



## An examination of processes linking perceived neighborhood disorder and obesity<sup>☆</sup>

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### ARTICLE INFO

#### Article history:

Available online 21 April 2008

#### Keywords:

Health inequalities  
Neighborhoods  
Body mass  
Distress  
Psychological distress  
USA

### ABSTRACT

In this paper, we use data collected from a statewide probability sample of Texas, USA adults to test whether perceptions of neighborhood disorder are associated with increased risk of obesity. Building on prior research, we also test whether the association between neighborhood disorder and obesity is mediated by psychological, physiological, and behavioral mechanisms. We propose and test a theoretical model which suggests that psychological distress is a lynchpin mechanism that links neighborhood disorder with obesity risk through chronic activation of the physiological stress response, poor self-rated overall diet quality, and irregular exercise. The results of our analyses are generally consistent with this theoretical model. We find that neighborhood disorder is associated with increased risk of obesity, and this association is entirely mediated by psychological distress. We also observe that the positive association between psychological distress and obesity is fully mediated by physiological distress and poor self-rated overall diet quality and only partially mediated by irregular exercise.

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### Introduction

Studies consistently show that residents of neighborhoods characterized by socioeconomic disadvantage, social disorganization, and disorder tend to exhibit higher rates of obesity than residents of other neighborhoods (Boardman, Saint Onge, Rogers, & Denney, 2005; Burdette, Wadden, & Whitaker, 2006; Cohen, Finch, Bower, & Sastry, 2006; Glass, Rasmussen, & Schwartz, 2006; Inagami, Cohen, Finch, & Asch, 2006; Mujahid, Roux, Borrell, & Nieto, 2005; Poortinga, 2006; Robert & Reither, 2004; Ross et al., 2007). If neighborhood conditions actually increase the risk of obesity, how do they? Researchers explain that residents of disadvantaged neighborhoods live within systems of

obesity that are defined by a constellation of factors that encourage risky eating habits and discourage regular physical activity, including high fast-food outlet density and related marketing, restricted access to grocery stores, supermarkets, recreational amenities, exercise facilities, health centers and health-related information, widespread structural disrepair, fear of crime, and other psychosocial stressors (Chang, 2006; Cohen et al., 2006; Cummins & Macintyre, 2006; Diez Roux, 2003; French, Story, & Jeffery, 2001; Glass et al., 2006; Hill & Peters, 1998; Inagami et al., 2006; Papas et al., 2007; Poortinga, 2006; Reidpath, Burns, Garrard, Mahoney, & Townsend, 2002; Robert & Reither, 2004; Ross et al., 2007; Stimpson, Ju, Raji, & Eschbach, 2007).

Although researchers often speculate as to how adverse neighborhood conditions might increase the risk of obesity, only a few studies have attempted to explain this association empirically (e.g., Cohen et al., 2006; Glass et al., 2006; Inagami et al., 2006; Poortinga, 2006). Surprisingly, this small body of research has shown very little support for structural characteristics of the neighborhood

<sup>☆</sup> The authors thank Catherine Ross for helpful suggestions. However, we are solely responsible for any errors of fact or interpretation that remain.

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(e.g., access to grocery stores) and individual health behaviors (e.g., diet and exercise) as potential mediators. For example, Glass et al. (2006) use data collected from a large probability sample of older adults living in the Baltimore area to test whether the association between perceived neighborhood hazards and obesity is mediated by poor dietary behavior (percent calories from fat and total dietary intake) and reduced physical activity (vigorous activity and leisure-time walking), but show no support for these mechanisms. Although these results appear to exclude diet and physical activity as viable explanations, additional research is needed to confirm these patterns and to establish new processes, including psychological and physiological pathways (Cohen et al., 2006; Glass et al., 2006; Poortinga, 2006).

In this paper, we use data collected from a statewide probability sample of Texas adults to test whether perceptions of neighborhood disorder are associated with increased risk of obesity. In the state of Texas, obesity affects over one quarter of the adult population and accounts for more than \$5 billion in medical expenditures each year (Finkelstein, Fiebelkorn, & Wang, 2004; Wang & Beydoun, 2007). Building on prior research, we also test whether the association between neighborhood disorder and obesity is mediated by psychological, physiological, and behavioral mechanisms. We propose that living in a neighborhood that is perceived as noisy, unclean, and crime-ridden can be psychologically distressing, which increases the risk of obesity through chronic activation of the physiological stress response, poor self-rated overall diet quality, and irregular exercise.

The remainder of the paper consists of four parts. We begin by formally introducing and developing the theoretical model upon which subsequent analyses are based (see Fig. 1). We then describe the data source, measures, and statistical procedures. After summarizing the results of our analyses, we conclude with a discussion of our findings and the potential implications of our study.

## Theoretical model

### *Neighborhood disorder and psychological distress*

Neighborhoods with high levels of disorder present residents with observable signs that social control is weak (Ross & Mirowsky, 2001; Skogan, 1986, 1990; Skogan & Maxfield, 1981; Taylor & Hale, 1986). In these neighborhoods, residents report problems with crime, vandalism,

graffiti, people hanging out on the streets, drug use, public intoxication, run-down and abandoned buildings, trouble with neighbors, and other incivilities associated with the breakdown of social control (Geis & Ross, 1998; Hill & Angel, 2005; Hill, Ross, & Angel, 2005; LaGrange, Ferraro, & Supancic, 1992; Lewis & Maxfield, 1980; Lewis & Salem, 1986; Miles, 2006; Ross & Mirowsky, 1999; Skogan, 1986, 1990). These are only some of the many signs of neighborhood disorder. They are stressful because they convey to residents that social order has broken down and signify a potential for threat and danger.

The constant threat of living in an environment that one perceives to be dangerous can be psychologically distressing. Indeed, studies consistently show that chronic exposure to disadvantage, disorder, and decay in one's neighborhood is associated with higher levels of depression and anxiety (Aneshensel & Sucoff, 1996; Christie-Mizell, Steelman, & Stewart, 2003; Latkin & Curry, 2003; Ross, 2000a; Ross, Reynolds, & Geis, 2000; Schulz et al., 2000; Steptoe & Feldman, 2001). According to our theoretical model, psychological distress is a lynchpin mechanism that links neighborhood disorder with obesity risk through chronic activation of the physiological stress response, poor self-rated overall diet quality, and irregular exercise.

### *Psychological distress and the physiological stress response*

Perceptions of neighborhood disorder may increase the risk of obesity by elevating levels of psychological distress, which, in turn, leads to chronic activation of the physiological stress response (Hill et al., 2005; McEwen, 2002, 2003, 2004). Daily exposure to threatening conditions in one's neighborhood may be sufficient to elicit a two-stage stress response. The initial stage—the fight-or-flight response—releases adrenaline into the blood stream. In order to supply the body with a ready source of energy to fight or flee, adrenaline triggers the release of glucose from energy stores and prompts the breakdown and release of fatty acids from fat reserves.

The follow-up stage of the stress response activates the hypothalamic–pituitary–adrenal (HPA) axis and releases cortisol into the circulating blood. In an effort to replenish energy reserves depleted during the initial fight-or-flight response, cortisol converts food into stored fats and acts on the brain to induce hunger and food-seeking behavior. Psychological distress exacerbates these metabolic processes by elevating cortisol levels throughout the day. When cortisol levels are chronically high, excessive

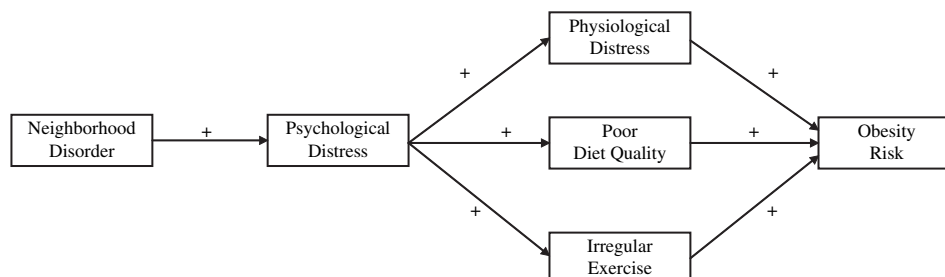


Fig. 1. Theoretical model of a process by which perceptions of neighborhood disorder increase the risk of obesity.

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