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Cover Page Footnote

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I alone am responsible for the findings and conclusions of this report.

The Impact of School Spending on Student Achievement

Results of MEAP Statewide Tests

Robert D. Gaudet

Examining school spending and student achievement as measured by the Massachusetts Educational Assessment Program tests on a community-by-community basis indicates that high spending in and of itself does not ensure achievement. While every community must have adequate funding to deliver an acceptable level of education services, there is a wide variation in achievement in similar communities with similar spending. The data suggest that other factors influence outcomes at least as much as spending.

Attempts to reform public education during the past thirty years have produced various policy responses to perceived educational shortcomings. During the 1960s, largely as a reaction to the Soviet Union's launching Sputnik in 1957, the federal government took a larger role in school issues, primarily by funding programs at the state and local level through programs like the Elementary and Secondary Education Act of 1965 and the Experimental Schools Program of 1970.[1] In the 1970s policymakers sought to improve the schools by ameliorating the pernicious effects of racial prejudice and segregation on student achievement. Various busing orders instituted across the nation assigned students of different races to schools on the theory that desegregation itself would have a salutary impact on urban school quality. In the 1980s several approaches were touted to fix the schools, including school-based management, teacher empowerment, and parent involvement.

While none of these reforms succeeded in bringing substantive improvement to American education, they did accelerate the post–World War II trend toward increasing school spending across the nation and in Massachusetts. In constant dollars, the commonwealth now spends three times more per pupil than it did in 1960. Between 1982 and 1987 Massachusetts increased per pupil expenditures by 74 percent, 34 percent more than the national average increase.[2] Implicit in such spending is the belief

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that there is a positive correlation between the amount of money spent educating a student and the quality of the education that student receives. Indeed, much of the national reform effort over the years has sought to equalize and increase per pupil outlays. In Massachusetts, the reform efforts of the past quarter century have attempted to bring more money to systems seen as underspending on education. The Willis-Harrington Commission of the 1960s, the Collins-Boverini legislation of the 1970s, and the Equal Educational Opportunity Grants of the Chapter 188 School Improvement Act of the 1980s all sought to lessen the disparity in funding between wealthy and poor communities.[3] The Supreme Judicial Court of Massachusetts ruled in *McDuffy v. Robertson* that "as a result of its school finance system, the state has neglected its constitutional duty to provide public school students with an adequate education."[4] While the court provided no specific remedy to correct the situation, many observers feel that significantly increased state funding will be the result of the ruling. If the court is right, more spending should eliminate the differences in resources and performance among Massachusetts's poorest and wealthiest school systems.

Spending and Achievement

Opinions on the relation between spending and achievement are as varied as the results of standardized achievement tests. When one moves beyond the commonsense notion that a certain critical mass of money is needed to run any quality enterprise, including a school system, the data are confusing and saddled with ideological baggage. An often cited study of researcher Eric Hanushek examined various studies that surveyed a range of such educational inputs as per pupil spending, class size, characteristics of teachers, and so forth. He concluded that there was no strong correlation between school expenditures and student performance.[5] The Pioneer Institute, a market-oriented Boston think tank, sees little relation between spending and school quality.[6]

International comparisons indicate that despite relatively high spending levels, the United States fares poorly against global competition. "The findings indicated that money alone is not the answer, because the United States spends 7.5 percent of its gross national product on education, the second highest percentage among the twenty nations studied, yet its students were close to the bottom in three of the four assessments."[7] On the other hand, groups like the Massachusetts Advocacy Center and the Boston Citywide Parents Council argue that money does buy better schools. The Supreme Judicial Court's decision in *McDuffy* codified that belief into the law of the commonwealth.

Evaluating the impact of spending on education is a complicated challenge, but one to which we must apply our best analytical skills. If increased spending in and of itself generally raises performance levels, then the challenge for the policymaker is relatively easy. Rather than one of dissecting and striving to understand the educational and pedagogical cultures, the task becomes one of finding ways of putting more money into the schools. If, on the other hand, more money is not necessarily correlative with better results, the reformers' task is much more difficult. Those who would improve our schools would have to identify what does drive achieve-

ment in the classroom, then develop policies and programs which contribute to that achievement.

Educational Achievement

Over the years, different definitions of education reform have been posited. Reform has at times been variously defined as increasing access to quality education for those in poverty, increasing per pupil spending, ensuring equitable treatment for racial minorities, providing appropriate services for the mentally challenged, and improving the graduation rate for all. Over the past few years many have come to see school reform in more substantive terms of improved actual outcomes for all students. While it is unclear what constitutes acceptable results, there is a general sense that reforms should contribute to solid student achievement in school. There is a growing awareness that merely affecting the process aspects of education — reducing class size, raising teacher salaries, utilizing computers, setting up school-based management — is not sufficient to improve results.

Any discussion of student achievement invites controversy. While there may be a general consensus that our young people should leave school fully prepared to succeed in the world, there is no agreement about what students need to know in order to thrive in our society. Former President George Bush and his education secretary, Lamar Alexander, President Bill Clinton and his education secretary, Richard Riley, and many civic and business leaders have called for the development of national standards of performance. Clinton's Goals 2000: Educate America Act includes a section codifying national education goals and establishes a federal role in developing national education standards and assessments.[8] Administration spokespeople are careful to point out that the legislation is intended to set up a "framework" around which to develop actual goals, not to dictate to the states what those goals should be. The New Standards Project, a consortium of prominent education leaders such as Marc Tucker of the Carnegie Forum, was set up to create a national examination system that "prepares students for the challenges of the twenty-first century."[9]

The Council for Basic Education (CBE), working in support of the national standards project, has developed a comprehensive chart detailing exactly what students should know at each level of their education. For example, fourth-graders should be able to "listen to literature, appreciating its sounds and cadences," and high school seniors should be able to "understand in some depth the unifying concepts of the life and physical sciences such as cell theory, geological evolution, organic evolution, atomic structure, chemical bonding and transformations of energy."[10] Considering that many American high school and college students do not know in which century the Civil War was fought, that could be a tall order, but the wall chart is an attempt to delineate what we want our children to learn at each stage of the education process.

The CBE based its chart on extensive research that incorporated input from professional education associations and from individual states that had moved toward setting standards. Closer to home, Vermont, in conjunction with various stakeholders including the business community, has created its own chart of standards. An interesting development is the difficulty the state is having in attempting to move academic evaluation away from standardized tests and toward portfolio assessments of individual students. While pen-and-paper tests have many critics, the RAND Corporation

"found severe problems" with the reliability and accuracy of Vermont's portfolio alternative.[11] Based on enacted education reform legislation, Massachusetts is beginning to develop its own standards.

At this point, policymakers are in the early stages of understanding achievement and developing standards that make sense. While there is a growing belief that more rigor at every level of education is needed, there is no agreement as to how to define that rigor. Setting up a chart of standards is fine, but problems quickly develop when it comes time to make such a chart the driving wheel of curriculum. Kentucky is one of the few states said to have made real progress toward developing a true achievement-based curriculum. One challenge standards-oriented reformers face is the difficulty of setting tough standards in a political context where some advocacy groups may see academic rigor threatening the interests of disadvantaged students.

Some people argue that any type of demanding performance-based requirements is guilty of being "ist" — sexist, racist, elitist. Real standards are also hard to achieve, as indicated by the fact that three-quarters of Massachusetts students did not reach acceptable proficiency levels on the April 1992 assessment of educational progress. What is more interesting than the failure of students to achieve at higher levels is the reaction of many school districts to the results. Many educators argued that the test was not fair or did not accurately measure their students' knowledge and skills.[12] It may be that whoever deigns to set standards must be prepared to be criticized for setting them.

Because it is so difficult to rationalize all the concerns and satisfy all the disparate interest groups that define the contemporary educational culture, the nation's first embrace of substantive achievement standards may have a private sector genesis. American College Testing (ACT), a corporation that administers college entrance examinations similar in purpose to the Scholastic Assessment Tests (the famous SATs, previously know as Scholastic *Achievement* Tests), has developed "an assessment system that will measure student abilities at critical transition points, beginning as early as eighth grade."[13] This Educational Planning and Assessment System will develop standards for student achievement, assessments to gauge progress toward these goals, and improve the transition from school to work. Assessments will be available at the eighth-grade, tenth-grade, and twelfth-grade levels. A new assessment to measure student abilities in a dozen skills critical to success in the workplace is also available. For the first time in this nation, ACT will offer workshops and training to help teachers and administrators make the best use of the tests and interpret results correctly. This last point is noteworthy because one of the most glaring deficiencies of American educator training programs is the lack of any requirement for teachers to take courses in testing and assessment.[14]

Despite the manifest difficulties in establishing and implementing standards-based public education, it may be more risky to continue business as usual in our schools. The nation no longer enjoys the automatic advantage of seemingly unlimited resources and a productive labor force that have characterized much of our history. Some theorize that a major factor in the erosion of the United States' competitive ability is a poorly educated workforce. Where the 1950s and 1960s celebrated America's bounty, as described in historian David Potter's classic *People of Plenty*, the 1990s must contend with diminishing natural resources, shrinking capital, a weaker labor force, and less of a technological advantage over the rest of the world, as

described in MIT professor Lester Thurow's *Head to Head,* which paints a less rosy picture of the country as the new century looms.[15]

Assessing Student Achievement in Massachusetts

No state today has in place accurate, reliable assessment procedures that can perfectly gauge aggregate student performance. One area in which perfection will continually elude us is assessment; by definition, any type of test reflects only a small slice of behavior and includes some error component. There simply is no magic way of figuring out how well a student, school, or system is performing. Most tests that children take are not aimed at assessing general performance. Most classroom examinations — the Metropolitans (the "Mets"), the Iowas, various IQ tests, teachers' weekly tests — are aimed at evaluating the performance of individual students, not any group of students.[16] Results of these individually oriented tests are not and should not be available to the public.

Massachusetts has only comparatively recently joined the national effort to develop assessment instruments that will enable observers to compare student progress across communities, states, and eventually countries. Until the 1992 statewide assessment, the commonwealth had not been involved in the National Assessment of Educational Progress, which was established to give observers a way to compare individual states' educational performances with one another. The Massachusetts Educational Assessment Program (MEAP) is a statewide battery of tests given every two years to every school system in the commonwealth. The MEAP represents an early step along the road to developing the accurate, fair assessment instruments needed to generate reports on student progress in a variety of areas.

The precedent for developing reports on educational matters in Massachusetts is clear. One hundred fifty-five years ago, Horace Mann published the first in his series of annual reports on the commonwealth's public schools, which contributed mightily to the establishment in Massachusetts of this country's and the world's first system of universal free public education. Mann succeeded in convincing a skeptical public and a wary business community to support public education by developing a series of reports on various aspects of schooling in antebellum Massachusetts. His famous annual reports developed the rationale for creating and sustaining schools for all.

A Survey of Massachusetts Public Schools

The Horace Mann Foundation, a nonprofit, independent, volunteer citizens group committed to creating grassroots support for better schools, has completed the first ever evaluation of school spending and student achievement in Massachusetts. The foundation's *Survey of Massachusetts Public Schools* is designed to assist citizens in understanding how well their schools perform and provide them with the necessary benchmarks against which future reform efforts may fairly be judged. The *Survey* brought together information which, while available to those willing to track it down, has never before been presented to the general public in a coherent form. Using data drawn from the U.S. census, the Massachusetts Department of Revenue, and the Massachusetts Department of Education, this report, the first of several to be issued by the foundation, will enable citizens to compare the resources they devote to

education with the results obtained. The foundation hopes that the publication of these reports will generate the widespread citizen activism it believes is a necessary precondition for school improvement.

Over the next two years, the foundation will examine the relations between various school and community characteristics — per pupil spending, household income, social class and status, teacher salary and training levels — and student performance as measured by the Massachusetts Educational Assessment Program in an attempt to pinpoint the factors that contribute to successful schools. The questions we will ask — and which we urge every citizen and policymaker of the commonwealth to consider — are basic ones. Are the public schools graduating students prepared to assume an active role in the economic and political lives of their communities? Do we get a reasonable return on our education dollar? And if more money is necessary, how may it best be spent? The *Survey* will provide the citizens of the commonwealth with an independent source for the information they need to answer these questions and to make informed decisions about the future of their schools.

The goal of the Horace Mann Foundation in producing this report and those to follow is to use available data to separate myth from reality in the debate over school reform. The data and analysis are presented so that policymakers, educators, and the public can use this information and analysis to improve educational performance in Massachusetts communities.

The Approach

Data for this report include the results of the April 1992 MEAP statewide assessments for 220 towns and cities and 41 regional systems, per pupil spending information supplied by the state Department of Education,[17] and demographic information from the 1990 federal census.

The MEAP is a standardized achievement test that measures student knowledge in five subject areas, math, science, social studies, reading, and writing, at three grade levels, fourth, eighth, and twelfth. The test is administered biannually in every Massachusetts public school. MEAP was developed by Advanced Systems, Inc., Dover, New Hampshire, the company that is working on the assessment devices to be used in Kentucky's widely praised education reform effort.[18]

The reported MEAP scores were put in a database and organized in terms of the percentage of students in individual communities who achieved satisfactory levels on the assessments. The state Department of Education has defined achieving "proficient" or "advanced" status as a satisfactory outcome on the MEAP. Approximately 25 percent of our students statewide achieved at those levels. This figure was used as the baseline for evaluating community performance. Integrated per pupil spending figures for each community were incorporated into the database.[19]

Standard deviations were computed for spending and achievement, and standard scores (Z scores) computed for spending and achievement for each community. This enables us to determine how far a community is above or below the state average (or mean) in terms of MEAP performance and spending. A community in which a higher percentage of students than the state average of 25.5 percent achieved proficiency or better would have this figure reported as a positive Z score. Performance at less than the state average is reported as a negative Z score.

The same procedure was used for per pupil funding. If a community spent more than the 1990–1991 integrated per pupil average of $5,082, this would show as a positive Z score; less than state average spending would show as a negative Z score. The tables and exhibits in this report incorporate these data. The information is also presented in actual dollars for spending and as the overall percentage of students who achieve proficient or advanced levels on the MEAP for each community and regional system.[20]

Does Per Pupil Spending Correlate with Achievement?

In the absence of an independent source for information and analysis, many of the participants in the school reform debate have grounded their arguments on assumptions — or myths — that the available data do not support. This has been the case especially over the past ten years, as the education reform debate has come to be dominated by entrenched interest groups.

During the past quarter century, reformers have proposed the adoption of a number of major changes in school structure and educational practice. Between conception and implementation, however, each reform package has been stripped of its most ambitious measures, leaving behind little besides increased funding. Reformers have consoled themselves with the belief that, even if their most far-reaching measures have fallen by the wayside, the additional funds would result in higher achievement. This study examines that premise.

The Analysis

Examining the levels of spending and achievement in our cities and towns reveals great variation in per pupil costs and performance, with little apparent relationship between the two. Running a regression analysis of the data indicates that about 18 percent of MEAP performance variability can be explained by per pupil spending. Spending, therefore, while a significant factor, is only one of the variables that affect outcomes. While it is important to use statistical tools to evaluate correlations, examining actual situations provides clear evidence that there is more to high achievement than high spending.

If there were a high correlation between per pupil expenditures and achievement, the state's best performing systems would likely have the highest per pupil spending. In fact, some of the state's highest-achieving systems spend less per pupil than the state average. And some of the poorest-performing systems spend much more than average. The state's 1990–1991 average integrated per pupil spending was $5,082. Per pupil spending in the thirty top-performing systems on the April 1992 MEAP varied from a high of $8,861 in Lincoln to $3,856 in Shirley. Simply put, there is only a relatively small correlation between per pupil spending and MEAP performance.

Lincoln and Weston achieve high MEAP scores while spending over $8,700 per pupil; Westwood, Stow, and Carlisle achieve top results while spending around $6,521 per pupil. Medfield ($4,929) spends slightly less than the state average of $5,082 and Shirley ($3,856) spends considerably less than the state average.

A Note on the Exhibits

These exhibits show the relative spending and achievement in different communities. The dollars spent per pupil and MEAP performance in a community are included. The horizontal line represents the state average in both spending ($5,082) and MEAP performance (25.5 percent of students testing Proficient or Advanced). The length of the bars reflects real differences in spending and achievement.

Spending and Achievement

Table 1

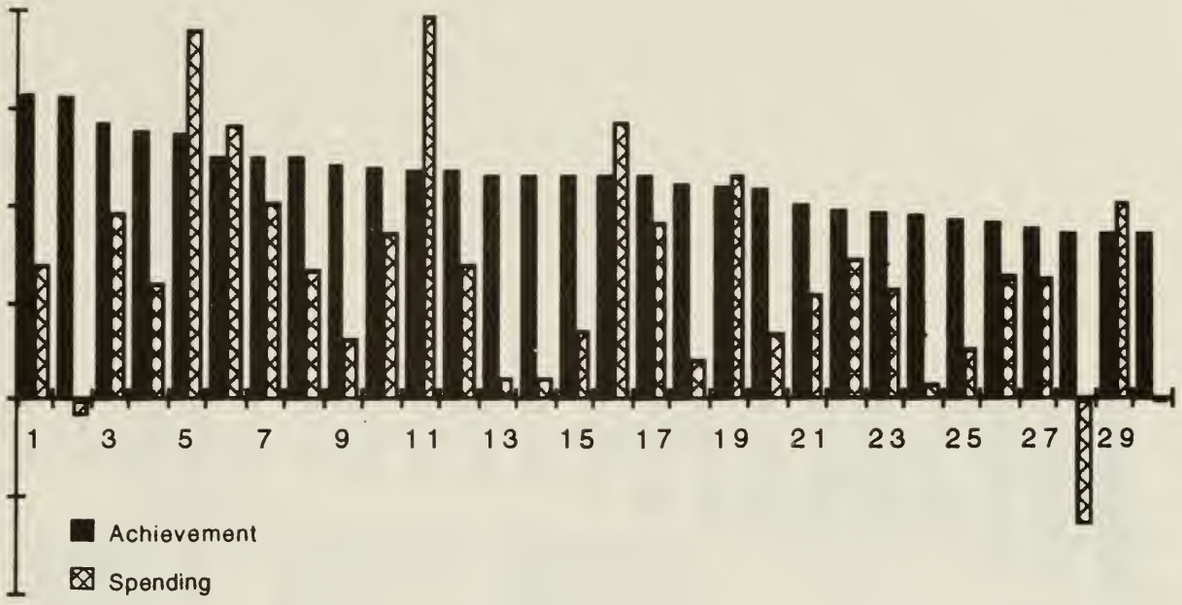
The Top Thirty Communities

		Dollar Spending per Pupil	% Students Proficient/ Advanced
1	Carlisle	6,394	48.3
2	Medfield	4,929	04.8
3	Westwood	6,933	46.1
4	Stow	6,236	45.5
5	Weston	8,721	45.2
6	Concord	7,796	43.7
7	Lexington	7,041	43.6
8	Needham	6,359	43.5
9	Acton	5,686	42.9
10	Newton	6,713	42.7
11	Lincoln	8,861	42.7
12	Sudbury	6,402	42.6
13	Wenham	5,280	42.3
14	Hamilton	5,270	42.3
15	Boxborough	5,760	42.2
16	Dover	7,807	42.2
17	Sherborn	6,841	42.2
18	Andover	5,463	41.7
19	Wellesley	7,310	41.5
20	Winchester	5,727	41.2
21	Harvard	6,112	40.1
22	Wayland	6,480	39.5
23	Belmont	6,167	39.4
24	W. Boylston	5,245	39.3
25	Longmeadow	5,583	38.9
26	Lenox	6,307	38.6
27	Natick	6,278	38.2
28	Shirley	3,856	37.9
29	Brookline	7,038	37.9
30	Dunstable	5,048	37.9

There are also significant differences in spending in communities with lower MEAP achievement. Per pupil spending is $8,758 in Cambridge, $6,954 in Boston, $6,727 in Somerville, $4,163 in Brockton, and $4,004 in Lawrence. Although several cities spend well above the state average, the typical urban system spends below it. Given the problems they face, there is little doubt that most of our urban centers are seriously underfunded. Since the high-spending cities generally fare no better on the MEAP than the low-spending cities, perhaps the better-funded systems should explore new ways of spending their money to produce improved achievement.

Exhibit 1

The Top Thirty Communities



Note: The numbers identify the communities listed in Table 1.

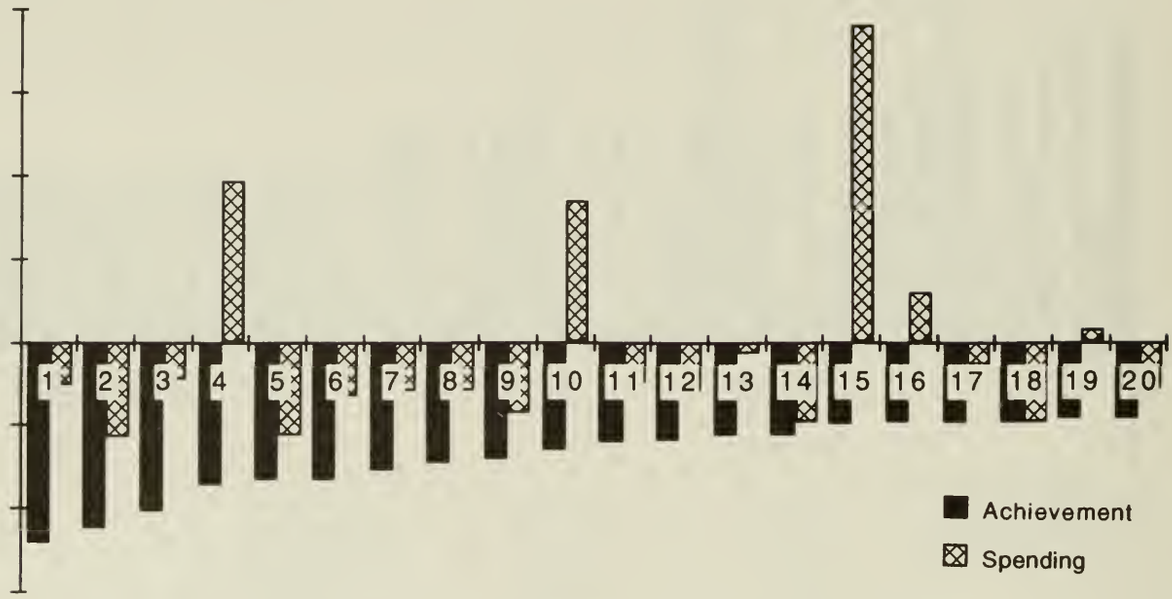
Table 2

Lower-Performing Systems

		Dollar Spending Per Pupil	% Student Proficient/ Advanced
1	Chelsea	4,598	8.2
2	Lawrence	4,004	9.4
3	Holyoke	4,658	10.9
4	Boston	6,954	13.2
5	Springfield	4,029	13.7
6	Lowell	4,465	13.7
7	Lynn	4,529	14.5
8	Ware	4,538	15.0
9	Fall River	4,278	15.4
10	Somerville	6,727	16.2
11	Chicopee	4,610	16.9
12	New Bedford	4,543	17.0
13	Webster	4,961	17.6
14	Fitchburg	4,180	17.6
15	Cambridge	8,758	18.5
16	Malden	5,680	18.6
17	Worcester	4,830	18.7
18	Brockton	4,163	18.7
19	Holbrook	5,236	19.0
20	Everett	4,567	19.0

Exhibit 2

Lower-Performing Systems



Note: The numbers identify the communities listed in Table 2.

The Conventional Wisdom

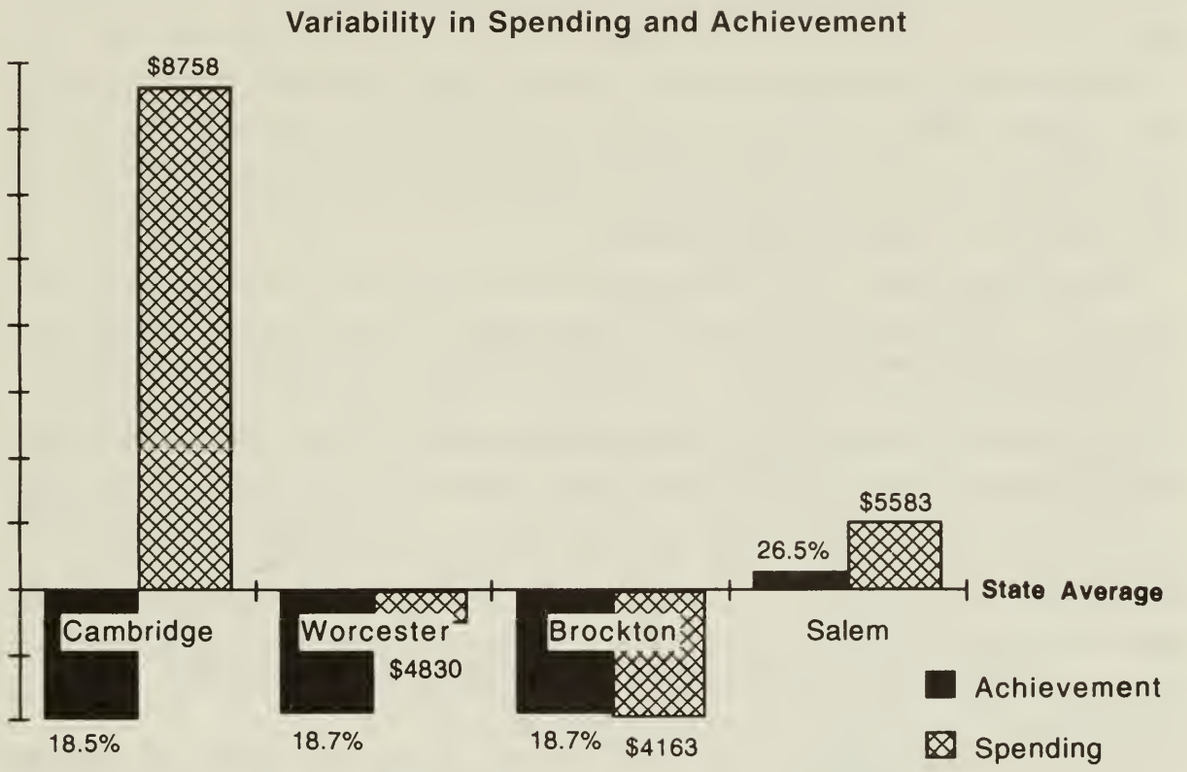
In the absence of an independent source of data about education issues, much of the information available to citizens and policymakers comes from organizations and agencies that have a vested interest in reform outcomes, an interest that may interfere with the dispassionate analysis needed to develop sound educational policy. Several of the assumptions that have guided education policy formulation can be analyzed with more detailed examination of the database.

Assumption 1
Money is the answer to educational deficiencies.

Cambridge, Worcester, Brockton, and Salem. Worcester and Brockton are older urban centers with much of the social and economic malaise that has come to characterize America's cities. Cambridge and Salem, communities with relatively less urban pathology, face substantial challenges nonetheless. Cambridge, despite spending more than twice as much money as Brockton and almost twice as much as Worcester, finds that its students scored no higher on the MEAP than their counterparts in Brockton and Worcester. Salem achieved significantly better results than Cambridge despite spending more than $3,000 less per pupil.

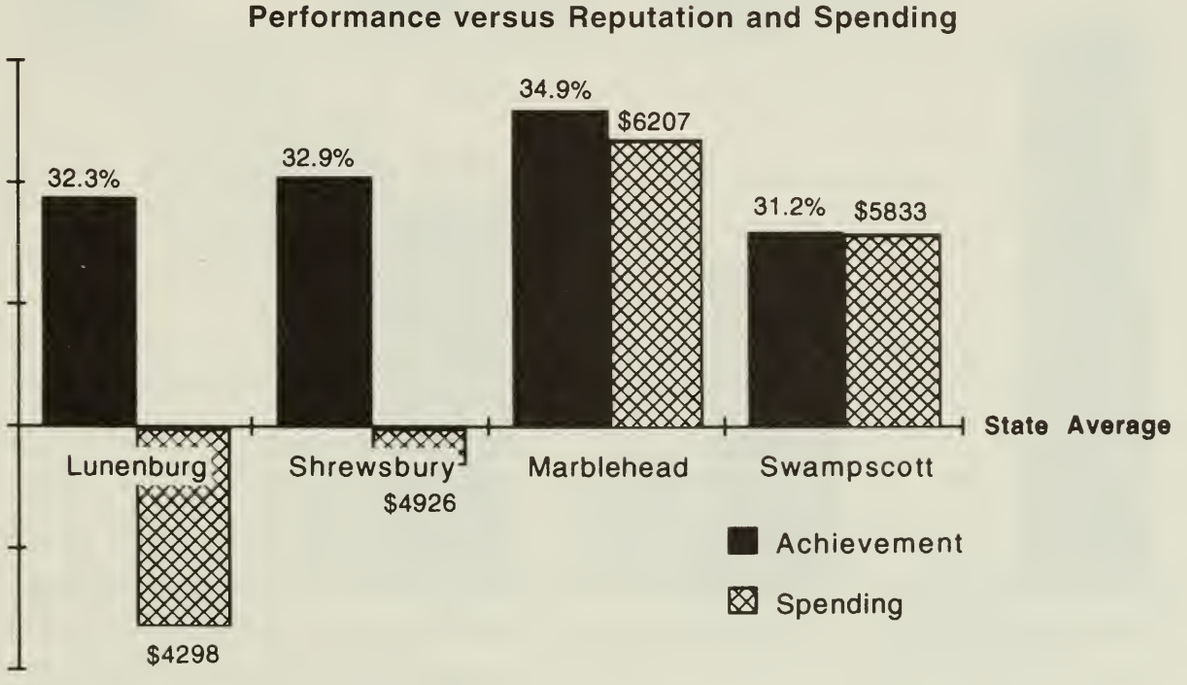
Lunenberg, Shrewsbury, Marblehead, and Swampscott. These four communities achieve similar results but report much different per pupil spending levels. The school systems of Marblehead and Swampscott enjoy excellent reputations, and both towns attract residents because of the perceived quality of their schools. MEAP performance and spending are both above the state average in these two towns.

Exhibit 3



Lunenberg and Shrewsbury have no such reputations for educational quality, but their MEAP performance is essentially the same as that of Marblehead and Swampscott, but their per pupil spending is considerably less.

Exhibit 4

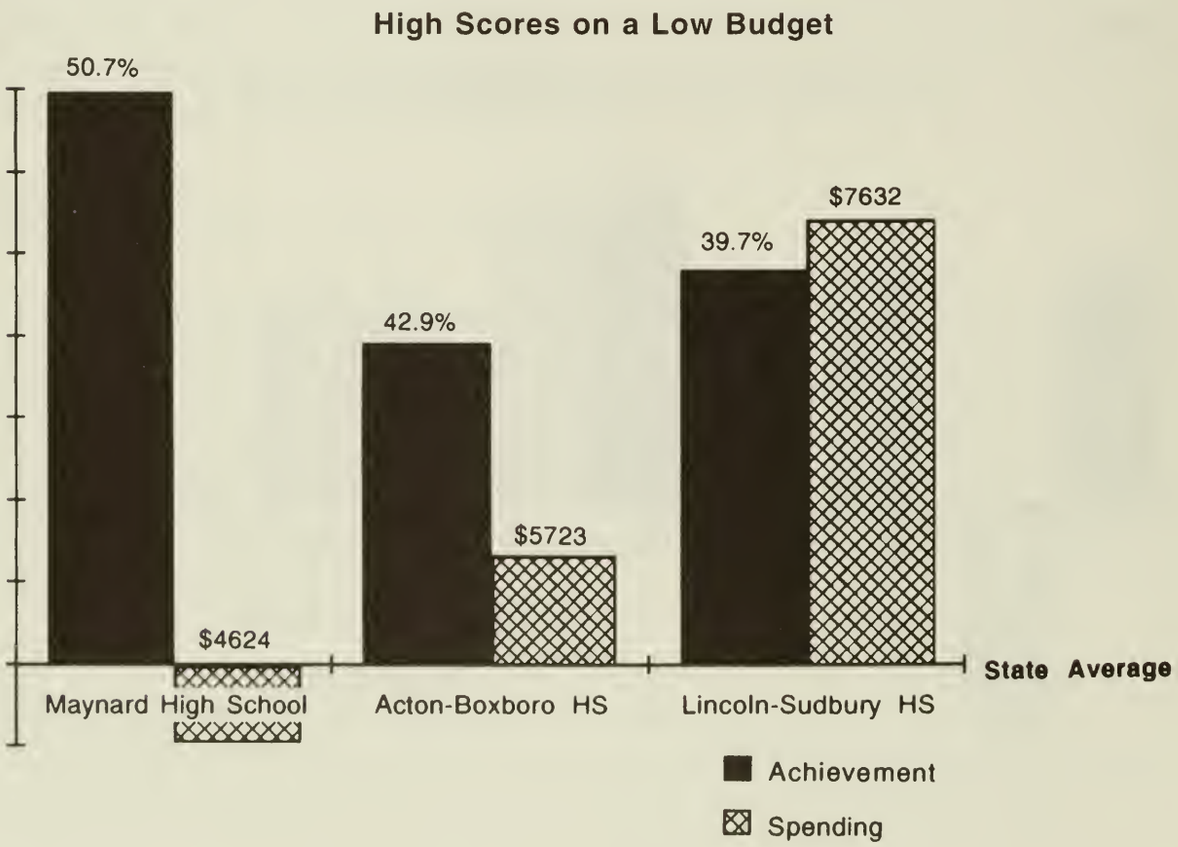


Maynard, Acton-Boxborough, and Lincoln-Sudbury. Lincoln-Sudbury High School and Acton-Boxborough High School are among the finest in the state. Maynard High School, although historically a solid performer, has never been considered to be in the same league as its upscale neighbors. Maynard spends almost $500 less than the state average, while the other two systems spend considerably more than the state average. Despite this, Maynard High reports a higher percentage of twelfth-graders with proficient or advanced scores on the MEAP (50.7%) than either Lincoln-Sudbury (42.9%) or Acton-Boxborough (39.7%).

Determining why Maynard twelfth-graders did so well requires further study, but discussions with Maynard parents and officials suggest several factors. The first was a decision made several years ago to emphasize reading and writing as the underpinning of the high school curriculum. Although such a shift requires more of students, parents, teachers, and administrators, it does help students acquire some of the higher-order thinking skills that tests like the MEAP evaluate. The second was the rejection by Acton voters of a proposed merger with Maynard, a rejection that galvanized Maynard residents into working to make sure that their students excelled academically. And a third factor was Maynard's loss of more than one hundred students to Acton-Boxborough under the state's school choice program. The only way to stop the exodus was to improve performance in Maynard, something the town had the community pride and commitment to accomplish.

Maynard's accomplishment suggests that there are changes in educational practice which do not require higher per pupil expenditures but can nevertheless improve student performance.

Exhibit 5

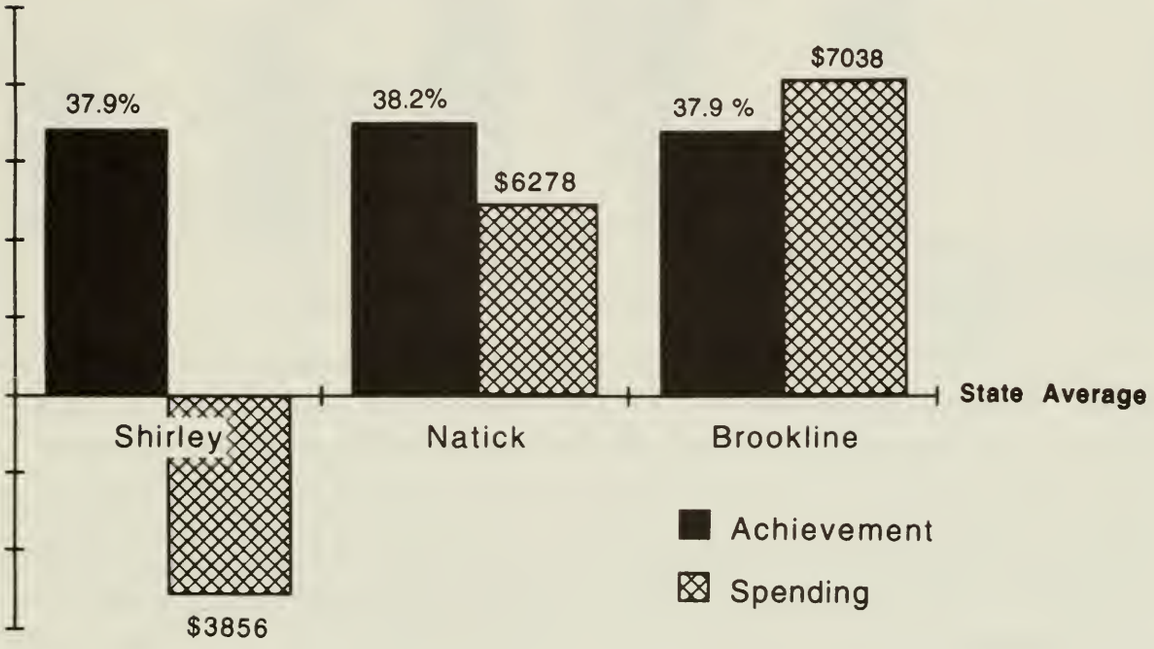


Shirley, Natick, and Brookline. Each of these three systems does a good job meeting various educational challenges. Brookline, long considered as having an excellent system, has made a successful transition from a relatively homogeneous upscale community to a culturally diverse, urbanized town. Brookline has a high average family income, and 30 percent of its residents do not speak English as a first language. Twenty-five percent of its households are headed by single parents with children under eighteen. Natick is a solid outer suburb with relatively high income and relatively low populations of single parents and non-English speakers. Shirley, one of the surprise performers of this study, reports average income, with a higher-than-average percentage of single parents and no reputation as an educational leader.

Despite markedly different community characteristics, all three towns performed well above the state average on the MEAP. In each, approximately 40 percent of students achieved proficient or advanced status, placing these towns in the top 10 percent statewide. Significantly, spending ranges from $7,038 in Brookline to $6,278 in Natick to $3,856 in Shirley.

Exhibit 6

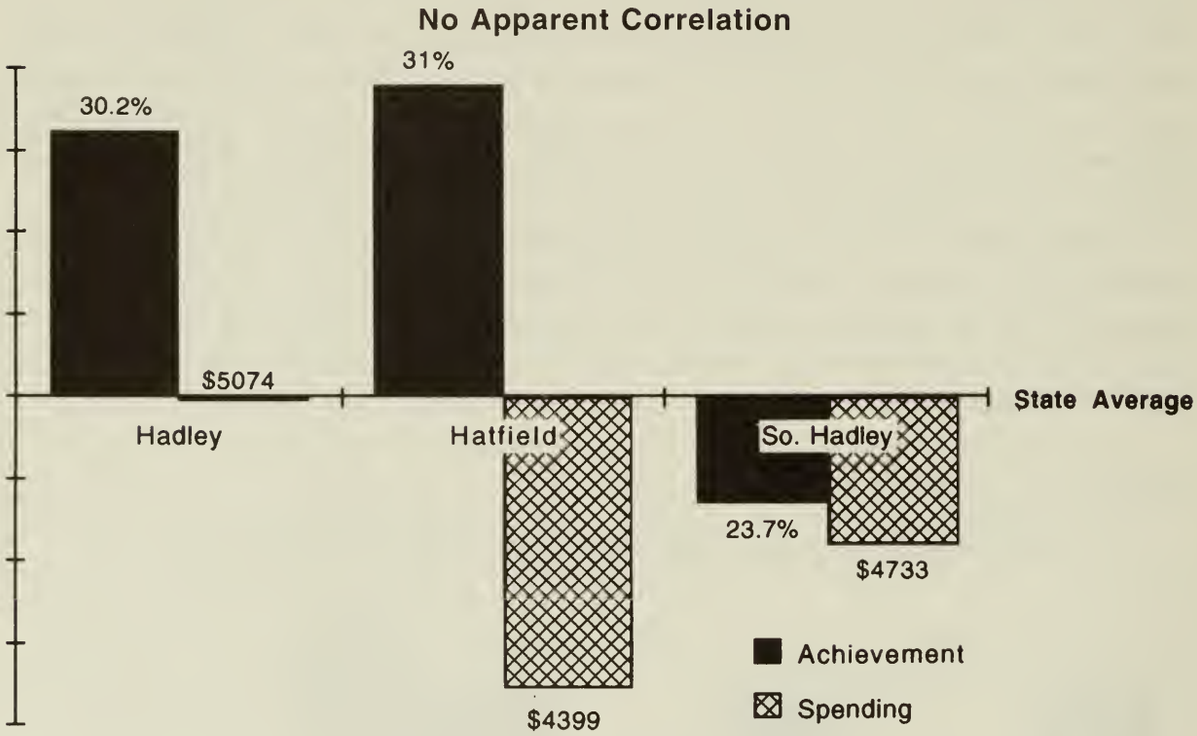
Different Challenges and Spending, Similar Achievement



Western Massachusetts: Hadley, Hatfield, and South Hadley. While the majority of Massachusetts citizens live in the eastern part of the state, the same findings about spending and achievement obtain when western Massachusetts systems are examined. Hadley and Hatfield achieve above the state average on the MEAP, while South Hadley performs at slightly under the average. Hatfield, the system with the best MEAP results of these three towns (31 percent of students scored proficient or advanced), spends the least per pupil ($4,399). Hadley spends at about the state average ($5,074) and achieves about the same as Hatfield on the MEAP (30.2%). South Hadley achieves slightly under the state average (23.7%) spending $4,733 per pupil. These communities are similar in terms of income (family income ranges from

$44,834 to $45,900) and other demographics, but there is no apparent correlation between their spending and achievement.

Exhibit 7



Assumption 2
Similar spending in similar communities produces similar results.

A community's demographic characteristics have a powerful impact on educational attainment. Without exception, the very top performers on the MEAP are towns whose residents are affluent and highly educated. The worst-performing systems are generally older urban centers characterized by low incomes, high poverty rates, high percentages of single mothers, and low percentages of residents with advanced degrees. But while demographics drive performance to some extent, many demographically similar systems with substantially similar MEAP performance have quite different per pupil spending levels.

The South Shore: Cohasset, Norwell, Hingham, Scituate, and Duxbury. The South Shore has been the destination of choice for many former Boston residents in search of safe streets and good schools. While schools in upscale communities often enjoy a good reputation, an examination of five South Shore communities with substantially similar demographics indicates that per pupil spending has little to do with achievement on the MEAP.

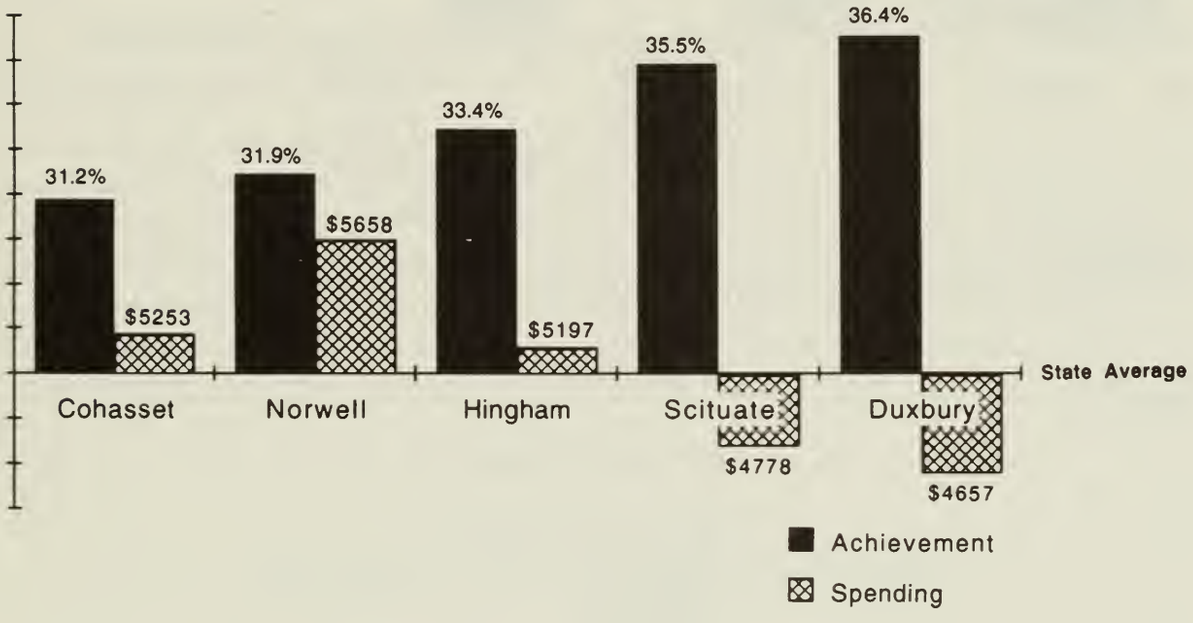
Incomes in the five towns were comfortably above the average statewide family income of $44,367. Of the five, Cohasset has the highest income ($74,310) and Scituate the lowest ($59,168), with the others falling between. Adult residents in each community tend to be well educated, the percentage of residents with at least a B.A. degree ranging from 39 percent in Norwell to 54.5 percent in Cohasset, all well above the statewide average of 27.2 percent. The percentage of single-parent house-

holds is consistent among the towns, ranging from 9.5 percent in Norwell to 13.7 percent in Scituate, and relatively few people in any of these communities do not speak English as a first language.

Besides being demographically consistent, these communities are similar in MEAP performance, all above the state average of 25.5 percent, ranging from Duxbury (36.4 percent achieving proficient or advanced) to Cohasset (31.2%), with the rest falling between. What is interesting is that the two best-performing towns, Duxbury and Scituate (35.5 percent achieving proficient or advanced), are the two lowest-spending communities. Duxbury ($4,657) spends under the state's average, as does Scituate ($4,778). The two higher-spending communities, Cohasset and Norwell, scored lower on the MEAP than the lower-spending towns.

Exhibit 8

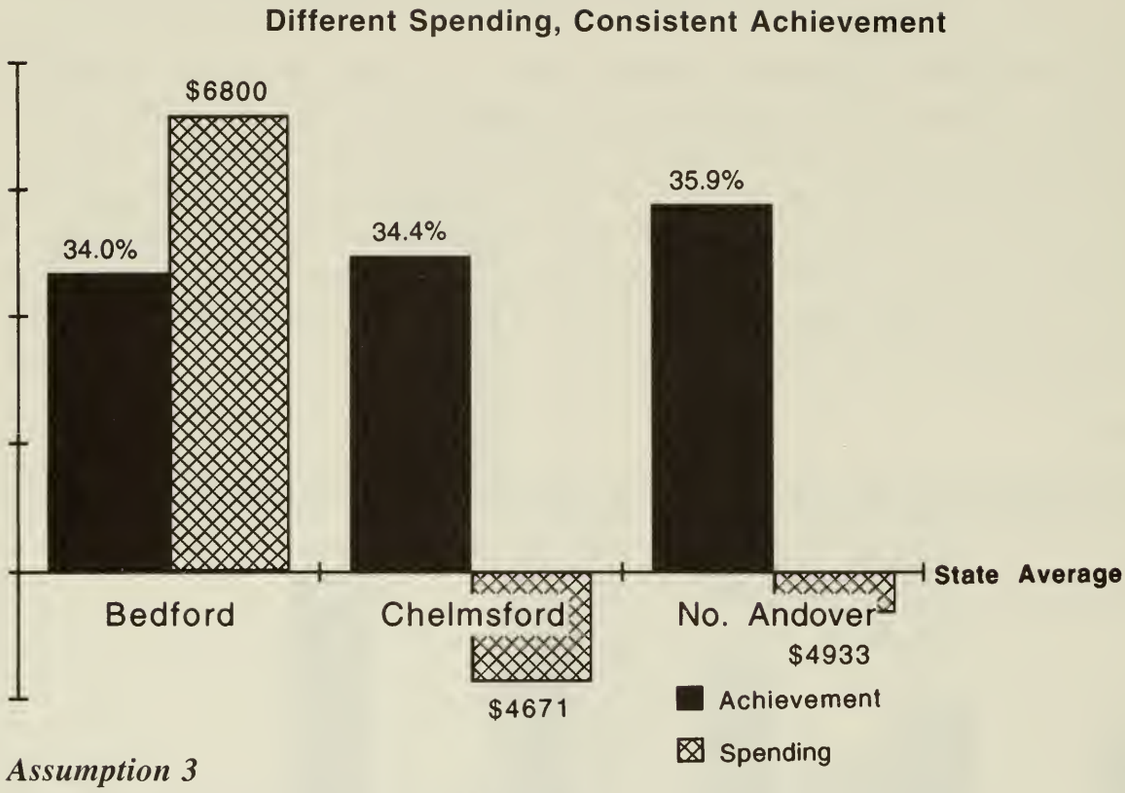
Low Spending, High Achievement; High Spending, LowAchievement



Bedford, Chelmsford, and North Andover. Each of these communities is relatively affluent, with median family income ranging from $64,537 in Bedford to $61,468 in North Andover and $59,368 in Chelmsford, all well above the state average of $44,367. All have higher-than-average percentages of college-educated residents. The percentage of single-parent households is about 14 percent for each, and the percentage of residents whose first language is not English varies narrowly from 7.9 to 9 percent.

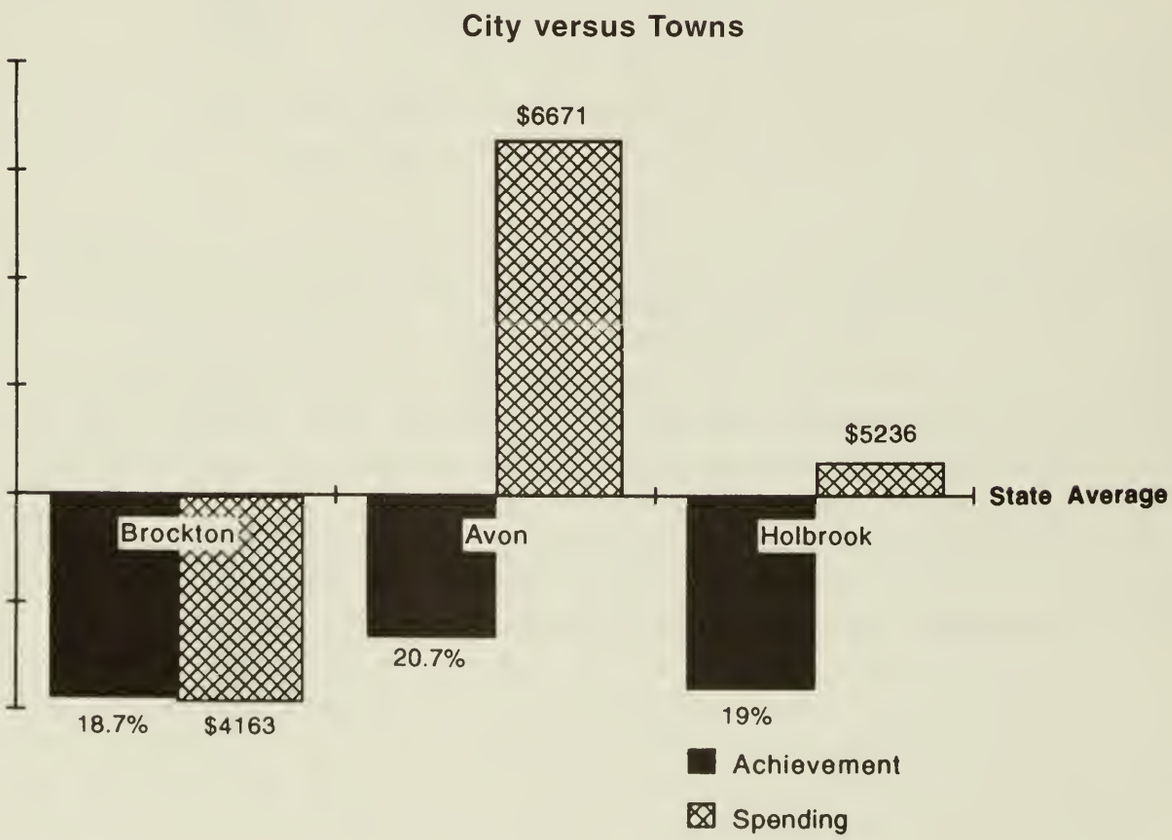
MEAP performance was relatively consistent (34 to 39 percent of pupils achieving proficient or advanced), but spending varied widely. Bedford spends $6,800 per pupil, Chelmsford $4,671, and North Andover $4,933.

Exhibit 9



Assumption 3
Underfunded urban schools cannot compete with suburban schools.

Exhibit 10



Many Massachusetts urban systems spend less than the state average, yet some of our city schools compare favorably with their suburban counterparts. While suburban systems generally outperform urban ones, the data demonstrate that many individual city schools do a good job of educating their students despite the challenges of the contemporary urban environment.

Brockton, Avon, and Holbrook. Brockton is a fairly typical underfunded urban school system. Its residents are poorer and less educated than the residents of neighboring Holbrook and Avon. In addition, Brockton has a much higher percentage of single mothers and non-English-speaking residents. Further, Brockton spends relatively little per pupil. Despite all this, the performance of this city is remarkably similar to that of the two towns.

It is interesting to note that more than one hundred former Brockton students have chosen to attend other systems, most often Avon. The data, however, indicate that the achievement level of Avon students is no higher than that of Brockton students despite Avon's much higher per pupil spending.

Outstanding Urban Schools

Most urban systems perform at levels significantly lower than those of most suburban systems. Our cities face enormous challenges that require higher spending levels. Despite these problems, many urban schools exceed expectations. The Tansey and the Coughlin in Fall River, the Devalles and Brooks in New Bedford, and Canterbury Street and Flagg Street in Worcester all produce results on the MEAP that equal those of many suburban schools. The nation's oldest public school, Boston Latin, scored higher on the MEAP than most of the best suburban high schools.

Table 3

Scaled MEAP Scores
(appropriate measure for individual schools)

School	Score
Boston Latin	1,527
Coughlin (Fall River)	1,393
Tansey (Fall River)	1,473
Devalles (New Bedford)	1,463
Brooks (New Bedford)	1,460
Canterbury (Worcester)	1,447
Flagg (Worcester)	1,440
State Average	1,317

While spending has an impact on the education students receive, the data suggest that other factors must be equally important. Spending more money might improve performance in some of our systems. In others, additional funding might very well have no impact at all. The Horace Mann Foundation's ongoing research indicates that a variety of demographic variables affect achievement at least as much as spending. While adequate funding is certainly *necessary* to produce quality education, it is not *sufficient* to assure good performance.

Our research suggests that educational achievement and success are very much a function of local characteristics — demographics, popular commitment to the schools, the importance a community places on quality education. Good schools are idiosyncratic — they are not all cast from the same mold — and reformers must develop strategies to involve citizens in reform efforts on the local level if we are ever to improve our schools.

Final Thoughts

Examination of school spending and MEAP achievement on a community-by-community basis makes clear that high spending in and of itself does not ensure achievement. This does not mean that money does not matter — it does. Certainly every community must have adequate funding to deliver an acceptable level of educational services. Many currently do not. But other factors influence outcomes at least as much. General increases in funding without regard for those other factors will not necessarily improve student performance. If our goal is to have our children meet world-class education standards, we must reconsider how we go about delivering educational services, not just increase spending. Over the next two years, the Horace Mann Foundation will be developing models that help explain performance on the MEAP. With those models as guides, it should be possible to develop policy recommendations that meet the real needs of our students.

Improving our public schools is a daunting task, one that admits of no easy solution. But there will be no solution until those who care about public education have done the necessary homework. The first task in completing the assignment is to provide the general public with the information and analyses it needs to become the driving force behind school improvement. Because citizens have not played a prominent role in them, past reform efforts have yielded disappointing results. Reformers who began their crusades intent on bringing real change to our classrooms have been unable to resist the power of an education establishment that routinely reduces reform to a plea for more money. Only when citizens come together as a countervailing force will Massachusetts see real education reform. ❧

I would like to thank those who contributed to the creation of this document. Professor Stephen Coelen of the Massachusetts Institute for Social and Economic Research (MISER) at Amherst provided invaluable database services. Commissioner Robert Antonucci of the Massachusetts Department of Education graciously provided us with much of the data used in the report.

Technical assistance was provided by Professor Ronald Hambleton of the University of Massachusetts Amherst, Professor Karl Wesolowski of Salem State College, Professor Thomas Willemain of Rensselaer Polytechnic Institute, John Gaviglio of MISER, and Richard Devens of the Bureau of Labor Statistics, Washington, D.C.

Former University of Massachusetts president and Horace Mann Foundation chairman David C. Knapp lent his good name and good graces to our work. Patricia Brady provided us with solid technical editing as well as an inspiration or two. And we offer our sincere thanks to the many friends of the foundation without whose help and advice this report would not have been possible.

I alone am responsible for the findings and conclusions of this report.

Appendix

Methodology

The process employed in the development of this study included

1. Organizing information into a database for computer analysis and modeling.
2. Developing statistical profiles of community spending and achievement. This was accomplished by utilizing the 25.54 percent figure provided by the state as the percentage of students statewide who achieved proficient or advanced status on the MEAP; calculating the standard deviations of the MEAP scores and per pupil spending; and developing standard or Z scores for each community's spending and MEAP performance. By utilizing these statistical tools, observers can better understand the relation between variables like spending and achievement.
3. Conducting a regression analysis of the overall database to determine the statistical correlation between spending and achievement in Massachusetts communities.
4. Sorting the database and utilizing Z scores (standard deviation units) to evaluate the actual relation between spending and achievement in communities.
5. Developing a model that identifies the factors in addition to spending that appear to contribute to educational achievement in the commonwealth's communities. This model will be more fully developed in a report to be issued in the fall of 1994 by the Horace Mann Foundation.

The data reveal little correlation between spending and achievement. The exhibits demonstrate that per pupil expenditures vary widely in communities that perform at substantially similar levels on the MEAP. Running a single regression analysis of data from over two hundred school districts produces a statistical correlation (R^2) between per pupil spending and MEAP achievement of .18. This means that about 18 percent of performance variability can be explained by per pupil spending. Spending, therefore, while a significant factor, contributes relatively little to MEAP results. Further analysis of other factors by the foundation is ongoing.

The MEAP

The MEAP (Massachusetts Educational Assessment Program) is the battery of tests used by the commonwealth of Massachusetts to assess the performance of individual systems. The foundation anticipates that its findings in this study will be criticized as relying too heavily on a single year's MEAP results. A single test can reflect only some smaller or larger portion of a student's overall performance. The developers of MEAP drew on the experience of decades of test development and administration to develop an assessment instrument that gauges achievement reliably and validly. It is important to remember that the foundation is using the MEAP results to analyze the performance of entire school systems, not that of individual students. The inaccuracies of the MEAP in assessing individual performance are in large measure offset by analysis of systems as a whole.

The foundation is convinced that student performance is the only credible measure of school reform initiatives. If the critics of MEAP can point to a better assessment device, the foundation will support their efforts to employ it. But until such time, the foundation will continue to rely on MEAP.

Notes

1. Diane Ravitch, *The Troubled Crusade* (New York: Basic Books, 1983), 257–258.
2. Information on school spending over time in the individual states is available from the U.S. Department of Education Wall Chart, Washington, D.C.; Massachusetts spending figures are available from the state Department of Education, Malden; William F. Buckley, Jr., discussed the increase in education spending since 1945 in the *Boston Herald*, June 26, 1993, 17.
3. Robert D. Gaudet, "The Politics of Education Reform," *New England Journal of Public Policy* 3, no. 2 (Summer/Fall 1987): 66–86.
4. Karen Diegmueller, "Massachusetts Court Rules Finance System Is Unconstitutional," *Education Week* 12, no. 39 (June 23, 1992): 1.
5. Erik A. Hanushek, "The Impact of Differential Expenditures on School Performance," *Educational Researcher* 18, no. 4 (May 1989): 47.
6. See *The Legislature's Education Reform Bill: An Analysis*, February 4, 1993, available from the Pioneer Institute for Public Policy Research, Boston.
7. *Boston Globe*, February 6, 1992, 18.
8. *Education Week*, March 24, 1993, 1.
9. See material from *The New Standards Project* of the National Center on Education and the Economy, Washington D.C.
10. See "Standards: A Vision for Learning," in *Perspective*, Winter 1991, available from the Council for Basic Education, Washington, D.C.
11. *Education Week,* December 16, 1992, 1, 20. Portfolio reliability coefficients varied between .28 to .57 as opposed to .67 to .75 for the more traditional methods of testing writing proficiency.
12. For typical reactions, see *Boston Globe*, March 7, 1993, A-51; *Cape Cod Times*, November 27, 1992.
13. *Education Week*, March 10, 1993, 1.
14. Ibid., 17.
15. David M. Potter, *People of Plenty: Economic Abundance and the American Character* (Chicago: University of Chicago Press, 1968), and Lester C. Thurow, *Head to Head: The Coming Economic Battle among Japan, Europe, and America* (New York: Morrow, 1992).
16. See Gilbert Sax, *Principles of Educational and Psychological Measurement and Evaluation* (Belmont, Calif.: Wadsworth, 1989), 462, for information on popular achievement tests.
17. This study utilizes the Massachusetts Department of Education's integrated per pupil expenditure for 1990–1991, which reflects overall spending and is higher than the regular education per pupil figure. The information is in *Per-Pupil Spending, 1990–1991,* available from the Massachusetts Department of Education, Malden.
18. Advanced Systems in Measurement and Evaluation, Inc., of Dover, New Hampshire, is the contractor on the MEAP and the Kentucky assessment project.
19. Information for the analysis comes from *Summary of District Performance,* November 1962, available from the Massachusetts Department of Education, Malden.
20. There are several different ways of computing per pupil expenditures. For this study, the integrated per pupil cost was used because it is a good indicator of actual operating expenses in the schools. Concerning regional school systems, which are funded differently from independent systems, the regular education per pupil cost was utilized since the integrated per pupil cost was not available. Typically integrated costs are 15 to 20 percent higher than regular education costs.