score.

Indian Student Standardized Reading Test Scores

There was a small positive relationship between the standardized reading test scores of Indian students and their 1980 days of attendance ($r = .07$, $p < .001$). The multiple regression analyses controlled for the effects of the math test scores and for SES of the students. The net effect was an increase of .05 days of attendance for each standardized unit increase in reading score. The math and reading scores were standardized on the same scale; therefore, the effects are comparable. Math test scores had a slightly greater relationship with 1980 days of attendance than did the reading scores. Overall, the test scores and SES were very weak predictors of 1980 attendance. They explain less than 1% of the variance in 1980 days of attendance.

Analysis of Attendance Gains for the Student Group with Low Attendance in 1979

The longitudinal analyses considered all students as a group. The total group was shown to have a relatively high level of attendance on the average. To assess the impact of Part A projects on students who were particularly in need of help in improving attendance, an analysis was conducted on a subgroup of the total student group. Students with attendance of 150 or fewer days in

1979 were classified as the Low Attendance Group. This Low Attendance Group contained 386 students.

The Low Attendance Group was divided into two classifications: a Successful Group, which had a gain of 15 or more days between 1979 and 1980, and an Unsuccessful Group which had fewer than 15 days gain. The difference of 15 days would bring a student with an attendance of 150 days in 1979 up to the grand mean of 165 days in 1980.

Four groups were compared in the analyses: Unsuccessful Group, Successful Group, Total Low Group, and Total Students. The differences among the groups are presented in Table 10-4. The mean difference on attendance days between 1979 and 1980 for the Low Attendance Group was much higher than that of the Total Group, indicating that, overall, these students had tended to improve attendance to a greater extent than had the average student. This difference, however, could be at least partially accounted for by regression to the mean. Of the Low Attendance Group students, those in the Successful Group had a very high mean difference of 36.1 days, while the students in the Unsuccessful Group had a mean loss of 2.7 days between 1979 and 1980. The Successful Group represented 46% of the Total Low Attendence Group.

TABLE 10-4

HOURS OF PROJECT EFFORT TO IMPROVE ATTENDANCE: MEAN DIFFERENCES IN DAYS BETWEEN 1979 AND 1980 AND MEAN HOURS OF EFFORT EXPENDED, 1981

Group	N	Mean Days of Difference	Hours of Effort by Project
Unsuccessful	207	-2.7 Days	25.5 Hours
Successful	179	36.1	45.7
Total Low Attendance	386	15.3	35.0
Total Students	4516	0.2	25.0

Differences existed among the mean number of hours of effort expended by the Part A projects during 1981-82 to improve attendance rates. Projects serving the students in the Successful Group expended a much larger mean number of hours on improving attendance than did projects serving the students in the other groups (see Table 10-4). The projects serving the Low Group, on the average, expended about 2.2 hours more per student per year than the average for all students. Projects that served the Successful Group expended 45.7 hours of effort, compared with 25.5 hours by projects that served the Unsuccessful Group.

The causality of this relationship is complicated, however, by the fact that the information about project effort was collected for a period 1-2 years after the data on student attendance. If project effort on attendance is relatively stable across years, these data may indicate that projects with intensive special programs were successful in improving the attendance of low attending students. The number of students who showed improvement is extremely small, however, (4% of the total group).

The students in the Successful Group were sorted by grade level and the location type of their school district. The percentage of students in each classification for the Successful Group was compared to the percentages in the Total Low Attendance Group. Table 10-5 illustrates the percentages of students by grade level groups. The students in Grades 3-5 comprised 65% of

TABLE 10-5

PERCENTAGE OF STUDENTS IN SUCCESSFUL AND TOTAL LOW ATTENDANCE GROUP BY GRADE LEVEL

Grade Level	Successful Group		Total Group		Successful Group Total Difference in Percentage
	N	%	N	%	
Grade 3-5	116	65%	227	59%	+6%
Grade 6-12	63	35	159	41	-6
Totals	386	100%	386	100%	

the Successful Group. In the Total Low Attendance Group, these students represented 59%. The elementary grade level group was thus overrepresented in the Successful Group.

Table 10-6 illustrates the percentages of students by location type of the school districts attended. In the Total Low Attendance Group, 21% of the students attended rural, non-reservation schools. But, the rural students comprised 26% of the Successful Group. The rural projects were thus particularly successful in increasing attendance for this group of students.

TABLE 10-6

PERCENTAGE OF STUDENTS IN SUCCESSFUL AND TOTAL LOW ATTENDANCE GROUP BY SCHOOL DISTRICT LOCATION

District Location	Successful Group N	Successful Group %	Total Low tendance Group N	Total Low tendance Group %	Successful Group Total Difference in Percentage
On/near reservation	96	53%	217	56%	-3%
Other rural	46	26	80	21	+5
Urban	19	11	42	11	0
Metropolitan	18	10	47	12	-2
Totals	179	100%	386	100%	

D. Summary

The data presented and discussed above provide evidence that the attendance of Indian students has been in the same range as attendance of other students in most areas of the United States. There are certain areas with below average attendance, especially the Dakotas, the Southwest, and California. The eastern United States had high attendance compared with the other regions.

Grade level of Indian student was a major factor in attendance. When students began school, attendance was low. It improved to a stable and relatively high level during the middle school years. The secondary level marked the beginning of a decline in attendance.

The attendance of Indian students varied by the location type of school district. Reservation schools had the lowest attendance; other rural schools had the highest attendance. The size of the school district and the density of the Indian population were shown to be related to Indian student attendance. A valley-shaped pattern existed in which very small and very large school districts had higher attendance rates than did those of intermediate size or density of Indians.

There was very little difference between the sexes with regard to school attendance. A difference did exist between students with subsidized and unsubsidized lunches: students with subsidized lunches had a lower attendance than did those with unsubsidized lunches.

The perceptions and reports of Indian parents were related to 1980 school attendance of Indian students. In school districts where Indian parents reported high satisfaction and high sensitivity of school personnel to Indians, the 1980 attendance tended to be higher than in districts with low satisfaction and low sensitivity reported by parents. Standardized math and reading test scores were related positively to 1980 attendance. However, none of these relationships was capable of explaining more than a few percentage points of variance in 1980 attendance of Indian students.

The hours of effort expended by a project to improve attendance was related to the attendance trend of the students. The pattern was complex, as discussed in detail. The proportion of effort to improve attendance expended during the school day generally increased with the severity of the attendance problems of the school district.

When students with low attendance in 1979 were studied as a separate group, the impact of Part A projects became somewhat more clear. Students with gains of 15 or more days in attendance between 1979 and 1980 were served by projects that provided more extensive effort in improving attendance in 1981-82. The Part A projects in rural, non-reservation areas appear to have been most effective in improving attendance of low attending students. The projects improved the attendance of low attending elementary students more effectively than they improved attendance of low attending secondary students.

CHAPTER 11: RATINGS BY TEACHERS, STAFF, AND PARENTS WITH RESPECT TO PROJECT IMPACT ON STUDENT ATTENDANCE

G. Mike Charleston and Paul Hopstock

A. Introduction

In addition to the data on Indian student attendance collected from school districts and reported in Chapter 10, the Part A impact study also collected information on Indian student attendance from teachers of Indian students, Part A project staff, and parents of Indian students. These respondents answered a survey item regarding the extent to which the Title IV, Part A project had helped to improve attendance of Indian students in the school district. The response categories were: not at all, a little, some, and a great deal.

The data provided by the teachers, staff and parents were analyzed to determine the average level of impact on attendance within projects reported by the three groups. The levels of impact reported by each respondent group were analyzed by:

- Location of the school district; and
- Average hours of project effort per student per year spent on improving attendance.

Also, the level of impact as reported by the respondent groups was compared with the actual attendance trends of elementary and secondary students. These comparisons made use of the school district attendance data described in Chapter 10.

B. Procedures

Responses were collected from teachers of Indian students in each project. The responses of all teachers were averaged within a project to provide a mean rating of impact on attendance from the perspective of the teachers of Indian students in each project. The same process was performed on the responses of the staff and parents of Indian students to provide a mean rating of impact on

attendance from the perspective of staff and parents in each project. These ratings on the level of impact were merged with project descriptive information for each project and with the attendance data on individual students. There were valid teacher, staff, and parent data available for 101 of the projects included in the Part A impact study sample. Some projects in the study sample were missing data from one or more of the respondent groups and were excluded from these analyses.

The data used in all of the analyses of reported impact levels were unweighted. The teachers represented in the data for these projects were not intended to be representative of all teachers of Indian students. However, they do represent the regular classroom teachers of Indian students in the Part A impact study's sample. Thus, they are an excellent sample of experienced teachers of Indian students who are knowledgeable about, but not directly associated with, the Title IV, Part A projects. The parents were the parents of a sample of students. They were selected so as to preserve to some extent the self-weighting properties of the student sample. Project staff data were collected from key Part A staff working half-time or more in each project represented. Although these data could be weighted to estimate the population of Title IV, Part A staff, they were left unweighted in these comparisons with other unweighted data. The weighted means for the staff varied only slightly from the unweighted means used in these analyses.

The data were analyzed using Statistical Analysis System (SAS) procedures. The SAS Summary procedure was used to calculate the means by various classification variables, and statistical tests were performed using the General Linear Model (GLM) and Correlation programs.

C. Findings

Teacher Reports of Impact on Attendance

There were 1,307 teachers surveyed as part of the impact study. Of these, 867 (66%) responded to the item regarding project impact on attendance of Indian students. Overall, the teachers in the 101 projects rated the impact of Title IV projects on attendance at 2.83 on the assumed interval scale of 1 to 4 (no

impact, a little, some, a great deal). The distribution of individual teacher responses is illustrated by a pie chart in Figure 11-1. As can be seen, most teachers rated the project as having some (45%) or a great deal (31%) of impact on attendance. Relatively few teachers rated the project as having a little (12%) or no impact (12%).

To perform project-level analyses, teacher responses were averaged within projects and mean project rating was obtained. As expected with such a procedure, the mean project ratings were more closely grouped around the overall mean rating than were the individual teacher ratings. Approximately three-fifths (60%) of the projects had mean ratings between 2.5 and 3.5 on the scale of 1 to 4. Throughout the rest of this chapter, the results for teachers will be presented in terms of mean project ratings.

Staff Reports of Impact on Attendance

There were 413 Title IV, Part A staff members surveyed in the impact study. Of these, 381 (92%) responded to the item about the impact of the project on student attendance. Overall, the staff in the 101 projects rated the impact at 3.14 on the scale of 1 to 4. Figure 11-2 illustrates the distribution of staff members on this question.

As the figure illustrates, half (49%) of the staff members rated the project as having some impact, and an additional 39% rated the project as having a great deal of impact. Relatively limited numbers rated the project as having a little (9%) or no impact (3%).

As with the teacher ratings, staff ratings were averaged within projects, and the mean project rating was used in subsequent analyses. Also as with teachers, approximately three-fifths (59%) of the mean project ratings for staff members fell between 2.5 and 3.5 on the 1 to 4 scale.

Parent Reports of Impact on Attendance

There were 1,543 parents interviewed in the data collection for the impact study. Of these, 1,197 (78%) responded to the question about the impact of

FIGURE 11-1

LEVEL OF IMPACT ON ATTENDANCE

INDIVIDUAL TEACHERS, N=867

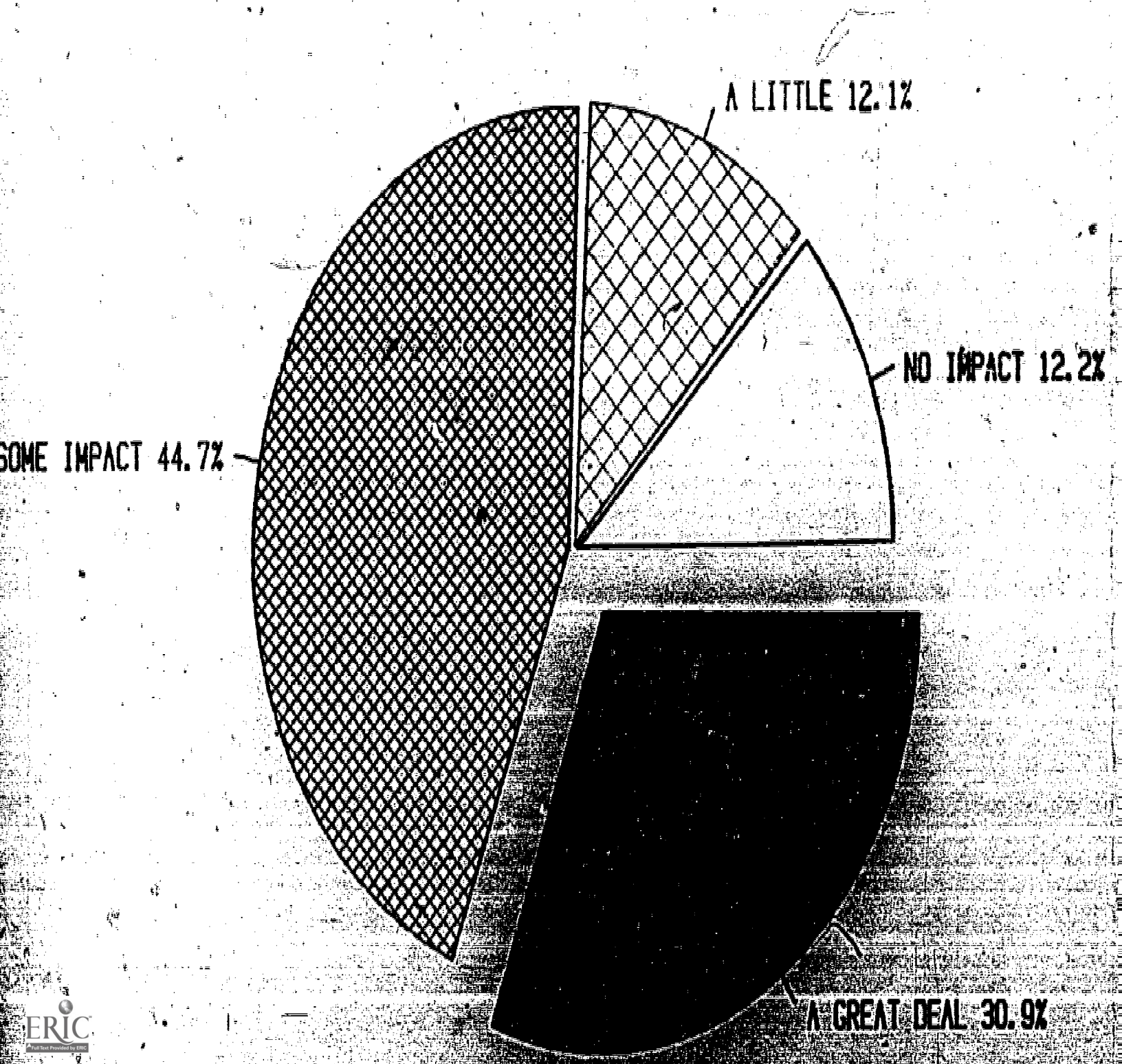
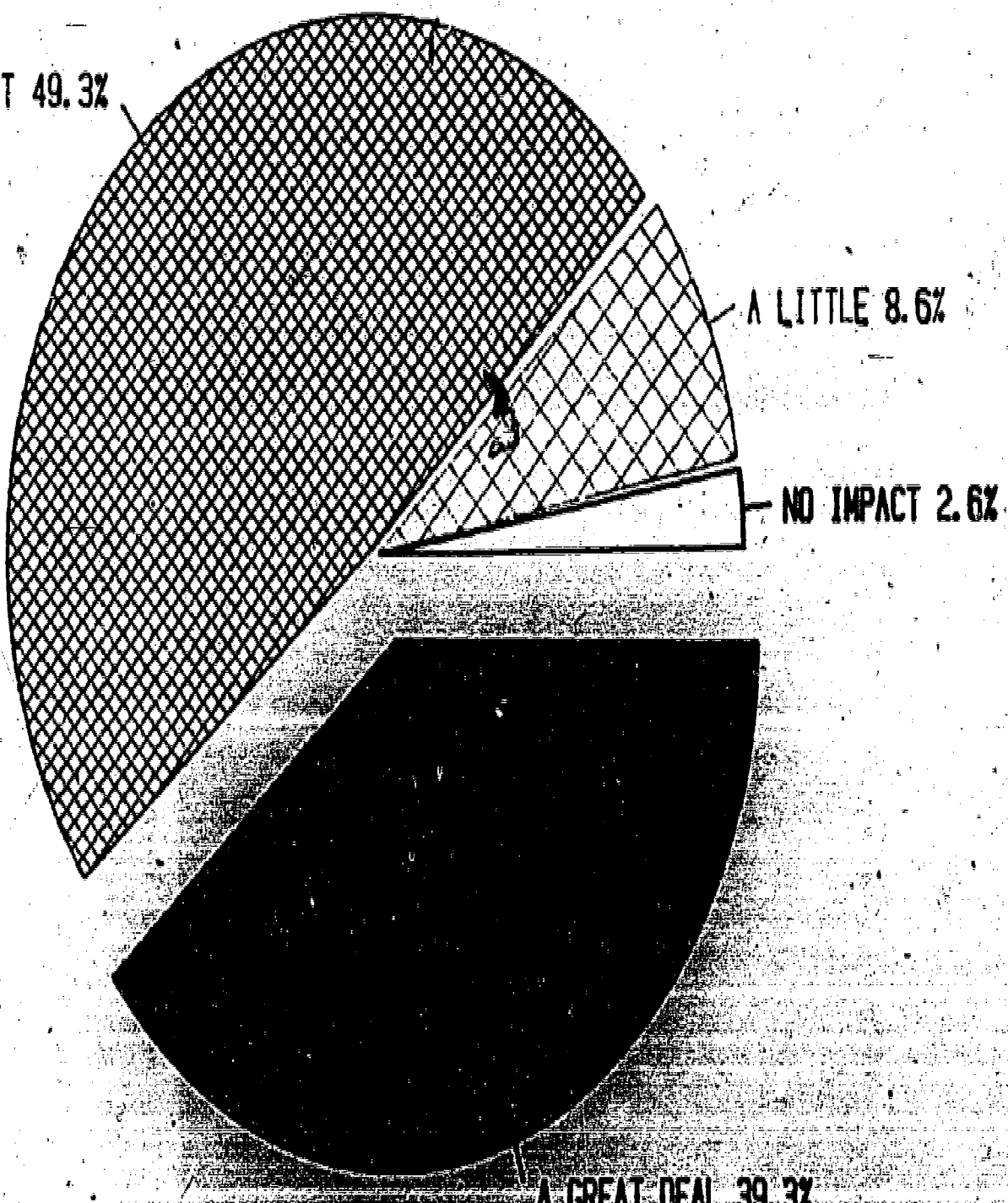


FIGURE 11-2

LEVEL OF IMPACT ON ATTENDANCE

INDIVIDUAL STAFF MEMBERS, N=381



the Part A projects on attendance. Overall, the parents in the 101 projects rated the impact of the projects on student attendance at 2.42 on the scale of 1 to 4. The distribution of responses is illustrated in Figure 11-3.

As illustrated, parents had a broader range of opinion than did teachers and staff members. Approximately one-third (36%) of parents rated the project as having no impact, but a third (31%) also rated the project as having a great deal of impact. The remaining respondents reported some (22%) or a little (10%) impact on attendance.

When parent ratings were averaged within projects, the mean project ratings fell near the center of the scale. Almost half (44%) of the projects had mean ratings between 1.5 and 2.5, and over a third (38%) had mean ratings between 2.5 and 3.5.

Over all 101 projects, the staff rated the impact significantly higher than did the teachers. The parents rated the projects signficiantly lower than did either of the other respondent groups ($F=27.40$, $df=2/291$, $p < .001$).

Reported Impact by School District Location

The reported level of impact of Part A projects varied by the location type of the school district (on or near reservations, 38 school districts; other rural, 29 non-reservation school districts; urban, 13 school districts; and metropolitan, 21 school districts). The variation is illustrated in Table 11-1.

A test of differences among groups indicated that projects in metropolitan areas were rated as having significantly less impact than projects on or near reservations or in other rural areas. This difference was found for all three types of respondents.

FIGURE 11-3

LEVEL OF IMPACT ON ATTENDANCE

INDIVIDUAL PARENTS, N=1,197

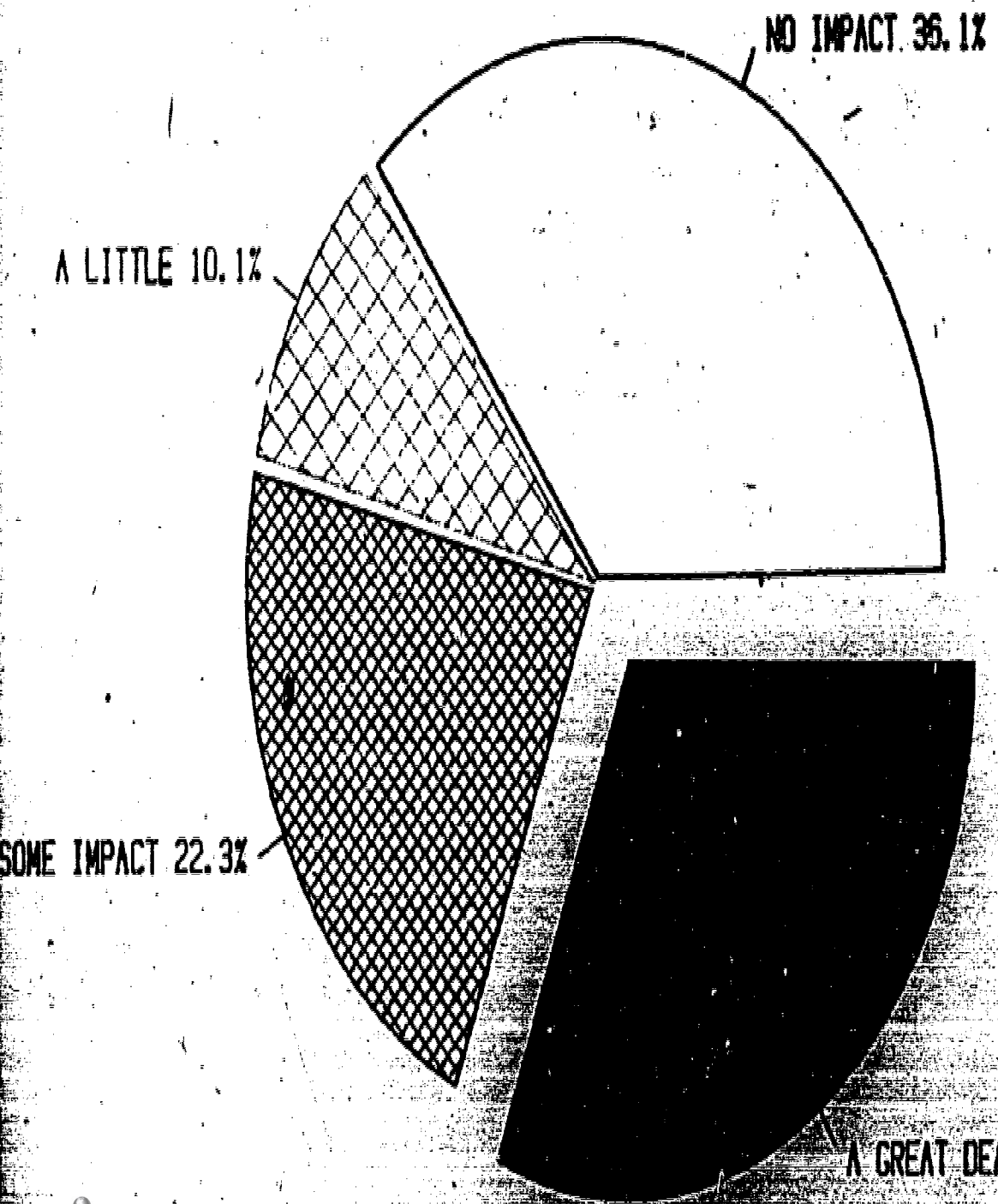


TABLE 11-1

MEAN IMPACT RATING ON ATTENDANCE BY TYPE OF SCHOOL DISTRICT LOCATION*

Location Type	N	Staff Mean	Teachers Mean	Parents Mean
On or near reservation**	38	3.25	2.97	2.69
Other rural	29	3.25	2.96	2.39
Urban	13	3.04	2.76	2.36
Metropolitan	21	2.83	2.43	2.00

*Rating Scale: No impact = 1, A litte = 2, Some = 3, A great deal = 4.
**Difference between locations for all groups: $F=8.95$, $df=3/291$, $p < .001$.

Reported Impact by Average Hours of Project Effort Per Student Per Year Spent on Improving Attendance

Projects reported spending varying numbers of hours per student per year on improving student attendance. Table 11-2 shows the distribution of projects in the sample by hours of effort devoted to improving attendance.

TABLE 11-2

HOURS OF PROJECT EFFORT DEVOTED TO STUDENT ATTENDANCE

Hours Per Student Per Year	Number of Projects
0	41
1-20	24
21-40	12
41-80	17
81 or more	7
Total	101

Ratings by staff, teachers, and parents of the impact of the projects on attendance were analyzed based on the amount of project effort devoted to attendance. The results of those analyses are presented in Table 11-3.

TABLE 11-3

MEAN RATINGS OF THE IMPACT ON ATTENDANCE
BY HOURS OF PROJECT EFFORT*
(N=101)

Hours per Student Per Year	N	Staff Mean	Teachers Mean	Parents Mean
0**	41	2.92	2.69	2.32
1-20	24	3.40	2.93	2.46
21-40	12	3.15	2.88	2.12
41-80	17	3.24	2.95	2.55
81 or more	7	3.29	2.91	3.03

*Rating Scale: No impact = 1, A little = 2, Some = 3, A great deal = 4
**Difference between projects for all groups: $F=7.11$, $df=4/285$, $p < .05$

In general, the ratings given to projects which spent at least some hours on improving attendance were higher than the ratings given to projects spending no hours on improving attendance. The number of hours which were spent per student per year, however, was not systematically related to impact ratings given by staff, teachers, and parents.

It is an important finding that the 41 projects which did not formally spend effort on improving attendance nevertheless were rated by teachers, staff, and parents as having had a little to some impact on improving attendance of Indian students. Also, it is important that those projects which formally made an effort to improve attendance were rated higher by teachers, staff, and parents than projects which did not formally make an effort to improve attendance.

Relationship Between Reported Impact on Attendance and Attendance Trends

In order to determine whether the reported impacts on attendance were related to actual attendance trends, correlations were computed between mean project impact ratings by staff members, teachers, and parents, and scores showing project-wide changes in attendance between 1977 and 1980. Separate change

scores were calculated for elementary school students, for secondary school students, and for an average of the two groups.

The results of the analyses show no significant correlations between impact ratings and changes in attendance. Although some positive correlations might have been expected, the failure to find such correlations was not surprising given that:

- The range of mean project impact ratings was narrow, due to regression toward the mean;
- Even those projects where no effort was devoted to attendance had moderate impact ratings; and
- The project change in attendance score was a relatively insensitive measure, because changes in attendance would be expected for only a limited number of students (see Chapter 10).

D. Summary

Title IV, Part A project staff, classroom teachers, and parents all reported that the Part A projects had produced a positive impact on student attendance. Project staff were most positive in their ratings (mean=3.14 on a scale from 1 = no impact, 2 = a little, 3 = some, and 4 = a great deal). Teachers gave somewhat lower ratings (mean=2.83), and parents gave the lowest (mean=2.42). Ratings for all groups were highest for projects on or near reservations or in other rural areas, and were lowest for projects in metropolitan areas. Ratings were higher for those projects which specifically devoted hours to improving attendance, but even the projects which did not formally devote project hours to improving attendance were rated as having a little to some impact. The number of hours devoted to improving attendance was not systematically related to ratings of impact.

CHAPTER 12: DROPOUT AND RETENTION IN PUBLIC SCHOOLS

T. LaFromboise and Blair Rudes

A. Introduction

Although a prime indicator of successful educational programs is academic achievement, another major indicator is student matriculation or persistence. The process of defining dropout or attrition rates has been complicated by the inability of researchers to (1) agree upon behaviors that constitute an appropriate definition of dropout and (2) distinguish between individual and institutional variables that contribute to the problem. A "dropout" may be defined as "any youth who for any reason, except death, has left school before graduating from high school without transferring to another school" (Cervantes, 1965). However, this definition fails to distinguish between two very different types of behavior--dismissal and voluntary withdrawal (Tinto, 1982). A voluntary decision not to complete a given course of study is much different from failing to do so because of personal and academic difficulties. Dismissal usually hinges upon displays of behavior inappropriate to institutional standards (e.g., stealing, drinking, non-attendance, or poor performance). Voluntary withdrawal, on the other hand, is marked by adherence to values incongruent with those that characterize the social and intellectual climates of the school (Pascarella & Terenzine, 1977).

In order to fully understand the nature of the dropout problem among Indians, one needs to first look at the characteristics of dropouts and the factors which lead them to terminate the educational program short of graduation. Cervantes (1965) states that the "typical" dropout is more likely to be male than female, to live in the South, and to be a slum dweller. The lower the family's socioeconomic level, the greater a student's chance of becoming a dropout (Beck & Muria, 1980). Bachman (1972) reports affective characteristics of the dropout to include low self-esteem, little desire for personal growth, and limited commitment to accepted social values. With respect to health, the dropout displays a greater-than-average number of somatic symptoms, especially auditory and dental disorders (Howard & Anderson,

1978). Also, the less cohesive the family, the less likely it is that the student will graduate (Cervantes, 1965).

The characteristics of Indian dropouts are similar. There appears to be an equal prevalence among Indian males as females (Brown, 1973; Oviatt, 1973). The typical profile includes the following variables: 17.5 years of age with 6.4 siblings (one previously a dropout), single rather than married, between the tenth or eleventh grade, arrested one or more times, and never contacted or helped by a social service agency after leaving school (Davids, 1963; Scott, 1967). Elias (1973) found that over one-half of Indians who had dropped out demonstrated an interest in returning to school. Those who did return displayed a greater concern for future plans than those who did not.

Many of the reasons Indian students leave school are similar to those which have been noted for non-Indians. However, attention must also be paid to certain culture-specific factors associated with Indian lifestyle and environment. According to Szasz (1974), Indian non-participation and failure within the educational system arise from the system's lack of relevance as perceived by American Indians, coupled with its failure to deal with Indian cultural traditions and values.

Traditionally, Indian education was practiced within the extended family network. Many Indian families still operate on the basis of a mutual sharing or reciprocal relationship wherein family needs take priority over the demands of the larger, majority society. For instance, irregular attendance of Indian students may be due to such family responsibilities as an annual wild rice harvest. Ricing and the associated festival activities in September typically involve entire families, including the children. Since urban school schedules do not take such activities into consideration in setting up their calendars, Indian children returning to school in the fall may be a month late in entering the academic program (Dysinger, 1975). Further, Hanks (1973) found that Indian dropouts frequently cited their being needed at home to care for younger siblings and elders while family members work at full or part-time jobs as contributing to their decisions.

Other family-related factors influencing dropout include mobility and family cohesion. Many Indian families display a high rate of mobility in search of opportunities and jobs (Antell, 1979; Hopkins & Reedy, 1978) causing students to transfer between or within different types of schools; Wax and Wax (1964) found a higher frequency of dropouts among Indian high school students when the father was irregularly employed. Brown (1973) found that dropouts were characterized by factors indicative of instability in basic family relationships. On a practical level, Indian students frequently observe little relationship between educational level achieved and jobs acquired by their parents and older siblings; due to limited job offerings, high school diplomas simply do not open doors on reservations (Kleinfield, 1973).

In addition to the role which the family plays, the general traditions and customs of the student's culture may influence whether the student stays in school or drops out. While this is particularly the case with Indians from rural/reservation areas, even those living in urban areas, where the cultural expectations are not as great, report confusion about primary culture and dominant culture expectations. For example, the kind of individual competition typical of schools is foreign to some tribal groups. Also, Indian students brought up in the peer educational approach of most tribes find it difficult to adjust to the teacher-student learning style of schools. In some cases, students simplify matters by rejecting their heritage (Dysinger, 1975). Once students have been thus alienated from their own culture as a result of culture conflict, they frequently display feelings of hopelessness and estrangement from their schools, home, and society in general (James, 1975). Oviatt (1973) found a limited future orientation, a negative self-concept, and little involvement of students or parents in the educational system to be variables differentiating Indian dropouts from Indian graduates.

Like with their non-Indian counterparts, socioeconomic problems have much to do with the dropout rate, and Indian peoples have been shown to be the poorest of the poor (American Indian Policy Review Commission, 1976). McCarthy (1971) reports that Indian students first realize their relative poverty upon attending school with non-Indians. Wax and Wax (1964) found a correlation of Indian dropout with extreme poverty, but none with personality, intelligence, and attitude toward school. Another study identified the two major factors

underlying majority student reasons for dropping out (Howard & Anderson, 1978) as family history and academic difficulties. The most important aspect of family history is socioeconomic status (Bachman, 1972; Thompson & Nelson, 1963). The probability of dropping out as a solution to personal and educational dissatisfaction is also maximized when the student has contact with family members and other persons who have dropped out (Elliot, Voss & Wendling, 1966).

Academic predictors of dropout include poor grades (especially in reading or math), being held back (Bakal, Madaus & Winder, 1968; Coplein, 1962; Schuster, 1971; Vogel, 1961), and difficulty retaining information (Brown & Peterson, 1969). Strained student-teacher relationships and lower teacher expectations (Hecht, 1975) are also identified as contributing factors for both majority and Indian dropouts. Other school-related predictors include irregular attendance, frequent tardiness, lack of participation in extracurricular activies, frequent change of schools, and an overall feeling of "not belonging" (Cervantes, 1965). Thus, the decision for students to drop out is a complex process encompassing a variety of factors. Conflict with institutional values of the schools, socioeconomic status, and parental concern for cultural education, in the Indian case, are paramount.

While many of the factors influencing Indian student dropout have been identified, it is far more difficult to pin down the actual number of Indian students dropping out. In large part, this results from the unreliability of the previously available information on Indian dropout rate. Reports of Indian dropout rates and high school completion rates from the Current Population Surveys (CPS) conducted annually by the U.S. Bureau of Census do not permit reliable analysis of Indian attrition because of the sparse data available on American Indians (Astin, 1982). The Digest of Educational Statistics, for example, reports ethnic data collectively in terms of "Blacks and other races." The Condition of Education[1] only differentiates among Blacks, Hispanics and Whites. Even the most complete delineation of cultural

[1]The Digest of Educational Statistics and the Condition of Education are annual reports published by the National Center for Education Statistics of the U.S. Department of Education.

groups only presents American Indian dropout data from 1960, 1970, and 1976 (U.S. Commission on Civil Rights, 1978). Furthermore, reliance on total Indian population figures is dangerous, since these fail to consider tribal and regional diversity, as well as variations among the types of schools that Indian students attend. As an example of the importance of such factors, Antell (1979) reported that Indian dropouts occur at a greater rate (30%) in public schools, where seventy percent of Indian children are educated, than in BIA schools (6.5%) or private schools (1.9%).

Special studies on Indian dropouts present an array of programmatic data regarding the effectiveness of specific educational programs in decreasing student attrition. Dropout rates contained in the studies are presented in Table 12-1, and range from 14% to 60%, with 11,000 reservation children attending no school in 1976 (American Indian Policy Review Commission, 1976b).[2] Bryde (1967), reported an Indian dropout rate of 60% in the middle of the 1960s. Although broader total U.S. population reports found the lower Indian dropout rates of 27% in 1960, 16% in 1970, and 15% in 1976 (U.S. Commission in Civil Rights, 1978) than did the special studies, this rate is still substantially higher than that of the general population. Comparisons of Indian and total population dropout rates show a rate twice that of the general population in 1959 (Thompson & Nelson, 1963; Bryde, 1967), decreasing in 1976 to a rate 10% over the general population rate (U.S. Commission on Civil Rights, 1978).

In order to get a more systematic picture of the trends in Indian student dropout over the past decade, information on the subject was collected as part of Development Associates' evaluation of the impact of the Part A Entitlement Program. Specifically, the academic and occupational histories of a random sample of 2,098 Indians and Alaska Natives who were sophmores in high school

[2]These widely varying dropout rates may be due, in part, to different methodologies or definitions. For example, in its periodic population surveys the U.S. Census Bureau defines a dropout as a person between 16 and 19 who is not enrolled in school and who has not received a high school diploma. The Census Bureau also tends to underrepresent minorities. Selinger (1968), by contrast, followed a longitudinal sample of eighth graders as they progressed through or left school.

TABLE 12-1

DROPOUT RATES IN THE INDIAN AND GENERAL STUDENT POPULATIONS, AS REPORTED IN THE LITERATURE

Survey Date	Sample	Indian Dropout Rate	Overall Dropout Rate	Author-Publication Date
		Percentages		
National				
1959	National	51%	22%	Coombs (1959)
1960	Total BIA Schools	60	30	Thompson and Nelson (1963)
1960*	National	27	14	U.S. Commission on Civil Rights (1978)
1963	Total BIA Schools	60	33	Davids (1963)
1967	National	60	--	Bryde (1967)
1969	Total Indian Population	40	26	"Kennedy Report" (1969)
1970*	National	16	12	U.S. Commision on Civil Rights (1978)
1975*	National	--	25	Grant (1975)
1976*	National	15	5	U.S. Commission on Civil Rights (1978)
1978	Total BIA Schools	40	--	Hopkins and Reedy (1978)
Regional				
1968	Northwest	50	--	Selinger (1968)
1969	Southwest	39	--	Bass (1969)
1976	Northwest	48	--	U.S. Department of Interior (1976)
1974	New Mexico	26	25	Horten (1974)
1978	Seattle	19	10	Corwin (1978)
1978	Minneapolis (Junior High Students)	50	6	Squires (1978)
1981	New Mexico	14	9	Young (1981)

* Data acquired through U.S. Census procedures. These studies tend to under-represent Native American and non-Indian citizens. Therefore, it should not be surprising that the data reflects a lower dropout rate.

at the visited Part A project sites in this country during each of the academic years 1970-71, 1972-73, 1974-75, 1976-77, and 1978-79 were reviewed. The objective was to determine if there were changes over time in the educational patterns of Indian students who attended schools receiving Title IV, Part A funds. Subjects were almost equally divided by sex (M = 1004, F = 1063). Most (39%) of the subjects lived on or near reservations, while others lived in other rural (28%), urban (19%), and metropolitan (14%) areas. Many (34%) attended schools with 5% or fewer Indian students; 24% of the subjects attended schools with a 5-21% Indian student population, 28% attended schools of 21-70% Indian enrollment, and 14% with Indian enrollment of 70-100%. Because recorded data on the ethnicity of students tends to be more consistently available toward the middle and later half of the 1970's, and because the memories of local personnel concerning of which students in past years were Indian were also better for later years, the total number of potential subjects which could be identified increased over the years (1970-71, 357; 1972-73, 371; 1974-75, 416; 1976-77, 453; 1978-79, 462).

Of the subjects reviewed, 78% had graduated from high school, 3% had earned a GED, 3% were still in high school at the time of the survey, and 16% had dropped out. A look at the 16% who had dropped out of high school uncovers some characteristics of their educational experience, their current employment status, and their occupational choices. A grouping of the dropouts by sophomore year shows no significant change from 1970 to 1979 (1970-71, 20%; 1972-73, 14%; 1974-75, 17%; 1976-77, 17%; 1978-79, 15%). Distribution according to school location indicates that metropolitan schools have fewer dropouts and more graduates than rural/urban/reservation schools (Table 12-2). Most of the dropouts were currently unemployed (20%) or homemakers (33%); some were on active duty in the armed services (4%) or in full or part-time work (50%). Only 2% were engaged in either vocational technical or academic training (Table 12-3).

[3]The 3% percent who earned a GED may be considered to have initially dropped out, and then returned to complete their studies. However, for the remainder of this chapter the more conservative definition of 'dropouts' (i.e., excluding those who earned a GED and including only those who left school before graduation and did not subsequently complete their studies) is used.

TABLE 12-2

PERCENTAGE OF DROPOUTS AND GRADUATES BY PROJECT LOCATION
(Weighted N=2181)

Project Location	N	Dropouts	Graduates
On or near reservation	960	17%	83%
Other rural areas	543	19	81
Urban areas	276	22	78
Metropolitan	402	12	88

*The actual number of cases reporting information on this topic was 1881. The table does not include those still in high school or receiving a GED degree after initially leaving school.

TABLE 12-3

CURRENT EMPLOYMENT STATUS OF DROPOUTS*
(Weighted N=244)

Employment	Dropouts
Full or part-time work	50%
Homemaker	33
Unemployed	20
Active duty in Armed Forces	4
Vocational or technical training	2
Two or four-year academic training	1

*The actual number of cases reporting information on this topic was 216. Data presented in this table were weighted to make the proportion of students supplying information approximately equal across the all Title IV, Part A projects. Responses equal more than 100% due to multiple responses, which are primarily from homemakers who are also employed.

These results confirm the findings of earlier studies regarding the high incidence of Indian student dropout in public schools, and show that the trend has been for the dropout rate to remain relatively constant over the past decade.

B. The Involvement of Title IV, Part A Projects in Reducing Dropout

As discussed earlier in this chapter, the factors which influence the decisions of Indian students to stay in school or to dropout are varied and complex. Many, such as family mobility and socioeconomic status, are outside the control of the educational system proper. However, others of these factors may be dealt with by educational programs and, insofar as they relate to Indian students in particular, are appropriate concerns for Title IV, Part A projects. For this reason, during Development Associates' evaluation of the impact of the Part A Program, information was collected on the extent and perceived impact of Title IV, Part A projects' involvement in reducing dropouts among Indian students. When project directors of Title IV, Part A projects at each of the 115 sites visited for the study were asked to identify the primary objectives of their projects, somewhat over half (58%) indicated that reducing dropout was among them. On the other hand, when principals at schools served by these Title IV, Part A projects were asked to list what they considered to be the primary purposes of the local projects, only 20% listed "reducing student dropouts and increasing student retention." This discrepancy may in part be related to the fact that Title IV, Part A projects, through their cultural and counseling activities, address many of the factors influencing dropout without having specific activities directed to the dropout issue.

Information gathered from project staffs, teachers, and parent committee members at the 115 sites visited also indicates that Title IV, Part A projects were perceived to be having a moderate impact on reducing dropout. Project staff and non-staff teachers of regular school classrooms attended by Indian students, when asked to assess the impact of the Indian education project on reducing dropouts, provided mean ratings of 3.26 and of 3.05, respectively, on an assumed interval scale from 1 (no impact) to 4 (great deal of impact). Similarly, Indian parent committee members, when asked to measure the success of the projects' cultural activities in preventing dropouts, provided mean ratings of 2.99 on an assumed interval scale from 1 (not successful) to 4 (very successful).

C. Summary and Conclusions

Indian dropouts demonstrate many of the same characteristics and motives as their non-Indian counterparts. The situation among Indian students is, however, complicated by culture-specific factors influencing the decision to dropout. As a result, the Indian student dropout rate has consistently been shown to be higher than public school students overall. The data collected for this study on Indian student dropout from public schools over the past decade show that the dropout rate averaged 16%, and was relatively consistent over those years. Thus, available evidence indicates that the level of Indians dropping out of public schools is quite high, although there seems to have been some reduction during the 1960s and 1970s.

When project staff, teachers, and parent committee members were asked to rate the role which local Title IV, Part A projects had played in reducing dropouts, each group gave relatively positive ratings. However, the study's data on the experiences of specific Indian students indicates that, nationally, no substantial change has occurred in the number of Indian dropouts from public schools since Title IV began. Thus, the findings regarding the probable influence of Title IV, Part A on Indian student dropouts are mixed. The behavioral measures regarding a sample of Indian students suggest no change, while parents and school personnel report some positive change as a result of the Program. In the chapter which follows we examine these findings in light of information presented elsewhere in this report in order to better determine what impact Title IV, Part A projects may have had on reducing Indian student dropout.

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CHAPTER 13. SUMMARY AND CONCLUSIONS CONCERNING INDIAN STUDENT PUBLIC SCHOOL ATTENDANCE AND RETENTION/DROPOUT

Blair Rudes

A. Preface

A wide range of findings concerning Indian student attendance and retention, and the role that Title IV, Part A projects have played in this area has been presented. To facilitate an overview, they are summarized here. Additionally, the findings led to several conclusions. These are presented in the final section of this chapter.

B. Summary of Findings

On the basis of a comparison of Indian student attendance rates with national student attendance data, it appears that overall Indian student attendance is in the same range as that of the general population. Overall Indian attendance was relatively stable across the four study years. A breakdown of Indian student attendance data by geocultural region shows that the highest attendance levels occur in the eastern states, in the Mid-South, in Alaska, and in Oklahoma, while the lowest levels are found in the Dakotas and the western states.

The average daily attendance of Indian students generally increased at a decelerating rate from kindergarten through the fifth and sixth grades. From sixth grade to ninth grade, attendance remained relative stable at a high level. Between ninth and eleventh grades, there was a progressive loss of about three days per grade level.

Analyzed in terms of location of school districts, the highest attendance levels occurred at rural, non-reservation sites, except in 1977, when metropolitan schools showed the highest levels. A breakdown of the data by density (proportion of Indian students to the total student population of the school) revealed an inverted bell-pattern, with Indian student attendance highest in schools with either the least or greatest densities of Indian

students. This same pattern was found when the data were analyzed in terms of size of school districts; that is, the smallest and the largest districts had the highest Indian student attendance levels.

An examination of the attendance data in terms of student characteristics showed these to be nearly the same for male and female, the latter averaging less than one day better attendance each year. Indian students with a low SES (as measured by the free lunch program) averaged below the attendance of other Indian students.

In evaluating the role of Title IV, Part A projects in improving the attendance of Indian students, it was found that projects with very low and/or worsening attendance rates tended to devote more hours to improving attendance than did other projects. Furthermore, projects tended to expend a larger percentage of their efforts during school hours as the attendance problems increased.

When the analysis focused on only those Indian students with low attendance (150 or fewer days) in 1979, it was found that their attendance had improved an average of over 15 days between 1979 and 1980. Moreover, the low attendance students who had gained 15 or more days between 1979 and 1980 had been served by projects that expended more extensive efforts in 1981-82 - in terms of hours of service per year - on improving attendance. Rural, non-reservation projects were found to be the most effective in improving the attendance of the low attending Indian students.

The analysis of parent, classroom teacher, and project staff ratings of Title IV, Part A project impact on attendance revealed positive mean ratings for all three groups, with the latter rating the impact of the project highest. Within all three groups, respondents from metropolitan projects reported less impact than those from other locations, and respondents from rural and reservation projects reported the greatest impact.

A literature review revealed that, notwithstanding a range in estimates of 14-60%, Indian dropout rates were, in each case, markedly higher than the overall dropout rates cited. For Indian student dropouts, like their

non-Indian counterparts, socioeconomic problems have much to do with the dropout rate. Culture-specific factors associated with Indian lifestyle and environment, and the educational system's perceived lack of relevance or sensitivity to Indians, were also cited as factors. The Development Associates data, gathered from sites receiving Part A funds, affirmed this pattern, revealing further a sizable average dropout rate of 16%, which has remained relatively constant throughout the ten year period examined. Nevertheless, project staff, classroom teachers, and parent committee members at these sites gave generally positive ratings concerning the effect of the local projects in reducing dropout.

C. Conclusions

Several conclusions can be drawn from the information presented. First, it appears that the attendance problem is no greater among Indian students than among the general student population. Second, where Indian student attendance is below the mean attendance rate for all Indian students, Title IV, Part A projects are addressing the problem, with more time spent during school hours as the problem increases. Third, the data show that, at least for Indian students in the low attendance group, the Title IV, Part A projects which spend more effort on improving attendance may be having positive impacts.

Regarding Indian student retention, no hard evidence was found to support a view that Title IV, Part A projects have had an impact. While local perceptions of the role of Title IV, Part A projects in reducing dropout were positive, the Indian student dropout rate remained relatively constant over the past ten years. A somewhat similar pattern was found for attendance; that is, although local perceptions of project impact on improving attendance were positive, this was not reflected in substantial changes in the overall Indian student attendance rates. Specific analyses of the low attendance Indian students, however, demonstrated apparent improvements in attendance within this group as a result of the projects. Thus, where small numbers of Indian students have been retained as a result of Title IV, Part A project activities, the local perceptions of project impact may be based on these cases, which may not be sufficient to significantly influence the national

trends. Also, local perceptions of dropout rate were collected for the last school year, but dropout data for the past three years is undetermined.

In addition to examining the rate at which Indian students remained or dropped out, data were collected on post-secondary experiences, and on the aspirations held by students still in school. The findings are presented in the next section of this report.

PART C: POST-SECONDARY KNOWLEDGE, ASPIRATIONS, AND EXPERIENCES

Guidance and career counseling activities are key components of many Title IV, Part A projects. A review of needs assessments for Part A projects showed that guidance and career counseling was the third most frequently mentioned need (behind basic skills and cultural/historical components). Also, in three-quarters of projects where the need for career counseling was identified, the need was addressed through Part A objectives and activities.

Even in projects which did not have formal career counseling components, there was likely to be some informal career counseling. An unstated objective of many projects was to provide role models for Indian students, and most Part A staff members had had some form of post-secondary education.

Data were therefore collected to assess the knowledge and aspirations of Indian students toward post-secondary education, and the actual experiences of Indian students after high school. Data on post-secondary knowledge and aspirations were collected from Indian secondary school students, and are presented in Chapter 14. Data on post-high school experiences of former Indian students were collected from various sources in the school and the community, and are presented in Chapter 15.

CHAPTER 14: KNOWLEDGE AND ASPIRATIONS OF CURRENT PUBLIC HIGH SCHOOL STUDENTS WITH RESPECT TO POST-SECONDARY ACADEMIC OPPORTUNITIES

Paul Hopstock

As part of Development Associates' spring 1982 data collection, Indian students in grades 10-12 were asked a series of questions about their knowledge of post-secondary academic opportunities and whether they desired to obtain post-secondary schooling. A total of 2,860 Indian students in grades 10-12 completed the student questionnaire, and approximately 95% of these completed the items on post-secondary knowledge and aspirations.

There were three main areas of questions concerning post-secondary academic knowledge and aspirations. Students were asked whether:

(1) Anyone in the school had talked to them about going to school after high school, and if anyone had encouraged them to go on to school;

(2) They knew about colleges and vocational schools, scholarships for Indian students, and special schools or programs for Indian students; and

(3) They would like to continue their education after high school, and if so, where.

The results on these three areas of questions are presented in separate sections below.

A. Interactions With School Staff

Students were first asked if anyone in the school had talked to them about colleges, universities, or vocational/technical schools where they might go after finishing high school. Three-quarters (75%) of the students reported that they had had such conversations. Table 14-1 shows the percentages of all responding students who reported conversations with various types of school officials. (Because students could report conversations with more than one type of school official, the percentages in Table 14-1 total more than 100%.)

The data indicate that students are most likely to talk to guidance counselors and teachers about post-secondary opportunities. Almost a quarter of the

TABLE 14-1

PERCENTAGE OF STUDENTS REPORTING CONVERSATIONS WITH SCHOOL OFFICIALS ABOUT POST-SECONDARY EDUCATION (N=2759)

Type of School Official	Percentage of All Students
Guidance counselors	52%
Teachers	36
Indian education project staff	22
Principals or assistant principals	9
Others	14

responding students, however, indicated that they had had conversations about post-secondary opportunities with Indian Education project staff.

In order to gain additional information on the impact of the Title IV, Part A Program, students were divided (based on a series of screening questions) into those who had definitely had contact with the Program, those who might have had contact with the Program,[1] and those with no contact with the Program during the 1981-82 school year. Table 14-2 shows that students who had contact with Title IV, Part A were more likely to have discussed post-secondary opportunities with school officials than those who had not had such contact.

TABLE 14-2

CONVERSATIONS ABOUT POST-SECONDARY SCHOOLS BASED ON CONTACT WITH THE PART A PROGRAM

Conversations About Post-Secondary Schools	Contact With The Part A Program		
	Yes (N=1601)	Perhaps (N=1024)	No (N=133)
Yes	79%	70%	65%
No	21	30	35
Total	100%	100%	100%

$X^2 = 30.13$, df = 2, $p < .001$.

[1] These students' responses regarding program participation were ambiguous, suggesting that at most their contact was quite limited.

(Chi-square tests of statistical significance are used throughout this chapter to determine between-group differences.)

Whether students had talked to someone in the school about post-secondary academic opportunities also was related to certain student and project characteristics. Female students were more likely to have had such conversations than male students, and students in higher grades were more likely to have had conversations than students in lower grades (see Table 14-3). This latter finding was expected, since students in higher grades are closer to actually entering post-secondary institutions. Students who attended schools on or near reservations, in metropolitan areas (in or near cities of 50,000 or more), or in other urban areas (cities of 10,000-50,000) were more likely than students in non-reservation rural areas to have discussed post-secondary opportunities with school officials (the percentages of positive responses were 77%, 76%, 74%, and 70% respectively, with X^2 = 11.30, df = 3, $p < .05$).

TABLE 14-3

CONVERSATIONS ABOUT POST-SECONDARY OPPORTUNITIES BY GRADE AND SEX

Conversations About Post-Secondary Schools	Males Grade 10 (N=486)	Males Grade 11 (N=456)	Males Grade 12 (N=344)	Females Grade 10 (N=545)	Females Grade 11 (N=531)	Females Grade 12 (N=396)
Yes	61%	72%	87%	68%	76%	92%
No	39	28	13	32	24	8
Total	100%	100%	100%	100%	100%	100%

X^2 (Sex) = 11.36, df = 1, $p < .001$ X^2 (Grade) = 142.64, df = 2, $p < .001$

Another question asked of students was whether anyone in the school had encouraged them to go on to a college, university, or vocational/technical school after graduating from high school. Approximately 70% of Indian students responded that they had been so encouraged. When they were asked what kind of school had been recommended, 45% of all responding students said

that they had been encouraged to attend a college or university, 16% said that vocational school, 5% said that no particular type of school had been mentioned, and 1% said they had been encouraged to attend some other kind of school. Exposure to the Title IV, Part A Program appears to have increased the likelihood that attendance at a post-secondary school was encouraged. As Table 14-4 indicates, 10% more of those students who had contact with the Program than those who did not have contact were encouraged to attend a post-secondary school.

TABLE 14-4

ENCOURAGEMENT OF POST-SECONDARY EDUCATION BY LEVEL OF CONTACT WITH THE PART A PROGRAM

Encouragement of Post-Secondary Education	Contact With The Part-A Program		
	Yes (N=1544)	Perhaps (N=974)	No (N=123)
Yes	72%	66%	62%
No	28	34	38
Total	100%	100%	100%

$X^2 = 15.44$, df = 2, $p < .001$.

The extent to which students reported that they had been encouraged to attend post-secondary school was also strongly related to the grade and sex of the student. Females were more likely than males to report that they had been encouraged, and students in higher grades were more likely to report such encouragement than students in lower grades (see Table 14-5). Perhaps not surprisingly, males were more likely than females to be encouraged to attend vocational schools (21% versus 12% of all students), while females were more likely than males to be encouraged to attend colleges or universities (52% versus 37%).

TABLE 14-5

ENCOURAGEMENT OF POST-SECONDARY EDUCATION BY GRADE AND SEX

Encouragement for Post-Secondary Schools	Males Grade 10 (N=453)	Males Grade 11 (N=438)	Males Grade 12 (N=336)	Females Grade 10 (N=519)	Females Grade 11 (N=514)	Females Grade 12 (N=381)
Yes	58%	63%	77%	67%	71%	87%
No	42	37	23	33	29	13
Total	100%	100%	100%	100%	100%	100%

X^2 (Sex) = 22.08, df = 1, $p < .001$ X^2 (Grade) = 78.28, df = 2, $p < .001$

B. Knowledge of Post-Secondary Opportunities

The second area of questions which was asked of Indian students concerned their knowledge of post-secondary academic opportunities. In particular, they were asked if they knew:

1) Where to go if they wanted to find out more information about universities, colleges, or vocational/technical schools;

2) Any grants or scholarships that give Indian students money to go to a college or university;

3) Where to go if they wanted to learn more about grants or scholarships for Indian students;

4) Any colleges, universities, or vocational/technical schools in the United States that are mostly for Indian students; and

5) Any colleges or universities in the United States that have programs specifically for Indian students.

In all five questions, students were asked to name a specific source of information, grant, or post-secondary school. The number of Indian students who indicated that they had knowledge in each of the five areas is illustrated in Table 14-6. Students reported having knowledge in an average of 1.9 of the five areas.

TABLE 14-6

KNOWLEDGE OF POST-SECONDARY OPPORTUNITIES
(N=2743)

Area of Knowledge	Percentage of Students
Where to go for information on schools	67%
Grants or scholarships for Indian students	32
Where to go for information on grants	39
Schools that are mostly for Indian students	33
Schools with special programs for Indian students	20

Whether or not students had had contact with the Title IV, Part A project had a significant impact on knowledge of post-secondary opportunities. Table 14-7 shows that for each of the five knowledge areas, students who had contact with the Title IV, Part A project were more likely to have knowledge than students without contact.

TABLE 14-7

KNOWLEDGE OF POST-SECONDARY OPPORTUNITIES BY LEVEL OF CONTACT WITH THE PART A PROGRAM
(Percentage of students indicating knowledge)

Area of Knowledge	Contact With The Title IV-A Program		
	Yes (N=1593)	Perhaps (N=1019)	No (N=131)
Where to go for information on schools[a]	70%	64%	57%
Grants or scholarships for Indian students[b]	36	27	31
Where to go for information on grants[c]	44	33	27
Schools that are mostly for Indian students[d]	37	26	32
Schools with special programs for Indian students[e]	24	14	18
Mean number of areas indicated	2.1	1.6	1.6

[a] $\chi^2 = 17.94$, df = 2, p < .001
[b] $\chi^2 = 21.84$, df = 2, p < .001
[c] $\chi^2 = 41.22$, df = 2, p < .001
[d] $\chi^2 = 40.98$, df = 2, p < .001
[e] $\chi^2 = 35.41$, df = 2, p < .001

There were also a number of student and project characteristics which were related to the extent of knowledge of post-secondary opportunities. Students in higher grades had considerably more knowledge than did students in lower grades, and females had more knowledge than males. Table 14-8 shows the mean number of areas about which students reported they had knowledge, by grade and by sex.

TABLE 14-8

KNOWLEDGE OF POST-SECONDARY OPPORTUNITIES BY GRADE AND SEX
(Mean number of areas reported)

Sex	Grade 10 (N=1028)	11 (N=979)	12 (N=739)
Male	1.4	1.7	2.4
Female	1.6	1.9	2.7

F (Sex) = 16.64, df = 1/2740, p < .001
F (Grade) = 117.46, df = 2/2740, p < .001

In terms of project characteristics, the data indicate that students attending schools on or near reservations had more knowledge of academic opportunities than did students in other geographic settings. Students in schools on or near reservations reported knowledge in an average of 2.1 of these five areas, while students in other settings reported knowledge in an average of 1.7 of the areas (F = 12.00, df = 3/2742, p < .001). Students on or near reservations were more likely to report knowledge on availability of scholarships, the presence of special schools for Indians, and the presence of special programs for Indians. There were no significant differences in terms of knowledge concerning where to go to learn more about post-secondary schools or where to go to learn more about scholarships.

There was a difference in level of knowledge of post-secondary opportunities based on the presence or absence of a counseling component in the Title IV, Part A project. Students in projects with a counseling component (59

projects) reported knowledge in an average of 2.0 of the five areas, while students in projects without a counseling component (55 projects) reported knowledge in an average of 1.8 areas ($F = 12.30$, $df = 1/2733$, $p < .001$). The differences between groups were significant in the areas of where to go for information on grants, schools that are mostly for Indian students, and schools with special programs for Indian students. There were no significant differences in the areas of where to go for information on post-secondary schools, and grants or scholarships for Indian students.

C. Aspirations For Post-Secondary Education

The third area asked of Indian students concerned their aspirations for post-secondary education. Students were asked if they would like to continue their education after high school, and, specifically, if they would like to attend a vocational/technical school and/or a college or university. Nine out of ten (90%) Indian students reported that they had post-secondary academic aspirations, with 32% of those specifying that they would like to attend a vocational/technical school, and 53% specifying that they would like to attend a college or university.

Aspirations for post-secondary education were more likely among those students with contact with the Title IV, Part A project than among students without contact. As Table 14-9 indicates, students with contact with the Title IV, Part A project were more likely to desire to go to a college or university, but were not more likely to desire to go to a vocational/technical school.

TABLE 14-9

ASPIRATIONS FOR POST-SECONDARY EDUCATION BY LEVEL OF CONTACT WITH THE PART A PROGRAM
(Percentage of students)

Aspirations for attending. . .	Contact With The Title IV-A Program		
	Yes (N=1580)	Perhaps (N=1002)	No (N=128)
Some form of post-secondary school[a]	92%	89%	87%
A vocational/technical school[b]	31	36	30
A college or university[c]	56	49	52

[a] $\chi^2 = 7.67$, df = 2, $p < .05$
[b] $\chi^2 = 8.04$, df = 2, $p < .05$
[c] $\chi^2 = 15.97$, df = 2, $p < .001$

Post-secondary aspirations also depended upon certain student characteristics. As Table 14-10 shows, females were more likely than males to want to go to a college or university, while males were more likely to want to go on to a vocational/technical school. Aspirations for vocational/technical training also increased from grade 10 to grade 12, while aspirations for attending a college or university decreased. These changes may indicate that there is an increasing vocational orientation as students approach graduation.

TABLE 14-10

ASPIRATIONS FOR POST-SECONDARY EDUCATION BY GRADE AND SEX
(Percentage of students)

Aspirations for attending. . .	Males Grade 10 (N=470)	Males Grade 11 (N=447)	Males Grade 12 (N=343)	Females Grade 10 (N=537)	Females Grade 11 (N=520)	Females Grade 12 (N=393)
Some form of post-secondary school[a]	87%	87%	92%	92%	94	92
A vocational/technical school[b]	36	39	42	22	30	31
A college or university[c]	51	44	45	61	57	58

[a] X^2 (Sex) = 21.06, df = 1, $p < .001$ X^2 (Grade) = 0.99, df = 2, n.s.
[b] X^2 (Sex) = 28.41, df = 1, $p < .001$ X^2 (Grade) = 14.79, df = 2, $p < .001$
[c] X^2 (Sex) = 66.95, df = 1, $p < .001$ X^2 (Grade = 6.32, df = 2, $p < .05$

The other student characteristic which was related to post-secondary aspirations was achievement on standardized tests.[2] Table 14-11 summarizes the mean standardized (X = 50, S.D. = 10) reading and mathematics scores of Indian students who did and did not have aspirations for post-secondary education. The results indicate that students who had aspirations for college had higher reading and mathematics scores than students without college aspirations, but that there were no significant differences in test scores between those who aspired to vocational/technical schools and those who did not.

[2]Achievement test scores from the 1980-81 school year were available for 1,418 tenth to twelfth grade students who completed the questions on post-secondary knowledge and aspirations in 1982. See Chapter 4 for a discussion of the procedures used in obtaining and analyzing these test score data.

TABLE 14-11

MEAN STANDARDIZED READING AND MATHEMATICS SCORES
BY TYPE OF POST-SECONDARY ASPIRATIONS

Aspirations to attend . . .	Mean Reading Score (N=705)	Mean Math Score (N=713)
Some form of post-secondary school		
Yes	47.6	48.2[1]
No	45.0	44.8
A vocational/technical school		
Yes	46.1	47.1
No	48.2	48.6
A college or university		
Yes	49.1[2]	49.7[3]
No	44.9	45.6

[a] $F = 4.00$, $df = 1$, $p < .05$ [b] $F = 5.30$, $df = 1$, $p < .05$
[c] $F = 5.56$, $df = 1$, $p < .05$

Post-secondary aspirations also related to certain project characteristics. As Table 14-12 shows, students in projects on or near reservations or in other rural areas were more likely to desire to attend vocational/technical schools, while students in projects in metropolitan areas were more likely to desire to attend a college or university.

TABLE 14-12

POST-SECONDARY ASPIRATIONS OF STUDENTS BY PROJECT LOCATION
(Percentage of students)

Aspiration to attend. . .	Geographic Location: On or Near a Reservation (N=1435)	Other Rural Area (N=654)	Urban Area (N=291)	Metropolitan Area (N=330)
Some form of post-secondary school[a]	92%	87%	86%	92%
A vocational/technical school[b]	36	32	26	24
A college or university[c]	53	52	47	64

[a] $\chi^2 = 24.26$, $df = 3$, $p < .001$ [b] $\chi^2 = 25.62$, $df = 3$, $p < .001$
[c] $\chi^2 = 18.93$, $df = 3$, $p < .001$

D. Summary

A majority of Indian students have talked to school officials about post-secondary academic opportunities, have been encouraged to attend post-secondary school, and would like to attend such a school. Indian students also have moderate levels of knowledge concerning post-secondary opportunities. The Title IV, Part A Program appears to be a stimulus to post-secondary education. Students who had contact with the Program in the 1981-82 school year reported more knowledge of post-secondary opportunities, and indicated higher levels of post-secondary academic aspirations. Indian females were more likely than Indian males to want to go to college, while the latter were more likely to want to go to vocational/technical school. The location of the school was also related to students' knowledge of post-secondary opportunities and aspirations for post-secondary study. The relationships between student post-secondary knowledge and aspirations and a number of other variables (educational level of the project director, perceived success of a counseling component, etc.) were also examined, but the results failed to provide unambiguous explanations of the basic findings.

CHAPTER 15: TRENDS IN POST-HIGH SCHOOL ACTIVITIES OF INDIAN STUDENTS

Paul Hopstock and Teresa LaFromboise

As a part of the fall data collection in Development Associates' evaluation of the Title IV, Part A Program, information was collected concerning the academic and vocational experiences of past Indian students. A sample of Indian students who had been sophomores in high school in the school years 1970-71, 1972-73, 1974-75, 1976-77, and 1978-79 was selected, and data collectors sought out persons (principals, counselors, parents, etc.) who had knowledge of those past students. Knowledgeable persons were asked to describe the experiences of the former students in terms of high school completion, other education experiences, present working status, and vocational category. The results on high school completion have been presented previously in Chapter 12. Results concerning academic and vocational experiences are presented in this chapter.

Data were collected concerning a total of 2,098 students. Because the selection procedure was such that different proportions of students were selected at different sites, the data were subsequently weighted so that the final analysis sample included 2,438 cases. The data on those 2,438 cases are presented below.

A. Educational Experiences

As described in Chapter 12, of those Indian students in the sample who had stayed in school until tenth grade, 78% had graduated from high school, an additional 3% had passed a high school equivalency test such as a GED, and 3% were still in high school. This means that the dropout rate was 16% for those students in the sample.

For those former students who had graduated from high school or passed a high school equivalency test, respondents were asked to describe their highest level of educational attainment. The overall results on this question are presented in Table 15-1. These data indicate that the majority of Indian high school graduates had gone on to some form of post-secondary school, with 23% having attended a vocational, trade, or business school, and 34% having attended college.

TABLE 15-1

HIGHEST EDUCATIONAL LEVEL OF INDIAN HIGH SCHOOL GRADUATES
(N=1654)

Highest Educational Level	Percentages of Former Student
High school only	43%
Less than two years of vocational school	16
Two or more years of vocational school	7
Some college (including two-year degree)	28
Completed college (four or five year degree)	5
Master's or doctoral degree	1
Total	100%

There are significant differences in the highest educational level attained for the different high school cohort groups. As Table 15-2 shows, those in the later cohort groups were less likely to have finished college than those in earlier cohort groups. In many cases, this is likely to be true because the students are still in college and have not yet completed their degrees.

TABLE 15-2

HIGHEST EDUCATION LEVEL OF INDIAN HIGH SCHOOL GRADUATES
BY SCHOOL COHORT GROUP

Highest Educational Level	Sophomores in .... 1970-71 (N=281)	1972-73 (N=290)	1974-75 (N=322)	1976-77 (N=364)	1978-79 (N=362)
High school only	43%	41%	47%	42%	40%
Less than two years of vocational school	16	16	16	18	15
Two or more years of vocational school	8	8	11	6	4
Some college (including two year degree)	25	24	20	30	40
Completed college (four or five year degree)	8	10	5	4	2
Master's or doctoral degree	1	1	1	0	0
Total	100%	100%	100%	100%	100%

$X^2=77.97$, df=24, $p < .001$

If all students who have any college experience are placed in the same category, the 1978-79 cohort group had more students attending college than average, and the 1974-75 cohort group had fewer college students than average. There were also sex differences in educational level. As Table 15-3 shows, Indian females were more likely to attend and complete college than were males, while Indian males were more likely to end their education with high school.

TABLE 15-3

HIGHEST EDUCATIONAL LEVEL OF INDIAN HIGH SCHOOL GRADUATES BY SEX

(Percentage of students)

Highest Educational Level	Males (N=853)	Females (N=771)
High school only	48%	39%
Less than two years of vocational school	15	17
Two or more years of vocational school	8	7
Some college (including two year degree)	25	31
Completed college (four or five year degree)	4	6
Master's or doctoral degree*	0	0
Total	100%	100%

$X^2=16.88$, df=6, $p < .01$

*For both males and females, the percentage attaining advanced degrees was 0.2%.

The highest educational level of the high school graduates also depended upon the location of the school which they attended. As Table 15-4 illustrates, the college completion rates of those on or near reservations and in urban areas (cities of 10,000-50,00) were lower than for those in rural or metropolitan (in or near a city of 50,000 or more) areas.

TABLE 15-4

HIGHEST EDUCATIONAL LEVEL OF INDIAN HIGH SCHOOL GRADUATES
BY SCHOOL LOCATION
(Percentage of total)

Highest Educational Level	School Location			
	On or Near Reservation (N=725)	Other Rural (N=428)	Urban (N=191)	Metropolitan (N=310)
High school only	43	41	44	43
Less than two years of vocational school	17	13	18	18
Two or more years of vocational school	7	8	5	6
Some college (including two year degree)	29	29	27	26
Completed college (four or five year degree)	3	9	3	7
Master's or doctoral degree	0	0	2	0
Total	100%	100%	100%	100%

$X^2=35.06$, df=18, $p<.01$

B. Present Vocational/Educational Status

Respondents were asked to describe what the former student was doing at the time of the interview.[1] In most cases only one response to this question was given, but in 9% of the cases, at least two responses were given. Table 15-5 shows the overall percentage of former students who were reported to be engaged in each type of activity.

[1] In only 79% of all cases was the respondent able to describe the present status of the selected students. An analysis of the valid and missing cases indicated that high school dropouts were slightly underrepresented on this question. The response biases were small enough, however, that we believe that the response distributions were not seriously affected.

TABLE 15-5

PRESENT STATUS OF FORMER STUDENTS
(N=1825)

Status	Percentage of Former Students*
Working for pay at a full-time or part-time job	57%
Taking vocational or technical courses at any kind of school or college	6
Taking academic courses at a college	15
On active duty in the Armed Forces	4
Homemaker	18
Laid off, looking for work, waiting to report to work	9

*Percentage totals to more than 100% because in some cases more than one response was given.

There were considerable differences in present status for the different school cohort groups. As shown in Table 15-6, those in later cohort groups were more likely to be attending vocational school, attending college, or on active duty in the Armed Services, while those in earlier cohort groups were more likely to be homemakers or to be working for pay. These findings are not at all surprising given the expected ages of the cohort groups.

Present status was also strongly related to the sex of the former student. Indian males were more likely than Indian females to be working for pay full-time or part-time, on active duty with the Armed Forces, or laid off, looking for work, or waiting to report to work. Indian females, on the other hand, were more likely to be homemakers or to be taking academic courses at a college (see Table 15-7).

TABLE 15-6

PRESENT STATUS OF FORMER STUDENTS BY SCHOOL COHORT GROUP

Status	Sophomores in ...* 1970-71 (N=322)	1972-73 (N=324)	1974-75 (N=356)	1976-77 (N=399)	1978-79 (N=383)
Working for pay at a full-time or part-time job	68%	69%	61%	51%	40%
Taking vocational or technical courses at any kind of school or college	3	3	2	7	12
Taking academic courses at a college	4	6	10	16	36
On active duty in the Armed Forces	2	3	5	8	5
Homemaker	24	20	21	16	10
Laid off, looking for work, waiting to report for work	10	6	11	11	6

*Percentages may total to more than 100% because in some cases more than one response was given.

TABLE 15-7

PRESENT STATUS OF FORMER STUDENTS BY SEX
(Percentage of total)[a]

Status	Males (N=901)	Females (N=991)
Working for pay at a full-time or part-time job[b]	62%	47%
Taking vocational or technical courses at any kind of school or college	5	5
Taking academic courses at a college[c]	12	16
On active duty in the Armed Forces[d]	8	1
Homemaker[e]	1	32
Laid off, looking for work, waiting to report to work[f]	11	6

[a]Percentages do not necessarily add to 100% because of rounding error and because more than one response was sometimes given.

[b]$\chi^2=34.78$, df=1, $p < .001$
[c]$\chi^2=6.83$; df=1, $p < .01$
[d]$\chi^2=42.05$, df=1, $p < .001$
[e]$\chi^2=269.17$, df=1, $p < .001$
[f]$\chi^2=9.47$, df=1, $p < .01$

The location of the school which the former student attended was also related to present status. The pattern of the data is rather complex, but as Table 15-8 illustrates, those who attended school on or near reservations or in cities of 10,000-50,000 were more likely to be either employed for pay or serving as a homemaker, while those in other rural areas or in metropolitan areas (50,000 or more) were more likely to be taking academic courses.

TABLE 15-8

PRESENT STATUS OF FORMER STUDENTS BY SCHOOL LOCATION
(Percentage of total)[a]

Status	School Location			
	On or Near Reservation (N=836)	Other Rural (N=505)	Urban (N=256)	Metropolitan (N=327)
Working for pay at a full-or part-time job[b]	51%	59%	50%	60%
Taking vocational or technical courses at any kind of school or college[c]	6	3	4	8
Taking academic courses at a college[d]	13	18	10	15
On active duty in the Armed Forces	5	4	3	4
Homemaker[e]	17	14	25	15
Laid off, looking for work, waiting to report for work	10	6	9	8

[a]Percentages may total to more than 100% because in some cases more than one response was given.

[b]$\chi^2=13.90$, df=3, $p < .01$

[c]$\chi^2=9.79$, df=3, $p < .05$

[d]$\chi^2=8.56$, df=3, $p < .05$

[e]$\chi^2=14.91$, df=3, $p < .01$

C. Occupational Categories

For those former students who were employed full-time or part-time, respondents were asked to describe the type of work in which the former student was engaged. In this item, as with the previous one, respondents were allowed to give more than one response, though in only 1% of cases did they do so.

Table 15-9 presents the occupational distribution for the overall population and for males and females separately. As might be expected, males were more likely to be employed in occupational categories such as craftsman, laborer, military, and operator, while females were more likely to be employed in clerical, service, and homemaker positions.

TABLE 15-9

OCCUPATIONAL DISTRIBUTION OVERALL AND BY SEX
(Percentage of total)*

Occupation	Overall (N=1348)	Males (N=610)	Females (N=716)
Clerical	17%	4%	28%
Craftsman	7	15	1
Farmer or farm manager	1	1	0
Homemaker or housewife	18	0	34
Laborer	18	35	4
Manager or administrator	2	3	2
Military	6	11	2
Machine or vehicle operator	7	10	4
Professional	5	3	6
Proprietor or owner	1	2	0
Protective service	2	3	1
Sales	4	2	5
Service	10	7	12
Technical	2	3	1
Other	1	2	0

*Percentages may total to more than 100% because in some cases more than one response was given.

There were also occupational differences based on the school cohort group to which the former student belonged. As shown in Table 15-10, those in earlier cohort groups were more likely to be employed as craftsmen, professionals, managers, and homemakers, while those in later cohort groups were more likely to be employed as laborers, service workers, sales people, or by the military. These occupational differences for the school cohort groups probably reflect age differences in employment patterns rather than long-term career differences.

TABLE 15-10

OCCUPATIONAL DISTRIBUTION BY SCHOOL COHORT GROUP
(Percentage of total)*

Occupation	Sophomores in ... 1970-71 (N=278)	1972-73 (N=284)	1974-75 (N=281)	1976-77 (N=282)	1978-79 (N=190)
Clerical	20%	14%	19%	12%	15%
Craftsman	6	13	6	7	4
Farmer or farm manager	2	1	0	0	0
Homemaker or housewife	20	19	19	18	14
Laborer	16	16	18	20	21
Manager or administrator	3	4	3	1	1
Military	2	3	6	10	10
Machine or vehicle operator	5	8	9	7	8
Professional	9	7	5	1	3
Propretor or owner	3	0	1	0	0
Protective service	2	2	1	3	1
Sales	3	3	1	6	5
Service	8	8	8	11	17
Technical	3	2	2	2	2
Other	1	0	2	2	0

*Percentages may total to more than 100% because in some cases more than one response was given.

D. Summary

The data on post-high school activities of Indian students indicate that approximately 40% of those who were in school up to the tenth grade went on to some form of post-secondary education. The data are not representative of the entire Indian population, however, because a number of Indian students drop out before they reach the tenth grade. Indian females were more likely to go on to college than were Indian males, who were more likely to finish their education with high school. At the time of the study, 57% of the former students were members of the paid civilian workforce, 6% were taking vocational or technical courses, 15% were taking academic courses, and 9% were laid off or looking for work. Among those who were employed, the most common occupational categories were laborers (18%), homemakers (18%), clerical personnel (17%), and service workers (10%).