



Racial differences in parental perceptions of the neighborhood as predictors of children's physical activity and sedentary behavior

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ABSTRACT

Objective. Most U.S. children engage in insufficient physical activity (PA) and spend too much time in sedentary behaviors (SBs), leading to increased risk of obesity and chronic disease. Evidence remains inconsistent on relationships between parental perceptions of the neighborhood and children's PA and SB. This study examines parental neighborhood perceptions, stratified by race, as predictors of children's PA and SB.

Methods. Relationships were tested with regressions stratified by parental race. The sample included 196 parents, residing in St. Louis, Missouri with a child at home. Participants responded to a mailed survey in 2012. Parental neighborhood perceptions were examined by mean composite scores and individual items.

Results. For parents of all races, perceived barriers negatively predicted the number of days in a week children engaged in ≥ 60 min of PA. Examining parental neighborhood perceptions by individual item, the perception that drivers exceed neighborhood speed limits was a positive predictor of their children's SB only among white parents. Only among minority-race parents was perceived neighborhood crime rate a positive predictor of their children's SB.

Conclusions. While predictors of children's PA did not differ widely, several distinct predictors of children's SB by parental race lend support toward further examination of this topic.

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Introduction

Epidemiological research shows that most children (≤ 18 years) in the U.S. spend insufficient time engaged in physical activity (PA¹) and spend too much time engaged in sedentary behavior (SB²; e.g., riding in a car, watching TV) (Office of the Surgeon General, 2010; Spittaels et al., 2012; Tremblay et al., 2010). This lack of PA and abundance of SB have independent, but similarly poor effects on children's health (Ekelund et al., 2013; Fisher et al., 2011). Inactive children are at increased risk for obesity and related diseases (e.g., type 2 diabetes, cardiovascular disease, cancer) compared with children who meet national guidelines of 60 min of daily PA (Agbuga, 2011; Ekelund et al., 2013; Schroeder, 2011). Likewise, children who spend over 2 h a day in SB have an increased risk of obesity and related chronic diseases compared with children who meet national guidelines of fewer than 2 h

of SB a day, regardless of their PA, diet, age, race, or family income (Crespo et al., 2001; Fisher et al., 2011; Owen et al., 2011). A number of factors that contribute to children's PA and SB have been identified, many of which involve parents since they tend to regulate children's behaviors (Carson et al., 2010; Davison and Lawson, 2006; Salmon et al., 2008). Evidence remains inconsistent on the relationships between parental perceptions of the neighborhood and children's PA and SB. Several studies report significant relationships between parent's perceptions of neighborhood characteristics, including safety, presence of sidewalks, and accessibility of parks to children's PA and SB (Carson et al., 2010; Davison and Lawson, 2006; Salmon et al., 2013; Veugeliers et al., 2008). Conversely, two systematic reviews found a lack of notable relationships between neighborhood characteristics and children's PA (Carver et al., 2008; Ferreira et al., 2007).

Additional research is necessary to parse the relational complexities that may be contributing to the mixed findings. Studies investigating parental perceptions of the neighborhood on children's PA or SB tend to examine differences in these relationship by individual-level characteristics of the children (e.g., age) (Cecil-Karb and Grogan-kaylor, 2009; Datar et al., 2013; Timperio et al., 2012). Little is known about these relationships by individual-level characteristics of the parents. Racial disparities in PA and SB across the life course in the U.S. are reason to appraise differences in predictors of these outcomes by race of the parents (Gordon-Larsen et al., 2004; Whitt-Glover et al., 2009).

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¹ PA: physical activity.

² SB: sedentary behavior.

Research shows that white populations have lower risk perception than populations of a minority-race (Finucane et al., 2000; Flynn et al., 1994). For example, black adults are more likely to perceive their neighborhoods to be less pleasant and less safe for PA compared with their white counterparts, despite the racial make-up of their neighborhoods (Boslaugh et al., 2004). This difference in perceived neighborhood environment is likely to have an influence on where parents allow their children to be active. This study is novel in its approach to investigating parental neighborhood perceptions as predictors of children's PA and SB by parental race.

Material and methods

This cross-sectional study analyzed data collected in St. Louis City, Missouri, between July and August 2012. Data were collected as part of a larger study examining how changes in the built environment (i.e., a new walking and biking trail) influence perceptions of the neighborhood, PA, and SB (Zwald et al., 2014). Data for the current study were collected prior to implementation of the built environment changes. Addresses were obtained through the U.S. Data Corporation and surveys were mailed to every home within one-quarter mile of the new trail (2003 addresses) and another 1537 homes in the control neighborhood (US Data Corporation, 2012). Households were mailed paper surveys soliciting one adult resident of the home (≥ 18 years of age) to complete and return the survey in exchange for a gift card. A total of 772 surveys were completed and returned (response rate of 21.9%). This study includes only respondents reporting a child living in the home between three and 18 years old ($n = 196$). Children under three were excluded to ensure that children referenced by parents in the sample could walk independently. The larger study received Institutional Review Board approval from Washington University in St. Louis.

Measures

Parental perceptions of the neighborhood

Two scales were used to measure parental perceptions of the neighborhood. The first scale, abbreviated Neighborhood Environment Walkability Scale (NEWS-A), included 9 items, each with 4-point Likert scale response options anchored with "strongly disagree" to "strongly agree" (Cerin et al., 2009). This analysis used three subscales within NEWS-A that ask about perceptions of the neighborhood Traffic Hazards (two items; e.g., Most drivers exceed the posted speed limit), Infrastructure and Safety for Walking (four items; e.g., My neighborhood streets are well lit), and Crime (three items; e.g., The crime rate in my neighborhood makes it unsafe to go on walks during the day). NEWS-A and its subscales have shown factorial and criterion validity (Cerin et al., 2009). The unabbreviated NEWS has shown concurrent validity with objective Geographic Information Systems walkability findings and moderate reliability among U.S. adults (Adams et al., 2009).

The second scale asked parents to indicate which built environment and social barriers make it difficult for their child to be active in local parks. The scale derives from a longer survey of parents and children used in the Active Where? study (Durant et al., 2009). All items in the survey showed at least moderate individual item reliability (Joe et al., 2008). This scale includes 11 items, each with 4-point Likert scale response options anchored with "strongly disagree" to "strongly agree" and has shown acceptable internal consistency and construct validity (Durant et al., 2009). All items were negatively-oriented (e.g., "There is not enough space to be active in"). The parent was directed to respond with only one child in mind: the child closest to his/her 13th birthday.

Children's sedentary behavior

Children's SB was assessed using a scale from the Active Where? study that includes six items listing behaviors that are performed sitting

or lying down (e.g., watching television/videos, riding in a car, reading a book or magazine) (Joe et al., 2008). This scale was found to be reliable and has been used in several other studies (Lake et al., 2009; Robinson and Killen, 1995; Robinson et al., 1999). Parents were asked to indicate how much time on a typical week day their child spends doing each of the six SBs. Seven categorical response options ranged from none to four or more hours per day.

Children's physical activity

Parents were asked three questions from the Active Where? study, with eight response options ranging from zero to seven days (Joe et al., 2008). These questions were found to be reliable and significantly correlated with objectively measured PA (Prochaska et al., 2001). The three items include 1) "For the past seven days, how many days was the child physically active for a total of at least 60 min per day?"; 2) "Over a usual week, on how many days was the child physically active for a total of at least 60 min per day?"; and 3) "Outside of school, how many days per week does the child play or practice team sports?" Parents were also instructed not to include school physical education or gym when considering their responses to the first three questions, though this time should have been limited due to summer survey administration.

Parent's individual characteristics

Parents reported gender, age, race, education, household income, and total PA in the past week (see Table 1 for categories). Total PA in the past week was measured using the International Physical Activity Questionnaire long-form, which was found to be reliable and valid among U.S. adults (Craig et al., 2003). PA cut-offs are informed by national guidelines for daily PA (US Department of Health and Human Services, 2008).

Statistical analyses

Using SPSS version 22.0 (IBM Corp, 2013), descriptive statistics were conducted to examine individual characteristics of the study sample of parents. Independent samples t-tests and one-way ANOVAs were conducted to examine mean differences in the main independent (parental perceptions of the neighborhood) and dependent (child's SB) variables of interest by individual parental characteristics.

Assumptions of linear regression tests were tested on the univariate and bivariate levels. To assess for racial differences in the relationships between parental perceptions of the neighborhood as predictors of children's SB and PA, data were stratified by race and linear regression tests were conducted using mean composite scores of each of the three subscales within NEWS-A and the barriers scale. Race was dichotomized by collapsing the "other" and "non-Hispanic black" categories, creating minority-race and white categories. This decision was informed by Table 1 findings indicating that parents identifying with other races (e.g., Asian, Native American, mixed race) had mean scores on parental perceptions of the neighborhood and children's SB that were closer to the mean scores of non-Hispanic black parents compared with white parents.

For a more detailed examination of racial differences in the relationships between parents' perceptions of the neighborhood as predictors of children's SB, SB was regressed on each item of the NEWS-A individually, stratified by race of the parent. Each item of the NEWS-A was dichotomized into "agree" and "disagree" categories to be consistent with other studies (Hallal et al., 2010; Zwald et al., 2014). One study found equivalent relationships regardless of dichotomizing or maintaining the 4-point ordinal response scale (Adams et al., 2009).

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