Author's response to reviews

Title: Food venue choice, consumer food environment, but not food venue availability within daily travel patterns are associated with dietary intake among adults, Lexington Kentucky 2011

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Author's response to reviews: see over
Dear Editor in Chief of Nutrition Journal,

We appreciate the opportunity to revise and resubmit our article now titled “Food venue choice, consumer food environment, but not food venue availability within daily travel patterns are associated with dietary intake among adults, Lexington Kentucky 2011”. We have made every effort to make all suggested changes requested by the expert reviewers.

In our effort to revise the manuscript we have conducted new analyses which have changed the results and thus added new and different tables as well. We believe through the review process the manuscript has improved greatly. Within the manuscript we have highlighted in yellow the key changes made. Additionally, please find below a point by point response to each reviewer comment and suggestion.

Thank you again for this opportunity to potentially publish with Nutrition Journal.

Regards,

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We thank reviewer #1 for his expertise and thorough review of our manuscript. We are grateful for his time and insight into making this manuscript much improved. We have made every change suggested and listed below is a point by point response.

Compulsory
1. In the both the abstract and text, provide conclusions that identify more than the need for research. Research for the sake of research is not enough. What does this mean from a public health perspective?
   - We have changed the aims, results, and introduction and thus the conclusion in the abstract and within the manuscript have changed.

2. It is unclear whether the sample is county wide for Fayette County, or just Lexington. If the study is Lexington, then provide demographics and compare with recruited population.
   - Based on other comments from reviewer we have listed Lexington. However, Lexington is Fayette County. The US Census Lists Lexington-Fayette.

   It is not clear whether this analysis can be generalized beyond the 121 people in the study.
   - You raise a very good point and one that another reviewer raised. We have added this point to the limitations with the following sentence: A large and severe limitation is the type of sampling procedure used, which produced a homogenous study sample in terms of socio-economics. The sample which participated in this study was older and higher socio-economic status relative to the general population within the city. The sample was not representative of the city or of the general United States. This homogeneity limited the variability in our sample, and thus power to detect significant associations. Although every attempt was made to recruit a diverse sample, response rates were low and therefore selection bias may be an issue in our analyses.

   Is it representative of Lexington, much less Fayette County? See line 223-224 where the authors identify the sample as being Lexington.
   - We have removed Fayette and now listed Lexington per suggestions above.

3. GPS monitors were worn for 3 days within a seven-day period. Provide details on how these three days would be representative of usual activity. Were there protocols to include weekday and weekend days?
   - Thank you for the suggestion. Participants wore the GPS monitor for 2 weekdays and one weekend day. We have added this to the abstract and manuscript within the methods section.

4. The age range of 18-65 includes children with adults. Please justify and restrict. If age 18-20, was parental permission sought for the telephone survey?
Based on our IRB 18 and over was considered an adult and thus informed consent was used for all participating individuals. Assent was neither necessary nor parental permission since based on University of Kentucky IRB 18 and over is an adult. If we do not understand your suggestion, we apologize and hope we can resolve this concern.

**Major**

1. Report the response rate and provide.
   - Response rate of 79% has been added to the methods.

2. Provide details on the training of graduate students who administered the telephone surveys.
   - We have added details on training of graduate students within the methods section. The following information has been added:
     The graduate assistant was trained by the University of Kentucky Survey Research Center (SRC) in the procedures for collecting data via the telephone. The training within the SRC consists of internal review board training, sensitivity training, as well as programmatic training. This study provided salary support for a graduate assistant staffed at SRC to conduct the telephone survey.

3. Provide details on length of time to administer surveys (mean, SD, median, and range)
   - We appreciate the suggestions for detail in this section and hope the following has improved the clarity of the manuscript.
     The survey took approximately 40 minutes (mean 38 minutes SD 1.52 with a range of 32-44).

4. Since a supercenter (e.g., Super Walmart) is a large supermarket and a large general merchandise store in one, why do the authors posit that supercenters are less healthy along with convenience stores (lines 115-117)?
   - We agree with your comments as well the comments from another reviewer. Please see below for what has been added to the manuscript:
     The RFEI has been used previously to find a link between diabetes and obesity such that, a higher RFEI was associated with a higher prevalence of obesity and diabetes in low-income neighborhoods.[33] In this study supercenter was used in the numerator and denominator but point estimates did not change significantly, therefore it was retained in the numerator based on previous studies linking proximity to supercenters and high body mass index[34].

5. The RFEI appears to ignore variety within a space. Not all stores within a category are the same. Provide justification.
   - Thank you for this very good point and the opportunity to justify the use of RFEI. We agree that not all supermarkets are the same and thus we conducted NEMS-S within the stores to highlight the importance of conducting in store audits. We have added this point to the discussion. However, we also agree and see your point about how the RFEI can mask an association by grouping supermarkets all together. In this small relatively homogenous sample when we stratified by smaller and larger stores we then had too small cell size for analyses. We also looked at
discount stores such as Aldi relative to larger chain supermarkets (Kroger) but again we ended up with too small cell size. We do hope the following addition within the manuscript addresses your valid concern. Lastly, limitation of the RFEI measure is that not all supermarkets have the same availability and prices. Thus when grouping supermarkets into one group the result is that all supermarkets are being treated as though they are equal. However, based on the small sample stratification within supermarkets was not feasible and thus the RFEI was used for all models.

6. Provide clarification for purchase of food during the week or month (line 125). Which is it?
   • We have provided clarification on this point. The question asks per month but the person can answer per day, week, or month. We have added the following sentence:
     Participants could answer per day, week, or month.

7. Provide details on conducting the NEMS-S, such as asking permission of store owner/manager to conduct the survey. If store owners/managers were not asked, this is a major ethical problem. Were there any refusals? Did the authors obtain IRB exempt status?
   • Store managers were asked for their permission and this was not exempt since we're reporting data from stores. More detail has been provided within the methods. The following has been added:

8. The dietary measure of diet documents frequency, but not amount (portion size). How would someone who consumes two portions at one time differ in data from someone who consumed one portion two times? This should also be added to the limitations.
   • You raise a good point and we have added this to the limitations.

9. The data do not support the claims made in line 260-262.
   • Our results have changed based on reviewer comments and thus this has been omitted.

Minor
1. Were there efforts made to validate the InfoUSA list?
   • We conducted ground-truthing within the neighborhoods for those stores listed. All stores listed were located and open. We have added this to the methods section. To verify that stores were open and located ground-truthing was conducted.[29] Such that, once the daily activity space was categorized the food stores that were within those spaces were verified to be open and located by driving to each store and comparing the list of stores on InfoUSA with what was found. All stores were located and open within the activity spaces of participants.

2. Provide examples of each type of food store.
   • We have added examples as suggested by yourself and another reviewer.
   - We have added nine am – five pm

4. Lines 153-154, did the two graduate assistants conduct the audits at the same time? No they conducted them in the same week but on different days. We have added this within the methods

5. Line 160, change “provide” to “provides”.
   - We have changed to provides

6. The author state that the dietary instrument came from the validate NHANES 2009-2010; however, the citation provided is dated 2004. Please correct?
   - We apologize the this error and have added the correct reference. However, some unpublished data is also available and we have added the link to that data as well.

6. Line 208, explain ½ mile pattern as activity space.
   - We have added a line about the ½ mile pattern and hope this explains a bit more about the activity space.

8. Provide data on validation of fruit and vegetable consumption questions.
   - Based on previous comment regarding correct references we have added the updated reference which discusses validation of the survey. We utilized the NHANES 2009-2010 for all dietary questions.

9. Delete lines 244-250 as not necessary.
   - We have deleted these lines

10. Since all the data, include CI, are reported in the tables, there is no need to provide this level of detail also in the text.
    - We have not included the CI in the results section given the suggestion

11. Provide details on the NEMS data
    - We have included some result discussion on the NEMS data Line 297

13. Line 270-272 is not necessary at this point.
   - We have eliminated

14. Table 1. There is too much information for a single table; separate into two tables. Create separate columns to report categorical and continuous variables. Presently, the table is difficult to follow.
   - We have created two tables based on your suggestion and have separated out.

15. Table 1. The use of comparisons (p values) in a descriptive table is very confusing. Is it not clear in the table what the authors are presenting.
   - We have omitted this from the table

16. Table 2. Change from landscape to portrait. The legend (letters a-h) has no meanings in the table. If you are using the letters, then also use in the table. If you are stating in the legend that supermarkets are the referent, then omit the column supermarkets with REF. Explain in the text, the very wide CI for the one significant result. At the lower end, 1.01 is barely significant.
   - Our tables and results have changed and thus a more robust results section is now being presented.

17. Change all table titles and paper title to indicate Lexington, KY and not Fayette County. The use of Fayette County is misleading, unless there are no population areas in Fayette County beyond Lexington.
   - There is no population in Fayette beyond Lexington. But we have changed all tables and text to read Lexington.

18. Table 3. Same comments as above on the legend letters. What is NA? Overall, this table is very confusing
   - We have significantly changed our tables and results and this has been omitted.
We thank reviewer #2 for her expertise and time in reviewing our manuscript. We are very grateful for the reviewer’s insightful and salient suggestions. We have made every attempt at improving the manuscript based on the revisions suggested. Please see below for a point by point response to each salient review comment.

Major Compulsory Revisions:
1. The authors list three hypotheses in the introduction. While the first two are understandable and clear, the third hypothesis sounds circular: “The third hypothesis was that individuals with a healthier food activity space, that is, residents who operate within a space with more healthy food venues relative to unhealthy food venues, would report shopping in healthier food venues, compared to residents who operate within space with fewer healthy food venues.” To my understanding, the same variables inform both the definition of a “healthier activity space” (having more healthy food outlets) and “shopping in healthier food venues” (shopping at healthy food outlets). Please clarify your position or edit accordingly.

- Based on the above suggestions and reviewer #3 comment we have deleted hypothesis and aim #3. We agree with your point and after reading through the Tables and results with clear eyes we have removed this aim from the paper. We have streamlined the aims and the tables.

2. No background information was found for food activity space in the introduction section. I had also hoped to see some introduction to the theme of shopping behavior.

- We have significantly revised the introduction and included more key references regarding food activity space with using GPS and food shopping behavior. Specifically, we have added a paragraph on recent publications from Zenk, et al on GPS use in urban settings. We have also added references from Kestens on activity spaces and health.

Two recent studies utilizing GPS technologies indicated that individual’s traveling within a high density of fast-food restaurants had higher odds of being overweight[18] and consuming more saturated fat. [19] While understanding travel patterns and how food venue exposure within those travel patterns is needed, food shopping choices or behaviors which may influence travel patterns is equally relevant. Such that, where a grocery store or super center is located may influence the choice in shopping at that store. Findings related to food store choice have indicated that those who shop at a grocery store in a disadvantaged neighborhood report a higher body mass index (BMI) relative to those who shop at a grocery store in a higher income neighborhood. [20, 21] Yet, among those who “choose” to shop at store in a disadvantaged neighborhood this may be more of a function of proximity, socio-economic status, transportation, and a host of other proximal and distal determinants which influence choice”.

- We have also added a section on food shopping behavior with mention to your comment about super markets also carrying a large variety of unhealthy items. The following paragraph has been added:
“To adequately capture the interdependent nature between the individual and their neighborhood both choice of food venue and availability of healthy food within venue are necessary. To date studies have found that availability of healthy food within stores may or may not be associated with dietary intake and body mass index. [11, 22, 23] The conflicting results may be more a reflection of the methods used, sample population, and also the reality that supermarkets sell more produce but they also sell more unhealthy items at the same time[24]. Individual’s when food shopping are faced with the decision to purchase a healthy food item at the same time they are faced with the decision to buy an unhealthy food item.”

3. The authors used GPS to measure the “food activity space” in this study. However, how are they determining if this space includes any food shopping?? To my understanding, it is the space for “working” for employed individuals or “traveling” for others. Using this method to define food activity space may cause problems if shopping did not occur in the 3 day interval.

- Thank you for this very insightful comment. We agree with your assessment and have thus changed this term throughout the paper to indicate travel pattern since food purchases did occur but not always food shopping.
- Additionally, we have added a section to table 2 (old Table 1) that indicates what people purchased during the 3 days they were wearing the GPS unit. As stated in the table 75% did conduct food shopping at a supermarket within the window of when they wore the GPS device.

4. The classification of food outlets to define RFEI is not clear to me. In CDC’s Children’s Food Environment State Indicator Report (http://www.cdc.gov/obesity/downloads/childrensfoodenvironment.pdf), specialty stores and farmer’s markets are not mentioned in the healthy store category.

- We agree that the CDC definition uses the modified retail food environment index, which is a proportion and does not have produce stands. We decided to use the RFEI since our sample did report shopping at farmers’ markets and the RFEI uses this food venue in their ratio measure. We have added the following language to clarify the measure used with additional references.

Step two was to determine the healthfulness of an individual’s daily activity space. To measure the healthfulness of an individual’s daily activity space the retail food environment index (RFEI) was used.[31, 32] The RFEI is a ratio of healthy relative to unhealthy food venues: Supermarkets/grocery stores, farmers’ markets, and produce stands were considered healthy venues, relative to supercenters, convenience stores, fast-food restaurants, and gas stations with convenience stores, or less healthy venues. The RFEI has been used previously to find a link between diabetes and obesity such that, a higher RFEI was associated with a higher prevalence of obesity and diabetes in low-income neighborhoods [33]. In this study supercenter was used in the numerator and denominator but point estimates did not change significantly, therefore it was retained in the numerator based on previous studies linking proximity to supercenters and high body mass index[34].
Also, why are supercenters categorized along with other “unhealthy” outlets?

- We agree that classifying super center as unhealthy may or may not be accurate. However, based on our research within KY shopping at supercenters has been associated with a higher BMI. When we have tested super center in the numerator or denominator our estimates do not change significantly. We also feel that more research is needed in classification of this type of food venue before a substantive claim can be made.

Lastly, given the ratio nature of the RFEI (and assuming their formula equates to what is described on line 114-115), how did the authors deal with neighborhoods in which no healthy food outlets existed (i.e. numerator equal to 0) or in which no unhealthy food outlets existed (i.e. denominator equal to 0).

- Thank you for the very good point. Since we used the GPS data loggers to define neighborhood we didn’t have anyone that traveled within a space without at least one “healthy” food store and one “unhealthy” food store. However, given this is a fairly dense semi-urban area with high a socio-economic status population this would not be the case in most neighborhoods in the U.S. This is a large limitation of this pilot study and one that is brought up in the discussion.

5. Line 130-122, I think the assertion that “In the ratio measure used here, higher scores indicated a food activity space with more venues selling more low-calorie healthy food items relative to stores selling energy dense foods.” is not tenable as written, because it is well know that supermarkets carry a large amount of unhealthy products, and in terms of volume, that amount will exceed the amount available in a convenience store. It would be good if the authors would review and revise their language on this matter to present a more nuanced understanding of the issues.

- You raise a very good point and one that we have now mentioned in the introduction and the discussion.

To date studies have found that availability of healthy food within stores may or may not be associated with dietary intake and body mass index. [11, 22, 23] The conflicting results may be more a reflection of the methods used, sample population, and also the reality that supermarkets sell more produce but they also sell more unhealthy items at the same time[24]. Individual’s when food shopping are faced with the decision to purchase a healthy food item at the same time they are faced with the decision to buy an unhealthy food item.

- As seen by our revised results, based on your suggestions, shopping in a supermarket was associated with consumption of sugar-sweetened beverages. We have added the following as a description

In the ratio measure used here, a higher score indicated a travel pattern where individual’s encountered more stores selling fruits, vegetables, and other nutrient dense items. A lower score indicated a travel pattern where individual’s encountered more stores selling snack items, processed foods, and high calorie items.
6. The response rate is very low (153/1400=11%) and the demographic characteristics of the sample suggest that this is a middle-to-old sample with high SES. There are about 76% Whites in this county based on Census data, however, in the sample, there are 94% Whites. This issue needs to be addressed as a limitation, as the results can not be generalized to the residents in the county even to those with high SES.

- We agree with your assessment and have revised the discussion to reflect the severe limitation of the sample. The sample which participated in this study was older and higher socio-economic status relative to the general population within the county. The sample was not representative of the county or of the general United States.

7. In Table 1, are the specialty markets and farmer’s markets combined as one category for type of store for primary shopping? If not, does this mean that not a single participant reported using a farmer’s market as the primary shopping choice? From the percentage, we see that only 10% reported supercenters and 10% reported specialty markets.

- Yes that is correct and based on this and the comment below we have changed our analyses and results section.

In the logistic regression in Table 2, when comparing to supermarkets, is the sample size for those reporting specialty and farmer’s market too small? The sparse data may be the reason that large confidence intervals for fruit & vegetable intake for specialty and farmer’s market.

- Thank you for this point. We have revised the analyses to assess reporting at any store type, rather than just the primary store type. Thus in our analyses for food venue choice we modeled the odds of diet intake for food shopping choice, whether primary or secondary store type.

8. With a sample size of 121, a test of interaction is an overly ambitious and statistically risky undertaking and I think the authors would be wise to remove any reference to this effort.

- Thank you for this point. Based on this comment and another reviewer comment we have taken this out of the manuscript.

9. The analyses underlying data presented in Table 3 can not be easily connected with the results section pertaining to the same table. I am not sure if it is a matter of inconsistent labeling of if there are actually other analyses being described. In part, the quite confusing layout of Table 3 is making the interpretation very difficult. I would also suggest separating this table into two.

- We have changed most of the tables and analyses to present a more complete picture based on your comments and another reviewer comments. We appreciate your suggestions and feel that they have improved the manuscript considerably.
10. At a more conceptual level, the authors need to explain their rationale for presenting their main findings in Table 2 (focusing on primary food shopping venue type) adjusting from the start for both the active living space and the RFEI attribute of the neighborhood. My suggestion would be to start the modeling process without either of the other two variables, because they would be hypothesized to be influencing the shopping behavior and may, or may not, have direct effects on fruit and vegetable intake.

- We have taken your suggestion and now present findings from RFEI in a separate table. We did not adjust for activity space or RFEI based on your suggestion and now present new findings.

Minor Essential Revisions:
1. In the abstract, the authors mentioned the GPS was worn for a week but in the methods section it was said to be worn for three days.

- We have clarified this point that it was worn for 2 weekday and 1 weekend day.

Please clarify and also discuss the implications on the assessment of food shopping behaviors and space. The dependent variables were coded into dichotomous variables for some analysis in the study. How were the cutoffs chosen? For example, for F&V intake 2 times/day was used, for milk 1 time/day etc.. Have the investigators explored the effect of choosing different cutpoint on the results of the analyses?

2. In the logistic models in Table 3, the food venue availability scores were coded as dichotomous variables. Please give some rationale and potential references for the cutoffs, such as 56 for total score and 45 for availability score?

- Based on comments from another reviewer we have conducted a new analysis with different cut points for each store type. Our results have changed and we have provided rationale for cut-points.

3. The SDs are very small for several variables included in Table 1, e.g. age, years in Lexington and neighborhood. Please verify that these are in fact correct, they seem somewhat implausible, especially for age.

- We apologize for this error. We reported the standard error and have now changed everything to SD.

4. What do the p-values mean in Table 1?

- We have revised Table 1 and deleted p-values based on reviewer comments.

5. The initial samples (N=1400) were from a survey on cancer control. Please provide a little more detail on this sample’s characteristics. Are the participants healthy or patients with cancer?

- We have added detail on the sample with the following sentence: The participants in the survey are not currently diagnosed with cancer but may have undiagnosed chronic disease.

6. In footnotes in Table 2, the abbreviation of CI was provided, but I can’t find a “CI” in the table labeling.

- We have added “confidence interval to all tables.
7. Table 2 heading and labeling is rather incomplete. Please spell out the outcomes (e.g. Fruit & Vegetable intake of > X servings/day), improve the titles of the exposure variables (e.g. Primary food shopping venues …, …. , …).
   - We have revised table headings, outcome and exposure labels

Furthermore, the convention is the indicate the reference group with 1.0
   - We have revised the table based on new analyses, such that this is not the case any longer for reference.

Discretionary Revisions:
1. The authors mentioned that they asked shopping behavior questions during the interviews. What shopping behavior questions do they include? In the method section, only “food shopping stores” was asked during the interview. Including more shopping behavior questions may enhance the analysis between food environment and dietary intake in this study.
   We have added the following description under food shopping behaviors:
   - Frequency of shopping at each store type was captured by asking how often in a week or month do you shop at each store type (supermarket, convenience, farmers’ market, specialty market). Frequency was categorized as zero or never for shopping at store type compared to shopping at store type at least once a week based on the distribution of the data.
We thank reviewer #3 for her very thorough review. We are very appreciative of her expertise in the field and are grateful to have such an expert review our work. We have made every effort to make all suggested changes and edits and hope the revised manuscript reflects our effort. Below is a point by point comment for each revision.

Major
I did not understand the third aim. It seems disconnected from the first two since you are not testing the relationship between diet indicators and food activity space. More generally, it was not clear what you saw as the relationships among food activity space, venue choice, and diet. I assume food activity space would affect venue choice, and subsequently diet? (Lines 218 seem to suggest you think venue choice # activity space # diet.)

- Thank you for this point. Based on your comments and reviewer #2 comments we have changed the aims and analyses of the paper to reflect a more coherent presentation. The aims now read as follows:

The aims of this study were to examine associations between various dietary indicators and 1) food venue availability within daily activity space; 2) food venue choice and frequency (supermarket, supercenter, specialty grocer, farmers’ market) and 3) healthy food availability within the food venue. The primary hypothesis was that those travel within an area that has more healthy food venues relative to less healthy food venues will report higher intake of healthy foods. Additionally, those who shop in healthy food venues (defined as supermarkets, farmers’ markets, specialty markets) will report greater healthy food consumption. Lastly, the third hypothesis was that those who shop in stores with high availability of healthy food would report greater healthy food consumption.

The article does not adequately incorporate prior literature on activity spaces (e.g., Kwan), activity spaces and health (e.g., Sarloos, Matthews), or activity spaces and the food environment and/or diet (e.g., Zenk Health & Place, Kestens) specifically. There are large (for the first) and rapidly growing (for the latter two) literatures in each of these areas. Thus, the authors could do a better job placing their study in the context of this literature, including the study findings.

- Thank you for the this very good point. In the first version we anticipated submitted a brief and thus the introduction was shortened. We have added the work done by these authors and by the authors suggested below. We have added to the introduction to set the stage a bit more.

There is also literature on relationships between where people shop and diet or weight (e.g., Zenk Am J Prev Med 2005, Inagami 2007 Am J Prev Med). Again, putting the findings in the context of prior studies, would strengthen the manuscript.

- We have added the above articles and the following paragraphs and references have been added.

Recently researchers have tracked individual’s daily movement pattern as a way to understand how individuals behave within their neighborhoods[17]. Through
the use of global positioning system (GPS) data loggers the neighborhood can be organically defined through the individual’s daily living habits. The use of these new technologies allows for an improved measurement of the neighborhood but still does not capture how the neighborhood food environment influences choice of food venue or availability of food inside the venue and subsequent dietary intake. Two recent studies utilizing GPS technologies indicated that individual’s traveling within a high density of fast-food restaurants had higher odds of being overweight[18] and consuming more saturated fat. [19] While understanding travel patterns and how food venue exposure within those travel patterns is needed, food shopping choices or behaviors which may influence travel patterns is equally relevant. Such that, where a grocery store or super center is located may influence the choice in shopping at that store. Findings related to food store choice have indicated that those who shop at a grocery store in a disadvantaged neighborhood report a higher body mass index (BMI) relative to those who shop at a grocery store in a higher income neighborhood. [20, 21] Yet, among those who “choose” to shop at store in a disadvantaged neighborhood this may be more of a function of proximity, socio-economic status, transportation, and a host of other proximal and distal determinants which influence choice.

To adequately capture the interdependent nature between the individual and their neighborhood both choice of food venue and availability of healthy food within venue are necessary. To date studies have found that availability of healthy food within stores may or may not be associated with dietary intake and body mass index. [11, 22, 23] The conflicting results may be more a reflection of the methods used, sample population, and also the reality that supermarkets sell more produce but they also sell more unhealthy items at the same time[24]. Individual’s when food shopping are faced with the decision to purchase a healthy food item at the same time they are faced with the decision to buy an unhealthy food item.

Obviously the sample size is small and thus it seems the analyses are underpowered, but I do not see that acknowledged.

- This is a very good point and one that has been added to the limitations: Coupled with an older higher socio-economic sample was that the sample was small and thus underpowered to detect associations. Therefore results may be spurious and thus future studies are needed among a larger more representative sample before conclusions can be made.

Novel questions and/or methods could help to offset this limitation, but I think a stronger case needs to be made for how – despite the small sample – this study contributes in important ways.

- We have added this sentiment within the limitation. However, the novel approach of using GPS to define travel patterns and the exposure to food venues within the travel patterns sheds light on different methods for measuring the relationship between the individual and their neighborhood. Additionally, the results suggest that although the ratio of healthy to unhealthy food venues within travel pattern may not be relevant the
availability of food within those stores and where individuals choose to shop may influence dietary intake.

That said, though it did wind up being a socioeconomically advantaged sample, the attempt to get a more representative sample (rather than just convenience only) is helpful. I did find that the description was a little confusing (lines 71-78) though, with the use of “low response households,” then “low response area,” and then “household categorized as low response” with a definition.

- We have revised this section for clarity and hope the following sentence clears up the confusion.
  
  Each household received at least two flyers on separate occasions several weeks apart. For those households that were categorized as low-response (no response was received from research staff within two weeks after flyer was mailed) a third flyer was mailed to that household.

I was not clear how you constructed the NEMS measures for analysis. In the measures section it sounded like you dichotomized across all stores (e.g., above or below 56 for total score). But based on the Table, I thought you may have dichotomized within store type: healthy or unhealthy supermarket. Perhaps you applied the same cutpoint (e.g., 56) to categorize all stores types as high or low.

- We applied the same cut point to create “healthy” stores versus “unhealthy stores”. However after reflection at your very insightful points below we have now created different cut points for each store type. In the methods section we have now addressed the different cut points. We also have different results in Table 5.

If so, did the same cutpoint work well across all store types? I am not clear what variables were used for the Table 3 analyses. Are these three dichotomous variables for high compared to low for each store type?

- As stated above and based on your input we have conducted new analysis, different cut points, and clarified the results section, methods for variable definition, and now discussion.

What is the advantage of creating variables that incorporate both type and the NEMS information and not just using for the second question variables based on the NEMS information?

- Based on your comments we have redone the analysis and clarified the NEMS variables. We hope the revision improves the manuscript based on your thoughtful response.

I did not understand lines 214-219. It did not seem to match your third aim. I am not clear conceptually why the food activity space quality would moderate the effect of food venue choice on diet or the effect of food venue quality on diet. I am not sure if it supposed to, but the third hypothesis does not match aim 3 well. As written, the aims and hypotheses do not seem to suggest interactions. Thus, it seems you may need to more clearly lay out your aims/hypotheses and provide an explanation for how conceptually they make sense/how it could potentially work.
Based on your feedback and feedback from reviewer #2 we have substantially changed the analysis, results. We appreciate your valuable insight and hope that the new tables represent the suggested changes.

1. We have added a table on the results modeling the RFEI score within the travel pattern and diet
2. We have conducted new analysis NOT controlling for RFEI or travel pattern per reviewer #2 comments
3. We have conducted new analysis with different cut-points for each store type. The results have changed for supermarkets and we appreciate your insight on this.
4. We have clarified aims based on comments

Unfortunately, I do not understand the results in lines 238-243/Table 3 or those in lines 244-250. It may be a combination of lack of understanding of the variable construction and the table set-up/description.

- We have made major revisions among our tables and our analyses. Based on your expert advise and that of the other reviewers we have changed our analyses and thus the results and tables have been changed as well.

Minor
There are a number of typos (e.g., grammatical errors). Please review carefully and edit.

- We have reviewed for errors and have made editorial changes
The description of the “daily activity space” could be improved by justifying the use of three days, discussing whether weekend and weekdays were included, and then being more clear what you mean in lines 97-98.

- We have added this justification including 2 weekdays and 1 weekend day.

In other words, are you defining the 3-day activity space as the actual path/GPS tracing and then the “food activity space” as what is in a ½ mile buffer of the GPS tracings? (The description in “objective measure of food activity space” should build on what is in “daily activity space.” You seem to be mixing in the food part into the daily activity space description.)

- We appreciate your help in clarifying and have added new phrasing to distinguish between the two.

I also did not understand the sentence in lines 103-106. Looking at line 215, it seems you might want to define your terms early on and then use consistently throughout since there it says “food activity space within the ½ mile daily activity space.”

- Based on your suggestion we have revised and now the manuscript reads food activity space within the travel pattern.

I do not understand lines 126-128: what were the subcategories of specialty grocery store?

- We have added a definition for specialty grocer (i.e. Whole Foods).
Discretionary
It would be helpful if you could summarize briefly how price was scored (lines 163-164).

• We have added the following Price was collected by capturing the price per unit or ounce for each food item.

How often did you need to repeat a store audit due to low reliability? It would be helpful to summarize in 1-2 sentences these findings (lines 226-227). Based on a kappa of 0.60 we did not have to conduct a re-audit. The following sentence was added:

Since no store had a kappa equal or lower than 0.60 no store was re-audited.