Economics and Human Biology 11 (2013) 18–29

Contents lists available at SciVerse ScienceDirect

Economics and Human Biology

journal homepage: http://www.elsevier.com/locate/ehb

Effects of the built environment on childhood obesity: The case of urban recreational trails and crime

Robert Sandy [a], Rusty Tchernis [b,*], Jeffrey Wilson [c], Gilbert Liu [d], Xilin Zhou [e]

[a] Department of Economics, Indiana University Purdue University Indianapolis (IUPUI), United States
[b] Department of Economics, Georgia State University, IZA and NBER, United States
[c] Department of Geography, Indiana University Purdue University Indianapolis (IUPUI), United States
[d] Department of Pediatrics, Indiana University School of Medicine, United States
[e] Department of Economics, Georgia State University, United States

ARTICLE INFO

Article history:
Received 11 May 2011
Received in revised form 17 February 2012
Accepted 17 February 2012
Available online 6 March 2012

Keywords:
Childhood obesity
Built environment
Crime

ABSTRACT

We study the effects of urban environment on childhood obesity by concentrating on the effects of walking trails and crime close to children's homes on their BMI and obesity status. We use a unique dataset, which combines information on recreational trails in Indianapolis with data on violent crimes and anthropomorphic and diagnostic data from children's clinic visits between 1996 and 2005. We find that having a trail near a home reduces children's weight. However, the effect depends on the amount of nearby violent crimes. Significant reductions occur only in low crime areas and trails could have opposite effects on weight in high crime areas. These effects are primarily among boys, older children, and children who live in higher income neighborhoods. Evaluated at the mean length of trails this effect for older children in no crime areas would be a reduction of 2 lb of the body weight. Falsification tests using planned trails instead of existing trails, show that trails are more likely to be located in areas with heavier children, suggesting that our results on effects of trails represent a lower bound.

Published by Elsevier B.V.

1. Introduction

The extent and the dire health consequences of the U.S. child obesity epidemic are well documented (Anderson and Whitaker, 2009; Hannon et al., 2005). The alarming growth in child obesity has generated many proposals for interventions, some of which have been implemented at local and state levels. These proposals have been primarily aimed at schools and food sellers. They include: state and national taxes on sugared soft drinks (Salant, 2009); bans on such drinks in schools (Price et al., 2006); bans on building new fast food restaurants, increases in mandatory physical education requirements; and healthier school lunch menus (Trust for America's Health, 2009). Many of these proposals have been made without sufficient evidence that they would have a beneficial effect or in spite of evidence that they would have no benefit. Doubts about the effectiveness of specific mechanisms for countering child or adult obesity have been raised by Cawley et al. (2007) on physical education classes; Millimet et al. (2010) on changing school lunch programs; Sandy et al. (2011) and Anderson and Matsa (2011) on bans on new fast food restaurants; and, Whatley Blum et al. (2008) on banning sugared soft drinks.

There have been proposals to use differential health insurance pricing to reduce adult obesity (Johnson, 2009). For adults with any health insurance, an obesity surcharge on their health insurance premium is similar to a direct tax for being obese. The application of such proposals to children has been met with strong resistance. Even if differential health insurance pricing were to improve parents' child-rearing behavior and reduce child obesity, it

* Corresponding author.
E-mail address: rtchernis@gsu.edu (R. Tchernis).

1570-677X/$ – see front matter. Published by Elsevier B.V.
doi:10.1016/j.ehb.2012.02.005

is unlikely to be politically feasible. An incident that occurred in October of 2009 illustrates the public's highly negative reaction. A private insurer, the Rocky Mountain Health Plan, refused to sell health insurance to a Colorado family on the grounds that the family's 4-month old baby was obese (Lofholm, 2009). Within 2 days a tsunami of national unfavorable publicity caused the company to reverse its decision (Sandell, 2009). It is similarly difficult to find politically feasible policies to reduce children's at home sedentary activities, such as television viewing or playing video games. Obesity report cards, i.e. reports on the child's BMI percentile sent from schools to a child's parents, are an example of a policy designed to reach into the child's home. Obesity reports cards have generated a great deal of resistance (Kantor, 2007). The political landscape may be shifting toward an increased receptiveness to within-the-family interventions. For example, in a commentary in the Journal of the American Medical Association, Murtagh and Ludwig (2011) urged the consideration of transfer of approximately two million morbidly obese children to foster care. The author's rationale was that being beyond the 99th percentile for BMI indicated unfavorable home circumstances that were so threatening as to merit removal from their parents' care. A second "straw in the wind" was a suggestion in March of 2011 by Illinois State Senator Shane Cultra that families with obese children lose their state child income tax deduction (Hess, 2011). It is not clear that these proposals targeting families and home environments are politically feasible. They may merely be indicative of the frustrations with current policies, or serve as ploys to garner attention to a worsening public health menace.

Reversing the child obesity epidemic will require policies that are both effective and politically feasible. A broad category of potential interventions entails changing the built environment to promote healthier eating and increase physical activity. Subsidies for, or public provision of, potentially weight-reducing built amenities would be potentially easier to implement than in-home interventions. An additional advantage of weight-reducing built environment interventions is that they have smaller negative spillovers on individuals who are at healthy weights. While individuals who are in a healthy weight range would be taxed to support changes in the built environment, such as recreational amenities, the non-obese appear to be at least as likely to use these amenities. In contrast, taxes on sugared soft drinks and bans on fast food restaurants impact non-obese individuals without giving them a direct benefit.

Proposals for altering the built environment run the gamut from modifying streets to encourage walking, to constructing recreational amenities as pools, soccer fields, basketball courts, and trails, to zoning laws requiring mixes of residential and commercial land use, to locating schools within walking distance of the homes (King et al., 1995; Sallis et al., 1998; Margetts, 2004). Proposals addressing the built environment are also running well ahead of the evidence. Although the American Academy of Pediatrics Committee on Environment recommends that policymakers: "Fund research on the impact of the built environment at neighborhood and community levels on the promotion of overall health and active lifestyles for children and families" the committee surprisingly does not suggest such research be completed before it goes on in the same report to recommend a host of interventions that have little empirical support (Committee on Environmental Health, 2009).

A crucial problem for identifying public policies that can counter the child obesity epidemic via the built environment is the endogeneity of household and amenity location choices. Households who chose to live near an amenity would be expected to have stronger preferences for that amenity. Moreover, the locations of public recreational amenities are a political decision that can be influenced by the lobbying of the households most interested in using the amenity. Thus, cross-sectional studies of built environment may reveal more about the preferences of the families who live near an amenity than they reveal about its impact. Private companies, such as fast food restaurants, place outlets where, ceteris paribus, they expect to have the most customers. An example of this endogeneity problem is the conclusion, formed on the basis of many cross-sectional studies, that urban sprawl contributes to obesity. This result was not supported in either a study of people who moved between cities with different levels of sprawl (Plantinga and Bernell, 2007) or in a study of changes in the level of sprawl over time in a given city (Ewing et al., 2006).

The amenity that is the subject of this paper, recreational trails, presumably attracts families to locate nearby who value a trail as an exercise opportunity. It is reasonable to assume that these households would most likely have healthier diets and engage in more exercise than the average household, even without a nearby trail. Absent the random assignment of residential location, such as the Moving to Opportunity Experiment (Kling et al., 2004), an ideal research design is to either have an instrument that predicts location but not BMI or a natural experiment that moves households or amenities. Since body weight is influenced by so many factors, it is difficult to find a plausible instrument. Some natural experiments that have moved many households, e.g. Hurricane Katrina, also change other factors that are related to body weight; for example, individuals displaced by natural disasters could experience depression, psychological stress, or impaired sleep, all of which would complicate discerning how new recreational amenities would contribute to changes in their weight status.

In this paper we investigate the effects of urban recreational trails on child weight status. The trails could potentially reduce the cost of exercise due to lower time and money cost (e.g. compared to costs of gym memberships), and, for individuals who prefer exercising outdoors, trails can also increase the marginal utility of exercise. Both of those effects should lead to more exercise and potentially lower weight. However, one needs to consider the potential use of trails, particularly in inner-city environments. In high crime areas, trails may facilitate criminal activity by providing more targets for criminals and/or a means of escape or of blending in with other users. Fear of crime has been associated with reduced physical activity, and so trails that increase crime could subsequently lead to higher rates