RESEARCH YOU CAN USE

Compact Development and Good Outcomes—Environmental Determinism, Self-Selection, or Some of Both?

I have wrestled with analytical methods in two previous columns. The old mainstay of our profession, ordinary least squares regression, is often inappropriate for analyzing a particular planning problem. In my May column on safe streets, I lauded the use of negative binomial regression as the right approach to analyzing traffic crashes. My reasoning was simple. The dependent variable—number of crashes—has no negative values, many zero values, and few large values. In a case like that, ordinary least squares regression would not give a reliable estimate of regression coefficients.

In my column last June on metropolitan economic performance, I criticized the use of least squares regression as being ineffective for analyzing the interrelated effects of an educated workforce and a creative workforce. In that case, I wrote, the preferred method of analysis was structural equation modeling.

So what are the options available to planners in this complex world of advanced statistics? Recent articles on residential self-selection by two of the most able econometricians among our planning brethren, Patricia Mokhtarian at the University of California, Davis, and Xinyu Cao at the University of Minnesota, suggest some answers. One article, which appeared in the March 2008 issue of *Transportation Research Part B*, focuses on methodologies. The second, in the most recent issue of *Transport Reviews*, focuses on results.

The question is: Does residential choice come first, and travel choice and other outcomes follow (environmental determinism)? Or does a propensity for travel and physical activity determine the choice of residential environment (self-selection)? Does environment or attitude drive behavior more?

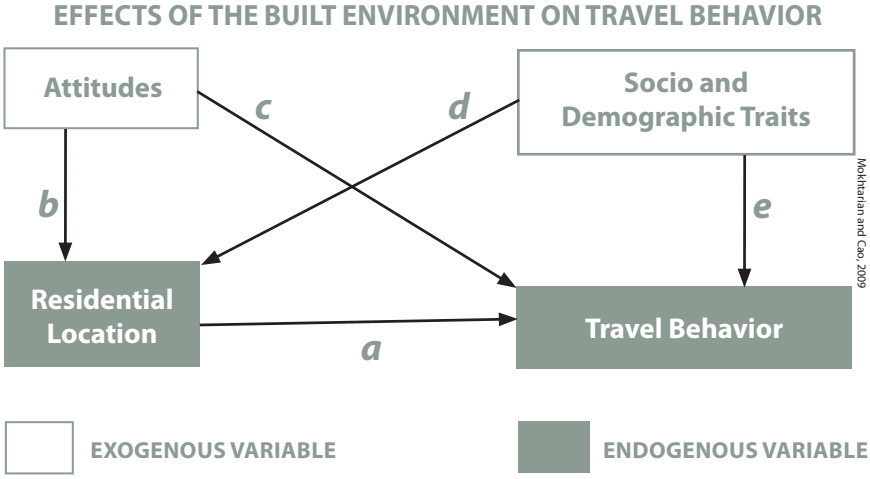
In fact, statistical bias related to self-selection casts serious doubts on the benefits of compact urban development patterns. Consider this from a 2005 report by the Transportation Research Board/Institute of Medicine: "If researchers do not properly account for the choice of neighborhood, their empirical results will be biased in the sense that features of the built environment may appear to influence activity more than they in fact do."

Mokhtarian and Cao's paper, with its smorgasbord of statistical methods, is not for everyone. But I can think of no more accessible essay for those with an appetite for statistics.

In their 2009 article, the two researchers considered 38 quantitative studies on residential self-selection that used nine different research approaches. Nearly all of them, they report, found "resounding" evidence of statistically significant associations between the built environment and travel behavior after accounting for self-selection. The fact that people to some extent "self-select" into neighborhoods matching their attitudes is itself a demonstration of the importance of the built environment on travel behavior.

On a practical level, it may not matter much whether the association between the built environment and travel is caused by environmental determinism or by self-selection. Where people live ultimately depends on housing supply and demand, and there is ample evidence that the supply of walkable, transit-oriented environments falls far short of demand.

A study of residential preferences in Boston and Atlanta (by Jonathan Levine et al., published in 2005 in the *Journal of Planning Education and Research*) found a huge unmet demand for pedestrian- and transit-friendly environments. Given the gap between supply and demand, its authors concluded, "it seems unlikely that new transit-oriented housing in Atlanta would fill up with average Atlantans; rather, it would tend to be occupied by people with distinct preferences for such housing."



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They conclude that "self-selection in this case would be a real effect, but it would hardly negate the impact of urban form on travel behavior. This is because in the absence of such development, those households would be unlikely to reside in a pedestrian neighborhood and would have little choice but to adopt auto-oriented travel patterns."

Reid Ewing

Ewing is a professor of city and metropolitan planning at the University of Utah and an associate editor of the *Journal of the American Planning Association*. Past "Research You Can Use" columns can be found at http://cmpweb.arch.utah.edu/. A report summarizing both studies of self-selection by Mokhtarian and Cao is downloadable at http://pubs.its.ucdavis.edu/publication_detail.php?id=1194.

