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ABSTRACT

The judgment of whether or not a city's Title I reading program is a success is dependent upon the length of time used in the evaluation. This study's findings that estimates of achievement rates and judgments of success were dramatically affected by the length of time used in the evaluation was consistent across all the compensatory education programs investigated. Specifically, the inclusion of the summer months in an evaluation often reduces considerably estimates of achievement and hence monthly achievement rates. In other words, achievement gains made during the school year were not sustained even until the next fall. These findings are based on analysis of matched, longitudinal samples containing over 8,700 students and are unaffected by grade level, the subject area, the program, the standardized achievement test or the metric used in the analysis. (RC)

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AN ANALYSIS OF LONGITUDINAL DATA FROM COMPENSATORY EDUCATION PROGRAMS

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This paper is based on work done at Stanford Research Institute for the Office of the Assistant Secretary for Education (Contract No. 300-76-0025) and for the National Institute of Education (Contract No. 400-75-0066).

SRI's study of the achievement of students in ESEA Title I programs began with a report entitled "Patterns in ESEA Title I Reading Achievement." The report used as its primary data source six years of state Title I evaluation reports supplemented by interviews with various members of state Title I offices. Based on the analysis of these data, Title I seemed to be having a substantial impact on the reading achievement of disadvantaged students. For each grade and each year from 1971 to 1974, the averages of the states' monthly gains were consistently near 1.1 grade-equivalent months. Since these rates exceeded the unofficial standard of success, which is an average monthly gain of exactly one grade-equivalent month, Title I appeared to be quite successful.

To verify these conclusions, the report then analyzed the results of three statewide annual testing programs. If Title I were having a substantial impact on achievement, we expected to detect an upward shift over time in the scores of low-percentile students (those students most likely to be in Title I programs). However, since the inception of Title I, there has been no such upward shift. In fact, we were not able to detect any Title I impact on achievement.

We suspected that the apparent contradiction in our findings was caused by the increases in achievement not being sustained during the summer which followed the program. A major goal of Title I is to increase the expected achievement of disadvantaged students in order to improve their academic futures. But to change students' academic futures, the increase in achievement must persist, at least over the summer following a school-year program.

To evaluate whether or not gains were being sustained and to resolve the paradoxical results of our first report, SRI conducted two further studies of the achievement of compensatory education students, one study for the Office of the Assistant Secretary for Education and one for the National Institute of Education. These studies analyzed data from evaluations of several compensatory education programs. All the programs spanned several grades and had collected data annually in both the fall and spring. The data from each program originally had been collected as part of an annual evaluation and, therefore, were cross-sectional by year. By matching students across time and test administrations, we were able to create longitudinal data that permitted us to determine, for a given group of students, the extent to which achievement gains were sustained, at least until the beginning of the next school.

We present in this paper one set of data that illustrates our findings and a summary of all the programs studied. We obtained data from students who had participated in a city-wide Title I reading program in a large midwestern city, which we will refer to as City M. All our analyses were performed in grade-equivalents since we could only obtain grade-equivalent scores. For each grade level, a sample was defined consisting only of students who received the Reading Comprehension section of the Gates-MacGinitie Reading Test three consecutive times: fall and spring of one school year and fall of the next school year. To evaluate the extent to which achievement gains were sustained, we calculated the

sample means for the three test administrations and compared rates of achievement from two different periods of time: the traditional fall-to-spring evaluation period and a 12-month, fall-to-fall period.

The first three columns of Table 1 contain the means and standard deviations for these samples. Since we used data from a matched longitudinal sample, all means for each grade are based on exactly the same group of students. An examination of the means shows that students make large gains during the school year and suffer large losses over the summer. We converted the gains into monthly rates of achievement for two time periods, fall to spring and fall to fall, by dividing each gain by the number of months between the two test administrations (see table footnote). If the program were judged on the basis of only the fall and spring means, the program would be considered a success--gains and rates of achievement are higher than expected. For example, the fall-to-spring rates of achievement in Column IV are consistently greater than the month-for-month standard for success. However, if the program were judged on the basis of the two fall means--that is, judged over a 12-month period--the program appears to have little impact. The rates of achievement in Column V are about what would be expected without any compensatory education program. Figure 1 presents the same results graphically.

Clearly, the judgment of whether or not City M's reading program is a success is dependent upon the length of time used in the evaluation. Our finding that estimates of achievement rates and judgments of success

Table 1

CITY M MEANS, STANDARD DEVIATIONS AND MONTHLY RATE OF ACHIEVEMENT OVER TWO TIME PERIODS, IN GRADE EQUIVALENTS FOR THE GATES-MacGINITIE READING TEST AVERAGED ACROSS COHORTS FOR STUDENTS IN THE MATCHED, LONGITUDINAL SAMPLE

		Means and Standard Deviations in Grade-Equivalent Years			Monthly Rate of Achievement in Grade-Equivalent Months*	
		I	III	III	IV	V
Grade	N	Fall	Spring	Fall	Fall to Spring	Fall to Fall
Third	272	2.23 (1.04)	3.29 (1.42)	2.78 (.96)	1.5	.6
Fourth	931	2.65 (.83)	3.58 (1.19)	3.18 (.96)	1.3	.5
Fifth	980	3.26 (.99)	4.30 (1.38)	4.01 (1.30)	1.5	.8
Sixth	316	3.85 (1.20)	4.78 (1.47)	4.42 (1.32)	1.3	.6
Seventh	128	4.35 (1.24)	5.25 (1.68)	4.95 (1.41)	1.3	.6

*To calculate the monthly rate of achievement, the number of grade-equivalent months gained during each period of time (based on the means in Columns I, II, and III) is divided by the number of grade-equivalent months between test administrations. There were seven grade-equivalent months between the fall and spring test administrations, so the fall-to-spring gain is divided by seven. By definition a grade-equivalent year is composed of the grade-equivalent months; therefore, the annual fall-to-fall gain is divided by ten.

CITY M MEANS IN GRADE EQUIVALENTS FOR THE GATES-MacGINITIE READING TEST FOR STUDENTS IN THE MATCHED LONGITUDINAL SAMPLE

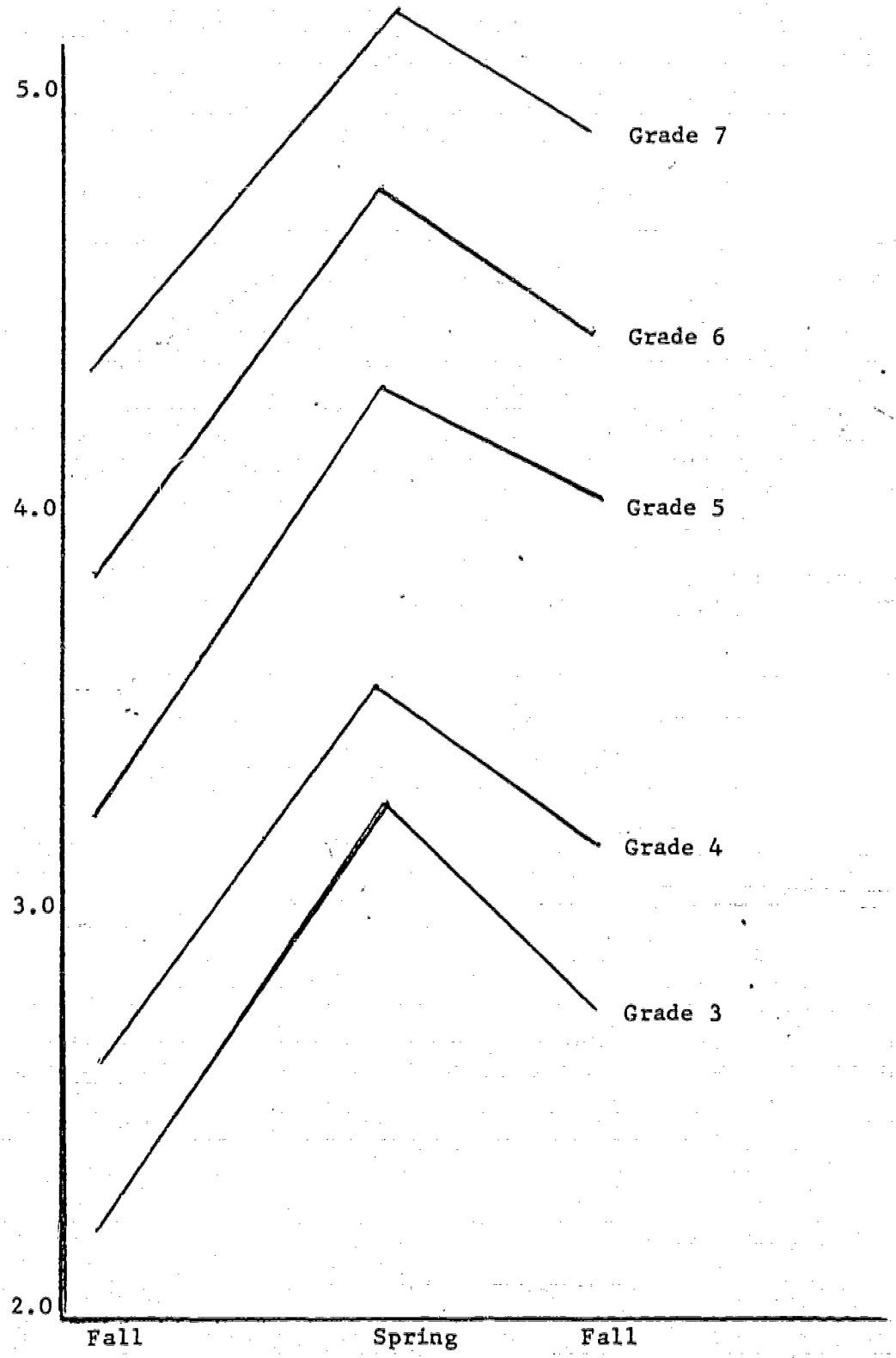

Figure 1

were dramatically affected by the length of time used in the evaluation was consistent across all the compensatory education programs we investigated. These results are summarized in Table 2. Specifically, the inclusion of the summer months in an evaluation often reduces considerably estimates of achievement and hence monthly achievement rates (a comparison of the last two columns of Table 2 demonstrates such a reduction in monthly rates of achievement). In other words, achievement gains made during the school year were not sustained even until the next fall. These findings are based on analysis of matched, longitudinal samples containing over 8,700 students and are unaffected by the grade level, the subject area, the program, the standardized achievement test or the metric used in the analysis.

The results of our new studies explain the contradictions of our first Title I report. The state Title I evaluations were based mainly on data from fall and spring administrations of achievement tests--and the programs appeared to be quite successful. Statewide testing programs measure annual achievement, the same as our fall-to-fall measures. When the annual achievement gain is used as the criterion for success, compensatory education seems to be having little effect. With a few notable exceptions, annual gains are not greater than expected, which is roughly seven grade-equivalent months.

Table 2

AVERAGE MONTHLY READING ACHIEVEMENT RATES BY GRADE
ACROSS PROGRAMS FOR TWO TIME PERIODS

Grade	Number of Programs	Number of Students	Fall-to-Spring	Fall-to-Fall
1	1	665	0.6	0.4
2	1	582	1.0	0.7
3	2	1,053	1.1	0.7
4	2	2,042	1.1	0.6
5	2	1,812	1.3	0.7
6	2	1,044	1.0	0.7
7	6	1,342	1.3	0.8
8	2	171	1.4	1.0

Our findings have important implications for the interpretation of previous Title I evaluations. Since most evaluations have primarily used data from only fall and spring administrations of achievement tests, their results may be misleading. If Title I has as a goal a sustained increase in achievement, and I believe this is an agreed upon goal, it should be recognized that there is virtually no information on this from previous studies. We therefore urge that Title I be reconsidered in light of whether or not increases in achievement are sustained.

Our findings also have implications for future research. Since the summer is clearly a critical period of time, there need to be further studies of compensatory education strategies which might affect the loss of achievement during the summer. To date, no such strategies have been identified, although a number of possibilities such as year-round schools exist.

In conclusion, we urge that districts administer achievement tests minimally each fall and preferably each fall and spring. These data would provide the capability for estimating the extent to which school-year gains are sustained through the following summer. Both fall and spring tests have the added advantage of allowing a separation of school-year and summer achievement. Although this information is not critical for estimates of annual gains, it is a valuable source of information for studying the extent and causes of summer losses. If, for example, the phenomenon is a function of the measures used, the standardized

achievement tests, one would want to change the measures, not the program. If it is a result of instructional techniques that mitigate against retention, then the techniques should be changed. Since there are no simple solutions (for example, there is little research to support the notion that summer school would alleviate the summer losses), it is important to be able to determine why the losses occur in order to develop appropriate remedies.