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Does Size Matter? School Consolidation Policy Issues in Arkansas

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ARKANSAS EDUCATION REPORT
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**DOES SIZE MATTER? SCHOOL CONSOLIDATION POLICY ISSUES IN
ARKANSAS**

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Spring, 2004

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I. EXECUTIVE SUMMARY

Public debate over the alleged benefits and disadvantages of court-ordered educational reform measures in Arkansas has been both intense and often acrimonious. Unfortunately, pertinent research to guide policy making appears virtually non-existent. On a purely descriptive level it is possible to compare school and district sizes in Arkansas with national averages. Isolated studies have investigated optimal school size and relationships between school size and such variables as student academic performance, costs and spending, and the socioeconomic status of students from a given school district. However, hard empirical data to support specific reform initiatives is sorely lacking. Notwithstanding, it is noted, a review of the extant literature may yet prove helpful to policy makers charged with effecting fundamental changes in the state's public secondary education system.

This review concludes that not nearly enough is known empirically about the effects of school consolidation to furnish policy makers with a trustworthy basis for sweeping education reform. At best, available research offers hints and caveats that should be taken into account on a provisional basis, pending the availability of additional data. By the same token, political and legal realities in Arkansas make it impossible to defer action until more is known. Some pertinent findings from this analysis include the following:

- Investigations of optimal school size suggest that high schools enrolling between 600 to 900 students are best situated to balance out the social benefits of a small-school environment with the curricular diversity and fiscal benefits potentially associated with larger schools.
- Very small and very large high schools are disproportionately expensive to operate. In Arkansas, the very small high schools (fewer than 200 students enrolled) are the highest spenders, followed by the very large high schools.
- Spending is typically higher than the state average at very small and very large schools--though it must be borne in mind that spending is not the same as actual cost.
- It is commonly alleged (but remains unproven) that small schools engender stronger feelings of affiliation, identification and loyalty than do larger schools where alienation, lack of involvement, and disengagement are more common among students.
- There does not appear to be any statistically significant relationship between school size and student academic achievement--in either direction--once the effects of socioeconomic status on academic performance are controlled for in the analysis.

II. INTRODUCTION

Providing a reasonable education for all students in Arkansas is a legal responsibility explicitly mandated by the state's constitution. Consistent with the long-standing American tradition of "grassroots" control of education, public schools in all states are funded and managed first and foremost at the local level. The federal government can and does enact legislation with which schools must conform. Directly or indirectly, federal mandates provide significant amounts of monies to support particular types of school services and programming. But ultimate responsibility for financing and operating schools devolves on state government. In Arkansas, it has been held, the state must provide "a general, suitable, and efficient system of free public schools" (Lakeview v. Huckabee, 2001).

Since 1983 the State of Arkansas has been repeatedly challenged in court over whether it has been meeting its constitutional duty. (Similar challenges have been mounted in more than 40 other states across the country.) Most recently, Arkansas schooling came under fire in a major 1992 lawsuit filed by the Lakeview School District of Phillips County. The plaintiff's key accusation was that Arkansas in fact had not been providing fair and equal education for all of its students.

The original complaint passed through successive levels of litigation for nearly a decade. Ultimately, in May of 2001, Pulaski County Chancery Court Judge Kilgore ruled that Arkansas' educational system was in fact unconstitutional, and that a more equitable distribution of state monies for education throughout all districts would be required to remedy matters. The court's indictment of the state's funding system for education cited multiple disparities: inequitable differences in teachers' salaries from one district to another, dramatic differences in the breadth and quality of school curricula offered, significant differences in the condition of school buildings and facilities (depending mainly on the relative poverty or affluence of the districts involved), and starkly contrasting per pupil expenditures. The Little Rock School District, for example, spent \$4,064 per pupil in the 1992-93 school year. The Mountain View School District, however, spent only \$2,270 per pupil that same year--little more than half the amount allocated per capita in the state's capital district. Egregious differences like these had prevailed for decades.

Matters came to a head on November 21, 2002, when the Arkansas Supreme Court affirmed the lower court's ruling on the unconstitutionality of the state's public school funding system (Lakeview v. Huckabee, 2002). The court went further, giving the state until January 1, 2004 to correct the situation. Unfortunately, there was little consensus on how to proceed among state legislators, school superintendents, and state education officials. Nor was any agreement forged in the months that followed, either on the question of an equitable funding formula or the minimal statewide funding level needed to provide all children with an adequate education. Notwithstanding, initially at least very little public debate or discussion was heard. Not until early the following year did media attention began to fasten on what had begun to look like a major legal, social and economic crisis.

With little progress apparent as the court's deadline approached, Arkansas Governor Michael Huckabee opened the 2003 session of the General Assembly with an "eleventh-hour" proposal for far-reaching school consolidation. The governor's original plan, if enacted without modification, could have amalgamated over 300 small school districts statewide into just slightly more than 100 administrative units (Blomeley, 2003). Without extensive consolidation, Huckabee avowed, there would be insufficient savings forthcoming to fund the state's system of schools at anywhere near the level needed to pass constitutional muster.

Predictably, the ensuing debate on the alleged merits or dangers of school consolidation proved highly charged. Emotions ran high among both proponents and opponents of the Governor's plan. Unfortunately, few of the protagonists were inclined to consult the relevant research literature for whatever light it might shed on the many complex issues raised by the courts. Even had they been so inclined, however, they would have found a real paucity of evidence to guide policy making.

III. SCHOOL CONSOLIDATION LITERATURE

On the national level it is worth noting that the overall trend toward fewer, larger school districts has continued unimpeded for many decades. In 1920 the United States had approximately 130,000 administrative units of varying size, ranging from large urban districts to a multitude of tiny rural school jurisdictions. By 1991, the total number of districts had dropped to 15,100, an 88 percent reduction over a span of about 70 years (Adams & Foster, 2002). Most estimates place the reduction in number of school districts at around 114,000 over the entire course of the century.

James Conant, for one, author of *The American High School Today* (1959), was an especially influential voice arguing in favor of school consolidation. “The enrollment of many American public high schools,” he declared, “is too small to allow a diversified curriculum except at exorbitant expense.... The prevalence of [small] high schools ... constitutes one of the serious obstacles to good secondary education throughout most of the United States.” He continued, “I believe such schools are not in a position to provide a satisfactory education for any group of their students.... A small high school cannot by its very nature offer a comprehensive curriculum.” Conant concluded, “Furthermore, such a school uses uneconomically the time and efforts of administrators, teachers, and specialists” (p. 77)

Elsewhere in the same work, Conant spelled out explicitly what he felt was essential: the development of systematic statewide plans for school district reorganization. “Experience in those states that have been most successful in eliminating the small high school through district reorganization,” he avowed, “shows that imaginative leadership is necessary at the state level in order to promote the necessary local action.” (p. 82)

Rhetorical Arguments Supporting Consolidation

Most recent consolidation literature, it must be said, is purely hypothetical and tends not to be buttressed with empirical data. Or, alternatively, discussions approach the question of the possible effects of consolidating schools from a “what-if” perspective--“if A or B, then C.” Complicating matters further is the difficulty of assessing claims for or against consolidation when they are cast in the form of purely descriptive assertions. Thus, for example, it is alleged that when larger schools are created, they are able to secure greater resource bases, which can provide for expanded, enriched curricula and more course electives than would otherwise be feasible; more teaching specialists and laboratory facilities; more resources for advanced, gifted and talented, and special-needs students; a broader array of extracurricular activities (including more sports, clubs, and other student organizations); and more modern classrooms (Andrews, Duncombe & Yinger, 2000; Bidwell & Kasarda, 1975; Duncombe & Yinger, 2001; Fox, 1981; Friedkin & Neocochea, 1988). In the absence of hard data supporting such allegations, however, the status of the “enrichment” argument for consolidation remains somewhat suspect.

Arguments from “economy of scale” likewise figure prominently in discussions of the presumed benefits of larger school or district size. A common allegation is that larger schools enjoy greater flexibility. Five second-grade teachers in a large school, for example, can collaborate, team teach, and assist one another in delivering the curriculum. A single second-grade teacher alone in a much smaller school enjoys none of those options.

A second argument emphasizes the cost savings presumably realized when many small schools are replaced by a few larger ones. It requires two building principals to oversee two separate schools with enrollments of 250 pupils each, for example. But only one principal is needed to administer a school with a student enrollment of 500. A second-grade teacher can handle a class of up to 25 students. Merging two

schools, each with only ten second-graders enrolled, presumably could save the salary and benefits costs of one teacher (Ferguson & Ladd, 1996).

Similarly, all other things being equal, one superintendent could be entrusted with the administration of a single school enrolling 1,000 students instead of several administrators presiding over districts with far fewer pupils enrolled in each (Duncombe & Yinger, 2001). Even allowing for the possibility of having to hire more support staff for a larger school, the net savings, it is said, could be considerable.

Rhetorical Arguments Against Consolidation

Consolidation opponents take issue with both arguments--the contention that larger schools can and do offer enhanced academic opportunities for their students as compared with smaller schools and the claim that cost savings are realized through mergers of schools or districts. Barker and Gump (1964) went so far as to claim that whether based on these or any other grounds, the alleged superiority of the larger school or district is wholly illusory (p. 195).

Most problematic, according to consolidation critics, is the allegation that larger schools almost inevitably offer fuller, richer curricula. Pittman and Haughwout (1987), for instance, discerned no clear linear relationship between enrollment increase in a given school and an expansion of course offerings sponsored by the same institution. McGuire (1989) and Monk (1992) concluded that whereas larger schools are inclined to offer more curricular breadth than their more modest-sized counterparts, the addition of new courses does not necessarily enhance curricular depth. Moreover, they found, no more than 8 percent of the students in the institutions they examined were enrolled in the new courses initiated. Larger schools generally do not offer more core courses (English, science, mathematics, and so on). On the contrary, when resources permit, they tend to offer more specialized electives (art, foreign languages, vocational-technical training, and so on), in which only a small percentage of students actually enrolls.

Cotton (1996) concluded that proportionately more students participate in extracurricular activities in smaller schools than in larger ones. Hypothetically, a school of 100 students and a school enrolling 1,500 students both have student governments. Ten students from the smaller school participate--1 in every 10. Twenty students from the larger school remain active in student government, or 1 in every 75. Thus, in this simple illustration, the rate of student involvement and participation in a given co-curricular activity is actually higher in the smaller school.

Presumably many factors affect the rate of student participation in extracurricular activities. The rate may be higher in low-enrollment schools simply because there is a greater need for broadly-based student participation. Whatever the reasons, Cotton found that students were likely to participate in a greater variety of activities in smaller schools (upwards of two to three more than students enrolled in large schools) and in consequence felt a closer association with their respective schools.

Other studies have reached similar conclusions. Coleman (1966), following up on the work done by Barker and Gump (1964), concluded that small schools might be better for students both socially and academically. Smaller schools, some researchers allege, provide a more friendly and supportive environment for students, teachers, and parents alike. Small schools reportedly enjoy higher student motivation and more positive attitudes among teachers than in larger schools. High self-esteem among students, lower drop-out rates, higher attendance rates, and decreases in the incidence of disruptive behavior have all been more closely associated with smaller- than with larger-enrollment schools (Barker & Gump, 1964; Cotton, 1996; Duncombe & Yinger, 2001; Haller & Monk, 1988; Summers & Wolfe, 1977).

Inversely, Friedkin and Necochea (1988) have argued that large schools tend to suffer from too many internal decision-makers, from bureaucratic complexity, and increased staff time spent adjudicating personal rather than professional disagreements (for example, time spent persuading contending teachers to work together more harmoniously rather than on a discussion of optimal ways of educating the schoolchildren entrusted to their care). Larger schools, it is also claimed, are inherently less well adapted to fostering a sense of institutional affiliation among students who attend them; whereas smaller schools may easily inspire strong loyalties and a sense of belonging. Table 1 summarizes major attributes invoked in debate between advocates and opponents of large or small schools.

Table 1: Theoretical Arguments in the School Consolidation Debate

Arguments For Consolidation	Arguments Against Consolidation
Larger schools offer:	Larger schools suffer from:
Increased course offerings	Increased discipline problems
Economies of scale	Increased Personnel Problems (e.g. personality conflicts)
Increased specialized teachers	Increased feelings of alienation by students, teachers/staff, and parents
Increased specialized classrooms	Increased teacher union political power
Increased resources for advanced and special needs students	Decreased coordination in management
Increased extracurricular activities	Decreased experiences for students
Increased cultural learning	Decreased student participation in activities (proportionately)
Decreased administrative costs	Decreased responsibility for students
Decreased number of personnel and staff	Decreased student, staff, and parental motivation
	Decreased fiscal efficiency

IV. EMPIRICAL EVIDENCE: RESEARCH ON “OPTIMAL” SCHOOL SIZE

It might be assumed, given the magnitude of the consolidation process over time, that “hard” empirical research on the effects of merging school districts would be quite extensive. In fact, such studies are far and few between. Given this lacuna, policy makers have had to draw upon related research treating questions of school size. Hence, most of the literature on school and district consolidation focuses on issues of students’ academic performance and on fiscal efficiency as functions of varying school size. To some extent, the implications of the results of this literature are not entirely clear due to varying views on school size. That is, a school or district considered “large” in New York City is not the same as a “large” school in Northwest Arkansas. Cotton (1996) among others has argued, however, that without some clear consensus on an operationalized meaning for a “small” or “large” school, confusion over consolidation issues will continue. Notwithstanding this lack of clarity, it is worthwhile to examine the school size literature in search of lessons for the school consolidation debate in Arkansas.

School Size and School Cost

Consolidation supporters, it will be recalled, tend to emphasize the possible cost savings realized through school or district mergers. Opponents vehemently deny significant gains can be realized. Yet “despite the variety of measures used and geographic areas examined,” two prominent researchers in the field observe, “a surprising level of consensus emerges. To be specific, almost all ... studies find economies of size *over some range of enrollment*” (Duncombe & Yinger, 2001, p.7).

Notwithstanding, the cost effectiveness alleged to inhere in larger schools entails several confounding considerations. First, the phenomenon is applicable only within a “U”-shaped distribution or spectrum--meaning that larger schools may be more cost effective than smaller schools up to a certain point--beyond which their cost effectiveness begins to disappear (Duncombe, Miner & Ruggiero, 1995; Gregory, 1992). Second, complicating the analysis and difficult to factor in are possible increases in transportation costs and travel times brought about as consequences of the consolidation process. It is difficult to assign some specific weighting to the fact that students who formerly walked to school or rode their bicycles prior to consolidation can no longer do so now because of the distance created by a merger. Or how does one factor in the situation where it became necessary for schoolchildren to spend more time on the bus traveling to and from school than might have previously been the case? Again, a parent accustomed to dropping his or her children off at school en route to work now discovers the school is no longer located on a convenient route to the office. How should that inconvenience be taken into account?

School Size and Academic Performance

Much of the literature on school size and academic performance is theoretically linked to consolidation. The literature gives a number of academic benefits to “smaller” schools when compared to “larger” schools (Andrews, Duncombe, & Yinger, 2002; Cotton, 1996). Cotton summarized much of the literature surrounding “small” schools and determined that they academically outperform or perform equal to “large” schools. Several other important performance benefits also appear to be realized in “smaller” schools (again, note that smaller is not defined exactly). The literature also shows that “small” schools have students with higher feelings of belongingness, higher self-concepts, increased interpersonal relationships, increased participation from teachers, parents, and students, and increased feelings of responsibility by teachers, parents, and students (Andrews et al., 2002; Cotton, 1996).

Optimal School Size

Thus, the research literature on school size informs us that per-student expenditures are higher than average in very small schools. Further, common sense indicates that it is difficult to staff extremely small schools with talented teachers in each and every subject. On the other hand, the literature also warns against negative academic impacts of schools that are too large. These lessons beg the question, is there an optimal school size that balances the benefits of large schools with the benefits of small schools?

Helpful in this regard has been the meta-analysis of 22 separate empirical studies on school size recently conducted by Andrews, Duncombe and Yinger (2002). From their systematic review, they have stipulated that schools of “moderate” size (with an enrollment of 300 to 500 students at the elementary level, between 600 and 900 students at the high school level) “optimally balance economies of size with the potential negative effects of large schools” (p. 245). Williams (Cotton, 1996), after reviewing thirty size discussion articles, also concluded that moderate school size, 300 - 400 for elementary schools and 400 - 800 for secondary schools, is most effective. In Williams’ review he found that “large” schools were not always more cost effective, nor did they provide better education to students than do small schools (Cotton, 1996).

V. EMPIRICAL EVALUATIONS OF SCHOOL OR DISTRICT CONSOLIDATION

While actual research addressing the specific cost effects of consolidation is “virtually nonexistent,” a few key studies have uncovered some consequences of consolidation (Duncombe & Yinger, 2001, p. 1). For example, seeking to identify the effects of district consolidation in rural New York State, Duncombe and Yinger (2001) studied 12 pairs of rural school districts that had consolidated between 1985 and 1997. They found that operating costs of two 300-student districts decreased by 22 percent after consolidation, but decreased by no more than 8 percent for two districts with student enrollments of 1,500. Similarly, they found that capital costs lowered only for small districts and actually increased for the two 1,500-student districts after consolidation. They further discovered that consolidation was likely to decrease the “costs of two 300-pupil districts by over 20 percent, to lower costs of two 900-pupil districts by 7 to 9 percent, and to have little, if any, impact on the costs of two 1,500-pupil districts.” (p. 30)

Adams and Foster (2002) analyzed state educational costs for Kentucky and how they related to school property taxes. Kentucky’s poorest school district was separated by 102 percent in per pupil spending from the wealthiest district (\$2,022 versus \$4,079, respectively). Seeking to understand the differential, Adams and Foster looked to see whether consolidation would eliminate the dichotomy between rich and poor districts existing across the state (*Rose v. Council for basic Education*, 1989). They found that in almost all cases consolidation by itself would do little if anything to reduce or eliminate Kentucky’s funding disparities. Specifically, their finding was that differences in per-pupil expenditures were almost exclusively products of the wealth or poverty of districts as reflected in their tolerance for varying tax rates. Adams and Foster concluded with a call to policy makers not to treat consolidation as a panacea, but to look at the unique circumstances prevailing in specific districts or schools.

As Friedkin and Necochea (1988) note, school and district consolidation can have positive, negative, and negligible effects on student performance and open education economies. The implication for policy makers is plain: each individual situation must be approached carefully, with care taken to avoid any broad-based assumptions unsupported by the data in hand. For a state such as Arkansas where charges and counter-charges, claims and counter-claims, over consolidation have been recklessly exchanged in recent months, this cautionary note seems especially worthy of attention.

School and District Enrollments in Arkansas

School and district enrollment figures for Arkansas, placed alongside comparable national data, help situate debates over consolidation across the state. Table 1 below presents the most recent data available on school-building enrollment in Arkansas and in the nation as a whole. Data are presented for all schools in total and then specifically for high schools (since the Arkansas consolidation debate focuses on the potential merging of secondary schools).

Table 2: School Enrollment in Arkansas and the United States

School Size (number of students)	Arkansas: % of <u>all</u> schools (2002-2003)	United States: % of <u>all</u> schools (1999-2000)	Arkansas: % of <u>high</u> schools (2002-2003)	United States: % of <u>high</u> schools (1999-2000)
Fewer than 100	4.6	10.4	7.6	9.2
100 to 199	14.5	9.6	21.8	9.8
200 to 299	20.1	11.3	22.1	8.3
300 to 399	21.1	13.3	17.6	8.2
400 to 499	14.9	13.2	7.9	7.2
500 to 599	9.4	11.2	5.2	7.1
600 to 899	11.1	18.0	8.8	16.7
900 to 1499	3.8	9.5	7.9	19.2
1500 and above	0.4	3.5	1.2	14.3
Average Enrollment	410	521	401	785

Source: Arkansas data based on authors' calculations from AS-IS (www.as-is.org) Arkansas Schools Database. Federal data from NCES Digest of Education Statistics, 2001.

Even a cursory perusal of the data reveals some facts pertinent to the consolidation question. First, it is clear that the average school in Arkansas is considerably smaller than the average school for the country at large. In particular, the average high school in Arkansas enrolls approximately 400 students, whereas the average secondary school at the national level enrolls nearly 800 students. Moreover, only 18 percent of the high schools in Arkansas enroll more than 600 students, while approximately half of all high schools across the country are home to at least 600 students. Further, the majority of Arkansas' high schools enrolled fewer than 300 students in the 2002-2003 school year.

As for district enrollment size, more than two-fifths (42.7 percent) of all Arkansas school districts enrolled fewer than 600 students in 2002-2003, while more than three-fifths (63.6 percent) of all Arkansas school districts enrolled fewer than 1,000 students. It is clear that the average school district in Arkansas (average enrollment of 1,421) is smaller than the average school district in the United States (3,333). Governor Huckabee's consolidation proposal focuses on districts with fewer than 1,500 students. More than three-quarters (75.6 percent) of the state's districts enroll fewer than 1,500 students.

Table 3: School District Enrollment in Arkansas and the United States

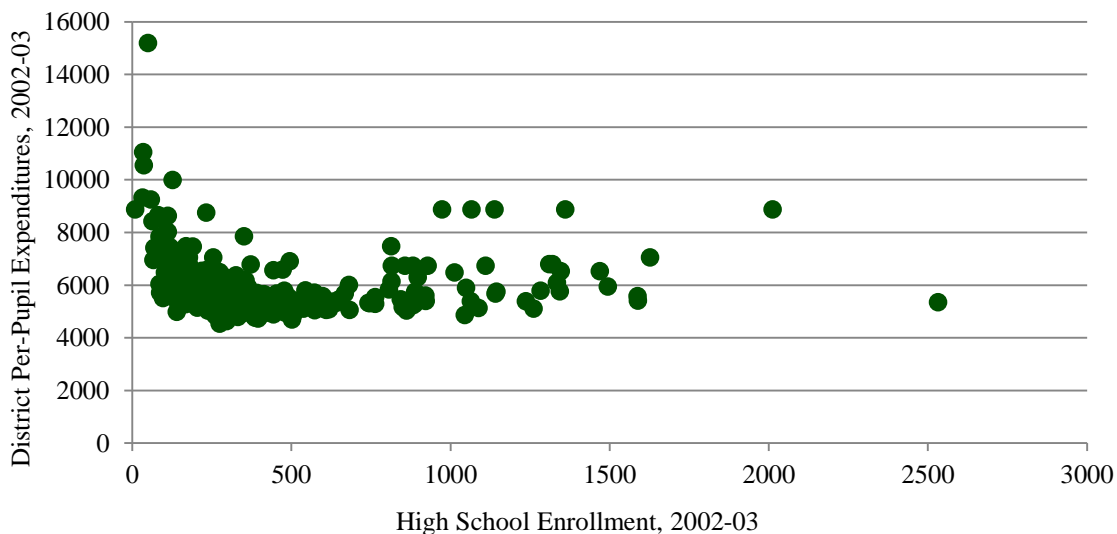
District Size (number of students)	Arkansas: % of <u>all</u> Districts (2002-2003)	Arkansas Cumulative %	United States: % of <u>all</u> Districts (1999-2000)	United States Cumulative %
Fewer than 300	17.4	17.4	22.1	22.1
300 to 599	25.3	42.7	13.9	36.0
600 to 999	20.9	63.6	12.2	48.2
1000 to 2499	22.8	86.4	23.2	71.4
2500 to 4999	8.9	95.3	13.9	85.3
5000 and above	4.7	100.0	12.4	97.7
Average Enrollment	1,421		3,333	

Source: Arkansas data based on authors' calculations from AS-IS (www.as-is.org) Arkansas Schools Database. Federal data from NCES Digest of Education Statistics, 2001. (Note: Federal figures do not add up to 100% as just over 2% of districts did not report enrollment.)

Relationship Between School Size and Spending For Arkansas High Schools

One of the hypothesized benefits of school consolidation is the fiscal efficiency of larger districts. Research on such efficiencies, or economies of scale, suggests a “U”-shaped spending curve, or a curve in which the lowest enrollment school units and the highest enrollment schools incur the highest costs. In order to test this hypothesis for Arkansas high schools, we first plot the school spending data versus the school enrollment data in Figure 1 below. As is indicated, although there is not a perfect “U” curve, there is some indication that, indeed, schools with extremely high or low enrollments face the highest costs. In fact, part of the reason for an imperfect “U” shape may be the fact that in Arkansas there are not many high schools with sufficiently large enrollments to affect any diseconomy of scale. (The same analysis was run with district-level data as well as the school-level data presented in Figure 1. There was no substantial difference in the results--the curves were nearly identical.)

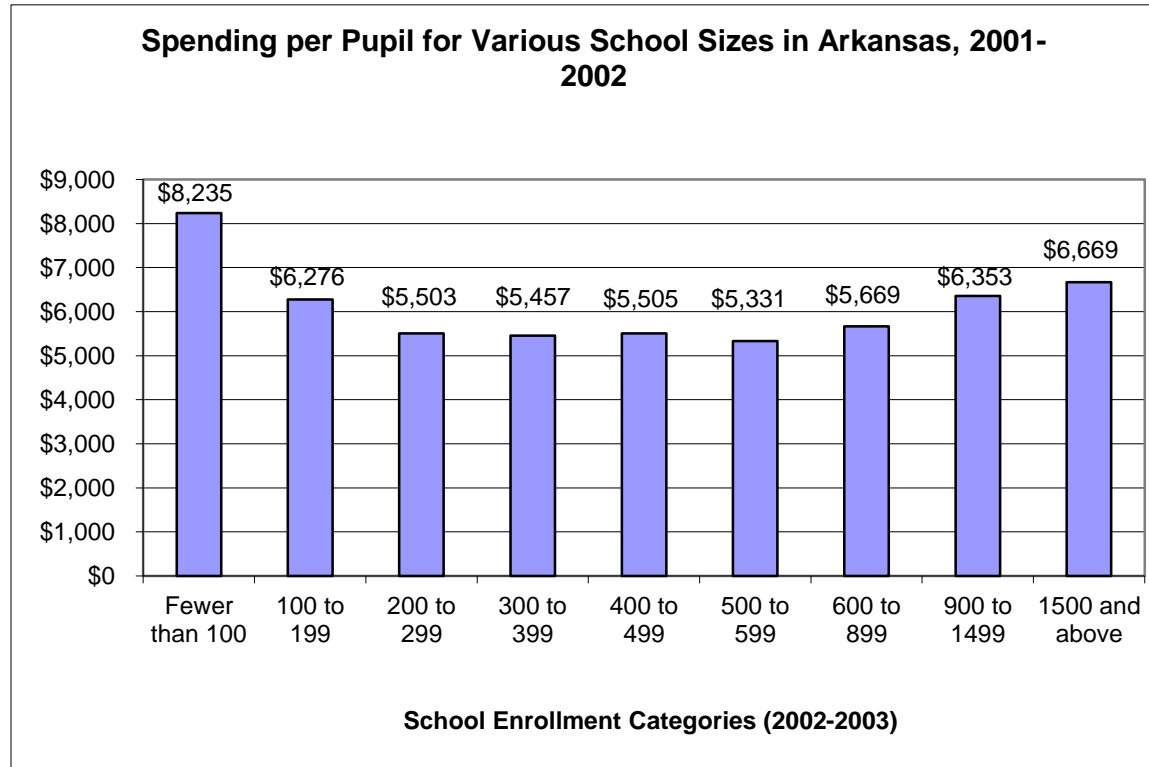
Figure 1. Arkansas Per-Pupil Expenditures Related to High School Enrollment, 2002-03



The approximate “U” shape is highlighted in Figure 2, showing that per-pupil expenditures for the year 2001-2002 were above the state’s average among high schools with fewer than 200 students and in those with more than 900 students. In fact, the highest spending levels (\$8,235) were registered for the state’s very few high schools (25) having enrollments under 100.

It needs to be added that these figures do not perfectly represent costs. Expenditure per pupil is a function of many factors, including local preferences. The economic cost of operating a school is an important aspect – but not the sole determinant – of educational spending in a given district.

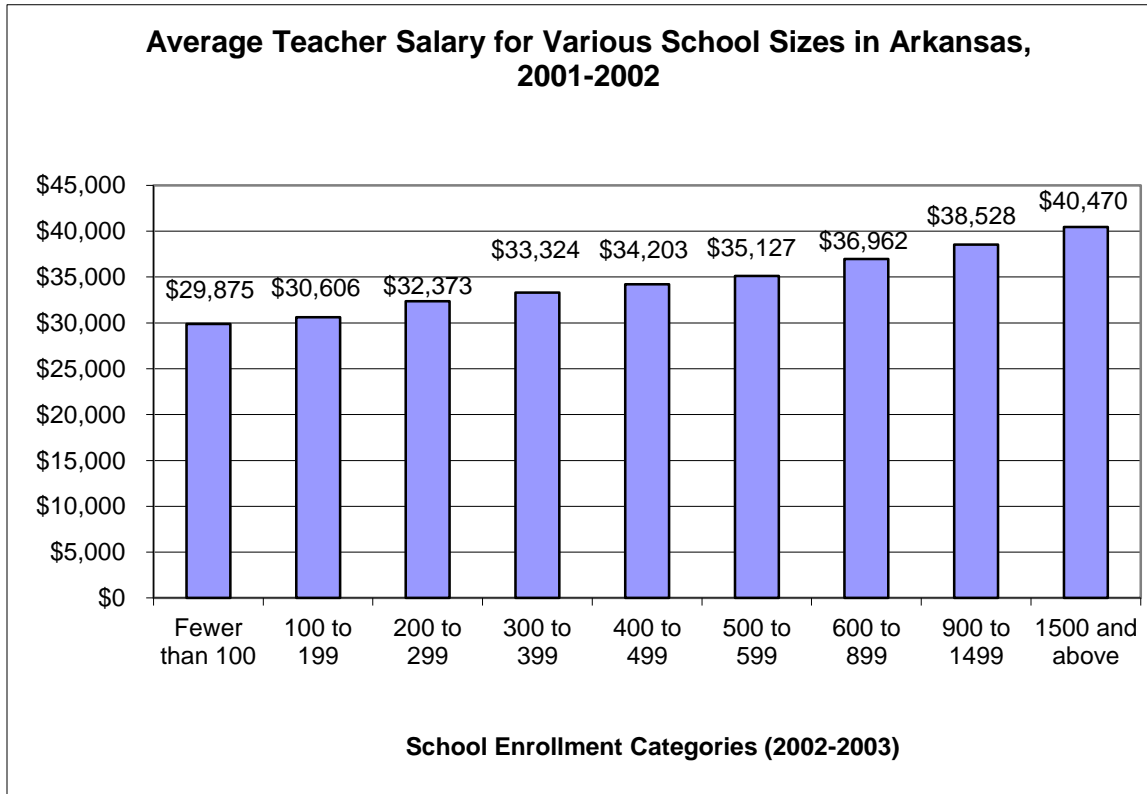
Figure 2: School Size versus School Spending in Arkansas



Source: Figures based on authors’ calculations from AS-IS (www.as-is.org) Arkansas Schools Database.

Figure 3 highlights one cost variable which does appear to be related in linear fashion to student enrollment, namely, average teacher salary (Pearson’s Correlation Coefficient for this relationship is 0.716). Teachers in the smallest high schools in the state earned an average salary of approximately \$30,000 in 2001-2002, while their peers in Arkansas’ largest districts earned salaries approaching \$40,000.

Figure 3: Average Teacher Salaries in Arkansas



Source: Figures based on authors' calculations from AS-IS (www.as-is.org) Arkansas Schools Database.

School Size and Academic Performance

Figure 4 and Table 4 present the relationships between school size and key indicators of academic performance for Arkansas high schools. Figure 4 plots the performance of tenth-grade students in the Stanford-9 norm-referenced achievement test. Scores used are the percentile rankings for students' combined scores on the reading and mathematics sections of the test. The plot reveals no obvious pattern, although there is a suggestion of a slightly positive-shaped curve. As enrollments rise, so too apparently do performance scores.

Figure 4: Academic Performance Related to School Enrollment in Arkansas

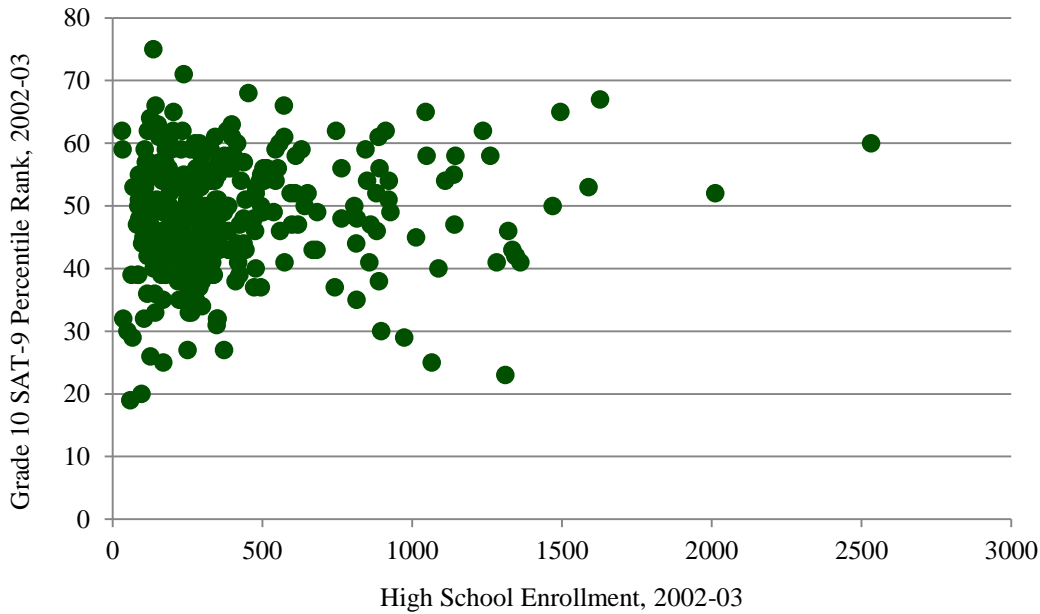


Table 4: Indicators of Academic Performance in Various Sized Schools in Arkansas

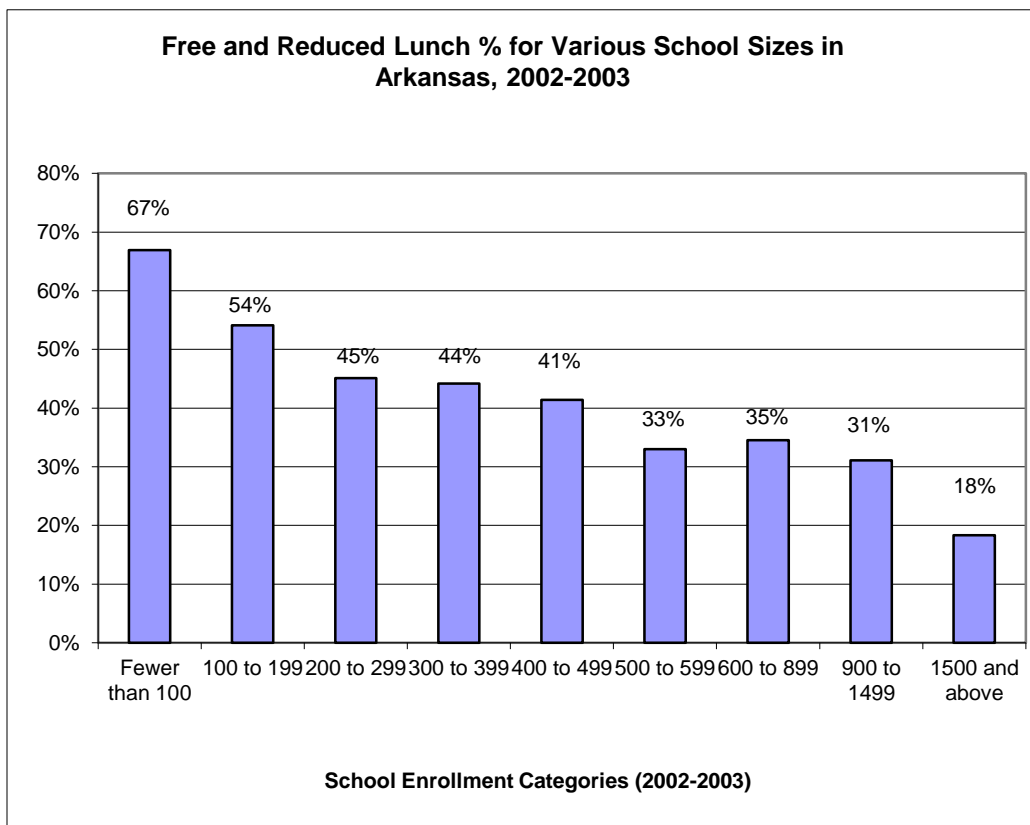
School Size (number of students)	SAT-9 Composite %ile, Grade 10, 2002	ACT Exam Composite Score, 2002	Literacy Exam (% pass), Grade 11, 2002	College Remediation Rate, 2002
Fewer than 100	43.2	17.1	27.3	76.1
100 to 199	49.0	19.4	39.3	58.7
200 to 299	46.9	19.6	41.2	50.4
300 to 399	48.9	19.7	38.4	55.3
400 to 499	48.3	20.0	40.8	47.5
500 to 599	53.4	20.6	41.3	47.5
600 to 899	48.5	19.9	39.6	50.4
900 to 1499	48.2	19.8	40.0	48.5
1500 and above	58.0	21.6	57.8	37.3
State Average	48.3	19.6	39.4	54.1

Source: Figures based on authors' calculations from AS-IS (www.as-is.org) Arkansas Schools Database.

Table 4 displays a trend indicating higher average academic test scores on various instruments for students attending larger schools. Further shown is a lower rate of college remediation for students from high-enrollment schools. These patterns are not very strong however. Note the Pearson Correlation Coefficients representing the strength of the linear relationship between enrollment and academic indicators: SAT-9 composite percentile ($r=.10$), Literacy Exam, percent passing ($r=.10$), ACT college entrance exam ($r=.16$), and Remediation rate ($r=.19$). The comparatively low values for each of the correlation coefficients suggests there are relationships in the hypothesized direction (in favor of larger schools), but the relationships are not strong.

Furthermore, it is a widely-accepted fact that most indicators of academic performance are strongly associated with measures of socioeconomic status. The associations cited here are not exceptions. Each is significantly correlated, for example, with free and reduced lunches, and in the predicted direction. Moreover, in Arkansas high schools, school size is linked with socioeconomic status. Smaller schools are more likely to serve students who are economically disadvantaged--as measured by eligibility for free and reduced price lunches. The Pearson Correlation Coefficient representing the linear relationship between the poverty variable (percentage eligible for free and reduced lunches) and the enrollment variable is negative and significant ($r = -0.44$). Thus, for example, 67 percent of those attending schools with fewer than 100 students are eligible for subsidized lunches. The eligibility percentage drops to 54 percent for students in schools with 100 to 199 students, 31 percent in schools with 900 to 1,499 students, and drops to only 18 percent in schools with more than 1,500 students.

Figure 5: Relationship between Poverty and High School Size in Arkansas



Source: Figures based on author's calculations from AS-IS (www.as-is.org) Arkansas Schools Database.

Owing to the close correlation of poverty with both school size and academic performance, it is quite possible that the apparent relationships between school size and academic achievement are due to the fact that smaller schools are more likely to educate poor students. Accordingly, we conducted straightforward regression analyses with school size and school poverty used to predict academic outcomes. These regression models allowed us to hold the poverty level constant and test the relationship between school size and performance. The results were clear. After controlling for poverty, there was no statistically significant relationship between school size and academic performance.

VI. CONCLUSIONS

As the foregoing makes plain, not nearly enough is known empirically about the effects of school consolidation to furnish policy makers with a trustworthy basis for sweeping education reform. At best available research offers hints and caveats that should be taken into account on a provisional basis, pending the availability of additional data. By the same token, political and legal realities in Arkansas make it impossible to defer action until more is known.

Key Findings

Pertinent findings to date include the following:

- Investigations of optimal school size suggest that high schools enrolling between 600 to 900 students are best situated to balance out the social benefits of a small-school environment with the curricular diversity and fiscal benefits potentially associated with larger schools. Whereas it may be true to claim that a smaller high school is severely constrained in its ability to offer a rich, diverse curriculum, it does not necessarily follow that even if it has the resources to do so a larger school will invest resources in a broad range of elective courses. And even when it does, there is no guarantee that a substantial percent of the students enrolled will take advantage of so-called “enrichment” electives. Other researchers have suggested that high schools as small as 400 to 800 students may be optimal. A cautious interpretation of the literature indicates that secondary schools enrolling fewer than 400 or more than 900 students may fall outside an ideal size range. In Arkansas, significantly, 60 percent of the state’s public high schools have enrollments of less than 400 students; and 43 percent of the state’s districts enroll fewer than 600 pupils. It would seem, all things being equal, many of these smaller schools would be reasonable candidates for consolidation.
- Very small and very large high schools are disproportionately expensive to operate. In Arkansas, the very small high schools (fewer than 200 students enrolled) are the highest spenders, followed by the very large high schools. Only those high schools within the middle group spend at or below the state average. As of 2002-2003, it is worth noting, nearly 30 percent of the state’s high schools fell into the “very small” category.
- Spending is typically higher than the state average at very small and very large schools--though it must be borne in mind that spending is not the same as actual cost. The percentage of students participating in extracurricular activities in small schools may be higher than the equivalent percentage in large schools.
- It is commonly alleged (but remains unproven) that small schools engender stronger feelings of affiliation, identification and loyalty than do larger schools where alienation, lack of involvement, and disengagement are more common among students.
- There does not appear to be any statistically significant relationship between school size and student academic achievement--in either direction--once the effects of socioeconomic status on academic performance are controlled for in the analysis. Neither large nor small high schools proved superior in 2001-2002 with respect to such academic measures as ACT scores, SAT-9 scores, 11th Grade Literacy Scores, or College Remediation Rates.
- Although in some cases substantial cost savings might be anticipated under consolidation, increased transportation costs and other costs may erode whatever actual savings would have been achieved. Alternatively, transportation costs may decrease on a per-pupil basis due to the consolidation of two districts close to one another. All costs and benefits should be considered in each individual consolidation decision.

- In any given instance where consolidation is contemplated, there are imponderables to consider. Students' travel times to and from school represents one such variable worthy of careful consideration.
- Much of the debate over education in Arkansas so far has focused on the pros and cons of school consolidation. Less attention, unfortunately, has been given to the constitutionally mandated imperative to provide an "adequate" and "suitable" education for all children. Consolidation may prove to be a one part of an overall strategy toward that end. But debate over consolidation must not be allowed to overshadow more fundamental considerations, such as developing an equitable and constitutional funding formula.

All other considerations aside, school consolidation advocates may be correct in their assertion that court-ordered "efficiency" in Arkansas' public education system cannot be achieved so long as efforts continue to maintain a disproportionate number of very small schools in the mix. Whereas in any particular case there may be mitigating circumstances that might make consolidation inadvisable, relevant literature to date on school size relative to other important educational variables offers scant support for the status quo. On the other hand, neither does current research unequivocally point to any particular program of consolidation. At best, what the literature offers so far is a useful set of considerations to be taken into account when formulating school reform policy in Arkansas for the years ahead.

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