“How much of our academic talent can we afford to waste? If the answer is 'none,' then . . . the elimination of the small high school through district reorganization and consolidation should have top priority.”

—James Conant, president of Harvard University, 1959

“One of the key issues that I believe affects safety and the whole educational enterprise is the size of our schools. This is an area where we have made terrible mistakes. . . . Too many schools are just too big.”

—James Hunt, governor of North Carolina, 2001

How times change. Small schools, once derided as relics of the education system and obstacles to national progress, now lie at the heart of one of America’s most popular reform strategies. After decades on the endangered species list, small schools have become the next big thing in education.

The idea behind small schools is simple: having fewer students in each school should create a more nurturing environment where all kids can receive the attention they need—and none fall through the cracks that may develop at a larger school. Among its followers, the small-schools movement includes some of the heaviest hitters in the education world, such as the Bill and Melinda Gates Foundation, the Annenberg...
The dramatic growth in school size during the 20th century yields evidence that bigger is not necessarily better.
The desire to create larger schools frequently made it necessary to consolidate school districts as well.

Foundation, and the New York City school system. For several years, reformers in New York City have been carving large comprehensive high schools into several smaller “learning academies” or “schools within a school” housed within the same building. Now the goal is to create 200 small high schools citywide—an effort that the Gates Foundation is supporting with a $51 million grant awarded in September 2003. Gates awarded another big-city district, San Diego, with $11 million to turn three large high schools into 18 smaller academies.

Support for small schools also comes from some advocates of charter schools and school vouchers. To justify the push for smaller schools, some proponents point to the fact that, on average, private schools are a third smaller than public schools, an indication that the private sector is responding to the market’s demand for smaller schools.

Yet there has not been enough rigorous research examining the effects of school size on student achievement. The basic problem researchers face is that families make educational and residential choices that determine the schools their children attend. If small schools attract unusual students to begin with, then it will be hard to know whether differences in achievement between students in small and large schools have anything to do with the schools themselves or are merely reflecting preexisting differences between the students. However, the sudden growth in the size of the average school during the mid-20th century created a kind of natural experiment that enabled me to address this issue without many of the drawbacks that have hindered earlier research.

Vanishing Act

The United States was once a nation of small schools. In fact, as late as the 1930s, most American schools employed just one teacher. Over the ensuing decades, however, the number of schools declined rapidly, from a peak of 271,000 in 1920 to a low of around 83,000 schools in the late 1980s (since then, about 10,000 schools have been added nationwide). Meanwhile, public school attendance roughly doubled between 1929 and 1969, the period of most rapid consolidation. The combination of consolidation and rising attendance produced a five-fold increase in school size during this short time, with average daily attendance per school rising from 87 to 440 students (see Figure 1). Schools employing just one teacher all but disappeared from the landscape; just 400 one-teacher schools remained as of 2000.

The movement to consolidate schools must be seen as part of the larger 20th-century effort to “professionalize” education. To the reformers known today as history’s Progressives, putting schools in the hands of professional educators was seen as a cure for both the corruption of urban school systems and the parochialism of rural systems. That meant moving away from what they derided as the inefficient, unprofessional, and “backward” practices of small community schools.

In the view of Ellwood P. Cubberley, the longtime head of Stanford’s school of education and leading reformer of the early 20th century, larger schools enjoyed three distinct advantages. First, larger schools would reduce the ratio of administrators to teachers, thus providing for more efficient, centralized administration. Second, at a time when many small schools did not even divide students by grade level, larger schools facilitated more specialized instruction—by age level, subject area, and level of ability. Finally, Cubberley argued that consolidated schools could provide better facilities at lower cost.

The desire to create larger schools frequently made it necessary to consolidate school districts as well (see Figure 2). Cubberley and other reformers of the day believed that one large school should replace five to seven existing schools, on average. However, at the time the average school district held only two schools. Thus consolidating five to seven schools required consolidating school districts as well.

As school districts became larger and more complex, day-to-day authority over schools gradually shifted from elected school boards to professional superintendents and administrators. From 1930 to 1970, about 9 out of 10 school board members nationwide saw their positions disappear.

These centralizing trends were encouraged by state officials, who spearheaded initiatives to consolidate local schools as part of broader efforts to expand state control over public education. In other words, not only was local control over education weakened by the elimination of most elected school boards, but the authority of the remaining boards was also eroded as state governments gradually extended their authority over issues such as accreditation, curriculum, and teacher certification.

These changes met with fierce local resistance, especially in rural areas, where the school was often the community’s central institution. Consolidation of the local district—in particular, the loss of the town school—often threatened a community’s social cohesion and economic vitality. To achieve their objectives, state education officials often had to provide
Wave of Consolidation (Figure 2)

During the mid-20th century, a rapid process of consolidation reduced the number of U.S. public schools by nearly two-thirds. The number of school districts has declined by 90 percent since 1930.

**NOTE:** Data for one-teacher schools available only after 1927. Some years interpolated by author.

**SOURCE:** U.S. Department of Education
strong fiscal incentives or simply force consolidation by redrawing district boundaries.

A series of related reforms, such as the lengthening of the school term, a decline in class sizes, and higher salaries for teachers, also took hold during this period. The overall effect was to transform the small, informal, community-controlled schools of the 19th century into centralized, professionally run school bureaucracies. The American public school system as we know it today was born during this brief, tumultuous period.

Previous Studies

Despite the dramatic scale and breakneck pace of these reforms, little is known about the consequences of district consolidation and the movement toward larger schools. The research literature of the 1920s through the 1970s focused mainly on resources rather than results. In general, researchers found that larger schools had better facilities, more highly qualified teachers and administrators, a greater depth and variety of courses, and more extracurricular activities. An influential 1967 report by James Conant, a former president of Harvard, concluded that large “comprehensive” high schools were more cost-efficient and provided higher quality schooling through a wider range of course offerings. However, Conant did not examine whether student achievement was any higher in large comprehensive high schools.

Beginning in the 1980s, scholars began to look at the relationship between school size and student achievement. These studies have been less favorable to large schools. Of seven studies reviewed by Mathew Andrews, William Duncombe, and John Yinger, only one found that performance increased as schools grew in size. The remaining six studies found decreasing returns to scale. One study found that African-American students in particular do worse in large schools; another found that the same was true of students of low socioeconomic status.

The literature on the effects of district size on student outcomes is smaller and less consistent in its findings. Of the handful of studies on the subject, a few find that students in smaller districts do better, while a few others find just the opposite. Because the studies were conducted in different states, it is hard to know exactly what accounts for the inconsistent results.

Data and Methodology

Standardized tests were not in wide use until after the consolidation movement had largely run its course. Thus it is impossible to examine the effects of school consolidation using conventional measures of student achievement.

Instead, using data from the 1980 U.S. Census, I looked at one million white males born between 1920 and 1949 to see how characteristics of the school systems in which they were educated affected the value of their education in the labor market. (I restricted the analysis to white males because of the dramatic changes in the opportunities available to women and minorities during this period. Also, as the census tells us only where people were born and where they currently live, I assumed they were educated in the same state in which they were born.)

My analytical strategy involved two distinct steps. First, I estimated the increase in wages that can be attributed to an additional year of schooling for workers born in each of the 48 mainland states during the 1920s, 1930s, and 1940s. This yielded 144 distinct estimates (48 states times three birth cohorts) of the labor-market value of schooling for individuals from a given state. Second, I examined the relationship between the increase in wages associated with an additional year of schooling and the average size of a state’s schools.

To ensure that my estimates of the returns to additional schooling in the first stage of the analysis were valid, I compared only individuals currently living in the same state who were born and presumably educated elsewhere. I also included other variables to take into account a variety of factors that could affect wages, such as labor-market experience, marital
status, and residence in a large city. Finally, I allowed for the possibility that the value of an additional year of education may depend on the region of the country in which an individual currently lives.

In the second stage of the analysis, my estimates of the effects of school size on school quality are based only on changes in the value of additional schooling for students from a given state that are unrelated to national trends in the value of schooling—a difficult test to pass, but one that should increase confidence in the findings.

Finally, I also accounted at this second stage for several other changes in each state’s school system that might explain changes in the value of schooling for students educated there. These characteristics include the average district size; student-teacher ratio; length of the school term; teachers’ wages (measured relative to average wages in the state); and the state government’s share of funding for public education. These data are recorded in the Biennial Survey of Education and later the Digest of Education Statistics.

Results

Using this strategy, I found that smaller schools had a significant positive effect on students’ wages as adults. That is, students from states with smaller schools fared better in the labor market. Moreover, the effects are quite substantial. My findings suggest that increasing a state’s average school size by 100 students was associated with a decline of one-third of a standard deviation in the rate of return to education for students educated there. In plain English, this would amount to a 3.7 percent decline in earnings for a high-school graduate.

As noted above, these estimates take into account changes in other characteristics of state school systems that occurred during this same period. Interestingly, among the results for these other characteristics, I find evidence of a positive effect of district size on adult wages. All else being equal (including school size), students from states with larger districts saw higher returns to education. The estimated effect of district size is smaller in magnitude than the effect of school size, but is still statistically significant.

The two-step strategy used to generate these results was first developed by economists David Card and Alan Krueger in order to examine the effects of school resources on school quality. An important critique of this strategy—put forward in a 1996 paper by James Heckman, Anne Layne-Farrar, and Petra Todd—is that it is not able to distinguish the influence of education on people’s future wages from the effects of their family background or other early neighborhood characteristics. Because my analysis closely follows Card and Krueger’s, these issues warrant attention.

In what ways could a person’s family background or neighborhood characteristics potentially distort my findings? Consider what drove the consolidation movement. As discussed earlier, consolidation was just one of a series of Progressive reforms designed to centralize and professionalize the American school system. Of course, the pace of reform differed from state to state. States where reforms took hold more quickly might also have had voters who deeply valued education. Thus the effects of consolidation reported above might actually reflect the influence of being raised in a community that places a high value on education.

This is not a source of much concern regarding the finding on school size. Given the views of prominent experts of the time, communities that highly valued education were more likely to create larger schools. If the community’s influence were driving the results, we would expect increases in school size to be associated with higher wages. But I found just the opposite: the growth in school size led to declines in wages. So the finding on school size appears safe from this critique.

At the same time, my results with respect to the consolidation of school districts are less certain. Since consolidation was pushed by reformers, the finding of positive effects from consolidation could reflect the benefits of being raised in a state whose citizens were deeply committed to education (and therefore more likely to adopt these reforms), which puts the district size results in question.

A Closer Look

We can do better than speculate on other factors related to these results, however. To further explore whether early community factors could account for the observed school and district size effects, I added two more variables to the analysis: the per-capita income in each state at the time each cohort of men entered school and the corresponding percentage of each state’s population classified as rural by the census. These variables serve as measures of a state’s affluence and thus should serve as a rough proxy for a state population’s commitment to education.
The resulting estimates indicate that increases in parental income actually had a negative effect on the increase in students’ wages associated with an extra year of education. Apparently children raised in less-affluent states derived greater benefits from education. Moreover, the estimated effects of school size and district size were essentially the same after including the income variable. The share of a state’s population classified as rural had no significant association with the returns to education, nor did including it in the model alter the effects of school size and district size. It therefore seems unlikely that the observed effects of district size are actually caused by the influence of a rural upbringing.

In sum, the results of these validity tests indicate that the finding that the growth in average school size during this period led to a decline in school quality is remarkably robust. Based solely on the results of these tests, the finding that creating larger districts improved school quality appears to be equally sound. However, more caution is necessary in interpreting this second result. It is ultimately difficult to rule out the possibility that the effects of district consolidation are attributable to other, unobserved characteristics of residents of the states that led the way in consolidating districts or to other reforms they adopted at the same time. Nonetheless, based on the existing evidence, I would conclude that small schools in large districts are optimal, all else being equal.

However, all else is rarely equal. Large districts tend to create large schools. Whether school board members and superintendents in large districts will be willing to devolve authority to a large number of small schools remains to be seen. If they are not, saying that larger districts have a positive effect after controlling for school size may be a bit like saying butter is a health food after controlling for its fat content.

Conclusion
This study represents the first attempt to assess the impact of the school consolidation movement on the quality of students’ education during the period of greatest consolidation, from 1930 to 1970. Ellwood P. Cubberley and his fellow reformers would not be pleased with the results. Though they derided small schools as inefficient and provincial, the findings presented here suggest that students who attended small schools fared better in the labor market. While there may have been modest gains associated with increasing the size of districts (or with other reforms adopted at the same time), these gains were far outweighed by the harmful effects of larger schools.

For several reasons, however, it is important to be cautious in drawing policy implications from the findings regarding school size. For one thing, I have not examined any data on school size from a year more recent than 1966. Much can change over four decades. Also, the findings apply only to the average size of schools in a given state, making it difficult to ascertain the “right” size for any individual school. Likewise, the data did not allow me to report separate findings for elementary and secondary schools; size may matter more in one than the other.

In addition, I focused on only one of the channels through which school size may influence earnings: the rate of return to a year of education. There are at least two additional channels to be considered: the effect on the level of earnings and the effect on educational attainment. Understanding how school size influences earnings through these various channels could lead to a more complex picture than that presented here.

Finally, the results presented here do little to explain what it is about small schools that improves student outcomes. Those who study small schools have suggested that students are more likely to participate in extracurricular activities and their parents are more likely to be involved. But the results presented here cannot address the validity of these claims. Knowing the means by which small schools increase achievement is crucial in evaluating whether trends such as the slicing of larger high schools into several smaller schools or “academies” are likely to succeed. Small schools of the past were separately housed. Whether that fact was crucial to their success is unknown.

In short, while my results should encourage small-school reformers, more work along these lines is clearly needed before jumping on the small-schools bandwagon.

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