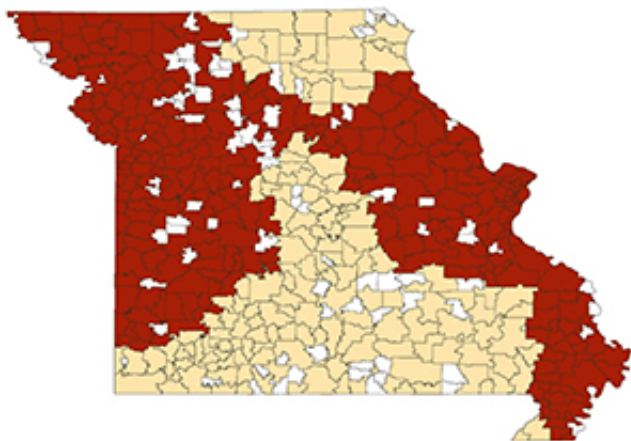


# Place matters in analyzing students' performance, research finds

June 7 2013, by Kelly Wiese Niemeyer

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The map shows the relationship between the percentage of students eligible for free or reduced-price lunches and Algebra I scores in Missouri school districts. The dark-shaded areas are those in which a higher percentage of students receiving such lunches is associated with lower end-of-course algebra scores. This statistically significant relationship is not found in lighter-shaded areas. Districts in white generally are elementary-only and have no Algebra I data. Credit: MARK HOGREBE

(Phys.org) —Where a child lives makes a difference in how demographics and other factors influence algebra performance, and policies should take into account local variation, research from Washington University in St. Louis suggests.

The findings of William Tate, PhD, chair of the Department of

Education and the Edward Mallinckrodt Distinguished University Professor in Arts & Sciences, and Mark Hoglebe, PhD, an institutional researcher in the department, were published in the *Journal of Mathematics Education at Teachers College* (Columbia University).

Hoglebe and Tate said some of their research would not have been possible even 10 or 12 years ago, but thanks to advances in technology, they were able to use Geographic Information Systems (GIS) data and computer models to analyze relationships between various educational factors on a regional basis.

Their analysis is an example of the kind of research with which the university's GIS office can help faculty, students and administrators, though the office wasn't involved in this paper. (See [previous Record story](#)).

In the article, "Place, Poverty and [Algebra](#): A Statewide Comparative Spatial Analysis of Variable Relationships," Hoglebe and Tate wrote that too often, educational data such as test scores are analyzed by comparing differences between schools or districts when district lines are often arbitrary. A child living on Main Street likely is not that different from a child a block away, but in a different district, yet those two students may be notably different from two more 20 miles away in a small rural school, they reasoned.

A more logical approach is to see how locations across the state vary in educational contexts and to study how different ecologies affect academic outcomes, they said.

The article's big takeaway was that place matters in analyzing relationships between algebra performance and other educational variables.

For example, the researchers studied whether a higher percentage of children in poverty was related to lower algebra scores, and whether higher teacher salaries meant higher algebra scores. They found those relationships held true in some districts but not across the board.

Their article used an example that aptly explains the issue: You wouldn't consider one statewide weather forecast effective or reliable, so why is it acceptable that state education policies are one-size-fits-all?

Algebra was a logical subject to study, Tate said, because in American schools, it's often viewed as a gateway course. That is, students who perform well in it are able to progress to higher-level math courses that often are necessary for a host of college courses and career fields, while students who can't master it are foreclosed from such opportunities. Also, in Missouri at least, students take a statewide assessment exam, providing large amounts of comparable data.

Hogrebe and Tate found that a single, global measurement based on aggregated data doesn't properly account for important local variations.

"There need to be location-specific solutions," Tate said.

Policies are unlikely to help [students](#) or be cost-effective if they apply the same response statewide, the researchers found.

"The evidence suggests that's not a good way of doing education policy-making," Tate said.

The researchers hope their work helps inform education policy and guide lawmakers and others as they determine the best use of scarce resources.

To review the article, visit [here](#).

Provided by Washington University in St. Louis

Citation: Place matters in analyzing students' performance, research finds (2013, June 7)  
retrieved 11 May 2024 from <https://phys.org/news/2013-06-students.html>

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