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The associations between neighborhood constructs, physical activity, and childhood obesity: Understanding race and income disparities

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ABSTRACT

Scholars suggest that children’s built and social environments play key roles in their physical activity (PA) levels and subsequent propensity toward obesity. This study examines the associations between neighborhood constructs and the race and income disparities in PA and health among children ages 10–17 years in the United States. Using the 2011–2012 National Survey of Children’s Health and a series of logistic and ordinary least squares regressions, this study compares obesity and PA levels of Black, Hispanic, and low-income children with their White and more affluent counterparts, interacting demographic and neighborhood characteristics with one another. Findings reveal that non-White respondents report having more amenities and more detractions; low-income respondents report having fewer amenities and more detractions; and non-White and low-income respondents report having less social cohesion. Additionally, though amenities and cohesion improve PA and health and detractions have the reverse effect, these effects are opposite for Black, Hispanic, and low-income children. Black children with more cohesion and Hispanic children with more amenities and fewer detractions have greater odds of being obese. Findings underscore the need for improved physical and social environments in non-White and low-income communities, as well as targeted initiatives to educate parents and children on obesity and healthful activities.

Since the 1960s, the rate of childhood obesity has risen nearly fourfold (U.S. Department of Health and Human Services [USDHHS], 2009). As such, childhood obesity has evolved from a relatively uncommon societal problem to a national public health crisis (Ben-Sefer, Ben-Natan, & Ehrenfeld, 2009; Brescoll, Kersh, & Brownell, 2008; Handy, Cao, & Mokhtarian, 2006; Levi, Segal, Laurent, Lang, & Rayburn, 2009; Rosenthal & Chang, 2004; USDHHS, 2009). This epidemic disproportionately affects Black, Hispanic, and low-income children. In fact, the literature overwhelmingly confirms that Black, Hispanic, and low-income children are more likely to be overweight or obese than White and more affluent children (BeLue, Francis, Rollins, & Colaco, 2009; Lutfiyya et al., 2008; Lutfiyya, Garcia, Dankwa, Young, & Lipsky, 2008; McMillan, 2007; Singh, Kogan, & van Dyck, 2008; Singh, Siahpush, & Kogan, 2010; Whitt-Glover et al., 2009). Some of these studies also indicate that Black, Hispanic, and low-income children are less physically active than their White and more affluent counterparts.

What factors are contributing to this disparity in physical activity and obesity among children? Studies suggest that children’s built and social environments play key roles in their physical activity level and subsequent propensity toward obesity. Some studies have found that children who live in
neighborhoods with poor pedestrian accommodations and physical decay, litter, and graffiti have lower odds of regular physical activity than those who live in safer or more equipped neighborhoods (Booth, Pinkston, & Poston, 2005; Larsen et al., 2006). Black, Hispanic, and low-income children are believed to have lower physical activity levels because of their reduced access to community facilities that encourage activity (Larsen et al., 2006). As a result, unhealthy weight is also attributed to less access to quality living conditions that encourage healthy behaviors. When parents perceived that the neighborhood had unsafe pedestrian accommodations, physical activity was less likely to increase among children (Hume et al., 2009). Poor pedestrian accommodations (busy road and poor infrastructure) decreased children’s likelihood of walking or bicycling to school. Access to recreational facilities was positively correlated to physical activity among children, although Black, Hispanic, and low-income groups were more likely to walk to their destinations, mainly out of necessity (Kerr, Frank, Sallis, & Chapman, 2007). Underserved groups have the highest proportion of children who walk or bike to school (Martin, Lee, & Lowry, 2007).

In one study, where low-income Caucasians lived in disadvantaged neighborhoods and more affluent African Americans lived in more advantaged neighborhoods, the low-income Caucasians had a higher incidence of obesity-related diseases than the affluent group of African Americans (Diez Roux, Stein Merkin, & Arnett, 2001). “Even after controlling for personal income, education, and occupation, [they] found that living in a disadvantaged neighborhood is associated with an increased incidence of coronary heart disease” (Diez Roux et al., 2001, p. 99). In their study, disadvantaged neighborhoods are characterized as those with low median household income, low median housing unit value, and low proportions of residents with college education or professional occupations (Diez Roux et al., 2001). In another study, Marmot (2001) characterized disadvantaged communities as those ridden with insecurity, fear of crime, suffering from the effects of a low position in the socioeconomic hierarchy, and lack of social support, and he asserted that these features might increase inequalities in health. Additionally, Singh and colleagues (2008) found that children with low neighborhood social supports, such as parental trust and reciprocity among neighbors, have lower odds of physical activity than children with high neighborhood social support. The findings of Diez Roux et al. (2001) suggest two potential targets of intervention: enhancing the social and psychological resources of individual people and improving the quality of neighborhoods and communal life.

Hume and colleagues (2009) found that when parents knew many people in their neighborhoods, children were more likely to be physically active. Timperio and colleagues (2006) found that children were less likely to walk or bicycle to school if parents did not know many neighborhood children and if pedestrian accommodations were unsafe (e.g., no lights or crossings for child to utilize). For parents with younger children, the social environment was found to be more important than the built environment (Hume et al., 2009). Neighborhoods perceived as having friendly and trusting social networks had higher physical activity among children (Hume et al., 2009).

Collectively, these studies assert that both socially and structurally deprived neighborhoods can discourage outdoor physical activity, which leads to higher rates of childhood obesity. Indeed, they underline the importance of environmental factors in understanding the childhood obesity disparity, yet they do not address the potential association between these environmental factors and demographic characteristics of the children. By interacting neighborhood characteristics with the child’s demographics, the present study is able to examine the relationship between childhood obesity, race and income, and obesogenic environments (unhealthy settings). Urban areas are found to be less obesogenic than rural areas, because they are found to have more outlets for exercising (Tai-Seale & Chandler, 2010). National studies of adults (rather than children) have consistently shown that obesity and low physical activity are more common among rural adults than urban adults (Jackson, Doescher, Jerant, & Hart, 2005; Martin et al., 2005; Patterson, Moore, Probst, & Shinogle, 2004). In addition, rural dwellers are typically poorer than urbanites (Davis, Bennett, Befort, & Nollen, 2011). For these reasons, I suspect that the child obesity predictors (demographic and neighborhood factors) may play significant and different roles in urban and rural settings.
Using a nationally representative data set, this article (a) compares the built and social environments of Black, Hispanic, and low-income children to that of their White and more affluent counterparts; (b) compares how race and income groups interact in similar environments; for example, are certain conditions positively associated with one group but negatively associated with another? and (c) examines whether built and social environments help explain Black, Hispanic, and low-income children’s lower physical activity levels and higher obesity rates; for example, if these environmental factors are controlled for (if they are the same among all race and income groups), will Black, Hispanic, and low-income groups still have worse health outcomes?

I expect to find that children living in unsafe, dilapidated, or poorly supplied physical environments (i.e., no crosswalks, no sidewalks, no or limited street lighting, graffiti, abandoned buildings, etc.) are at greater risk of obesity than those living in safer, more attractive, and better supplied physical environments (Booth et al., 2005; Hume et al., 2009; Kerr et al., 2007; Larsen et al., 2006; Martin et al., 2007; Timperio et al., 2006). I also expect to find that children living in tight-knit, supportive social environments are at lower risk of obesity than those who live in less cohesive and socially supportive environments (Diez Roux et al., 2001; Hume et al., 2009; Marmot, 2001; Singh et al., 2008; Timperio et al., 2006). As with the case of the low-income Caucasians living in disadvantaged neighborhoods (Diez Roux et al., 2001), I suspect that household income plays a stronger role in children’s built and social environments than race does. Evidence in support of this hypothesis might thereby indicate that income also plays a stronger role than race does in children’s physical activity levels and health outcomes. Lastly, I suspect that by controlling for race and income via built and social environments, children’s health outcomes will equalize among the demographic groups, indicating that (a) Black, Hispanic, and low-income populations have fewer social and structural supports than their counterparts and (b) these environmental factors are the greater contributors to this unexplained health disparity, not merely race and income alone.

Methods

Data

To conduct this study, I use the 2011–2012 National Survey of Children’s Health (NSCH; Centers for Disease Control and Prevention, National Center for Health Statistics, State and Local Area Integrated Telephone Survey, 2013). The survey is a nationally representative telephone survey sponsored by the USDHHS, Maternal and Child Health Bureau, and conducted by the National Center for Health Statistics of the Centers for Disease Control and Prevention (CDC). This NSCH data set is the most comprehensive, reliable, and up-to-date national information currently available for childhood obesity, where parents or adult guardians of children ages 0 to 17 were surveyed on matters pertaining to their child’s health and well-being.

This data set is ideal for the study at hand because it provides measures of child obesity as well as measures for neighborhood characteristics. Because body mass index (BMI) was not recorded for children under the age of 10, this study is limited to children ages 10 to 17. As such, the total number of observations used in this study is 25,094. For two reasons, the Asian race group is omitted from this analysis. First, it is well established that Asian children have a lower obesity rate than White children, the reference group for this study. Second, the survey consisted of a negligible number of Asian respondents (n = 206). Approximately 68% of the children in the study are White, 12% are Black, 12% are Hispanic, and 8% identified as multiracial. Children from low-income families made up 46% of the sample data, females made up 48%, and the average child age was 13.6 years.

Measures

BMI is the primary dependent variable, used as a proxy to measure obesity. Parents reported their child’s weight and height, which was then converted into kilograms and meters, respectively, and
used to calculate BMI (weight/height$^2$). The data set classifies children as *underweight*, *normal*, *overweight*, or *obese* according to cut points, as defined by the CDC BMI-for-age growth charts.$^4$ This study is primarily concerned with overweight and obese cut points, which are children who fall at or above the 85th percentile cut point. The majority of children in the data set had normal weight (70%), but nearly one third of the children were overweight (15%) or obese (15%). Because BMI-for-age at or above the 85th percentile is a level for risk and concern, the CDC and other health agencies use the terms *overweight* and *obesity* interchangeably, and efforts to address this issue typically group *obesity* and *overweight* together (USDHHS, 2009). Likewise, in this analysis, overweight and obese are combined. Considering the low percentage (6%) of underweight children and substantially higher percentage of normal-weight children, *normal* and *underweight* are combined in this analysis.

Because of the internal validity concerns associated with self-reported data, two secondary dependent variables are included in this analysis—child’s health and child’s level of physical activity. These variables help check respondents’ consistency. The child health variable measures parents’ perspectives of their child’s overall health, based on a 5-point scale: *poor* (coded as 0), *fair* (1), *good* (2), *very good* (3), and *excellent* (4). The physical activity variable measures the number of days in the past week the child exercised, played sports, or participated in physical activity for at least 20 min that made the child sweat and breathe hard; values range from 0 days to 7 days. As coded, both of these variables should be negatively related to the obese variable.

This study seeks to examine the obesity disparities across racial and socioeconomic lines. As such, race is measured as non-Hispanic Black, non-Hispanic White, Hispanic, and multiracial, and socioeconomic status is measured by parent-respondent’s income level. NSCH measures income via poverty level, which consists of eight categories that range from *at or below 100% of poverty level* to *above 400% of poverty level*. To simplify comparisons between low-income children and more affluent children, I created a new variable that narrowed the categories down to two: *at or below 300% of poverty level* and *above 300% of poverty level*. For many households, 300% of poverty level is above America’s median income (USDHHS, 2013). As a result, 46% of the sample is classified as children from low-income families and 54% is classified as children from middle- and upper-income families (also referred to as low-income children and affluent children).

I used two sets of variables as my proxy for built environment: neighborhood amenities and physical detractions. The survey asks about the existence of specific neighborhood amenities that are believed to encourage outdoor physical activity: (a) sidewalks and walking paths, (b) parks and playgrounds, (c) recreation centers community centers, and (d) other built facilities in their neighborhoods.$^5$ Respondents answered “yes” or “no” regarding the presence of each amenity. I created a neighborhood amenities indicator variable to capture how many of the four amenities exist in respondents’ neighborhoods, based on a 5-point scale from 0 to 4. The survey also asked about the existence of specific physical detractions, which are believed to discourage outdoor physical activity—that is, deter parents from allowing their children to play outside: (a) litter or garbage on the street, (b) poorly kept or dilapidated housing, and (c) vandalism or graffiti. Again, respondents answered yes or no regarding the presence of each detraction, and I created a physical detractions indicator variable to capture the total detractions, based on a 4-point scale from 0 to 3.

Likewise, I used two sets of variables as my proxy for social environment: neighborhood cohesion and social detractions (or neighborhood safety). Five variables in the data set captured whether respondents feel that they live in neighborhoods in which their neighbors (a) help each other out, (b) look out for each other’s children, (c) trust each other to help their child if the child was hurt or upset, (d) can count on each other, and (e) live in supportive neighborhood. Parents answered these questions on a 4-point Likert scale: *definitely disagree*, *somewhat disagree*, *somewhat agree*, and *strongly agree*. I collapsed responses into two categories, agree and disagree, and again created an indicator variable, social cohesion, based on a 6-point scale from 0 to 5. A social detractions indicator variable was created as a tally from questions about how often respondents feel that their child is safe in their neighborhood and at school.
Of the four neighborhood indicator variables I created, two of them measure positive neighborhood characteristics—physical amenities and social cohesion—and two measure negative characteristics—physical detractions (neighborhood looks unsafe) and social detractions (neighborhood feels unsafe). One final neighborhood variable available in the NSCH data set indicates whether respondents lived inside or outside of a metropolitan statistical area (MSA). Because MSAs are geographical regions with relatively high population densities, a response of “outside of an MSA” signifies a rural neighborhood. A response of “inside of an MSA” signifies an urban neighborhood (keeping in mind that the neighborhood could be either in a city or in a nearby suburb). The variable urban was included in this study for additional neighborhood controls and comparisons. For one, amenities such as sidewalks and detractions such as graffiti are generally more prevalent in urban settings (Nolan & Whelan, 2000; Pearce, Witten, Hiscock, & Blakely, 2007; Salmon et al., 2013). Secondly, rural settings are found to be more cohesive, with neighbors having stronger social networks and higher neighborhood personal safety (Putnam, 2000; Salmon et al., 2013). A summary of all of the aforementioned variables is presented in Table 1.

### Table 1. Summary statistics of study variables (N = 25,094).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obese</td>
<td>0.30</td>
<td>0.46</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Health</td>
<td>3.46</td>
<td>0.79</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Exercise</td>
<td>4.25</td>
<td>2.19</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Black</td>
<td>0.12</td>
<td>0.32</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.12</td>
<td>0.32</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Multiracial</td>
<td>0.08</td>
<td>0.28</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>White</td>
<td>0.68</td>
<td>0.46</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Low-income/poor</td>
<td>0.46</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Mid- to upper-income/rich</td>
<td>0.54</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Urban</td>
<td>0.78</td>
<td>0.42</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Amenities</td>
<td>3.12</td>
<td>1.14</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Cohesion</td>
<td>4.57</td>
<td>1.13</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Physical detractions</td>
<td>0.39</td>
<td>0.75</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Social detractions</td>
<td>0.15</td>
<td>0.42</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

Of the four neighborhood indicator variables I created, two of them measure positive neighborhood characteristics—physical amenities and social cohesion—and two measure negative characteristics—physical detractions (neighborhood looks unsafe) and social detractions (neighborhood feels unsafe). One final neighborhood variable available in the NSCH data set indicates whether respondents lived inside or outside of a metropolitan statistical area (MSA). Because MSAs are geographical regions with relatively high population densities, a response of “outside of an MSA” signifies a rural neighborhood. A response of “inside of an MSA” signifies an urban neighborhood (keeping in mind that the neighborhood could be either in a city or in a nearby suburb). The variable urban was included in this study for additional neighborhood controls and comparisons. For one, amenities such as sidewalks and detractions such as graffiti are generally more prevalent in urban settings (Nolan & Whelan, 2000; Pearce, Witten, Hiscock, & Blakely, 2007; Salmon et al., 2013). Secondly, rural settings are found to be more cohesive, with neighbors having stronger social networks and higher neighborhood personal safety (Putnam, 2000; Salmon et al., 2013). A summary of all of the aforementioned variables is presented in Table 1.

#### Statistical methods

A combination of univariate, bivariate, and multivariate statistics is used to assess obesity, health, and physical activity among Black, Hispanic, and low-income children and their counterparts. The descriptive statistics use the three dependent variables—obese, child health, and physical activity—to compare children in the sample based on their demographic group. Correlation matrices are also used to understand the association that each variable in the study has with the other variables. The analyses conclude with bivariate and multivariate inferential statistics in the form of logistic and linear regression models. All analyses for this study were performed using Stata statistical software (release 13.1, College Station, Texas, USA).

#### Results

As presented in Table 2, 30% of the children in this national sample are overweight or obese, based on their BMI. A shocking 43% of Black children and 37% of Hispanic children are overweight or obese, compared to 26% of their White counterparts (multiracial, 30%). Similarly, 38% of low-income children are overweight or obese, compared to 23% of middle and upper-income children. The differences of means t-tests find these differences to be statistically significant at the .001 level (except for multiracial–White difference).

The study data do not only confirm that health disparities exist among Black, Hispanic, and low-income children—with differences in obesity rates of up to 17 percentage points—but the data also
reveal that health disparities exist across gender lines. With the exception of Black children, where girls and boys are equally as likely to be overweight or obese, there is a considerably higher prevalence of obesity among male children \( (p < .001) \). In this sample, Black boys and girls have the highest obesity rates (43%) and White girls have the lowest (22%).

Although 30% of the children in this study are objectively overweight or obese, only 3% were considered to have poor or fair health by their parent/guardian respondents. In other words, despite their child’s unhealthy BMI, nearly all surveyed parents and guardians responded that their child’s health was good (10%), very good (26%), or excellent (61%). This is true across the board, because good health responses exceed 90% for all race and income groups. Nonetheless, Black, Hispanic, and low-income children have slightly lower percentages of good health than White and more affluent children (see Table 2). Although these are only 2 to 4 percentage point differences, they are significant at the .001 level.

About 91% of the children in this sample participated in at least one day of moderately intense physical activity lasting at least 20 min in the week prior to the survey. But again, Black, Hispanic, and low-income children are reported to have lower levels of physical activity than their White and more affluent counterparts. These percentage point differences are significant at the .001 level (Table 2).

The correlation matrix in Table 3 assesses how well the three dependent variables (DVs) relate to one another. As expected, the primary DV obesity is negatively correlated with health and physical activity (i.e., more exercise per week and higher health ratings are associated with lower BMI). Also as expected, health and exercise are positively correlated. All three DVs are highly statistically significant \( (p < .001) \) but are weak in strength. This confirms what was observed from the sample characteristics (discussed above), whereby child obesity rates are much higher than what parents reported about their child’s overall health and physical activity level. Thus, though correlation coefficients offer some assurance that these three variables are similarly measuring this notion of

### Table 2. Sample characteristics by race and income level (%).

<table>
<thead>
<tr>
<th>Sample characteristics</th>
<th>Black</th>
<th>Hispanic</th>
<th>White (multiracial)</th>
<th>Low income</th>
<th>Upper income</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of sample</td>
<td>12</td>
<td>12</td>
<td>68 (8)</td>
<td>46</td>
<td>54</td>
<td>100</td>
</tr>
<tr>
<td>Overweight/obese</td>
<td>43</td>
<td>37</td>
<td>26 (30)</td>
<td>38</td>
<td>23</td>
<td>30</td>
</tr>
<tr>
<td>Percentage of boys</td>
<td>43</td>
<td>41</td>
<td>30 (32)</td>
<td>39.5</td>
<td>28.6</td>
<td>33</td>
</tr>
<tr>
<td>Percentage of girls</td>
<td>43</td>
<td>33</td>
<td>22 (27)</td>
<td>32.2</td>
<td>19.0</td>
<td>26</td>
</tr>
<tr>
<td>Good health</td>
<td>96</td>
<td>95</td>
<td>98 (97)</td>
<td>96</td>
<td>99</td>
<td>97</td>
</tr>
<tr>
<td>Exercise at least 1 day/week</td>
<td>88</td>
<td>88</td>
<td>92 (91)</td>
<td>88</td>
<td>93</td>
<td>91</td>
</tr>
<tr>
<td>Rural</td>
<td>51</td>
<td>40</td>
<td>32 (4)</td>
<td>39</td>
<td>27</td>
<td>34</td>
</tr>
<tr>
<td>Urban</td>
<td>42</td>
<td>37</td>
<td>24 (29)</td>
<td>37</td>
<td>22</td>
<td>28</td>
</tr>
</tbody>
</table>

### Table 3. Correlation matrix (dependent variables).

Note. Values with lighter shade are not statistically significant. * \( p < .05 \). ** \( p < .01 \). *** \( p < .001 \).
health, this is a weak level of assurance. It may be the case that parents’ responses to the child health question were based on any number of implicit considerations not specified in the actual question. For example, respondents might consider their child to be in good health because the child is not physically or mentally challenged, which does not speak to whether the child is overweight or obese. As another example, the child might have height and weight measurements that translate to overweight or obese BMI scores even though the child exercises regularly (per parental response). The discrepancy between the obese and child health variables might even be an indication of an educational or cultural difference in how healthy is defined or understood by different demographic groups. Because this study does not have access to fully objective health and physical activity measures, we accept the limitation of this study as such and move forward with only the obese and physical activity variables for the remainder of this study (Brener, Mcmanus, Galuska, Lowry, & Wechsler, 2003). These two variables are less subjective and more reliable than the child health variable and will help us examine two distinct concerns that, as just mentioned, may or may not be related: (a) what types of physical and social environments are associated with higher rates of child obesity and (b) what types of physical and social environments are associated with more occurrences of daily exercise among children.

Between the two demographic variables, income ($r = 0.16$) has a stronger relationship with obesity than race ($r = 0.11$). But when it comes to exercising, race and income are comparable in strength. Of the neighborhood characteristics, both social environment factors (feeling unsafe and having cohesion among neighbors) have stronger relationships than the physical environment factors. Lastly, the correlation coefficients for the neighborhood variables tell an interesting story that is further explored in the forthcoming regression analyses. The coefficients in Table 3 indicate that urban settings are less obesogenic than rural settings, yet children exercise less in urban settings. The table also shows, as expected, that more amenities and cohesion are associated with lower rates of obesity, and fewer physical and social detractions are also associated with lower rates of obesity. Likewise, amenities and cohesion are positively associated with exercising; and detractions are negatively associated with exercising.

Table 4 provides a quick reference and summary of the relationships between the study’s independent variables. Unexpectedly, urban areas are reported to have fewer detractions (litter, dilapidated buildings, etc.; Nolan & Whelan, 2000; Pearce et al., 2007; Salmon et al., 2013). The correlation matrix also indicates that urban areas are more associated with higher income, more amenities (sidewalks, parks, etc.), and less cohesion than rural areas, as was expected (e.g., Davis et al., 2011; Putnam, 2000; Tai-Seale & Chandler, 2010). As such, it is no surprise that low income is more associated with having fewer amenities and with being Black and Hispanic (Larsen et al., 2006).

It is, however, surprising that being Black and Hispanic is associated with having more amenities, though these relationships are very weak. Additionally, Black, Hispanic, and low-income respondents seem to report more physical and social detractions in their neighborhoods and less social cohesion or supportive acts among their neighbors. These highlighted findings are statistically significant at the .001 level. Lastly, it is important to note that multiracial children are not similar to Black, Hispanic, or White children, whether in terms of household income or their built and

<table>
<thead>
<tr>
<th>Neighborhood variables</th>
<th>Urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor/low-income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>0.18***</td>
<td>0.17***</td>
</tr>
<tr>
<td>Hispanic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiracial</td>
<td>0.03***</td>
<td>0.02**</td>
</tr>
<tr>
<td>White</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>0.19***</td>
<td>0.11***</td>
</tr>
<tr>
<td>Hispanic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiracial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. Values with lighter shade are not statistically significant. *p < .05. **p < .01. ***p < .001.
social environments. They find themselves squarely in the middle, between White and non-White children.

Because the primary dependent variable obese is a binary variable (obese vs. not obese), a series of logistic regressions is used to estimate its odds ratios (ORs). Five different logistic regression models are run with DV obese, and each model is run separately for urban and rural neighborhood settings. In the data set, 28% of the children living in urban settings are obese, versus 34% in rural settings ($p < .001$; Table 2). Given this high level of significance and given this study’s objective of examining the associations between child obesity and neighborhood constructs, I ran separate regressions for urban ($n = 19,451$) and rural ($n = 5,643$) to offer a cleaner and clearer comparison of the demographic and environmental characteristics of urban and rural settings. By simply running the regressions with the urban variable as a predictor, the interesting differences between the two settings would be lost or at least less obvious. Table 5 depicts these logistic regression models.

Models 1 and 2 include only the demographic measures—race and income—as predictor variables for obesity. Model 3 combines these models and adds interaction terms of the demographic measures. Model 4 appends the neighborhood variables, and model 5 appends interaction terms of the demographic and neighborhood variables.

As was expected, results for the bivariate logistic regressions (models 1 and 2) indicate that race and income variables are highly significant. In both urban and rural settings, Black, Hispanic, and low-income children have significantly higher odds of being obese than their White and more affluent counterparts ($p < .001$ level). In urban settings, the odds of being obese are 120% higher for Black children compared to White children; 79% higher for Hispanic children compared to White

$\begin{array}{|c|c|c|c|c|c|c|c|c|} \hline 
\text{Dependent variable: Obese} & \text{Model 1} & \text{Model 2} & \text{Model 3} & \text{Model 4} & \text{Model 5} & \text{Model 1} & \text{Model 2} & \text{Model 3} & \text{Model 4} & \text{Model 5} \\
\hline 
\text{Demographic variables} & & & & & & & & & & \\
Black & 2.20*** & 2.17*** & 2.14*** & 1.27 & 2.19*** & 1.36 & 1.37 & 0.75 & & \\
Hispanic & 1.79*** & 1.51*** & 1.52*** & 1.37* & 1.41*** & 0.80 & 0.81 & 0.24* & & \\
Multiracial & 1.24*** & 1.19* & 1.18* & 1.35 & 1.10 & 0.70 & 0.70 & 0.92 & & \\
Low-income & 2.08*** & 1.95*** & 1.82*** & 2.04*** & & 1.45*** & 1.39*** & 1.42 & & \\
\text{Neighborhood variables} & & & & & & & & & & \\
Physical amenities & 0.90*** & 0.90*** & & & & 0.92*** & 0.95 & & \\
Low-income × Amenities & 0.98 & & & & & & & & & \\
Black × Amenities & 1.05 & & & & & & & & & \\
Hispanic × Amenities & 1.08* & & & & & & & & & \\
Multiracial × Amenities & 0.97 & & & & & & & & & \\
Social cohesion & 0.96** & 0.95 & & & & 0.93** & 0.89* & & \\
Low-income × Cohesion & 0.99 & & & & & & & & & \\
Black × Cohesion & 1.09* & & & & & & & & & \\
Hispanic × Cohesion & 0.97 & & & & & & & & & \\
Multiracial × Cohesion & 1.00 & & & & & & & & & \\
Physical detractions (looks unsafe) & 1.07** & 1.13** & & & & 1.08* & 1.06 & & \\
Low-income × Detractions & 0.99 & & & & & & & & & \\
Black × Detractions & 0.90 & & & & & & & & & \\
Hispanic × Detractions & 0.86* & & & & & & & & & \\
Multiracial × Detractions & 0.94 & & & & & & & & & \\
Social detractions (feels unsafe) & 1.09* & 1.02 & & & & 0.98 & 1.08 & & \\
Low-income × Unsafe & 1.04 & & & & & & & & & \\
Black × Unsafe & 1.11 & & & & & & & 0.73* & \\
Hispanic × Unsafe & 1.09 & & & & & & & 1.02 & \\
Multiracial × Unsafe & 0.93 & & & & & & & 0.71 & \\
\hline 
\end{array}$

Note. Values with lighter shade are not statistically significant. *$p < .10$. **$p < .05$. ***$p < .01$. ****$p < .001$. **
children; and 108% higher for low-income children compared to affluent children. In rural settings, the disparity between Black and White children is practically the same as in urban settings. But the disparities between Hispanic and White children and between low-income and affluent children are not as great as they are in urban settings; in rural areas, they are lower by about 40 percentage points. Therefore, although children in all demographic groups have lower rates of obesity in urban than in rural settings (data not shown), the obesity disparity is far greater in these less obesogenic urban settings than in rural areas. For Black children, the obesity disparity is equally as devastating in urban (OR = 2.20) and rural (OR = 2.19) settings alike; whereas Hispanic and low-income children in urban settings fare much worse than Hispanic and low-income children in rural settings when compared to their White and affluent counterparts. This might not be too surprising because urban areas characteristically have “a sharply contrasting mosaic” of high rates of both poverty and economic prosperity (Sjoquist, 2000, p. 1). Nevertheless, it is a problem that public managers and policy makers must work to address.

Model 3 maintains that, in urban settings, Black and Hispanic children have substantially higher odds of being obese than White children, holding household income constant. Likewise, low-income children have higher odds of being obese than affluent children, holding race constant. With the introduction of interaction terms, this model also depicts the relationship between race and income. For example, the lack of significance of the Hispanic × Low-income interaction term for urban settings indicates that the difference between Hispanic children’s rate of obesity and White children’s rate of obesity is about the same whether Hispanic and White children are being compared at low income or at mid to upper income. However, this is not the case for comparisons of Black and White children. The highly significant Black × Low-income interaction term for urban settings indicates that as income level changes from mid to upper income to low income, the difference between Black children’s rate of obesity and White children’s rate of obesity actually decreases. That is, the wide obesity gap between Black and White children is narrower among poor Black and White children than among affluent Black and White children. In rural settings, different trends emerge. The interaction terms help reveal that the obesity disparity in rural settings is really a matter of income; the main-effect race variables are no longer significant, indicating that income is more truly the predictor of obesity. Moreover, in rural settings, the disparity primarily affects poor non-White (both Black and Hispanic) children more so than any other category of children (i.e., poor White, affluent White, and affluent non-White children).

When the built and social environment variables are added in model 4, the race and income relationships from model 3 remain significant. As expected, more amenities, more social cohesion, and fewer detractions (physical and social) are all associated with lower odds of being obese. However, feeling safe is not a significant predictor of obesity in rural settings. This model also indicates that an increase in amenities has slightly greater impact in urban settings. Whereas an increase in amenities would lower the odds of being obese by 10% in urban settings, the odds decrease by only 8% in rural settings, holding race, income, and all other neighborhood variables constant. Each unit increase in cohesion lowers obesity probability by 4% in urban settings versus 7% in rural settings, holding all other variables constant. Each unit increase in physical detractions raises the odds of being obese by 7% (urban) and 9% (rural), and each unit increase in social detraction raises these odds by 9% (urban), holding all other variables constant. In model 5, I introduce interaction terms to further understand how these neighborhood variables relate to demographic characteristics in explaining the obesity disparity. Unexpected results emerge. For one, though each increase in amenities decreases the odds by 10% for Black and multiracial (vs. White) children (OR = 0.90) in urban areas, it only decreases the odds of being obese by 3% for Hispanic (vs. White) children (0.90 × 1.08 = 0.97). As such, amenities are not as strong a predictor of Hispanic children’s obesity propensity as they are for other races. In contrast, amenities are no longer a significant main-effect predictor in rural settings but rather specific to two demographic groups. As amenities increase, low-income children’s odds of being obese decrease by 8%, but Hispanic children’s odds increase considerably by 24%. Surprisingly, in urban settings, Black children’s odds of being obese
increase by 9% for each unit increase in social cohesion; in rural settings, each unit increase in cohesion decreases obesity odds by 11% for all race and income groups alike. In urban settings, each additional detraction increases odds of being obese (OR = 1.13), but Hispanic children experience a decrease in obesity odds (1.13 × 0.86 = 0.97). Once all variables and interaction terms are introduced, physical detractions do not predict obesity in rural settings and social detractions do not predict obesity in urban settings. However, feeling unsafe appears to lower the odds of being obese for Black children in rural settings, holding all other variables constant.

For the secondary dependent variable physical activity, an interval-level (continuous) variable, the standard linear regression procedure—ordinary least squares modeling—is used to estimate the coefficients. See Table 6. The results are consistent with the obesity results in that Black, Hispanic, and low-income children exercise less frequently than White and more affluent children. Also consistent with the obesity results, more amenities, more cohesion, and less social detractions are associated with better health outcomes (higher levels of physical activity and lower obesity rates). Once all variables and interaction terms are added (model 5), results indicate that rural Black children and low-income, urban Hispanic children are far less physically active than their peers. Results also reveal that cohesion is the strongest neighborhood predictor of physical activity in both rural and urban settings. Lastly, children in urban settings exercise less per week than those in rural settings ($p < .001$), which is in contrast to what was expected (e.g., Jackson et al., 2005; Martin et al., 2005) but might be an indication that, in rural settings, more time is being spent outdoors for leisure or work-related activities.

To verify study results, robustness checks were conducted for all logistic and linear regressions models. Results remained the same and held their level of significance. As such, the probabilities and regression coefficients discussed are based on robust standard errors clustered at the state level.

### Table 6. Ordinary least squares regression models (regression coefficients).

<table>
<thead>
<tr>
<th>Dependent variable: Physical activity</th>
<th>Urban Model 1</th>
<th>Urban Model 2</th>
<th>Urban Model 3</th>
<th>Urban Model 4</th>
<th>Rural Model 1</th>
<th>Rural Model 2</th>
<th>Rural Model 3</th>
<th>Rural Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>−0.23***</td>
<td>−0.29**</td>
<td>−0.25*</td>
<td>−0.19</td>
<td>−0.41***</td>
<td>−0.32*</td>
<td>−0.31*</td>
<td>−1.22***</td>
</tr>
<tr>
<td>Hispanic</td>
<td>−0.39***</td>
<td>−0.02</td>
<td>0.00</td>
<td>0.00</td>
<td>−0.22*</td>
<td>−0.02</td>
<td>−0.02</td>
<td>0.17</td>
</tr>
<tr>
<td>Multiracial</td>
<td>0.05</td>
<td>0.11†</td>
<td>−0.09</td>
<td>0.45</td>
<td>0.23†</td>
<td>0.05</td>
<td>0.05</td>
<td>−0.12</td>
</tr>
<tr>
<td>Low-income</td>
<td>−0.14***</td>
<td>−0.09*</td>
<td>−0.02</td>
<td>−0.13</td>
<td>−0.15†</td>
<td>−0.14</td>
<td>−0.08</td>
<td>−0.28</td>
</tr>
<tr>
<td>Black × Low-income</td>
<td>−0.07</td>
<td>0.12</td>
<td>0.09</td>
<td>0.11−</td>
<td>−0.11</td>
<td>−0.02</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>Hispanic × Low-income</td>
<td>−0.60***</td>
<td>−0.53***</td>
<td>−0.55***</td>
<td>−0.31</td>
<td>−0.31</td>
<td>−0.25</td>
<td>−0.29</td>
<td>−0.29</td>
</tr>
<tr>
<td>Multiracial × Low-income</td>
<td>0.13</td>
<td>0.14</td>
<td>0.13</td>
<td>0.26</td>
<td>0.26</td>
<td>0.30</td>
<td>0.35</td>
<td>0.35</td>
</tr>
<tr>
<td>Physical amenities</td>
<td>0.07***</td>
<td>0.05*</td>
<td>0.05*</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
<td>0.10**</td>
<td>0.10</td>
</tr>
<tr>
<td>Low-income × Amenities</td>
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<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>−0.10</td>
<td>0.10</td>
<td>−0.02</td>
<td>−0.02</td>
</tr>
<tr>
<td>Black × Amenities</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>−0.02</td>
<td>−0.02</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>Hispanic × Amenities</td>
<td>−0.06</td>
<td>−0.06</td>
<td>−0.06</td>
<td>−0.06</td>
<td>0.04</td>
<td>0.04</td>
<td>0.35</td>
<td>0.35</td>
</tr>
<tr>
<td>Social cohesion</td>
<td>0.13***</td>
<td>0.18***</td>
<td>0.17***</td>
<td>0.18†</td>
<td>0.17***</td>
<td>0.18†</td>
<td>0.18*</td>
<td>0.18*</td>
</tr>
<tr>
<td>Low-income × Cohesion</td>
<td>−0.04</td>
<td>−0.04</td>
<td>−0.04</td>
<td>−0.04</td>
<td>0.02</td>
<td>0.02</td>
<td>−0.02</td>
<td>−0.02</td>
</tr>
<tr>
<td>Black × Cohesion</td>
<td>−0.05</td>
<td>−0.05</td>
<td>−0.05</td>
<td>−0.05</td>
<td>0.11†</td>
<td>0.11†</td>
<td>−0.02</td>
<td>−0.02</td>
</tr>
<tr>
<td>Hispanic × Cohesion</td>
<td>−0.04</td>
<td>−0.04</td>
<td>−0.04</td>
<td>−0.04</td>
<td>0.06</td>
<td>0.06</td>
<td>−0.02</td>
<td>−0.02</td>
</tr>
<tr>
<td>Multiracial × Cohesion</td>
<td>−0.07</td>
<td>−0.07</td>
<td>−0.07</td>
<td>−0.07</td>
<td>0.06</td>
<td>0.06</td>
<td>−0.02</td>
<td>−0.02</td>
</tr>
<tr>
<td>Physical detractions (looks unsafe)</td>
<td>0.04†</td>
<td>0.05</td>
<td>−0.03</td>
<td>−0.13</td>
<td>0.03†</td>
<td>0.03†</td>
<td>−0.13</td>
<td>−0.13</td>
</tr>
<tr>
<td>Low-income × Detractions</td>
<td>0.15***</td>
<td>0.15***</td>
<td>0.15***</td>
<td>0.15***</td>
<td>0.13</td>
<td>0.13</td>
<td>0.13</td>
<td>0.13</td>
</tr>
<tr>
<td>Black × Detractions</td>
<td>−0.03</td>
<td>−0.03</td>
<td>−0.03</td>
<td>−0.03</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Hispanic × Detractions</td>
<td>−0.05</td>
<td>−0.05</td>
<td>−0.05</td>
<td>−0.05</td>
<td>0.19</td>
<td>0.19</td>
<td>0.19</td>
<td>0.19</td>
</tr>
<tr>
<td>Multiracial × Detractions</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.03†</td>
<td>0.03†</td>
<td>0.03†</td>
<td>0.03†</td>
</tr>
<tr>
<td>Social detractions (feels unsafe)</td>
<td>−0.20***</td>
<td>−0.15†</td>
<td>−0.07</td>
<td>−0.06</td>
<td>−0.07</td>
<td>−0.06</td>
<td>−0.06</td>
<td>−0.06</td>
</tr>
<tr>
<td>Low-income × Unsafe</td>
<td>−0.10</td>
<td>−0.10</td>
<td>−0.10</td>
<td>−0.10</td>
<td>−0.04</td>
<td>−0.04</td>
<td>−0.04</td>
<td>−0.04</td>
</tr>
<tr>
<td>Black × Unsafe</td>
<td>0.07</td>
<td>0.07</td>
<td>0.07</td>
<td>0.07</td>
<td>0.22</td>
<td>0.22</td>
<td>0.22</td>
<td>0.22</td>
</tr>
<tr>
<td>Hispanic × Unsafe</td>
<td>−0.01</td>
<td>−0.01</td>
<td>−0.01</td>
<td>−0.01</td>
<td>−0.04</td>
<td>−0.04</td>
<td>−0.04</td>
<td>−0.04</td>
</tr>
<tr>
<td>Multiracial × Unsafe</td>
<td>−0.19</td>
<td>−0.19</td>
<td>−0.19</td>
<td>−0.19</td>
<td>−0.19</td>
<td>−0.19</td>
<td>−0.19</td>
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</tr>
</tbody>
</table>

Note. Values with lighter shade are not statistically significant. *$p < .10$. †$p < .05$. **$p < .01$. ***$p < .001$. 

K. UZOCHUKWU
Lastly, it is important to note that some of the findings that are weakly significant at the .10 level should be interpreted with caution.

**Discussion**

This study set out to answer three questions. First, how do Black, Hispanic, and low-income children’s built and social environments fare in comparison to their Caucasian and more affluent counterparts? The findings from this national survey reveal that Black, Hispanic, and low-income children do indeed live in disadvantaged communities. In both urban and rural settings, they have significantly less cohesion and more physical and social neighborhood detractions than their counterparts. It would be most meaningful for public managers and policy makers to continue to seek ways to address these environmental deficiencies. Time and again, scholars have noted that largely non-White, low-income communities often lack organizational skills and internal neighborhood resources (Jakobsen, 2013; Mattson, 1986; Percy, 1984, 1987; Peters, 2010; Rosentraub & Warren, 1987; Thomas, 1987), which, if garnered, might lead to cleaner, safer, and more cohesive neighborhoods.

In rural settings, Black and low-income children have fewer amenities than their White and more affluent counterparts, whereas Hispanics have more amenities. In urban settings, low-income children still have fewer amenities, but Black and Hispanic children have more. This unanticipated finding that Black and Hispanic children have more amenities is initially puzzling given that Black and Hispanic are positively and moderately correlated with low income. It might have been less puzzling if low-income children also had more amenities. One conceivable explanation might be the fact that greater proportions of Black and Hispanic children live in urban areas than in rural areas, and in this and other studies, urban areas have significantly more amenities than rural areas. (See also Nolan & Whelan, 2000; Pearce et al., 2007; Salmon et al., 2013.) Furthermore, based on previous studies, Black and Hispanic children are more likely to walk to their destinations, mainly out of necessity (Kerr et al., 2007; Martin et al., 2007). This form of physical activity by way of commuting (transport walking) is more likely to occur in urban areas where the distance to destination is shorter than in rural areas. The lack of consistency among Black, Hispanic, and low-income children’s amenities might also be due to the much higher proportions of low-income children living in rural areas. Lastly, this finding might be an indication that some small but significant number of Black and Hispanic respondents perceives amenities differently than their counterparts. For example, it could be that some respondents in these race groups considered unpaved, makeshift sidewalks (e.g., grass, gravel, dirt), which might be more prevalent in rural and less developed urban communities, to be an amenity nonetheless. By contrast, it might be that when White respondents perceived their amenities as needing repair or improvement, they responded to the amenities question less favorably. Considering that Hispanic respondents report higher amenities in both urban and rural settings, different definitions or interpretations of amenities (and the other three neighborhood variables) might be at play here. These considerations bring to light an important limitation of the data set used in this study. The use of objectively obtained neighborhood measures would be most ideal.

The second question that the present study sought to understand was whether and how neighborhood environments are associated with obesity and physical activity level for each race and income group. That is, would certain conditions be positively associated with one group but negatively associated with another? Generally speaking, amenities and cohesion improve obesity and physical activity outcomes, and detractions worsen these outcomes. However, it is evident from study findings that similar environments affect race and income groups differently. In urban settings where Hispanic children report having more amenities than their White peers, amenities are not the strong predictor of obesity for Hispanic children that they are for all other groups. Conversely, in rural settings where amenities are not strong predictors for other groups, an increase in amenities significantly and quite substantially increases Hispanic children’s odds of being obese and less substantially but significantly decreases the odds for low-income children. It is unclear why...
amenities work to the detriment of Hispanic children in rural settings. Again, it is possible that they do not consider these amenities to be outlets for healthful activities; therefore, attempts to educate rural communities on obesity and physical activity might prove to be meaningful endeavors. Given the evidence that amenities improve health outcomes for low-income children in both urban and rural settings, it is critical that this gap be filled, particularly because there are significantly fewer amenities available among low-income households.

In addition, having cohesion in urban neighborhoods seems to work against Black children’s health outcome. Possibly more surprising, when urban Hispanic children experience more physical detractions and when rural Black children experience more social detractions, their odds of being obese decrease. Cultural or neighborhood norms might help to elucidate these differences. Take, for example, low-income communities, where residents might consider physical and social detractions to be common and commonplace. What is thought to be a deterrent or an inhibitor of desired outdoor activities (e.g., walking to the community recreation center or playing outside) among residents of a more affluent community may not be considered as such by residents of a low-income community. To be sure, the detractions that were collected for the study data set—graffiti, dilapidated housing, etc.—are possibly trivial in comparison to the realities of drug dealing and gun violence that those who live in poverty-stricken communities deal with on a daily basis. In some cultures or communities, these study detractions might in fact be sources of attraction, drawing them outdoors to explore and engage with their neighbors. Considering yet again the unintended interpretations of these neighborhood factors, a future study might seek to understand whether children exercise outside or indoors and what specifically influences (or discourages) their decision to do so. Lastly, communities with high concentrations of Black and Hispanic groups could benefit from a targeted effort toward improving the social and organizational resources available in these communities.

Third, this study sought to understand whether these environmental factors help explain Black, Hispanic, and low-income children’s lower physical activity levels and higher obesity rates. In other words, if these environmental factors are the same among all race and income groups, will these race and income groups still have worse health outcomes? Once neighborhood amenities, detractions, and cohesion are controlled for, Hispanic and low-income children’s physical activity levels are comparable to their White counterparts in urban and rural settings. In urban settings, Black children have physical activity levels comparable to those of White children; however, in rural settings Black children are still less likely to be physically active. With all controls in place, urban Black, Hispanic, and low-income children are still more likely to be obese than their urban White counterparts. In fact, for Black children, the obesity disparity is actually greater among low-income Black and White children than among more affluent Black and White children. Low-income rural Hispanics are also more likely to be obese; however, the disparity is even greater between low-income Hispanic and White children. Lastly, once neighborhood controls are in place, rural Black and low-income children have comparable odds of being obese than their rural White and affluent peers.

This study has several limitations. For one, no causation can be inferred from this study due to the cross-sectional design of the survey. Future studies would benefit from longitudinal analyses that can capture the causal effects of built and social environments on obesity and physical activity levels. Second, because the data were self-reported, parents may have underreported or overreported data on the weight and height of their children. Though parental reports of child height and weight have been found to be reliable (Brener, 2003), the findings and interpretations of the current study are made with caution. Likewise, the study children’s physical activity levels are dependent upon recall and personal interpretation of the parental respondent, which might also lead to estimation error. It is therefore important to note that more methodologically rigorous instrumentation, data collection, and analysis have been attainable in the past (i.e., physical activity monitors; Davis et al., 2011). Such measures may be more reliable and accurate than self-reporting survey questionnaires.

Third, the findings from this study suggest that race, income, urban location, and neighborhood amenities, detractions, and cohesion all contribute significantly to children’s physical inactivity and
obesity. Yet together, the role each variable plays accounts for only 3% of variation in child obesity rates and physical activity levels. Hence, there is much need for future research in this area. For example, the finding that fewer amenities improve health outcomes for rural Hispanic children warrants further research, as does the finding that detractions among Black and Hispanic children improve health outcomes. It could prove meaningful to understand what is constituted as safe in the minds of future responders. Additionally, even when all controls are in place, rural Black children exercise less than their counterparts and Black, Hispanic, and low-income children are still more likely to be obese. What other factors might we examine to understand obesity’s race and income disparity in urban settings? Finally, it might be useful for future research on this topic to include variables that provide more insight into the child’s home environment, general family makeup, and cultural background. Exploratory research might also facilitate the identification of any unknown factors that could be contributing to the obesity disparity. And, of course, it is well known and understood that the best health outcomes are achieved when physical activity is coupled with a good nutritional diet. Thus, a future study might combine the unique variables and interactions in this present study with food intake and nutrition variables, as well as variables that account for genetic predisposition, toward a multidisciplinary and more comprehensive research agenda.

Future studies have the potential to identify distinct areas for policy improvements that could lead to targeted assistance to underserved groups. As Rosenthal and Chang (2004) stated, “Childhood obesity is a highly politicized topic; there is momentum for change, but action must be tempered” (p. 32), because the evidence needed to move forward with certain policy changes has not been fully developed. The findings support the notion that interventions and policy changes aimed at improving built and social environments are needed in urban and rural areas in order to level the playing field for Black, Hispanic, and low-income children, toward a healthier and more socially connected tomorrow.

**Notes**

1. The built environment is any aspect of the physical environment that is created or modified by humans; for example, parks.
2. The social environment represents the intangible, communal components/constructs of a neighborhood; for example, trust.
3. A variety of characteristics of neighborhoods were used to determine neighborhood score. The lowest scores corresponded to the most disadvantaged neighborhoods. The six variables used in the construction of the neighborhood score were selected on the basis of factor analyses of data from census block groups: income/wealth (log of the median household income; log of the median value of housing units; the percentage of households receiving interest, dividend, or net rental income); education (the percentage of adults 25 years of age or older who had completed high school and the percentage of adults 25 years of age or older who had completed college); and occupation (the percentage of employed persons 16 years of age or older in executive, managerial, or professional specialty occupations).
4. For ages 2–19 years, BMI is plotted on the CDC (2015) growth charts to determine the corresponding BMI-for-age percentile. Overweight is defined as a BMI at or above the 85th percentile and lower than the 95th percentile. Obesity is defined as a BMI at or above the 95th percentile for children of the same age and sex.
5. Unfortunately, it is impossible to know whether the “other built facilities” can increase physical activity among children because it is impossible to determine what respondents were thinking when they answered the question.

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References


