Author's response to reviews

Title: The associations of perceived neighborhood disorder and physical activity with body mass among African American adolescents

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Version: 2 Date: 14 November 2012

Author's response to reviews: see over
Dear Dr. Khan,

Thank you for your review of our manuscript entitled "The associations of perceived neighborhood disorder and physical activity with body mass among African American adolescents". We appreciate the time taken and helpful comments from the reviewers. We have made the suggested revisions and have addressed the editorial and reviewer comments below:

Editor's comment
Title: The associations of perceived neighborhood disorder and physical activity with body mass among African American adolescents
Authors:
Akilah Dulin-Keita (akilah_dulin_keita@brown.edu)
Herpreet Kaur Thind (herpreet@uab.edu)
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Monica Baskin (mbaskin@uab.edu)
Version: 1 Date: 17 October 2012

1- Introduction: 41.2% and 30%- check the proportion of overweight and obesity in both

We thank the Editor for suggesting that we review these proportions. We did review the statistics and modified the text accordingly as reflected in the text below.

Page 3, Paragraph 1:

National estimates indicate that 41.2 percent of African American adolescents age 12 to 19 years are either overweight or obese (23.7 percent are obese) relative to 30.0 percent among white adolescents age 12 to 19 years (16.1 percent are obese) [8].
Table 2. Prevalence for 2009-2010 of High Body Mass Index (BMI) in US Children and Adolescents From 2 Through 19 Years of Agea

<table>
<thead>
<tr>
<th>By BMI Percentile</th>
<th>Children and Adolescents by Age Group, % (95% CI)b</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2-19 y</td>
</tr>
<tr>
<td>All racial/ethnic groups</td>
<td></td>
</tr>
<tr>
<td>≥85th</td>
<td>31.8 (29.8-33.7)</td>
</tr>
<tr>
<td>≥95th</td>
<td>16.9 (15.4-18.4)</td>
</tr>
<tr>
<td>≥97th</td>
<td>12.3 (11.1-13.5)</td>
</tr>
<tr>
<td>Hispanic</td>
<td></td>
</tr>
<tr>
<td>≥85th</td>
<td>39.1 (36.0-41.4)</td>
</tr>
<tr>
<td>≥95th</td>
<td>21.2 (19.5-23.0)</td>
</tr>
<tr>
<td>≥97th</td>
<td>15.6 (14.3-16.9)</td>
</tr>
<tr>
<td>Mexican American</td>
<td></td>
</tr>
<tr>
<td>≥85th</td>
<td>39.4 (35.8-43.1)</td>
</tr>
<tr>
<td>≥95th</td>
<td>21.2 (18.9-23.8)</td>
</tr>
<tr>
<td>≥97th</td>
<td>15.5 (13.6-17.7)</td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td></td>
</tr>
<tr>
<td>≥85th</td>
<td>27.9 (25.1-31.0)</td>
</tr>
<tr>
<td>≥95th</td>
<td>14.0 (11.7-16.7)</td>
</tr>
<tr>
<td>≥97th</td>
<td>9.8 (8.0-12.7)</td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td></td>
</tr>
<tr>
<td>≥85th</td>
<td>39.1 (35.5-42.8)</td>
</tr>
<tr>
<td>≥95th</td>
<td>24.3 (20.5-28.6)</td>
</tr>
<tr>
<td>≥97th</td>
<td>18.6 (15.4-22.2)</td>
</tr>
</tbody>
</table>

2- "To examine the relationship of perceived neighbourhood physical and social disorder with physical activity and obesity status among African American adolescents, we utilized the conceptual framework developed by Burdette and Hill [25]." This can be moved to the methods section, as the introduction is quite big.

Methods Section - Page 5, Paragraph 1: We thank the Editor for this suggestion, we did move this section to the methods.

3- Last part of the introduction. Please reduce the length of this part.
Thank you for this suggestion. To reduce the length of the last part of the introduction, we deleted the last three sentences from the text.

Introduction - Page 4, Last full paragraph

4- More information about covariates, if they were categorized, how?
For more clarity on the covariates, we provided more detailed information in the Methods Section as reflected in the statements below.

Methods – Covariates, Page 10:

Age, sex, and socioeconomic status were included as covariates. Parents reported the age and sex of the child. Age was treated as a continuous measure and sex was treated as a categorical variable. Parents self-reported the total annual household income and the highest level of education completed by any adult in the household (1 = less than high school, 2= complete high school, 3 = some college, and 4 = college graduate). For analyses, these measures were treated as continuous variables.
5- Were the variables checked for normality? Did the authors check if there was a sex interaction? All this information must be included at the beginning of the statistics.

We updated the text in the Data Analysis section to indicate that all variables were checked for normality and whether there were significant sex interactions. We added the following sentences:

Methods, Data Analysis: Page 10, Paragraph 2:
All variables were evaluated for normality. We conducted sex specific analyses but found no significant differences, thusly, all analyses presented include both adolescent girls and boys.

6- Please, include the reference of the international PA guidelines for children and adolescents. These recommendations aim to improve cardiovascular health, although some studies have shown that they are good also to prevent obesity. Due to the increased energy expenditure on vigorous PA, did the authors check if there was a mediation effect of vigorous PA?

We thank the Editor for this suggestion. We did include the WHO citation for global physical activity recommendations in the first paragraph of the Introduction Section.

We also examined whether vigorous physical activity mediated the association of perceived neighborhood disorder on percentile BMI and obesity status. We found results similar to those when we combined moderate-to-vigorous physical activity. We modified the text in the Results section as follows:

Results, Page 13, Last sentence:
We also examined whether vigorous physical activity mediated the associations of perceived neighborhood disorder on percentile BMI and obesity status (data not shown) and found results similar to those presented.

Figures. Education and education\(^2\)? Not clear

We modified the text for both the Figure captions to reflect that we controlled for the non-linear effects of education as follows:

Figure 1. Simple meditational model for the relationships between perceived neighborhood disorder and percentile BMI. Panel (a) path estimates for the direct effect of perceived neighborhood disorder on percentile BMI (controlling for income, education, education\(^2\)-to control for the non-linear effects of education, age and sex) (b) path estimates of the indirect effect of perceived neighborhood disorder on percentile
BMI (controlling for income, education, education$^2$-to control for the non-linear effects of education, age and sex).

Figure 2. Simple meditational model for the relationships between perceived neighborhood disorder and obesity status. Panel (a) path estimates for the direct effect of perceived neighborhood disorder on obesity status (controlling for income, education, education$^2$-to control for the non-linear effects of education, age and sex) (b) path estimates of the indirect effect of perceived neighborhood disorder on obesity status (controlling for income, education, education$^2$-to control for the non-linear effects of education, age and sex).

Reviewer's report
Title: The associations of perceived neighborhood disorder and physical activity with body mass among African American adolescents
Version: 1 Date: 13 October 2012
Reviewer: Augusto Cesar de Moraes
Reviewer's report:
Major Compulsory Revisions

ABSTRACT
1. In abstract it is interesting that the authors show the effect of Perceived neighborhood disorder and obesity in not only the value of p. The p value in epidemiology is the least important statistical referential. For the reader what the article is interesting to check what is the magnitude of the effect of exposure on outcome. We thank the Reviewer for pointing this out. We reviewed articles published in BMC Public Health and consistent with the format of those articles, we omitted the p-value but kept the textual information to describe the results.

METHODS
Sample
1. The authors could indicate what were the parameters used for calculating sample: alpha, beta, error marge, design effect, planning for possible occasional losses and refusals. We thank the Reviewer for this request. We did modify the text to include a discussion of the sample size calculations as follows:

Page 7, First Full Paragraph:
The sample size calculations were generated for multivariate linear regression models using the PASS statistical software. The sample size was calculated based on a significance level $\alpha = 0.05$ with varying levels for beta such that Power (1- Beta) equals 0.90, 0.85, or 0.80. The sample size calculations were adjusted for the multivariate nature of the analyses by including a conservative estimate of the R$^2$ (R$^2 = 0.10$) that is attained when family income, a primary independent variable used in our proposed
sampling procedure, is regressed on 10 other independent variables in the regression models. The sample size calculations are strong evidence that the proposed sample size of 120 will have enough power to conduct the multivariate analysis for this study.

2. Which include the institution's ethics committee that approved the research.
We thank the Reviewer for this request; we modified the sentence about Institutional Review Board Approval to indicate that study ethics were approved. This is noted in the following sentence modification:

Page 7, Last sentence prior to first full paragraph:

All study materials, methods, and study ethics were approved by the Institutional Review Board of the University of Alabama at Birmingham.

Body mass index Cutoffs
1. I think the cutoff for diagnosing obesity, the authors used is not appropriate. The cutoff points proposed by the CDC are greater than the cutoff points proposed by Cole et al. (BMJ, 2000), and this is a differential error, because it has a direct influence on the prevalence of obesity. Cole et al. cutoff developed from research in 5 countries and using more accurate methods those only statistics percentiles that the CDC suggests.
We thank the reviewer for this comment. We reviewed the article by Cole et al. and also consulted the general literature about the use of CDC percentiles to categorize obesity status among the study participants. We chose to use the CDC BMI cutpoints for this study as the American Medical Association expert committee recommends that using both 95th and 85th percentile cutpoints capture varying risk levels and minimizes both overdiagnosis and underdiagnosis; (p S167) (Barlow Se. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: summary report. Pediatrics 2007; 120(suppl 4): S164-92).

Further, one of the co-authors of the current study, Dr. Olivia Affuso, has published work (Affuso O., et al 2010. International Journal of Body Composition Research 8:117-122). that examines the concordance between the CDC cutpoints for obesity and adiposity levels as measured by Dual-energy x-ray Absorptiometry (DXA), which is considered one of the gold standards in body composition assessment. Dr. Affuso's work found that the CDC BMI cutpoints work fairly well to categorize adiposity levels for high-BMI-for-age across racial/ethnic groups. Given that the CDC BMI percentiles to estimate obesity have been validated against DXA for non-Hispanic black adolescents, we feel confident that despite its limitations, the obesity prevalence among the adolescents in this study is accurately classified.

Analyses
1. I suggest the authors to present the confidence intervals 95%, this is more important in epidemiology that the p-value.
We thank the Reviewer for this suggestion. We do present the 95% Confidence Intervals for the means presented in Table 1. For the mediation analyses, we clarified in the text and in the Figures that the point estimates are in fact, unstandardized beta coefficients. We reviewed the mediation analyses for the Preacher and Hayes approach that we used, the code for the Preacher and Hayes mediation analyses, the published literature using this method as well as the website developed by Hayes on mediation analyses. We could not find any published work where 95% CIs are presented for the point estimates and the macros code used for mediation analysis does not allow for these CIs to be estimated.

RESULTS
1. I suggest to the authors of the texts to remove the results already presented in figures and tables, is redundant to present twice.
We thank the reviewer for this suggestion, we did remove the results from the text for redundancy.

2. Replace the standard deviation for the confidence interval.
Thank you for this suggestion, we did re-run the means, standard deviations and 95% Confidence Intervals. For Table 1, we replaced all of the standard deviations with 95% Confidence Intervals.

3. In the figures, remove the p-value and the to present confidence interval 95%.
We thank the Reviewer for this suggestion. For the mediation analyses, we clarified in the text and in the Figures that the point estimates are in fact, unstandardized beta coefficients. We reviewed the mediation analyses for the Preacher and Hayes approach that we used, the code for the Preacher and Hayes mediation analyses, the published literature using this method as well as the website developed by Hayes on mediation analyses. We could not find any published work where 95% CIs are presented for the point estimates and the macros code used for mediation analysis does not allow for these CIs to be estimated.

4. What means those values (c = 0.116, p = 0.258)? The analyzes are very interesting, but for better understanding the authors must explain the methodology which means these analysis results. It is a correlation coefficient, is a coefficient beta?
We thank the Reviewer for these questions. We removed all reference to a, b and c and c’ as these are references to the paths. Instead, we provide information that the point estimates presented are the unstandardized beta coefficients. We reference this in the following sections below:

In the Data Analysis Section, Page 11, 2nd to last sentence:

As recommended by Preacher and Hayes, all of the point estimates presented in the mediation analyses are the unstandardized beta coefficients [32].

Results Section, Page 12 First Paragraph Mediation Models:
Figure 1, Panel A presents the unstandardized beta coefficients for the unmediated association of perceived neighborhood disorder with BMI percentile, while controlling for income, education, age and sex. There was no significant relationship between perceived neighborhood disorder and BMI percentile. Panel B of Figure 1 presents unstandardized beta coefficients for the model examining whether physical activity mediated the relationship between perceived neighborhood disorder and BMI percentile. Perceived neighborhood disorder was not significantly related to moderate-to-vigorous physical activity. Moderate- to-vigorous physical activity was significantly and inversely related to BMI percentile. The direct path of perceived neighborhood disorder remained statistically insignificant and there was no evidence of mediation (Table 2).

Results Section, Page 12 Second Paragraph Mediation Models

Figure 2, Panel A presents the unstandardized beta coefficients for the unmediated association of perceived neighborhood disorder with obesity status, while controlling for income, education, age and sex. Perceived neighborhood disorder was significant and positively related to obesity status. Panel B of Figure 2 presents the unstandardized beta coefficients for the model examining whether moderate-to-vigorous physical activity mediated the relationship of perceived neighborhood disorder on obesity status. Given the non-significant association between perceived neighborhood disorder and moderate-to-vigorous physical activity presented in Figure 1, we report relationships between remaining variables. Moderate-to-vigorous physical activity was significant and inversely associated with obesity status. The direct path of perceived neighborhood disorder remained statistically significant and there was no evidence of significant mediation of moderate -vigorous physical activity on the relationship of perceived neighborhood disorder on obesity status (Table 2).

DISCUSSION

1. Very good.

Level of interest: An article of outstanding merit and interest in its field
Quality of written English: Acceptable
Statistical review: Yes, and I have assessed the statistics in my report.
Declaration of competing interests:
I don't have competing interests with this manuscript

Reviewer's report
Title: The associations of perceived neighborhood disorder and physical activity with body mass among African American adolescents
Version: 1 Date: 15 October 2012
Reviewer: Joellen Wilbur
Reviewer's report:
These are recommendations for improvement which the author can choose to ignore.
Level of interest: An article of importance in its field
Methods
1. More information is needed on recruitment of participants. It would be interesting to know if both active and passive recruitment strategies were utilized. It appears that participants only reacted to seeing a flyer and called to inquire about the study. Also, note what the most successful recruitment strategy was. For example, note where the largest number of interested persons saw the flyer. This will inform future studies on recruitment of hard to reach adolescents. In addition, it is not clear if the adolescent or the parent contacted the researchers.

We thank the reviewer for requesting more information about the recruitment strategies used to recruit study participants. We provided more information in the Methods section to reflect these additions as follows:

Methods – Page 6 Last Paragraph:
To recruit study participants, we used passive and active recruitment strategies such as flyers and snowball sampling. Parents responded to flyers at local recreational centers, churches, community centers, newspaper and word of mouth advertising from previous study participants. For this study, snowball sampling was the most effective recruitment strategy.

The data collection sites are not identified.
We thank the Reviewer for highlighting this oversight. We did modify the text to reflect identification of the data collection site. We modified the text as follows:

Methods Section – Page 6, Last Sentence:
Study eligibility included children who self-identified as African American and presented with no physical or mental impairment, all study related events and data collection were obtained at the University of Alabama at Birmingham, Department of Medicine.

Census data are need for the recruitment area. This would provide additional information about the environment.
We thank the Reviewer for requesting more contextual information about the
recruitment area. We did modify the text to provide information about the US Census Statistics to reflect the following:

Methods Section, Page 6, First Full Paragraph:
Data for the current study are from a cross-sectional study that examined the social and cultural factors that influence African American adolescents’ participation in physical activity. Adolescents who were 12 to 16 years of age and their parents were recruited from the Birmingham, AL metropolitan area, where the population is predominantly African American (73.4 percent) and 32.7 percent of families with children have income below the poverty level (US Census Bureau: American FactFinder. Available at http://factfinder2.census.gov/, 2010.)

2. Missing data were not specified. For example, people may have completed the questionnaires, but did not return the accelerometer at a second visit. We do not know how these 16 participants differed from those with complete data.

We thank the Reviewer for this comment. We did conduct analyses to test whether those with missing data significantly differed from those with informative data. We modified the Methods Section as follows:

Page 8, Top of Page:
Of the 116 who participated in the study, 15 were excluded due to missing/incomplete data (nine were missing information on perceived neighborhood disorder, four were missing information on income, one was missing information on BMI and one did not have accelerometer data for three days). There were no significant differences in age, sex, socioeconomic status, perceived neighborhood disorder, moderate-to-vigorous physical activity, or BMI between those with missing data and those participants included in data analyses.

3. Additional information is needed related to the scoring of the neighborhood disorder measure. It appears there was reverse scoring with higher scores indicating higher perceived social disorder.

We modified the Methods section to include further discussion of how to score the Perceived Neighborhood Disorder measure. The following sentence reflects the changes made to the manuscript:

Methods Section, Page 9, Top of Page:
Response options for the social and physical disorder used the Likert format (‘strongly agree’ = 4 to ’strongly disagree’ = 1). The prosocial neighborhood environment items were reverse coded. The responses for the items were summed and the possible score values were 15 to 60, with higher scores indicating greater perceived neighborhood disorder.

4. Information is needed on how much money participates were paid to participate in the study.
We provided more information in the Methods section to indicate the amount of compensation received. The additions are as follows:
Methods Section, Page 7, Top of Page: 
Parents and teens received $10 each for completing the surveys and teens received additional $25 dollars for wearing and returning the accelerometer.

Discussion
5. These adolescents may not have cars and have to engage in walking as a means of transportation regardless of perceived neighborhood disorder. Inclusion of a self report measure of type of activity they engage in would give some context for their physical activity.
We thank the Reviewer for this suggestion. We did modify the Discussion Section to include a section on adolescents’ self-reported physical activity.

Discussion Section, Page 15 Last Paragraph:
In addition to wearing the accelerometers, the adolescents also maintained daily physical activity logs where they self-reported the types of physical activity and the duration. For girls, the top three activities were walking for exercise, dance, and basketball. For boys, the top three activities were basketball, football and walking for exercise. This suggests that that although adolescents were active, the accelerometer data reflected that the activity levels were insufficient to meet the recommended guidelines.

6. The theoretical model makes a link between perceived stress, physical activity and obesity. The measure of perceived environmental social disorder is an indirect measure of stress. This is a study limitation. Future work should take into consideration the inclusion of a stress measure.
We thank the Reviewer for this suggestion, as perceived neighborhood disorder indirectly assessed stress. We did include this as a limitation as follows:

Page 17, Top of Page, First Full Sentence:
Further, we measured neighborhood disorder to indirectly measure stress and did not include biomarkers of stress such as cortisol or inflammation, future work should incorporate these measures to examine the extent to which neighborhood context directly affects physiologic functioning.