

RESEARCH BRIEF

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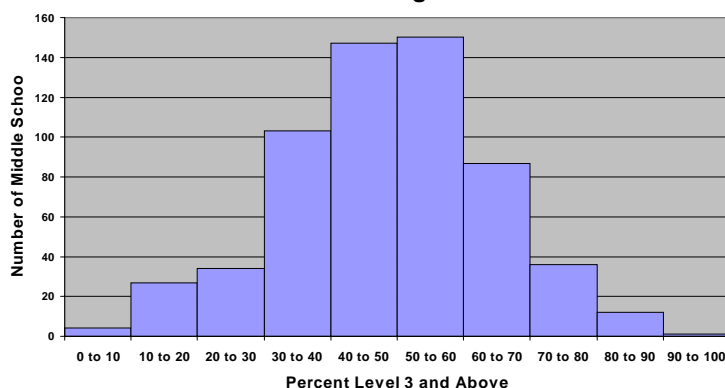
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The Relationship of District Size to Academic Achievement

A Preliminary Investigation

This study is a brief exploratory examination of the relationship between school district size and student achievement. Some previous research has found no consistent relationship between district size and performance, while other studies have found a negative correlation between the two (i.e., larger districts have lower achievement). Some of the more interesting recent work on this subject concerns a possible interaction between district size and socioeconomic status of the student population. This research focuses on these variables for the State of Florida. As a preliminary stage, this study is confined to the middle schools.

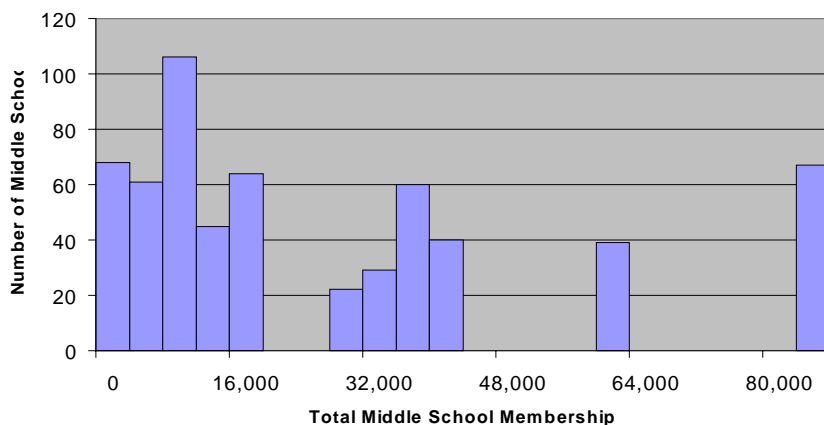
FCAT Reading 2002



Academic Achievement Data

The outcome variable in the analysis is the percent of students scoring at Achievement Level 3 and above on the FCAT Reading test for 2001-02. The unit of analysis is the school. All of the 601 middle schools in Florida with valid test data are included in the analysis. All data were derived from the Florida Department of Education website (<http://www.fldoe.org>) School Indicators Report.

District Membership



District Size Data

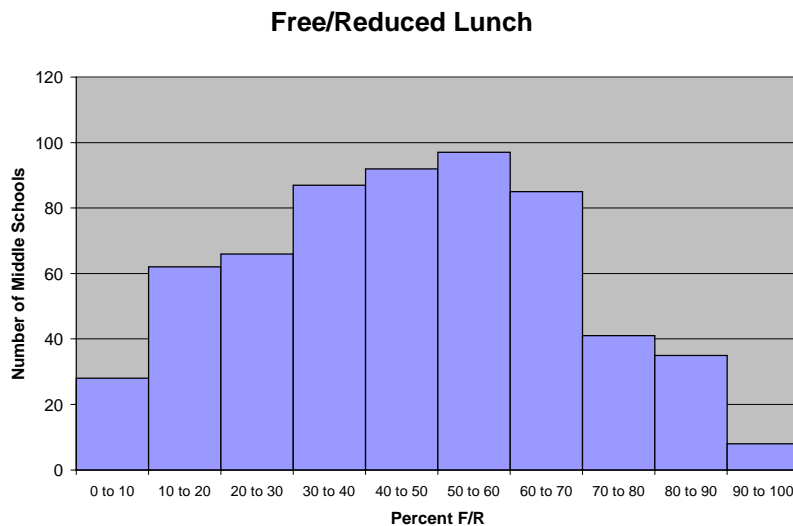
All 67 School Districts in Florida are represented by the middle schools included in this research. The district size variable used for these analyses is the total *middle school membership* for each district (which is almost perfectly correlated with overall district size). This variable averages 8,516 for the State and ranges from a low of 182 to a high of 85,386 for Miami-Dade County.

Single Variable Relationship

The correlation between achievement and district size is $-.24$, indicating a slight negative relationship. In other words, lower achievement percentages are associated with larger district size to a limited degree. Statisticians take the square of the correlation to calculate the percent of variance accounted for in the dependent variable. The following question and answer presents this information in plain English.

Question: How much of the differences in school achievement is predictable from the differences in district size?

Answer: 5.9%



Although this percentage is small, it is not trivial. It should be emphasized that the predictive relationship between large district size and low academic achievement does not imply that large district size causes low achievement. In many cases, one variable is predictive of another because it is associated with an intervening variable which is, in turn, predictive. It is well known that socioeconomic status is related to achievement. Below, we will add this variable to the prediction model to see if the role of district size changes.

Multiple Variable Relationship

In this study, socioeconomic status will be represented by the percent of students in each middle school qualifying for the free or reduced price lunch program. The correlation between achievement and F/R lunch percent $-.78$, indicating a strong negative relationship. In other words, lower achievement levels are associated with larger F/R lunch percentages to a substantial degree. Squaring this correlation yields 60 percent of the variance of academic achievement being accounted for. This is considerably more than the 6 percent accounted for by district size alone. By adding the district size variable into the model, we can see how much additional variance is accounted for.

Question: After accounting for the prediction due to F/R lunch, how much of the differences in school achievement is predictable from the differences in district size?

Answer: 2 tenths of one percent.

The size of the district is not a gradually changing variable. As the graph of this variable on the first page reveals, there are really four district size groups. If we use these four size categories, and also categorize the percent free/reduced lunch into three equal-sized groups, we can look at the academic achievement crossed by these two category variables.

Achievement Related to District Size and SES

School F/R Lunch	District Membership			
	Small	Medium	Large	Very Large
High	40%	29%	38%	30%
Medium	50%	47%	48%	53%
Low	62%	61%	65%	63%

Students in low F/R Lunch schools have higher achievement scores regardless of district size. However, achievement scores of students in any given F/R Lunch category do not change in any consistent manner with changes in school district size. Only in the High F/R Lunch category do we see any appreciable change in achievement levels, and that is not in a consistent direction.

Conclusions

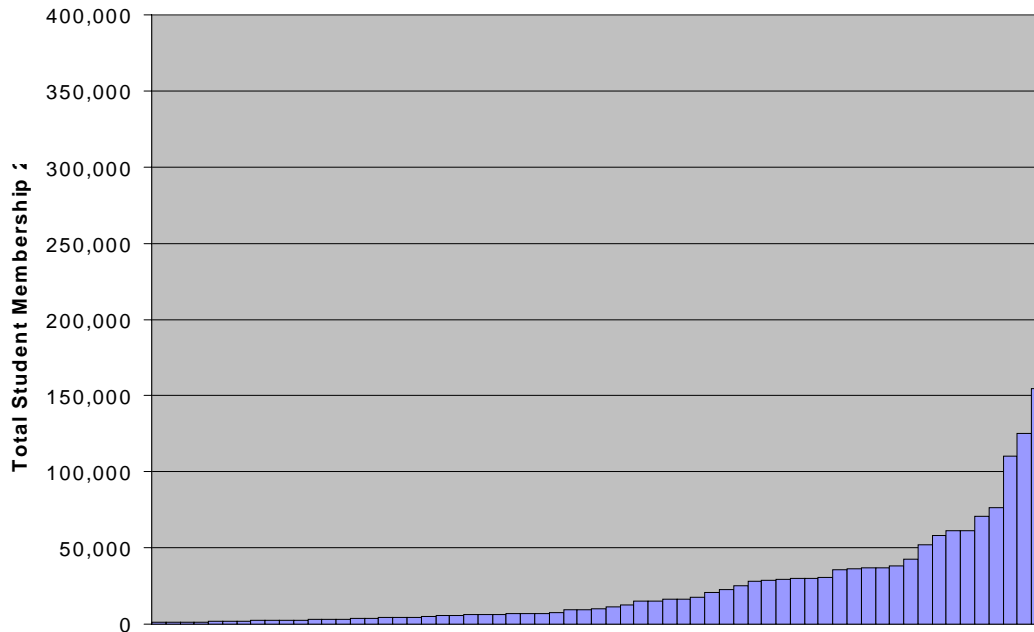
Although this research is of an exploratory nature, it is possible to draw some tentative but plausible conclusions.

District size is only minimally related to academic achievement. To the degree that it is related, the association can probably be accounted for by mutually related intervening variables. Although this study was confined to middle schools, it seems unlikely to be different at other educational levels.

School-level socioeconomic status is much more strongly associated with academic achievement. This merely reconfirms a long-standing research finding. Although SES is not under the control of the administration, if it is not *controlled for* in research studies, spurious conclusions can be reached concerning the role of district size.

The measurement of district size is misleadingly discontinuous. Because the size of the districts does not change in a smooth graduation, inferences concerning the impact of gradual size changes are rarely justified. The strength of the relationship largely depends on the conditions at the extremes, where circumstances are not easily generalizable.

Size of Florida School Districts



Simple correlations between district size and student performance do not support inferences about causation. There is a substantial difference between establishing a correlation (association) between variables and making causal inferences about the relationship. In fact, the absence of a correlational relationship does not necessarily indicate the absence of a causative influence. Causal inference requires: 1) correct chronological order, 2) correlation/association between variables, and 3) the elimination of rival causes. Research designs that meet these criteria (particularly, the last one) are rarely achievable in an educational setting and are not met by simple correlational studies. As such, research into the correlation between district size and academic achievement holds little promise for clearly directing policy decisions.

Proximal causes have more impact than distal causes. Variables associated with the individual student are those most likely to directly impact academic achievement. As we get further from the individual, to the classroom level, the school level, and, finally, to the district level, variables are less likely to be immediately influential on academic achievement.