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ABSTRACT

In 1991, the investigators completed a series of studies of data on Tennessee's 1988-89 school district report cards. The relationships among eight variables (average attendance, professional salaries, county per capita income, expenditure per student, average daily membership, percentage of oversized classes, percentage of students on free or reduced lunch programs, and percentage of educators on upper career ladder levels) were examined in relation to student outcomes. In 1990-91 Tennessee brought "on line" its new Tennessee Comprehensive Assessment Program (TCAP), thereby creating a new set of outcome measures. The 1990-91 report cards also added more school characteristics, which in turn enabled the investigators to expand their analyses from 8 to 15 variables. This report extends the previous study to the 1990-91 year and the new variables are as follows: (1) number of schools in the district; (2) percentage of enrollment change; (3) percentage of regular diplomas awarded; (4) percentage of honors diplomas awarded; (5) percentage of vocational students; (6) percentage of special education students; and (7) percentage of Chapter 1 students. Even with the added variables, Tennessee school district report cards do not appear to tell enough about what influences student achievement to enable policymakers to improve education in the state and local communities. Building-level data do appear to be more useful than district-level data for use in report cards. Ten tables present study findings, and one bar graph illustrates the influence of the variables. (SLD)

HOW MEANINGFUL ARE REPORT CARDS ON SCHOOLS?

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HOW MEANINGFUL ARE REPORT CARDS ON SCHOOLS?

I. INTRODUCTION

In 1991, the investigators completed a series of studies of the data reported in Tennessee's 1988-89 school district report cards. In those studies which have been reported in several papers (Bobbett, et al., 1992a, 1992b), and meetings, the relationships among eight school district variables (average attendance, average professional salaries, county per capita income, expenditure per student, average daily membership, percent of oversized classes, percent of students on free or reduced lunches and percentage of professional educators on upper Career Ladder levels II and III) were examined, and the relationships between each variable and student outcomes were determined.

The study reported herein is an extension of the previous study. In this investigation, 1990-91 report card data were used. Because of that, it was possible to revisit some of the relationships in the previous study and to gain new insights because of modifications in Tennessee's report cards from 1989 to 1991.

In 1990-91, Tennessee brought "on line" its new Tennessee Comprehensive Assessment Program (TCAP), thereby creating a new set of student outcome measures. Further, TCAP results were reported in greater detail than previous outcome data. Report cards now report TCAP assessment results at substantially more grade levels within the school districts than was previously done.

The 1990-91 report cards also added more school district characteristics; thereby enabling the investigators to expand their analyses from 8 to 15 variables. The seven added variables include number of schools in the district, percent of enrollment change, percent regular diplomas awarded, percent honors diplomas awarded, percent vocational students, percent special education students, and percent Chapter I students.

While certain comparisons in the results of the two studies can be made, some findings cannot be compared because of the differences in the outcome measures used in the different years and because no comparable data were available in certain areas in the

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This paper includes material presented as Evaluation of the Categories currently used in Report Cards with Student Outcome at SRCEA (11/92) and extends that work by addressing three additional questions of concern.

1988-89 report cards. Tables 1 and 2 present a school district report card as it appeared in 1988-89, and Tables 3 and 4 represent a 1990-91 school district report card.

II. METHODOLOGY

Although the 1990-91 report cards provided test results for grades 2 through 10, the investigators organized the data into four levels (elementary, grades 2-5; middle, grades 6-8; high school, grades 9-10; and system) rather than treat each grade level separately.

Mean student outcomes (MSOs) were created (by converting reported scores to Z scores and computing their means) for each level by combining TCAP data for the grades defined within the particular level. In the case of the high school level, the MSO was created by combining 10th grade TCAP data with the scores reported for the 9th grade Tennessee Proficiency (TPT). These MSOs were treated as dependent variables, as was the case in the analysis of 1988-89 report card data. The 15 school district characteristics studied were treated as independent variables that influence student outcomes. To guide the study ten research questions were developed:

1. How do school district characteristics currently reported relate to student academic achievement results?
2. Are there differences in the relationships between dependent and independent variables at different school levels (elementary, middle, high school, system)?
3. How do reported school characteristics relate to each other?
4. When rank ordered on the basis of student outcomes, how do school districts within the state perform in terms of reported school and community characteristics?
5. Do the reported school district characteristics appear to represent all or most factors that influence student academic achievement?
6. Is there evidence of major change in student academic performance from one school level to another within school districts?
7. When academic achievement is treated as scores on two separate test batteries (TCAP and TPT), are patterns of influence changed?
8. What differences in relationships among variables exist when test results of special education students are included in the analyses?
9. How do the results of this study compare with the results of the investigation using 1988-89 report card data?
10. How might the findings of this study inform educational policy at state and local levels?

Six of the ten questions replicate questions posed in the previous study.

Table 1. Testing Information For Widget City Schools (1988-89 Report Card Data)

Testing Information for Widget City		Grade Level	1987-88	1988-89	State Average
Basic Skills First Achievement Test (percent score)	Reading	3	90	88	80
		6	82	80	77
		8	92	91	81
	Math	3	91	90	82
		6	67	71	66
		8	77	84	66
Stanford Achievement Test (Stanine score) 7-9 = High 4-6 = Average 1-3 = Low	Reading	2	6	7	6
		5	6	6	5
		7	6	6	5
	Math	2	7	8	6
		5	7	6	6
		7	7	7	5
	Spelling	2	6	7	6
	Language	5	6	6	5
		7	6	6	5
	Environment	2	7	7	6
	Science	5	6	7	6
		7	6	6	5
	Listening	2	7	7	5
		5	6	6	5
		7	6	6	5
	Social Science	5	6	6	5
		7	6	6	5
Stanford Test of Academic Skills (TASK 2) 7-9 = High 4-6 = Average 1-3 = Low	Reading	9	6	6	5
		12	6	6	5
	Math	9	6	6	5
		12	6	6	5
	English	9	7	6	5
		12	6	7	5
	Science	9	7	6	5
		12	6	6	5
	Social Science	9	5	6	5
		12	6	5	5
Tennessee Proficiency Test (% Students Passing)	Language	9	88	92	78
	Math	9	95	98	90
	Both	9	86	91	76

Table 2. System Information for Widget City Schools (1988-89 Report Card data).

System Information for Widget City		Grade Level	1986-87	1987-88	1988-89	State Average
Number of Schools		K-12	5	5	5	12
Average Daily Membership		K-12	3,291	3,394	3,372	5,874
% Student Attendance		K-12	95.7	95.3	95.1	93.6
% Enrollment Change		9-12	-13.0	-16.1	-15.2	-24.7
% Oversized Class		K-12	1.2	1.4	2.3	3.8
% of Students on Free or Reduced Price Lunch		K-12	23	21	21	42
Expenditures per pupil		K-12	$2,718	$3,299	$3,501	$3,304
County Per Capita Income		K-12	"	"	$12,819	$12,878
% Elementary Schools Accredited by SACS		K-8		100.0	100.0	29.1
% Secondary Schools Accredited by SACS		7-12	100.0	100.0	100.0	64.9
Professional Educator Information						
% Professionals on Career Ladder Levels II & III		K-12	22.9	21.9	25.6	14.8
Average Professional Salary		K-12	$25,198.60	$26,085.44	$30,804.37	$26,756
Student Information						
% Diplomas Granted	Regular	12	90.6	68.7	75.8	81.8
	Honors	12	49.6	26.7	20.0	8.5
	Special Education	12	1.8	1.4	1.5	1.9
	Certificate of Attendance	12				0.9
	Seniors not Receiving Diploma in Spring Graduation	12	2.7	3.2	2.7	6.9
% Students in Vocational Education Courses		7-12	33.0	40.9	41.0	45.5
% Students in Special Education		K-12	12.1	11.3	12.1	14.2
% Chapter 1 Students		K-12	13.3	15.5	12.4	11.9

Table 3. Testing Information For Widget City Schools Too (1990-91 Report Card Data.

Widget Too Schools

TENNESSEE COMPREHENSIVE ASSESSMENT PROGRAM (TCAP)

Reading

Year	GRADE 2	3	4	5	6	7	8	10
State Avg.	na	na	na	na	na	na	na	na
1990-91	7	6	6	6	6	7	7	6

Language

Year	GRADE 2	3	4	5	6	7	8	10
State Avg.	na	na	na	na	na	na	na	na
1990-91	7	6	6	6	6	6	7	6

Math

Year	GRADE 2	3	4	5	6	7	8	10
State Avg.	na	na	na	na	na	na	na	na
1990-91	7	7	7	6	6	7	7	7

Science

Year	GRADE 2	3	4	5	6	7	8	10
State Avg.	na	na	na	na	na	na	na	na
1990-91	7	6	7	6	6	7	6	6

Social Studies

Year	GRADE 2	3	4	5	6	7	8	10
State Avg.	na	na	na	na	na	na	na	na
1990-91	7	6	7	6	6	6	6	6

TENNESSEE PROFICIENCY TEST (TPT)

Language

Year	Grade 9 With Special Ed.	Without Special Ed.
State Avg.	na	na
1990-91	90	91

Mathematics

Year	With Special Ed.	Without Special Ed.
State Avg.		na
1990-91	98	98

Both

Year	With Special Ed.	Without Special Ed.
State Avg.		na
1990-91	88	90

Testing Information

Students in Tennessee are given two types of tests. Students were introduced this spring to the **Tennessee Comprehensive Assessment Program (TCAP).** This program mandates a customized, norm referenced and criterion referenced test for grades 2 through 8, a norm referenced test for grade 10, and the **Tennessee Proficiency Test.**

The customized test will allow each teacher to assess progress of students during the school year with a minimum amount of testing time. The program will generate consistent types of test scores from grade to grade. The norm referenced data will allow longitudinal status of individual, school, system, and state growth in order to evaluate and improve programs and curricula. The criterion referenced data will report the mastery , partial mastery, and non-mastery of tested domains for each school year. Although the objectives for the Tennessee Proficiency Test has been updated, the rules and regulations governing the test will remain the same.

The Tennessee Proficiency Test measures minimum skills in mathematics and language arts. Students must achieve a passing score of 70 percent correct on both the math and language arts tests in order to fulfill one of the requirements for receiving a regular diploma. Students take the test for the first time in the ninth grade.

Table 4. General Information Found In A Typical School District's Report Card, 1990-91

Widget Too

System Information		Grade Level	1988-89	1989-90	1990-91	State Average
Number of Schools		K-12	5	5	5	na
Average Daily Membership		K-12	3,372	3,9290	3,436	na
% Student Attendance		K-12	95.1	95.8	95.6	na
% Enrollment Change		9-12	-15.2	-12.1	-20.1	na
%Oversized Classes		K-12	2.3	1.4	1.5	na
% of Students on Free or Reduced Lunches		K-12	21.0	22.0	23.0	na
Expenditure per Pupil		K-12	$3,501	$3,942	$4,073	na
County Per Capita Income		K-12	$12,819	$13,662	$14,192	na
% Elementary Schools Accredited by SACS		K-8	100	100	100	na
% Secondary Schools Accredited by SACS		7-12	100	100	100	na
Professional Educator Information						
% Professionals on Career Ladder II and III		K-12	25.6	28.6	30.8	na
Average Professional Salary		K-12	$30,804.37	$31,590.60	$33,753.00	na
Student Information						
% Diplomas Granted	Regular	12	75.8	73.4	79.5	na
	Honors	12	20.0	22.0	18.6	na
	Special Education	12	1.5	0.9	1.0	na
	Certificate of Attendance	12		.09		na
	Seniors not Receiving Diploma in Spring Graduation	12	2.7	2.8	1.0	na
% Students in Vocational Education Courses		7-12	41.0	41.3	39.3	na
% Students in Special Education		K-12	12.1	12.6	13.6	na
% Chapter 1 Students		K-12	12.1	12.6	8.7	na

Other Information:

Percent of Student in Attendance (%SA). This figure shows the average percent of student in attendance daily in your school system for the 1990 91 year.

Percent Enrollment Change (%EC). This figure shows the percent change in a group of student who started in the ninth grade four years ago and should have completed the twelfth grade this year. It is a four year average. Decreases happen when students drop out of a school, move away, graduate early, fail a year, or leave school for other reasons not listed.

Percent of Oversized Classes (%OC). This figure shows the percent of classes in all grade levels which had waivers for being over the maximum class size. Maximum class sizes in Tennessee are 25 for grades K-3; 28 for grade 4, 30 for grades 5-6; 35 for grades 7-12; 23 for vocation.

Percent Students on Free or Reduced Lunches (%FRL): Students whose family income meets certain criteria are eligible for free or reduced price lunches. This figure shows the percent of student sin your school system who receive free or reduced price lunches.

Expenditure per Pupil (EPP). This figure shows the average number of dollars spent for each pupil in average daily attendance for your school system.

County Per Capita Income(CCI): This figure represents the per capita personal income for the county in which your school system is located. The most recent figures available from the U.S. Bureau of Economic Analysis are for 1988.

Percent Elementary/Secondary Schools Accredited by SACS (%ES): Schools may elect to seek accreditation from the Souther Association of College and Schools (SACS) in addition to receiving state approval. This agency recognizes quality schools, maintains a list of accredited schools and requires a continuing school improvement program.

Percent Professionals on Career Ladder Levels II and III (%CL): This figure show the percent of professional staff in your school system who have met the standards for Career Levels II and III. These are the upper rungs of Tennessee's Career Ladder program. The number includes regular classroom teachers, guidance counselors, librarians, and administrators.

Average Professional Salary (APS): This figure shows the estimated average salary for all certificated personnel in your school system.

Diplomas Granted: These figures show the percent of the twelfth grade class receiving different types of diplomas. Some school systems have requirement that may exceed these standards. Tennessee students may receive four kinds of diplomas:

High School Diploma (D-HS): Awarded to students who (a) earn 20 units of credit, (b) make passing scores on all components of the Proficiency Test and (c) are satisfactory records of attendance and conduct.

Honors Diploma (D-HO): School systems may offer an optional diploma to students who meet increased requirements established by the State Board of Education. The requirements include accelerated English, math, science and social students, and a 3.0 grade point average.

Special Education Diploma (D-SE): Awarded to students who have satisfactorily completed an individualized Education Program and who have satisfactory records of attendance and conduct, but who have not passed all components of the Proficiency Test.

Certificate of Attendance (D-CA): Awarded to students who have earned 20 units of credit and who have satisfactory records of attendance and conduct, but who fail to meet Proficiency Test standards.

Students Not Receiving Diploma in Spring Graduation (D-NR): This figure represents students who will receive their diplomas after completing summer school or who failed to complete high school.

Percent of Students in Vocational Education Courses (%VO): This figure shows the percent of the school system's average daily membership enrolled in one or more vocational education courses. Students enrolled in more than one vocational courses are counted only once.

Percent of Students in Special Education (%SE): This figure show the percent of students in your school system who are receiving special education services.

Percent of Chapter 1 Students (%CH1): Chapter 1 is a federally funded program to assist students in the areas of reading and mathematics. This figure shows the percent of student receiving services under Chapter 1.

Questions 2, 6, 8, and 9 are new questions representing the capacity available in the 1990-91 report cards to analyze data at several levels within the school districts and the capacity of the current study for comparison with the earlier study results. Question 7 is a modification of a question posed in the earlier study, because only two test batteries (rather than three) were used in the current analysis.

As in the earlier study, most, but not all, districts reported comprehensive scores on both TCAP and TPT. These districts (120) constitute the sample for analysis.

Twenty school district characteristics were actually reported in the 1990-91 report cards. In responding to research Question #1, the investigators first evaluated all characteristics to determine their value as independent variables. A *Kaiser* test of variable sample adequacy was applied to each variable at each level (elementary, middle, high school, and system). Five characteristics were eliminated from further study: percent elementary schools accredited by SACS, percent high schools accredited SACS, diplomas granted in special education, certificates of attendance granted as diplomas, and seniors not receiving diplomas in Spring graduation. Appendix A presents the results of this analysis.

Two correlation procedures were used to generate a response to research question #1. A Pearson Product Moment correlation enabled comparison of variables, and Guttman's partial correlation allowed the researchers to develop percentages of influence to assess relationships between independent and dependent variables.

To answer research question #2, the correlations (Pearson and Guttman's) were generated for each independent-dependent variable relationship at each of the four defined school levels.

Research question #3 was answered by computing correlations among independent variables. A coefficient of determination (r^2) showed the levels of interaction between categories (variables).

Research question #4 required the rank ordering of school districts within the sample by system MSO. Comparisons of rankings at all school levels (elementary, middle, secondary) could be made. Only the top 10 and bottom 10 districts in the rankings are reported.

Research question #5 required no further statistical analyses. The partial

correlation coefficients and related percentages of influence previously developed provided the necessary data.

To answer research question #6, changes in MSO upward and downward of one standard deviation from school level to school level were first computed using Z-scores as the basis for the computation. To further clarify the results, school-level rankings were developed.

For research question #7, the investigators applied the Guttman partial correlation procedure to the relationship between each independent variable and each of the two test scores (TCAP and TPT) used in generating the high school MSO.

Research question #8 required application of the statistical procedures previously used to the relationships between each of the 15 school district characteristics and TPT test scores for grade nine under two conditions: with and without special education student's scores.

Research question #9 allowed the investigators to compare and contrast findings from the 1988-89 study and the 1990-91 study, wherever comparisons appeared to be valid. Some results could not be compared because different test batteries were used in the two different years.

Question 10 was used as a means of focusing conclusions and implications. Report cards on schools and the data included in them generate policy discussions. The findings of this study when added to those of the earlier one should be useful to policymakers at all levels.

III. FINDINGS

Findings of the study are reported in two ways: (A) a descriptive analysis of the 120 school districts used in the study, and (B) responses to the research questions.

A. Descriptive Analysis of School Districts

A profile of the 120 school districts qualifying for inclusion in the study by Report Card category was developed. For each category, the report card (state) mean score, standard deviation (SD), number of schools submitting data and ranges of scores or numbers were compiled. Table 5 presents the profile.

Table 5. A Report Card Profile of 120 Tennessee School Districts Sampled, 1990-91 data.

	SD	Max	Min.	n	District mean
Tennessee Proficiency Test (TPT)					
With Special Education					
Language	6.9	99	66	120	87.1
Math	5.8	100	68	120	90.8
Both	8.3	99	58	120	84.0
Without Special Education					
Language	5.6	100	72	120	92.2
Math	4.6	100	74	120	94.9
Both	5.6	100	72	120	89.7
System Information					
Number of Schools	20.1	161	1	120	12.9
Average Daily Membership	12,415	103,987	378	120	6,624
% Student Attendance	1	97.4	91.2	120	94.4
%Enrollment Change	9.4	3.6	-48.3	120	-23.0
% Oversized Classes	3.5	23	0.2	103	4.4
% Free or Reduced Lunches	14.2	85	10	120	41.7
Expenditure Pupil	$532	$5,312	$2591	120	$3,442
County Per Capita Income	$2,257	$22,097	$8,081	120	$12,371
% El. Schools accredited by SACS	34.8	100	3	48	60.4
% Sec. Schools accredited by SACS	23.1	100	25	83	85.3
Professional Educator Information					
% Career Ladder II & III	6.0	42.5	6.8	119	16.8
Average Professional Salary	$2,960	$36,505	$23,262	120	$27,465
Student Information (% Diplomas Granted)					
Regular	9.2	98.7	56.3	120	80.4
Honors	7.0	41.7	1	102	13.7
Special. Education	1.6	8.6	0.4	107	2.4
Certificate of Attendance	0.7	2.9	0.1	66	.9
Seniors not receiving Diploma in Spring Grad.	4.3	21.3	0.3	97	6.5
% Students in Vocational. Ed. Classes	13.7	98.8	19.8	120	47.6
% Students in Special Ed.	3.9	28.8	8.2	120	16.4
% Chapter 1 Students	8.1	47.5	2.6	120	16.2

1. **System Information**

All school districts in the sample (120) reported scores for TCAP and for the TPT. When special education students were included in the TPT results, 87.1 percent of all students passed the language test, 90.8 percent passed math, and 84.0 passed both tests. When special education students were excluded from the report, 92.2 percent of the students across the state passed the language test; 94.9 percent passed the mathematics test and 89.7 percent passed both tests.

Most of the 120 school districts studied reported all data for the 20 report card categories. One hundred and three reported percentage of oversized classrooms, 48 reported percentage of elementary schools accredited by SACS; 83 reported percentage of secondary schools accredited by SACS; 119 reported percentage of professionals on Career Ladder II & III; and 66 reported certificate of diplomas awarded. The statewide profile shows approximately 13 schools per district with an average daily membership of 6,624 students. In 1990-91, student attendance averaged 94.4 percent statewide; enrollments in the districts decreased from the preceding year by an average of slightly more than 23 percent. In these districts, approximately 4.4 percent of all classes exceeded state prescriptions for class size. Almost 42 percent of all students state wide received free or reduced lunches. Per pupil expenditures averaged $3,442 per district, and county per capita income averaged $12,371.

2. **Professional Educator Information**

Approximately 17 percent of all Tennessee educators had achieved Career Ladder Levels II or III by 1990-91, and average professional salary was $27,465. As few as 6.8 percent of the teachers in a district and as many as 42.5 percent had achieved upper Career Ladder status, and average salaries reported ranged from $23,262 to $36,505.

3 **Student Information**

Eighty percent of all diplomas awarded in the state in 1990-91 were Regular diplomas; almost 14 percent were Honors diplomas; slightly more than 2 percent were Special Education diplomas, and about 1 percent of all students leaving school were granted certificates of attendance. More than 6 percent of students graduating did not

receive their diplomas during spring graduation.

Almost 48 percent (47.6%) of Tennessee's students were enrolled in vocational education classes during the year investigated. Slightly more than 16 percent were special education students, and another 16 percent were participants in Chapter 1 programs.

4. **Comparison of Selected 1990-91 data with 1988-89 data.**

A few comparisons of data from the 1990-91 profile (see Table 5) with data from 1988-89 (see Table 6) are useful. In 1988-89, 76 percent of students taking the TPT passed the language test, 90 percent passed mathematics, and 76 percent passed both sections. Passing rates for the TPT had risen substantially in language (M=76%, 92%, respectively), and in passage of both language and mathematics tests by 1991 (M=76%, 84%, respectively).

Between 1989 and 1991, average per pupil expenditures had not risen much(≈$100), and average county per capita income had fallen by about $500. Average professional salaries of educators had increased about $700. The percentage of students receiving free or reduced lunches remained static at approximately 42 percent, and the number of oversized classes dropped by only 3 tenths of one percent.

B. Findings Pertinent to Research Questions

1. How do school district characteristics currently reported relate to student academic achievement results?

As in the 1988-89 study, a correlation matrix (Appendix B) was generated to assess the relationship between each reported characteristic and MSOs. However, four sets of relationships could be determined for 1991: one for Elementary Outcome Level (EOL), one for Middle Outcome Level (MOL), one set for High School Outcome Level (HOL), and one for the System Outcome Level (SOL). The same correlation matrix (see Appendix B) displays relationships between independent variables and system outcomes (SOL).

In response to question 1, one can see in Appendix B correlations exceeding ±.50 between four district characteristics and **EOL**: percent of free or reduced lunches (r= -.70), percent of upper career ladder professionals (r= .62), percent of special education diplomas (r= -.53), and percent of Chapter 1 students (r= -.68). Five

Table 6. A Report Card Profile of 121 Tennessee School Districts sampled, 1988-89 data.

121 SCHOOL DISTRICTS	SD	n	Max	Min.	Report Card Mean
OUTCOMES					
Basic Skills First (BSF)			(Percent passing): 8th grade		
Reading	4.9	121	91	65	81
Math	7.7	121	85	43	66
Stanford (STAT); Task 2			(Stanine score): 12th grade		
Reading	0.5	121	7	4	5
Math	0.5	121	6	4	5
English	0.6	121	7	4	5
Science	0.5	121	6	3	5
Social Studies	0.5	121	6	4	5
TN Proficiency Test			(% Students Passing): 9th grade		
Language	8.6	121	98	56	76
Math	6.4	121	98	59	90
Both	9.3	121	98	48	76
MONEY					
Co./Capita Income ($)(CCI)	1,962	121	19,318	6,934	12,878
Stud. Expenditure ($)(EPP)	509	121	4,891	2,318	3,304
Aver. Prof. Salary ($) (APS	2,693	121	34,797	21,286	26,756
SCHOOL SYSTEM					
Average Daily Mem.(#) (ADM)	12,395	121	104,788	3[illegible]5	5,87 4
Student Attendance (%SA)	1.3	121	97.1	90.3	93.6
Oversized Class (%OC)	4.1	110	21.5	0.1	3.8
Free/Reduced Lunch (%FRL)	14.5	121	86.0	9.0	42.0
Career Ladder II/III (%CL)	5.9	121	41.5	4.1	14.8

characteristics correlated above ±.50 with **MQL**: percent of free/reduced lunches (r= -.69), percent of upper Career Ladder teachers (r= .65), average professional salaries (r= .51), percent of Special Education diplomas (r= -.69), and percent of Chapter 1 students (r= -.69). High correlations (above ±.50) existed between **HQL** and five district characteristics: percent of student attendance (r= .53), percent of free/reduced lunches (r= -.69), percent of upper Career Ladder teachers (r= .55), percent of special education diplomas (r= -.55), and percent of Chapter 1 students (r= -.74). When academic outcomes (MSO) for the entire system were the focus, four system

characteristics demonstrated correlations above +.50: percent free/reduced lunches (r= -.73), percent of upper Career Ladder teachers (r= .64), percent special education diplomas (r= -.62), and percent of Chapter 1 student (r= -.73). Academic outcomes at all levels were influenced positively by the presence of expert teachers (upper Career Ladder teachers) and to a somewhat lesser degree by attendance.

Attendance most influenced HOL performance. Most severe negative influences on academic performance at all levels were percent of students receiving free/reduced cost lunches and percentage of Special Education and/or Chapter 1students.

A second set of data relating to question 1 (see Table 7 and Appendix C) provided a Guttman's Partial Correlation matrix for each of the four outcome levels, and for 15 targeted system characteristics, and a display of the percentage of influence exerted by each system characteristic on each set of MSOs. Some findings produced from these analyses included:

1. System characteristics having greatest impact on student academic performance were not the same at all levels (see Figure 1). The factor most influencing the EOL was per pupil expenditure (11.2%). Middle school student academic performance was most impacted by the same factor (8.1%). Academic performance among high school students was most influenced by their

Table 7 Guttman's partial correlation used to evaluate the 15 report card categories from 4 educational levels (elementary (EOL), middle school (MOL), high school (HOL), and system (SOL), 1990-91 Tennessee school district report card data.

	#SCH	ADM	%SA	%EC	%OC	%FRL	EPP	CCI	%CL	APS	D-HS	D-HO	%VO	%SE	%CH 1	TOTAL
EOL	0.2	0.1	6.7	0.3	3.4	7.3	11.2	0.4	3.2	1.0	1.1	0.3	0.8	1.5	2.1	39.60
MOL	0.0	0.2	5.9	0.3	2.8	2.3	8.1	0.0	4.9	0.3	1.9	1.5	1.0	0.1	6.0	35.30
HOL	4.5	5.3	13.6	3.5	0.2	0.3	0.4	0.6	0.0	2.7	0.2	0.4	4.5	0.0	4.7	40.90
SOL	0.4	0.9	13.3	1.5	3.1	4.7	9.4	0.4	3.1	0.1	1.5	0.2	2.9	0.2	6.5	48.20

attendance (13.6%), as was overall academic performance in the school district (13.3%).

2. The factor having least impact on MSOs also varied by school level. The size of the system (ADM) had least influence on elementary student performance (0.1%). Neither the number of schools in a system nor the county per capita income had any influence on MOLs (0.0%). HOL was least influenced by the percentage of Special Education students in the district and the percentage of Career Ladder II and III teachers teaching there (0.0%). Overall MSO in a system was least impacted by average professional salaries of educators (0.1%).

3. Percentage of oversized classes, a rough indicator of the influence of class size on student performance, has increasingly less influence on student academic performance as students progress from elementary to middle to high school. Even at its most influential point (the elementary years), this factor accounts for only 3.4 percent of whatever it is that influences student academic outcomes.

2. Are there differences in the relationships between dependent and independent variables at different school levels?

The answer to this question is clearly "yes" as demonstrated by data in Appendix C. We have already reported the differences in system characteristics having most and least impact on student academic outcomes at the various school levels. No system characteristic influences student academic outcomes in the same way at all school/district levels. The combined set of 15 characteristics does not exert the same amount of influence on MSOs at any of the four levels studied. This finding will be explored more completely in response to research question 5.

A few other relationships demonstrated in Appendix C are important. The presence of upper Career Ladder teachers appears to have greatest impact on student performance at the middle school level (4.9%). The average professional salaries paid within a school district do not have great influence on student performance, but they have more influence (2.7%) on secondary students than on any other group. The socio-economic level of the community (county per capita income) had less than 1 percent influence on academic outcomes at any level.

The histogram presented in Figure 1 simply reinforces the statistics presented in the accompanying Appendix C. Note particularly the positions of the influence occupied by percent student attendance, expenditure per pupil, and percentage of students receiving free/reduced lunches in relationships to the positions of other variables.

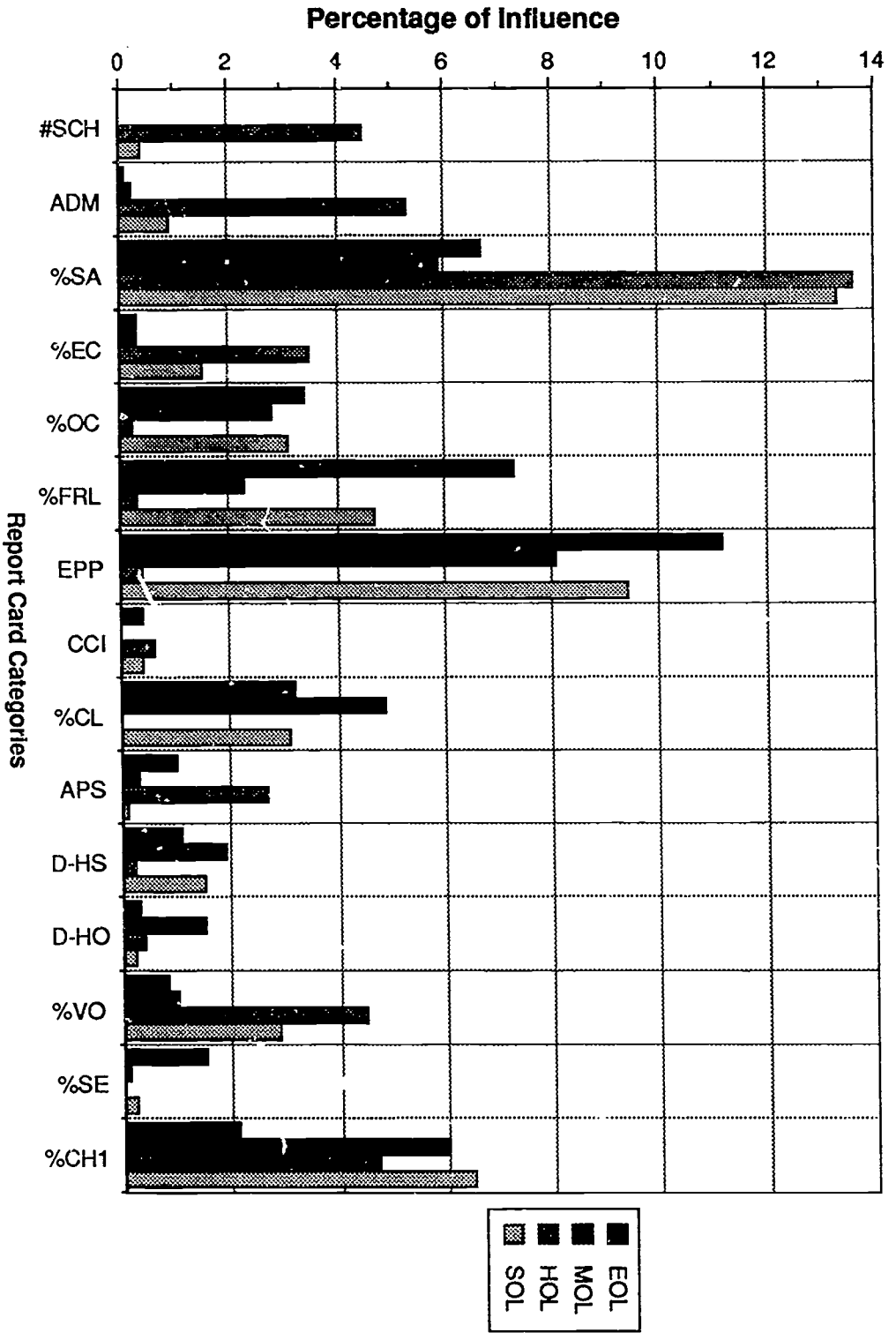

Figure 1 The percentage of influence for the 15 report card categories and the four levels (elementary [EOL], middle [MOL], high school [HOL], and system (SOL], 1990-91 Tennessee report card data.

3. How do reported school characteristic relate to each other?

The answer to this question is found in Appendix B. The correlation matrix reveals eight correlations exceeding ±.50. The relationship between number of schools in the system and student attendance is strongly negative (r= -.54). The same can be said of the relationships between student attendance and size of school district (r= -.54) and between percentage of student receiving free/reduced lunches and attendance (r= -.54). None are surprising statistics.

There is a strong positive correlation (r= .53) between percentage of special education diplomas awarded in a district and the percentage of students receiving free/reduced cost lunches. A strong positive correlation (r= .78) exists between percentage of Chapter 1 students in a school district and percentage of students receiving free/reduced cost lunches. Special education, free/reduced meals, and Chapter 1 are closely linked. Again, these findings are not surprising.

The relationship between average professional salaries in a system and expenditure per pupil is strongly positive (r= .79). Communities that spend more on education pay their teachers and administrators better than do other communities. The very high positive correlation (r=.99) between number of schools and size of school district does not tell us much. A strong positive correlation (r=.51) is found between percentage of students receiving special education students and percentage of students not receiving diplomas in the spring.

There is a positive correlation (r=.50) between percentage of special education diplomas awarded and percentage of students enrolled in vocational education programs. This correlation could reflect the creation of vocationally-oriented programs for special education students, or placement of special education students in vocational programs, regardless of the suitability of the programs to the students.

4. When rank ordered on the basis of student outcomes, how do school districts within the state perform in terms of reported school and community characteristics?

To explore this question, the investigators generated rankings by MSO at the four levels being investigated and by system characteristics for the top 10 and bottom 10 producing systems, using system MSOs (SOL) as the anchor. Table 8 and

Table 8 School District Rankings By Student Academic Performance, 1990-91 data, based on SOL and compared on EOL, MOL, HOL.

	Elementary		Middle		High School		System		Differences		
SCH #	EOL Z	Rk	MOL Z	Rk	HOL Z	Rk	SOL Z	Rk	Max. Z	Min. Z	Diff.
Top 10 Systems											
72	2.87	1	2.96	1	1.61	4	2.48	**1**	2.96	1.61	1.36
119	2.09	3	2.14	2	1.25	11.5	1.83	**2**	2.14	1.25	0.89
59	1.96	4	1.98	3	1.36	9	1.77	**3**	1.98	1.36	0.62
84	1.58	13	1.98	5	1.68	3	1.75	**4**	1.98	1.58	0.40
99	1.71	7	1.98	4	1.49	5	1.73	**5**	1.98	1.49	0.49
108	1.71	7	1.17	14	1.78	2	1.55	**6**	1.78	1.17	0.60
110	1.71	7	1.19	12	1.42	6.5	1.44	**7**	1.71	1.19	0.52
37	1.58	13	1.82	7	0.85	19	1.42	**8**	1.82	0.85	0.96
103	1.71	7	1.18	13	1.29	10	1.39	**9**	1.71	1.18	0.53
29	2.22	2	1.83	6	-0.03	60.5	1.34	**10**	2.22	-0.03	2.25
Bottom 10 Systems											
97	-0.75	94	-1.09	112	-0.75	106	-0.86	**111**	-0.75	-1.09	0.34
16	-0.88	106.5	-0.43	98	-1.36	115	-0.89	**112**	-0.43	-1.36	0.93
62	-1.40	115.5	-0.60	107	-0.82	108	-0.94	**113**	-0.60	-1.40	0.80
46	-0.88	106.5	-1.25	115	-1.02	112	-1.05	**114**	-0.88	-1.25	0.37
10	-1.14	113	-1.72	117	-0.90	109	-1.25	**115**	-0.90	-1.72	0.81
58	-0.88	106.5	-1.09	113	-1.82	117	-1.26	**116**	-0.88	-1.82	0.94
78	-1.79	117	-1.25	114	-1.43	116	-1.49	**117**	-1.25	-1.79	0.53
41	-1.79	118	-2.53	119	-0.75	107	-1.69	**118**	-0.75	-2.53	1.78
111	-2.43	119	-2.54	120	-2.72	120	-2.56	**119**	-2.43	-2.72	0.29
30	-3.21	120	-2.52	118	-2.70	119	-2.81	**120**	-2.52	-3.21	0.69

Appendix D present the findings. Table 8 displays the relationships between SOLs and school levels. Among important findings are the following:

1. The system having the highest MSO (#72) had the highest elementary and middle school MSOs, but not the highest high school MSO.

2. Eight of the top 10 systems ranked by district MSO were not in the top 10 at the elementary, middle, or high school levels.

3. The district ranking 10 in SOL ranked 60th in high school student performance.

4. No district ranking among the bottom 10 districts in district MSO ranked above the 94th position at any school level.

Appendix D provides data about school district/community characteristics in relation to system level MSO rankings. It also profiles the relationships between system/community factors and HOLs. Note the following:

1. There are no readily identifiable patterns of school/community characteristics among those currently reported that produce high achieving or low achieving school systems.

2. There are no common patterns of school/community characteristics among those reported that appear consistently to produce high achievement or low achievement among high school students.

3. Typical biases about characteristics necessary in a system or community to produce high achievement (e.g., money, larger or smaller schools, small classes) are not confirmed by the data available. Schools and communities with a range of the characteristics currently reported produce both higher and lower academic achievement.

5. Do the reported school district characteristics appear to represent all or most factors that influence student academic achievement?

The answer to this question is found in Appendix C. Clearly, the answer is, "NO." Together, the 15 characteristics under investigation provide 39.6 percent of the influence on EOL, 35.3 percent of the influence on MOL, 40.9 percent of whatever influences HOL, and 48.2 percent of the influence on SOL. These factors influence outcomes at different levels in different ways, and together they account for less than half of whatever influences student performance at any level. Further, they account for less than 50% of the influence on student outcomes at any single grade level as indicated in the response to question #3 above.

6. Is there evidence of major change in student academic performance from one school level to another within school districts?

Table 9 provides the data pertinent to this question. Eleven systems demonstrated shifts downward in MSO of at least one standard deviation somewhere between the elementary and the high school levels. Sometimes the shift occurred from elementary to middle school, sometimes from middle to high school. Sometimes the change was continuous from level to level, and sometimes a dramatic shift occurred from elementary to middle, but began to reverse from middle to high school.

Twelve systems demonstrated changes of at least one standard deviation upward over the three school levels. Again the patterns of change were not always constant, and the shifts occurred at different points in different systems.

Some of the notable change patterns can be seen in reviewing the changes in academic rankings within a system from level to level:

1. Six of the 11 systems showing downward shifts in MSO had consistent downward trends from the elementary to middle to high school levels.

2. Three districts showed significant declines in MSO from the elementary to middle school level, but reversed the trend from middle to high school. System #82 demonstrated a dramatic downward shift from elementary to middle school (20th to 78th) and a dramatic shift upward from middle to high school (78th to 18th).

3. Two districts (#71, #9) displayed better student performance (by rank) at the middle school level than at the elementary level, but dropped markedly in the high school rankings.

4. Of the 12 systems demonstrating upward shifts in MSO, six showed consistent patterns of improvement at each school level. Perhaps the most dramatic pattern was exhibited by system #1 which ranked 106 (of 120) in EOL, 23 in MOL and first in HOL. Data for this system also clearly point up the limited value of district level rankings. In the composite, this system ranked 28th in SOL.

5. Three systems (#41, #74, #52) displayed downward patterns of achievement from elementary to middle school, but strong upward patterns from middle to high school.

6. Three systems (#90, #64, #51) showed strong upward trends in MSO and ranking from the elementary to middle school level, but reversed the pattern from the middle to the secondary level.

The causes of the changes found among these 23 school districts are unknown. Such changes could relate to the quality of instruction students received at the several

Table 9 School districts with outcomes greater/smaller than +≤1.0 z-scores between the elementary, middle, or high school levels.

	Elementary		Middle		High School		System		Differences		
SYSTEM #	EOL Z	Rk	MOL Z	Rk	HOL Z	Rk	SOL Z	Rk	Max. Z	Min. Z	Diff.
DOWN											
AT Least -1 Standard Deviation at some level (n=11)											
101	**1.06**	20.5	**-1.52**	116	-0.69	102	-0.39	85	1.06	-1.52	-2.58
29	**2.22**	2	1.83	6	**-0.03**	**60.5**	1.34	**10**	2.22	-0.03	-2.25
22	**1.45**	16	0.55	21	**-0.67**	**100**	0.44	**30**	1.45	-0.67	-2.11
77	**-0.10**	57	-0.28	73	**-1.97**	118	-0.78	107	-0.10	-1.97	-1.86
85	**1.71**	7	1.66	8	**-0.15**	**67.5**	1.07	**13**	1.71	-0.15	-1.85
89	**1.58**	13	0.20	42	**-0.02**	58	0.58	24	1.58	-0.02	-1.60
82	**1.06**	20.5	**-0.43**	78	0.94	18	0.52	26	1.06	-0.43	-1.49
71	**1.58**	13	1.33	11	**0.09**	**54**	1.00	**17**	1.58	0.09	-1.49
67	**1.19**	18	**-0.11**	52	0.42	35.5	0.50	29	1.19	-0.11	-1.29
9	**1.58**	13	1.48	10	**0.29**	**42**	1.12	**11**	1.58	0.29	-1.29
39	**0.54**	30.5	-0.43	79	**-0.59**	**94**	-0.16	**62**	0.54	-0.59	-1.13
UP											
At least +1 Standard Deviation at some level (n=12)											
1	**-0.88**	106.5	0.54	23	**1.85**	1	0.50	28	1.85	-0.88	+2.73
41	-1.79	118	**-2.53**	119	**-0.75**	107	-1.69	118	-0.75	-2.53	+1.78
74	0.54	30.5	**-0.27**	69	**1.37**	8	0.55	25	1.37	-0.27	+1.64
90	**-1.40**	115.5	-0.76	110	**0.19**	**48**	-0.66	**104**	0.19	-1.40	+1.58
55	**-0.88**	106.5	-0.43	97	**0.47**	**33.5**	-0.28	**74**	0.47	-0.88	+1.35
64	**-0.49**	76.5	**0.84**	20	-0.36	78	0.00	57	0.84	-0.49	+1.33
51	**-0.88**	106.5	0.39	26	**-0.51**	89.5	-0.33	78	0.39	-0.88	+1.27
52	**-0.62**	82.5	-0.59	102	**0.63**	**24.5**	-0.20	**68**	0.63	-0.62	+1.25
33	**-0.62**	82.5	-0.27	66	**0.55**	29	-0.11	58	0.55	-0.62	+1.17
93	**-0.49**	76.5	0.21	40	**0.64**	23	0.12	47	0.64	-0.49	+1.14
47	**-1.01**	111.5	-0.43	99	**0.05**	**56**	-0.46	**91**	0.05	-1.01	+1.06
31	**-0.36**	70	0.22	37	**0.63**	24.5	0.16	43	0.63	-0.36	+1.00

KEY:

SYS = State System ID
EOL = Elementary Outcome Level
MOL = Middle School Outcome Level
HOL = High School Outcome Level
SOL = System Outcome Level
Bold = Unusual data

levels. They might reflect an emphasis on "teaching to the test" at certain levels. They could indicate the lack of alignment between outcome measure (tests) and curriculum. They might be caused, in part, by the movement to a new set of tests (TCAP) during the year being investigated. What is clear is that outcome data and rankings reported at the system level have limited utility in identifying what is happening academically within a system or in targeting areas for improvement.

7. When academic achievement is treated as scores on two separate test batteries (TCAP and TPT) are patterns of influence changed?

Appendix E presents the findings pertinent to this question. Percentages of influence of each school district characteristic on each high school student achievement measure (TCAP, TPT) were compiled. The high school TCAP score was selected for use because it represents the 10th grade level, the level closest to the point (9th grade) where the TPT is administered. Several statistics are noteworthy:

1. The combined influence of the 15 factors varies greatly from test to test (TCAP=19.5%, TPT=41.6%).
2. Student attendance plays a much more important role in passage of the TPT (13.7%) than in the scores attained on the TCAP (3.0%).
3. Oversized classes influence TCAP scores (1.3%) more than passage of the TPT (0.1%), but the influence of this variable is not great in either case.
4. Size of the school district (number of schools and ADM) has more influence on TPT scores (5.5%, 5.1%) than on TCAP scores (0.9%, 0.6%).

The difference in what is being reported in the two scores may have significant impact on the influence patterns. The TPT results are simply a summary of the percentage of student receiving scores of 70 percent or better on all sub-tests. TCAP results reported are school-level mean scores on the test. At any rate, various factors in the school district do influence outcomes on these two measures differently.

8. What differences in relationships among variables exist when test results of special education students are included in the analyses?

Data appearing in Appendix F provide the response to this question. When rankings of the top 25 and bottom 25 performing school districts with special education students' TPT scores included were compared with the rankings for same districts excluding special education results, there were some changes in rankings, but no district originally ranked in the top or bottom group moved out of that respective group.

Shifts in ranked position were both upward and downward. Few were dramatic; i.e., shifts did not change rank by more than a position or two. Among the top 25 districts, one district dropped six positions when special education students' scores were dropped from consideration. Another district rose six positions under the same circumstances. Among the bottom 25 districts, three climbed markedly in rank when special education results were removed. Two districts dropped more than four positions. In large part, special education students' test results did not dramatically influence the overall academic performance of the school district.

9. How do the results on this study compare with the results of the investigation using 1988-89 Report Card data?

Results of the two studies (1988-89 and 1990-91) are not comparable in several areas. Student outcome measures (tests) changed in the interval, and the 1990-91 report cards provided more and somewhat different data than were available in 1988-89.

Changes and similarities in the basic statewide system profiles have already been presented in the descriptive analysis of school districts appearing earlier (see pp. 2-5). Therefore, the comparisons presented here focus on findings in response to similar research questions in the two studies.

The 1988-89 study reported positive correlations between school district MSO and five school district characteristics: county per capita income, average professional salaries, per pupil expenditure, student attendance, and percentage of upper Career Ladder teachers. In that study, two district characteristics (percent of oversized classes and percentage of students receiving free or reduced lunch) correlated negatively with student academic performance, and one characteristic (size of school district) demonstrated no significant correlation to student outcomes.

In 1990-91, system MSO (or SOL) correlated positively with the five district characteristics: *student attendance, per pupil expenditure, county per capita income, average professional salaries, and percentage of upper Career Ladder teachers.* The same two district factors that correlated negatively with student performance in 1988-89 (*percentage of oversized classes and percentage of students receiving free or reduced lunch*) demonstrate that relationship again 1990-91. In the 1990-91 study, size of school district (ADM) also demonstrated a negative correlation with academic

performance. Relationships among variables change little from test to test or year to year (correlation data can be found in Appendix B, and in Bobbett, French, and Achilles, et.al.[2]). In 1988-89, correlations exceeding .50 (±) were found among four sets of system characteristics:

CCI and APS, r=.71 ***APS and EPP, r=.78***
CCI and ADM, r=.53
CCI and %FRL, r= -.53

When examining the same district characteristics using 1990-91 data, three correlations exceeding .50 (±) were found:

%SA and ADM, r= -.54 ***APS and EPP, r= .79***
%SA and %FRL, r= -.54

Only one pair of characteristics (*average professional salaries* and *expenditure per pupil*) exhibited essentially the same relationships in the two studies. However, many of the positive and negative correlations below ±50 were exhibited from study to study.

One comparison available from the two studies is the influence on MSO of the eight school district factors studied in 1988-89 and the 15 factors investigated in the current study. Table 10 presents the data.

What produces the changes in influence of various factors is unclear. However, several observations can be made.

1. Attendance is still the most dominant factor in student achievement, among factors available for study.

2. In both studies, factors considered by many to be major contributors to or inhibitors of student academic performance (e.g., teacher salaries, percent oversized classes, county per capita income) by themselves have limited influence.

3. Doubling the number of factors included in the analysis almost doubles the amount of influence for which one can account, but the 15 characteristics under scrutiny in the current study still account for less than half of whatever influences student performance.

4. The change in student outcome measures from study 1 to study 2 may have significant impact on the data. If so, the importance of test/outcome measures themselves is underscored again.

IV. CONCLUSIONS AND IMPLICATION OF THE STUDY

As in the initial study, investigators framed a final research question as a means of developing useful conclusions and implications.

Table 10 Comparison of Influence Exerted On Student Academic Outcomes By School District Characteristics in 1988-89 and 1990-91.

	Percentage of Influence (district level)	
District Characteristics	**1988-89**	**1990-91**
County Per Capita Income	0.4	0.4
Average Professional Salaries	5.6	0.1
Expenditure Per Pupil	0.0	9.4
Average Daily Membership	2.8	0.9
% Student Attendance	10.9	13.3
% Oversized Classes	0.6	3.1
% Free/Reduced Lunches	6.0	4.7
% Career Ladder II & III	0.2	3.1
Number of Schools in District		0.4
% Enrollment Change		1.5
% Regular Diplomas		1.5
% Honors Diplomas		0.2
% students enrolled in Vocational Education		2.9
% Students in Special Education		0.2
Percentage of Chapter 1 Students		6.5
Total Percentage of Influence	**26.5**	**48.2**

10. How might the findings of this study inform educational policy at state and local levels?

Several of the conclusions the 1988-89 study were reinforced by the results of the 1990-91 investigation. Specifically, policymakers at all levels need to consider that few of the individual inputs commonly associated in people's minds with production of student achievement have much impact on student performance. With the exception of student attendance (and perhaps per pupil expenditure) treatment of any isolated variable will have little effect. If we want to improve or change student performance, a systemic approach to education change is an absolute necessity.

In the 1988-89 study, the researchers concluded that the eight system characteristics taken from the Tennessee Report Cards for analysis were of limited value; i.e., they gave limited information to policymakers and educators who want to improve education in their states and local communities, because these variables accounted for so little of the influence on student outcomes. In the 1990-91 study, 15 variables were available for examination. Again, they do not appear to be the "right ones," i.e., they don't tell us enough about what influences student achievement. Based on the two studies, knowledge gained from review of related research and experience in schools, the investigators urge that consideration be given to collecting, reporting, and analyzing data on such things as school organization, school culture, student motivation, parental involvement, instructional methodologies, curriculum features and other factors that may have significant influence on student performance.

When reviewing the results of the 1988-89 study, the investigators suggested that building-level data are probably more useful and more valid than district-level data for use in report cards. That conclusion is confirmed by the present study. Major variations and fluctuations in results appeared from school level to school level within individual school districts. Identification of sources of these differences could be useful to educators and policymakers seeking improvement. Even the 1990-91 study did not have building-level data available for analysis. School-level data may reflect conditions across several schools.

Report cards are only as good as the assessments used to determine student performance. The 1988-89 study raised some questions about the assessments being

used. Those questions are highlighted in the findings of the current study. Enough variations in similar analyses from study one to study two exist to suggest that the differences in student outcome measures are probably one cause.

Finally, "What is the purpose of School District Report Cards?" The question is not an antagonistic one, but a supportive one. Definition of purpose or purposes is central to assessing the value of report card contents. A recent editorial in the Nashville Tennessean (1992) speaks of Tennessee's report cards in glowing terms:

> It (the Report Card) is simply the most comprehensive report in this or any state on school funding and student performance. . .
>
> The reports are more than just a tool for comparison, however; they can empower local communities to act. The reports give Tennesseans the power to get the job done and make the grade for better schools. (p.40).

If the purpose of the Tennessee Report Card is simply to report the status of a community's schools and selected factors generally associated with them, the current report card does that reasonably well. If the purpose is to provide citizens, parents, educators and policymakers meaningful information upon which to make decisions for improvement, much is lacking. At least 50 percent of what influences student performance has not been reported. This can provide serious impediments to school improvement, if education leaders focus entirely on what is now being reported as the primary sources of improvement in student performance.

V. References

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2. Bobbett, G. C., French, R. L., & Achilles, C.M. What policymakers can learn from school report cards: analysis of Tennessee's report cards on schools, Paper presented at the annual meeting of the American Educational Research Association (AERA), May, 1992. (ERIC Document Reproduction Service No. TM 018 929).

3. Nashville Tennessean, October 4, 1992, p. 40. Editorial.