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ABSTRACT

Associations between school district poverty and achievement and Chapter 1 programs are studied. The allocation formula in the legislation states that funding is to be distributed in direct proportion to poverty and regional cost. Dependent variables include Chapter 1 funding, the number of district participants in compensatory education (percentages of total), and effectiveness measured by achievement test score gain (available only for New York State). Predictor variables include: (1) child poverty rate; (2) district achievement level; (3) other factors in the legislation (average per pupil expenditure and save-harmless status); and (4) factors not in the legislation (district public school enrollment, district urbanicity, per pupil expenditures, state funds for compensatory education, local public school funds for compensatory education, and funding per enrolled student). Data from several sources, including the National Chapter 1 District Survey sample of 2,145 school districts, show strong associations among district poverty, achievement, and Chapter 1 funding levels and participation per student. Associations are exponential, rather than proportional, and are not as strong as federal and state allocation formulas and the assumptions behind the legislation would indicate. Some predictor variables that should have been neutral had significant associations with funding and participation, supporting critics' claims that certain types of districts are favored by the Chapter 1 distribution system. Average gain in achievement in New York showed no significant associations with any predictor variables. Possible remedies are discussed. Six tables and three graphs present study data, and there is a five-item list of references. (SLD)

Poverty, Achievement, and Chapter 1 Programs

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Introduction

In the early 1960's, the economic and social effects of poverty in many areas of the country began to be of federal concern. According to President Lyndon Johnson, poverty could be eliminated by providing greater educational opportunity for poor children which would increase their employment opportunities once they finished school. Title I of the Elementary and Secondary Education Act [ESEA] of 1965 (now Chapter 1 of the Educational Consolidation and Improvement Act [ECIA] of 1981) was the centerpiece of legislation designed to address "the impact of poverty and deprivation upon youngsters in the low-standard school districts of the country and in rural and urban slums" (Senator Wayne Morse, as quoted in Bailey and Mosher, p. 27). To that end, the purpose was stated as:

> In recognition of the special educational needs of children of low-income families and the impact that concentrations of low-income families have on the ability of local educational agencies to support adequate educational programs...To provide financial assistance...to local educational agencies serving areas with concentrations of children from low income families to expand and improve their educational programs by various means which contribute particularly to meeting the special educational needs of educationally deprived children. (Title I, ESEA, Section 101)

Congressional sentiment was that specific prescriptions of educational programs would be intrusive and preempt the authority of local school boards. However, initial plans to send unrestricted funds directly to state or local educational agencies with high poverty rates were met by skepticism as to whether the money would be equitably distributed.

As a compromise to direct aid to the neediest children while preserving local control over the daily operation of the schools, a multi-tiered distributional system was developed. In this system, federal officials allot

money to counties using a formula incorporating the number of low-income children and a cost factor. The number of low-income children is determined by adding the number counted by the Census Bureau in families below the poverty line to those in families above the poverty line receiving Aid for Dependent Children [AFDC]. The average per pupil expenditure in each state is incorporated into the formula as the cost factor. However, if this amount differs from the national average by more than 20%, it is not used; instead, 20% more or less than the national average, whichever is nearer the state figure, is used. The limits were imposed so that high-spending states would not be excessively rewarded, not low-spending states excessively penalized. The money is then sent to state educational agencies.

State officials are then given a choice as to whether to use the federal formula or a different method in calculating allocations to districts which do not match county lines. About half of all states use the federal formula; most of the remainder use other methods to count low-income children, such as using only AFDC counts.

Upon receiving the money from their state, local officials then decide which schools will receive Chapter 1 funds. Local officials are allowed considerable lattitude in these decisions: usually, funds may be concentrated on the poorest schools in the district or spread evenly among all schools. Individual school personnel then select participants, generally using achievement test scores and teacher recommendation.

The authors of Title I thought that additional money would directly improve educational programs, and hence attainment. Since the amount of money received is directly proportional to the number of low-income children, poor

districts would receive Chapter 1 money in direct proportion to the level of poverty. It was also assumed that poverty and achievement were closely related: therefore, districts would receive money in proportion to their educational needs as well. Districts would then translate these funds into higher achievement levels.

In most districts, Chapter 1 funds remedial programs in reading and math for students who are achieving below grade level. For most school districts, the amount of money provided amounts to a marginal sum--1 to 7% of their budgets. Many districts add local and/or state funds to the federal monies received in order to provide more elaborate programs.

Although the formula appears to provide that benefits accrue to districts in direct proportion to the level of poverty in the district, districts with the same number of low-income children do not necessarily receive the same amount of Chapter 1 funds if they lie in different states or counties. The use of the cost factor in the federal Chapter 1 formula was intended to assure that amounts were comparable; i.e. higher costs in New York meant higher allocations per child. However, the accuracy of this cost factor is questionable, according to many studies. Evidence that it is not accurate is that although 90% of all school districts now receive Chapter 1 aid, 13% of all elementary schools with the highest poverty rates receive no Chapter 1 funding (Birman, p. 18). As almost all unserved schools were in very poor districts (Birman, pp. 27-33), it is possible that these very poor districts do not receive sufficient money to fund all of their schools.

The relationship of Chapter 1 programs to poverty and achievement have been explored by many studies. Most have found that schools with many low-

income students received more Chapter 1 money. Schools with low achievement levels tend to be poor, and therefore also received more money. However, great differences exist between equally poor schools in different areas. In addition, there have been claims that some types of districts have received more money than would be expected from their location and poverty counts: urban schools, those with high enrollments, those in the Northeast, and richer ones have purportedly been unfairly favored.

Hypotheses

Congressional intent for Chapter 1 was never clearly defined. It can be seen as a program to provide additional funds to all districts, with more going to poor districts to attempt equalization of funds. Alternatively, it can be viewed as providing additional funds to poor children in districts to redress a previous lack of quality educational programs. Either way, howeve the allocations formula written into the legislation clearly stated that funding is to be distributed in direct proportion to poverty and regional cost. The formula states:

Allocations=

# of poor children * state average PPE * standard amount.

Therefore, districts with more poverty and higher costs should receive higher funding levels and have more participants than wealthier districts.

Although achievement is not mentioned in the legislation, Chapter 1 assumes that poor children usually achieve at a lower level than wealthier ones. Therefore, on average, districts with lower achievement should receive

higher funding levels and have more participants than those with higher achievement.

Other district characteristics, such as urbanicity and enrollment, should have insignificant associations with Chapter 1 effectiveness, funding and participation per district student, once poverty and cost are controlled. A program specifically targeted towards poverty and achievement should have only those characteristics influence the distribution of funds and services, and no others.

Methods

Chapter 1 programs can be characterized by funding, participation, educational effects, setting (pull-out v. in-class), contact hours, subject areas, materials used, and teacher-pupil rations. The most easily quantified inputs on a district level are funding and participation levels, and among outputs, educational effects.

Dependent variables included:

*1. Chapter 1 funding from local educational agency [LEA] grants[1], divided by the total number of students enrolled in district's public schools.[2]

*2. The number of public school compensatory education participants, divided by the total number of students enrolled in the district's public schools, to

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1. Where expenditure information was unavailable (e.g. state databases), revenue information was used as an approximation, as nearly all Chapter 1 revenues are actually spent, per legal requirements. The only figures including both expenditures and revenues were in the national database for 1985-86, where the correlation between them was .969. Analyses were run using both figures separately; results were nearly identical.

2. Public school enrollments were used, as private school enrollments were unavailable in most places.

determine what percentage of the student body was being served by compensatory education. To avoid overestimates of participation, unduplicated counts of Chapter 1 and state programs participants were used.

3. Effectiveness, as measured by the average gain in achievement test normal curve equivalent scores of program participants. This measure was available only in New York State for the combined Chapter 1 and state program, and will be described in more detail later.

Predictor variables tested for association with the dependent variables included:

*1. Child poverty rate. For the national database, the poverty rate was measured according to Chapter 1 specifications. Each state database used the state's measure of low-income children for determining allocations was used.[1]

2. District achievement level. Unfortunately, this type of information was only available in three states, and different measures and reporting methods were used.[2]

3. Other factors specified in the legislation, including:

a. Average per pupil expenditure in public schools in the district's state, as used to approximate regional cost by the federal allocations

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1. Louisiana and West Virginia used federal counts; New York and Vermont used only the U.S. Census figures; and California used only AFDC counts.

2. New York reported the percent of students achieving a certain standard on its PEP [Pupil Educational Progress] tests, given in grades 3 and 6 in reading and math, and writing in grade 5. Louisiana reported the percentage of students achieving above the 50th median national percentile on the California Achievement Tests in reading, language, and math in grades 4, 6, and 9. West Virginia reported a mean percentile for each district in reading and math in grades 3, 6, 9, and 11 on state tests.

formula, limited to within 20% of the national average, as per the Chapter 1 formula.

b. Save-harmless status, expressed as a dichotomous dummy variable. Districts are classified as "save-harmless" if the number of low-income students has declined. Save-harmless districts are allowed to receive up to 85% of the previous year's Chapter 1 total allocations for three years, and so may receive more money than they would be entitled to by poverty count alone for this period. This provision was written in to protect districts from fluctuations in funding because of population shifts, but its effects on program administration are unknown.

4. Other factors not mentioned by the legislation, but have been the subjects of debate as to their actual neutrality, including:

* a. District public school enrollment.

b. District urbanicity: whether the area was primarily rural, urban, or suburban, expressed as two dichotomous dummy variables. One denoted an urban district; the other, a rural district.

c. District public school per pupil expenditures, per student enrolled in public school.

* d. State funds for compensatory education, per student enrolled in the district's public schools.

e. Presence of local public school funds for compensatory education programs, per student enrolled in public school. Actual amounts were not available, so this was also expressed as a dichotomous dummy variable.

* f. When using participation as the dependent variable, funding per enrolled student (dependent variable #1, above) in the district was also used

as a predictor variable, to see if differences in allocations between districts accounted for differences in participation in districts of similar poverty.

* Asterisks denote information available in all databases.

Data Sources

Data were obtained from several sources to give a comprehensive view of the situation around the country. The national Chapter 1 District Survey, which sampled 2145 of the 16,000 school districts in the United States, was used for initial analyses. Many districts had some missing data: however, these districts did not differ significantly from the remaining districts, so listwise deletion of missing data was performed. Sample means, standard deviations, and ranges of all variables are contained in Table 1.

Most districts had moderate rates of poverty, small enrollments, and were in rural areas.[1] The average per pupil expenditure for most states fell within 20% of the average (between $2700 and $4200), making the limitations specified in the formula unnecessary. About 20 states have state compensatory education programs similar to Chapter 1: roughly a third of the districts were served by state-funded programs, which generally contributed very small amounts of money per enrolled student. Relatively few districts had locally-funded compensatory education programs.

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1. Urbanicity was measured by the U.S. Census Bureau by matching school districts with standard metropolitan statistical areas [SMSAs], the area around central cities or urbanized areas of 50,000 people or more. The urban population includes all persons living in these urbanized areas and in places of 2500 or more inhabitants outside these areas. Suburban areas included densely populated areas surrounding the urban areas. All others are rural.

Table 1: National Chapter 1 District Survey
Means, Standard Deviations, and Ranges of
District Characteristics, 1984-85

Variable:	Weighted Mean	SD	Minimum	Maximum	Within 1 SD
Demographic Data:					
% Poverty	12.7%	13.0%	0%	78.0%	0%-26.0%
Enrollment	2,815	12,168	0	898,400	0-14,983
Urban--43 (2%)					
Rural--1244 (58%)					
Suburban-622 (29%)					
Financial Data:					
District PPE	$3,505	$2,304	$14	$52,675	$1201-$5809
State Ave. PPE	$3,526	$729	$2,220	$7,843	$2767-$4285
State CE $/Enr.	$17	$48	$0	$1,246	$0- $65
Chapter 1 Data:					
C1 $/Enr.	$78	$75	$0	$1,357	$3- $153
C1 Part./Enr.	14.0%	12.3%	0%	100%	1.7%-26.0%
C1 $/Part.	$657	$408	$0	$7,991	$249-$1065

Number of districts: 2145

Chapter 1 expenditures in 1984-1985, including allocations and funds carried over from previous years[1], amounted to an average of $78 per enrolled pupil, about 2% of the total per pupil expenditure of $3505. The average district had 14% of its enrolled students participating in Chapter 1. This figure is somewhat greater than the average poverty rate of 12.7%; but few districts, even very poor ones, involved more than 50% of their students.

This dataset had no achievement or save-harmless status data. In addition, previous reports indicated that Chapter 1 program administration

1. There was no separation of allocation from carry-over funds for data from 1984-1985 in this database. These sources were separated for data for 1985-1986, and carry-over funds accounted for very little of the money available for Chapter 1 programs. The correlation between 1984-1985 expenditures and 1985-1986 allocations was .969.

varied among different states, so datasets from several representative states were obtained analyzed separately. These included New York[1], Louisiana[2], West Virginia[3], Vermont[4], and California[5]. States varied considerably: mean values and standard deviations are shown in Table 2.

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1. Data were collected from a stratified sample of 161 of the 732 school districts in New York State from the state Education Department records for the school years 1985-86 and 1986-87. Districts were chosen to reflect a range in child poverty rates: all districts at five data points were selected. Data points included: all districts with poverty rates 5.0% or less, 10.0 to 10.9%, 17.0 to 17.9%, and 20.0% or more. Eight districts had incomplete data due to mergers or smallness of programs, and were dropped. Although New York City showed characteristics typical of other districts with the same poverty rate (30%), it was not included in these analyses to avoid undue influence because of its large enrollment.

2. Louisiana has 64 county-wide school districts, or parishes, and two small, separate city districts (Bogalusa and Monroe). All of them were used in this analysis. All Chapter 1 information was from the 1988-1989 school year; all other information was from 1987-1988, since these 1988-1989 data were unavailable.

3. West Virginia has 55 county-wide school districts, all of which were included in the study. Due to inconsistencies in availability of data, all Chapter 1 information was from the school year 1988-89, 1987-88 for achievement information, and 1986-87 for financial information.

4. All data were from the school year 1987-88. School districts in Vermont are organized somewhat differently than in the other states in this study; often, one high school will serve several elementary districts. For taxes and other administrative functions, such as Chapter 1 administration, elementary and high school districts are combined into supervisory union districts. All 58 supervisory union districts in the state were included in the analysis.

5. California has 1019 districts in 58 counties. Districts are organized in a variety of ways, some including only elementary or high schools, with most encompassing all levels of schools. The random sample of 161 districts included 3 which were excluded because of missing data. All Chapter 1 information is from 1988-1989; all other information is from 1987-1988.

Table 2
State Datasets
Means, Standard Deviations, and Ranges of District Characteristics

State:	New York	Louisiana	West Virginia	Vermont	California
	1985-1987	1987-89	1986-1989	1987-88	1987-88
Demographic Data:					
% Poverty (by U.S. Census Bureau, except in CA by AFDC count only)					
Mean	14%	28%	25%	13%	13%
SD	9%	12%	10%	5%	10%
Range	1-39%	10-69%	5-63%	0-27%	0-62%
Public School Enrollments					
Mean	2864	11,969	6157	1572	13,306
SD	5068	15,078	5713	849	48,321
Range	54-44,094	1598-83,534	1076-36,155	300-2423	23-589,311
Urban Region	14%		0%	0%	
Rural Region	26%		100%	99%	
Suburban Region	60%		0%	1%	
Financial Data:					
District PPE					
Mean	$6128	$3142	$2911	$4099	
SD	$3165	$1363	$300	$1038	
Range	$3171-$19,640	$2203-$13,481	$2508-$4136	$2552-$7896	
Achievement Data:					
% of Students Above State Standard in Achievement					
Mean	90%	37%	57%		
SD	6%	10%	6%		
Range	57-99%	18-61%	44-72%		
Chapter 1 and State Compensatory Education Data:					
	Chapter 1	Total CE	Chapter 1	Chapter 1	Chapter 1	Chapter 1
Compensatory Education Allocations /Students Enrolled in District						
Mean	$95	$156	$129	$114	$87	$72
SD	$63	$86	$53	$47	$32	$49
Range	$11-$364	$18-$452	$43-$314	$25-$278	$30-$161	0-$295
Compensatory Education Participants /Students Enrolled in District						
Mean	11%	21%	16%	10%	12%	25%[1]
SD	7%	11%	7%	5%	6%	20%
Range	2-39%	3-79%	5-46%	3-32%	3-33%	0-100%
Compensatory Education Allocations /Participants						
Mean	$838	$772	$843	$1148	$816	$360

Table 2, Continued
State Datasets
Means, Standard Deviations, and Ranges on District Characteristics

State:	New York		Louisiana	West Virginia	Vermont	California
Chapter 1 and State Compensatory Education Data:						
	Chapter 1 S-S Test 94 Dist	Total CE F-S Test 100 Dist	Chapter 1	Chapter 1	Chapter 1	Total CE
Compensatory Education Students Achievement Pretest (NCE):						
Mean	38	34				
SD	6	6				
Range	19-52	9-52				
Compensatory Education Students Achievement Posttest (NCE):						
Mean	43	43				
SD	6	6				
Range	24-59	18-67				
Compensatory Education Students Gain in Achievement (NCE):						
Mean	5	9				
SD	5	6				
Range	-22-+15	-5-+32				

SD=standard deviation; S-S Test=testing 2 consecutive springs; F-S Test=testing in fall and the following spring; Enrollment=Total district enrollment, public and private, where available: Louisiana, California. All other states, public school enrollment only. PPE=public school per pupil expenditure, per student enrolled in public school. District achievement in NY measured by state Pupil Educational Progress [PEP] test. CE student achievement, tested on various tests, then scores converted to normal curve equivalents [NCE] by NYSED. Louisiana used national 50%ile as cut-off on California Achievement Test. West Virginia reported mean district scores on state tests. See text.

Data Analysis

The Statistical Package for the Social Sciences for IBM personal computers [SPSS-PC+], Version 2.0 (1988, SPSS, Inc., Chicago, IL) was used for all analyses.

The associations of dependent variables with poverty rate and then with achievement levels were tested by simple regression analyses. Finally, all other factors were added in multiple stepwise regressions to determine what,

if any, associations exist between the dependent variables and "neutral" predictor variables, with poverty controlled. Natural logarithms of all numerical values were used so these linear analyses could be performed.

Results and Discussion

Chapter 1 Funding

Poverty

An exponential association between poverty and Chapter 1 spending per district student[1] was found in the national database, as seen in Figure 1. Although higher poverty is associated with higher Chapter 1 funding levels, spending increases level off at the highest poverty rates (above 20%).

Regression analysis to predict Chapter 1 spending from the formula[2] resulted a multiple correlation (R) of .660. The regression equation was:

Chapter 1 expenditures per district student=

$$.000294 * (\% \text{ poverty})^{.601} * (\text{state PPE})^{1.324}$$

This equation is quite different from that specified by the legislation. Poverty was not proportionally related to Chapter 1 spending: in otherwise comparable districts, a poverty rate in one district double that in the other was associated with only about one-and-a-half times the spending on Chapter 1. See Table 3 for regression coefficients.

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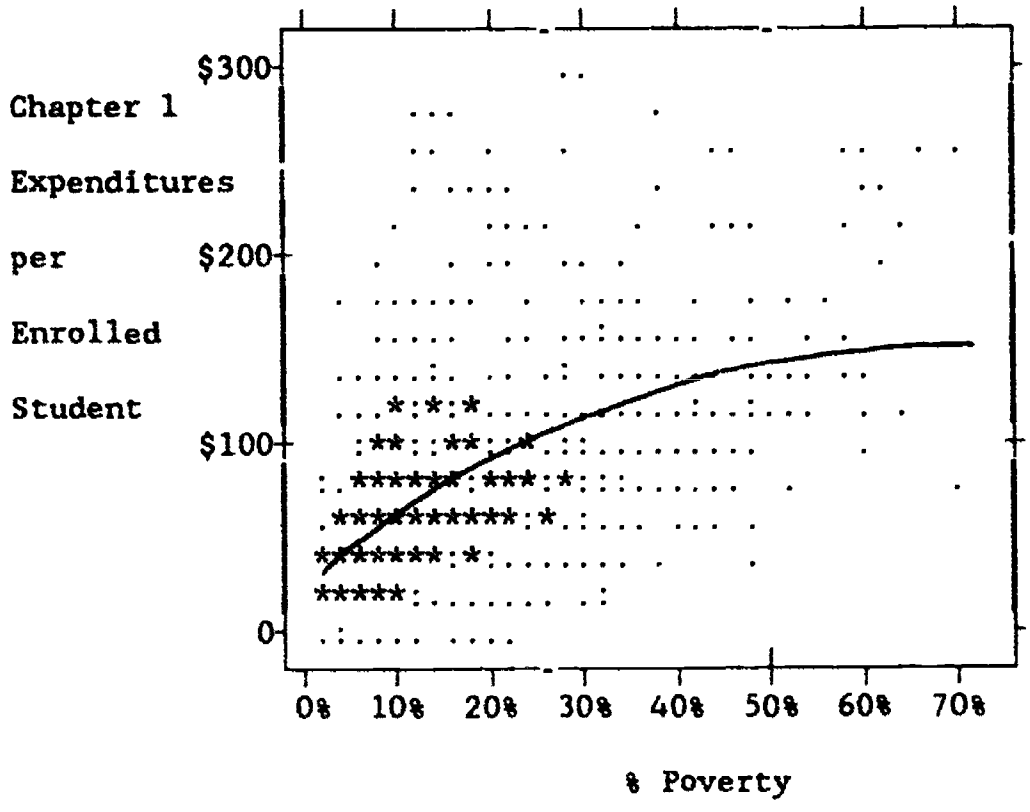
1. Chapter 1 expenditures in 1984-1985 were used in the analyses reported here. These associations were also tested using 1985-1986 allocations, with virtually identical results. In the interests of consistency of time periods covered, the results of the 1984-1985 expenditures are presented here, but it should be remembered that all findings also are true of allocations.

2. Natural logarithms of all values were used in order to perform a linear analysis; equations presented here use th· true values, however.



.=1-4 cases; :=5-9 cases; *=over 9 cases.

Figure 1: Chapter 1 Expenditures per District Student v. % Poverty

Table 3: Multiple Regression Results: Predictors: Federal Formula
Dependent Variable=Ln Chapter 1 Expenditures per District Student

R	.660	Residual Degrees of Freedom	1275
Standard Error	.535	F	492.471
p (R=0)	.0000		

Predictors:	b	p (b=0)	p (b=1)
Ln % Poverty	.601	.0000	.0000
Ln State PPE	1.324	.0000	.0080
Constant	-8.132		

R: multiple correlation. Ln: natural log. PPE: per pupil expenditure.
p: probability. b: regression coefficient.

Separate analyses within each state, using state data, revealed nearly perfect prediction of Chapter 1 funding from poverty, however, with multiple correlations of .813 to .980. In the two states in which there were virtually

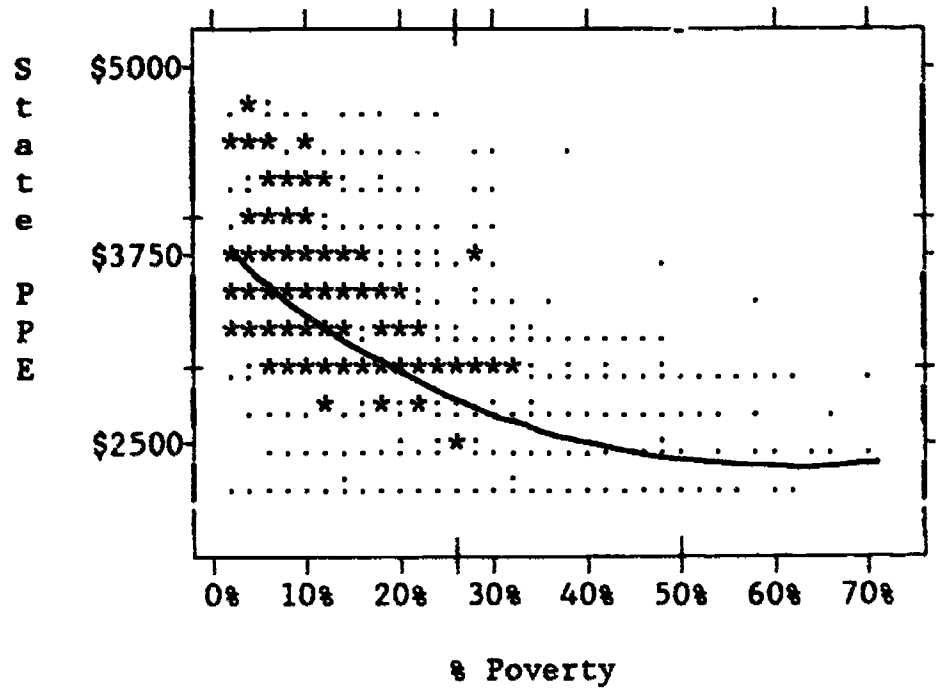
no state-calculated subcounty allocations, Louisiana and West Virginia, Chapter 1 funding showed a proportional association with poverty (coefficient not significantly different from a value of 1). In the remaining three, the associations were closer to proportionality than observed in the national dataset, but significantly differed from proportionality. Therefore, funding distributions would be expected to deviate from the formula provisions in states using their own allocations formulae. See Table 4 for regression coefficients.

Table 4: Multiple Regression Results: Predictor: Poverty
Dependent Variable=Ln Chapter 1 Funding per District Student

State:	NY	LA	WV	VT	CA
R	.928	.979	.980	.813	.929
Standard Error	.302	.084	.084	.230	.325
Residual df	151	64	53	57	157
p (R=0)	.0000	.0000	.0000	.0000	.0000
Predictor: Ln % Poverty					
b	.826	.973	1.003	.826	.854
p (b=0)	.0000	.0000	.0000	.0000	.0000
p (b=1)	.0000	ns	ns	.05	.002
Constant	2.347	1.602	1.511	2.296	2.072

R: multiple correlation. df: degrees of freedom. p: probability.
Ln: natural log. b: regression coefficient. ns: not significant.

The regression analysis of the national dataset also revealed that the state average per pupil expenditure also showed an exponential association with Chapter 1 funding, as shown in the equation above. Whether average expenditures actually reflect costs is uncertain. It is possible that states with low PPE's are too poor to raise the same amounts of money for public schools as those with higher PPE's, where state funds can aid poor districts. This view is supported by evidence that states with low average PPE's also have the most poverty, as shown in Figure 2.



.=1-4 cases; :=5-9 cases; *=10 or more cases

Figure 2: State Average Per Pupil Expenditure v. % Poverty

District Achievement

As mentioned previously, district achievement information was only available in the states of New York, Louisiana, and West Virginia. Results varied considerably in these three states: in New York, an exponential relationship between Chapter 1 funding levels and district achievement was observed; in other words, districts with lower achievement received more money, but differences between districts leveled off at the lowest achievement levels. In Louisiana, the association was linear: lower achievement was directly proportional to higher funding levels. In West Virginia, there was no significant association. See Table 5 for regression coefficients.

Table 5: Multiple Regression Results: Predictor: Achievement
Dependent Variable: Ln Chapter 1 Funding per District Student

State:	NY	LA	WV
R	.433	.699	.072
Standard Error	.730	.294	.422
Residual df	151	64	53
p (R=0)	.0000	.0000	ns
Predictor: Ln % Achievement			
b	-5.039	-.991	ns
p (b=0)	.0000	.0000	ns
p (b=1)	.0000	ns	.0000
Constant	26.960	8.332	

R: multiple correlation. df: degrees of freedom. p: probability.
Ln: natural log. b: regression coefficient. ns: not significant.

Other Predictor Variables

Adding other factors to the equation, via multiple stepwise regression, revealed that district per pupil expenditure (b=.189), enrollment (b=-.085), and urbanicity (urban areas receive more; suburban areas receive less) also were significant factors in the regression equation, significantly improving the multiple correlation in the national sample to .697.

Analyses of individual state datasets revealed even higher multiple correlations (R=.905 to .989) when other factors were added via multiple stepwise regression. With poverty controlled, save-harmless status was a significant predictor in the states with many of these sorts of districts, New York and California. Achievement was significant only in Louisiana (b=-.204). District per pupil expenditure was significant in New York and Vermont (b=.405 and .749). Urbanicity and enrollment were significant in states with wide

variation in these variables: New York[1] (urban district, b=.312; enrollment, b=-.085), Louisiana (enrollment, b=.044), and California (enrollment, b=.059). These results indicated that certain types of districts were receiving more money than indicated by the formula factors of poverty and state average per pupil expenditure.

Chapter 1 Participation

Poverty

Figure 3 shows the relationship between poverty rates and the number of participants relative to enrollment, as observed in the national dataset. As observed in the relationship between poverty and funding levels, the relationship here is exponential, with increases in participation leveling off at the highest poverty rates.

Simple regression analysis revealed a multiple correlation of .550, and the equation:

$$\% \text{ participants per district enrolled students} = 3.622 * (\% \text{ poverty})^{.426}$$

In other words, a poverty rate in one district double that in the other was associated with only about one-and-a-half times as many participants, in two otherwise comparable districts. Analyses of individual state datasets revealed similar results, except in Louisiana and Vermont, where proportional associations existed. See Table 6 for regression results. These results

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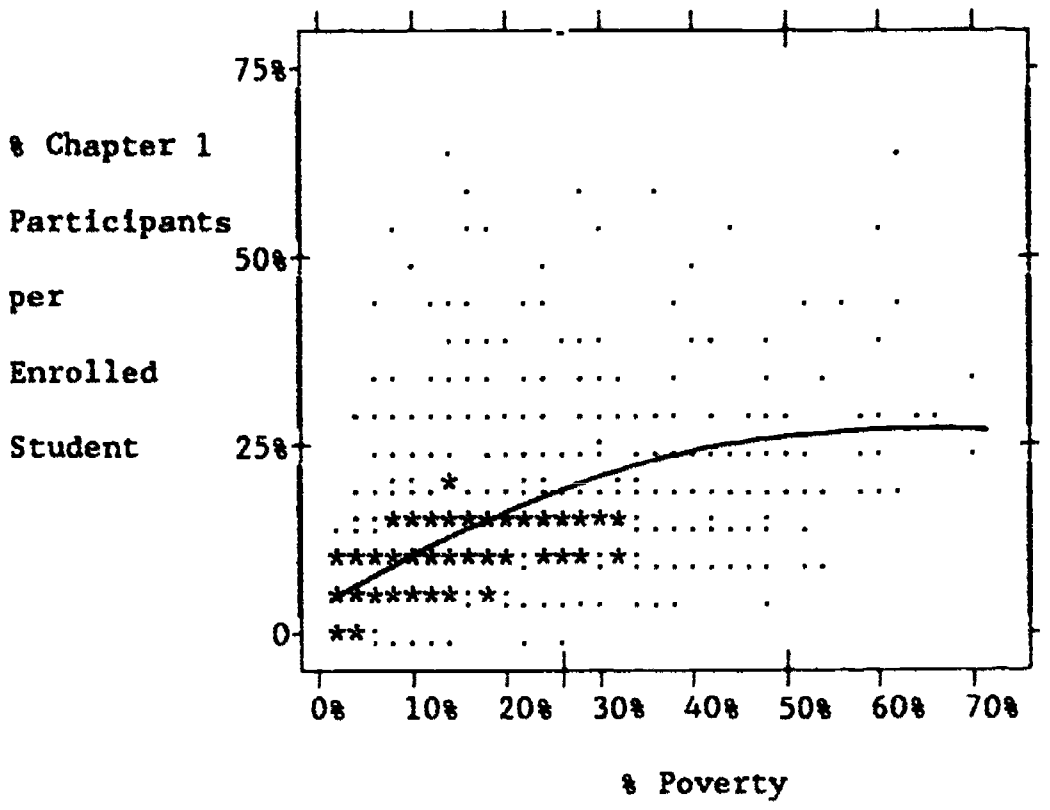
1. The state education department determines whether a school district is rural or suburban on the basis of population density, and a district is considered urban automatically if it includes a city government, no matter how small. New York's classifications of urbanicity therefore vary somewhat from those of the federal government.



.=1-4 cases; :=5-9 cases; *=over 9 cases.

Figure 3: Chapter 1 Participants per District Student v. % Poverty

indicated that participation tended to reach a ceiling of about 40%, even in districts with poverty rates much higher than 40%, despite federal efforts to encourage school-wide programs for high poverty districts.

District Achievement

Participation levels showed similar associations to district achievement levels to those seen between district achievement and funding, with an exponential relationship in New York, a proportional one in Lousiana, and no association in West Virginia.

Table 6: Multiple Regression Results: Predictor: Poverty
Dependent Variable-Ln Chapter 1 Participants per District Student

State:	NY	LA	WV	VT	CA
R	.753	.807	.808	.685	.759
Standard Error	.437	.269	.245	.368	.627
Residual df	151	64	53	57	157
p (R=0)	.0000	.0000	.0000	.0000	.0000
Predictor: Ln % Poverty					
b	.548	.889	.810	.892	.766
p (b=0)	.0000	.0000	.0000	.0000	.0000
p (b=1)	.0000	ns	.05.05	ns	.002
Constant	.958	-.244	-.286	.082	1.115

R: multiple correlation. df: degrees of freedom. p: probability.
Ln: natural log. b: regression coefficient. ns: not significant.

Other Predictor Variables

When all other predictor variables were tested for association with the dependent variable, using multiple stepwise regressions, Chapter 1 funding levels, not poverty, turned out to have the greatest associations with participation levels in the national database and three out of five states (New York, Vermont, and California). These associations were positive: the more Chapter 1 funding per district student received, the higher percentage of the student body participated in Chapter 1. As well, state average per pupil expenditure and enrollment showed significant negative associations with participation levels, and state compensatory education funds per enrolled student showed significant positive associations with participation levels in the national dataset. State datasets showed significant positive associations with save-harmless status in New York, and significant negative associations with district per pupil expenditure in Louisiana, and enrollment in Vermont. District achievement level was not significant in any state once poverty was controlled.

These results indicate that associations of participation are far stronger with funding levels than with achievement or poverty level. As well, some "neutral" factors, such as state average spending per pupil, enrollment, and save-harmless status, demonstrate significant associations with the dependent variable, and so are not truly neutral.

Effectiveness

New York was the only state to provide information on the achievement of compensatory education students specifically. These data were incomplete: not all districts reported standardized test results, and not all CE students in the participating districts took the tests. As well, testing was done at differing intervals in different districts, and a variety of tests was used, including the California Achievement Test [CAT], Comprehensive Test of Basic Skills [CTBS], Metropolitan Achievement Tests [MAT], Stanford Achievement Tests, depending on the grade and subject being tested. The state education department converted all scores to normal curve equivalents [NCE], so averages could be obtained and compared. Districts reporting testing did not differ significantly from those not reporting; as well, districts reporting different testing intervals did not differ either (mostly being the same districts).

These results indicated that no particular types of districts showed greater gains than others, at least in this limited sample. It should be noted that not all CE students in the reporting districts took these tests, and not all districts participated in the program. Furthermore, New York is atypical in that its state program adds much funding to Chapter 1 monies in all districts, so that the total CE program is extremely well-funded in

comparison to other states. It is very possible, therefore, that the finding that no particular types of districts show greater effectiveness of their CE programs is not true in other states. More research needs to be done on this topic.

Conclusions

In short, the study found strong associations between district poverty, achievement, and the Chapter 1 programs characteristics of funding levels and participation per student enrolled in public schools. However, associations were exponential, rather than proportional, and were not as strong as federal and state allocation formulae and the assumptions behind Title I/Chapter 1 would indicate.

Other predictor variables which should have been neutral, according to the formulae and legislative intent, had significant associations with funding and participation when poverty and other formula factors were controlled. In other words, certain types of districts--small districts, urban ones, and districts in high-spending states received more money and had more participants than would have been predicted from their poverty rates alone. Therefore, critics' claims that certain types of districts are favored by the Chapter 1 distributional system seem well-founded.

Average gain in achievement among CE students in New York State showed no significant associations with any of the predictor variables. Program outputs may be associated with more direct measures of educational inputs such as contact hours, setting, teacher-pupil ratio, teacher experience and

competence, etc., but these variables are more difficult to measure and were beyond the scope of this study.

As discussed previously, Congressional intent in enacting the Title I/Chapter 1 legislation was to provide money to districts for compensatory education, and the federal formula was designed to provide money in direct proportion to district poverty. These results show a violation of that intent, whether the exact intention was to equalize financial inputs or equalize educational services among districts.

The causes of this situation, and possible remedies, include:

1. Using the state average PPE as a cost factor has led to three- and four-fold differences in funding levels between certain states. True costs probably do not differ by that amount, so a more accurate measure of cost is called for.

2. Save-harmless provisions sustain aid to particular areas despite demographic changes, and benefit mostly small, wealthy districts. They should therefore be eliminated.

3. Use of differing methods of counting low-income students for sub-county allocations in different states leads to inconsistencies in the associations found between Chapter 1 program characteristics and poverty, as counted by the federal formula. In addition, the federal formula's use of outdated census information and lack of state access to AFDC figures lead to inaccurate, outdated counts.

A definitive decision should be made by Congress as to what aspects of poverty contribute to low achievement, and how to measure it to distribute allocations more consistently. This could mean using a different method of

counting poverty, and perhaps combining it with achievement measures. The method should be consistent for all counts to promote more equitable and efficient distributions throughout the nation.

For example, the formula could be changed to reflect differences in low-income students actually attending public schools, as the percentage of poor children in a school has been found to have a greater correlation with achievement than regional poverty. This information is already calculated for federal lunch subsidies, so no major changes in present practices would be necessary. It would promote equity and efficiency by assuring that the more poverty in the district, the higher levels of funding received, no matter where the district was located.

4. Lack of achievement standards mean that there is currently no incentive for districts to improve achievement levels. Achievement criteria could be included in legislation, with provisions to benefit effective schools and districts, so that districts are not rewarded for low achievement.

These changes would strengthen the program's ties to poverty and achievement. The equity of financial distributions would be raised, as low achievement caused by poverty would have a stronger association with funding, as Congress originally intended. The changes would allow districts more freedom to improve their programs in the way they consider most necessary educationally as well, while retaining federal financial control.

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