Author’s response to reviews

Title: Utility of eButton images for identifying food preparation behaviors and meal-related tasks in adolescents.

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Author’s response to reviews:

Dear Drs. Collins and Kirkpatrick,

I am writing on behalf of all the authors of the manuscript “Utility of eButton images for identifying food preparation behaviors and meal-related tasks in adolescents.” ID (NUTJ-D-17-00304).

Thank you for the reviewer and editorial comments on this manuscript. We were delighted to hear that your reviewers found the article “interesting”, “very well written” and potentially “acceptable for publication”. We appreciate that your reviewers have found this manuscript possibly worthy of publication in your journal and feel the revisions suggested will strengthen the final paper. We wish to especially thank the reviewers for their detailed comments, which we recognize took time and effort and were extremely helpful in reworking this manuscript. We have addressed each reviewer comment as listed below:
Editorial:

1) If you have data on social economic status of the study participants, please add these to Table 2.

This information has been added to Table 2.

Reviewer 1:

2) Lines 126-132 Please include here details that children wore the e-button at school. It would be useful to include whether schools were contacted and consented to this as it will be helpful for researchers considering using the method in future.

Lines 134 – 136: More detail has been added regarding the eButton at school.

3) Line 153 - Were food adverts counted in the "food media activities"?

Lines 163-165: and 320 – 321: Clarification has been added. Food advertisements were not included in food media activities. During codebook development, a preliminary screening of images was completed. Food advertisements were not commonly seen, potentially due to the downward angle of the camera. However, this could be explored in future studies. We have added this to the study limitations.

4) Line 187 - It is not clear whether the data exclusions meant all data for that participant were excluded, meaning your 31 participants was reduced to 21. Please make this clear.

Lines 199 – 202: This has been clarified in the manuscript; 31 participants were analyzed.
5) Line 244 - The reference for the systematic review seems to be missing.

Line 262: Citation has been added.

Reviewer 2:

6) Abstract: first sentence should be rephrased, I wasn't entirely clear on its meaning: 'Food preparation practices can be skills important to healthy eating.'

Line 38: First sentence has been rephrased.

7) If there is space in the abstract, name the seven major categories of food preparation that were coded.

Lines 45 – 47: The major categories have been added to the abstract.

8) The introduction needs to do a better job of justifying its focus on food preparation activity per se in this sample, when the sample was not involved in an intervention or similar program focused on increasing meal preparation or involvement of children in cooking.

Lines 91 – 94: Thank you for this comment. Clarification has been added to the introduction. This study was not designed to use the eButton as an evaluation tool for a specific intervention. Instead, it is a secondary analysis, which seeks to establish the basic utility of images generated by the eButton to identify any food preparation behaviors in a sample. The next step of this work will be to use the eButton for cooking education intervention evaluation and as a support for self-
report tools. At the moment, it is unclear how accurately adolescents or parents can self-report detailed food preparation behaviors.

9) Methods: participants are described as 8-13 (study 1) and 9-13 (study 2) but abstract refers only to 9-13 year olds- please clarify.

Line 119 – 120: Methods section has been clarified, although 8 year olds were eligible for the first study, only those 9+ completed the study and were included in the analysis.

10) Describe the limitations of 1 day collection in more depth.

Lines 313 – 316: Further limitations have been added.

11) Describe how each day was selected within study 2, given that two days were recorded for these participants, and explain why consistency of coding was more important than (for example) comparing the two methods (using 1 day vs. an average of 2 days' data).

Lines 204 – 213: Clarification has been added. While comparing one day vs an average of 2 days of data may be useful for future iterations of this work, this study was exploratory and focused on the ability of the eButton to generate images that identify meal and food preparation behaviors. Given the nature of this study, the authors deemed it sufficient to analyze a single day for each participant. To address possible differences in the days selected for inclusion, day one and day two images were coded and compared for a sub-sample of study participants described in the manuscript (lines 204-213).
12) Please clarify line 138: 'This study utilized the activity categorization software to more easily identify food preparation events'. Does this mean that only sections where activity category fit the expected profile for food preparation were analyzed? If so what are the limitations of this? Were any recordings viewed from start to finish to determine whether this was a reliable way to identify these events?

Lines 144 – 147: This has been clarified in the text. The activity categorization software does not hide or delete any images, but allows for researchers to view them in distinct homogeneous activity segments. All participant images were viewed in their entirety from start to finish.

13) Line 140: Much more background needs to be given to describe how and why the specific food preparation behaviours were chosen to be coded. This mentioned in 'data analysis' but only very briefly. Were there other behaviours that were evident that did not fit the coding scheme?

Lines 147-177: The relationship between included food preparation behaviors and possible intervention targets is described. Behavior categories were kept very broad to encompass the range of demonstrated behaviors. If a new, previously un-coded, behavior was seen during preliminary review of images during codebook development (e.g. cracking eggs) the code was added to the appropriate overarching category (in this case “food prep”).

14) Line 148 did this behaviour only occur when served food by parents (i.e. not in cafes, etc?)

Lines 156 – 158: Clarification has been added to the text.
15) Line 151 and onwards: it was not clear to me how and why food media was classified as part of this study? For example watching a food show - how is this a food preparation behaviour? What about watching a food advert?

Food media was included as a behavior in this sample as it is relevant to interventions attempting to utilize new technologies in nutrition intervention and/or assessment. For example, a mobile phone based intervention such as that conducted by Nour et al 2016, may be able to use eButton images to identify how often a participant engages with the program on their phones, as well as their subsequent preparation behaviors.

16) Line 163-4. It was not clear to me how classifying prep work and cooking identified adolescents' cooking skills unless all children were actually asked to cook something?

Line 174 – 175: This has been clarified in the text. While technical skill may not be measured adequately in this sample given the purely observational nature of data collection, demonstrated skills and habits are identified. This is relevant for future interventions using the eButton as an assessment tool as it demonstrates the eButton’s ability to capture images of these behaviors.

17) Why is Table 3 presented only as presence or absence of behaviour rather than frequency? Is it correct that a child who looks in the pantry 20 times in the day is only coded as showing that behaviour and is not recorded differently from a child who does it once?

Lines 224 – 225: Clarification has been added. The reviewer is correct in the assessment that the coding is simply did or did not do the behavior. Future studies can adapt the eButton image categorization method to behaviors relevant to their outcomes of interest. For our purposes,
however, the coding was kept simple and broad to demonstrate the range of behaviors identifiable in eButton images.

18) P196-199 please clarify when you are saying 'did three or fewer behaviors' etc; does this mean any three, or three of the same behaviour? If the data are only really measuring whether the behaviour ever occurs in a day, doesn't this fail to exploit the potential of the method somewhat, and make the measure less sensitive? Is this really then significantly more effective that asking a parent or adolescent to report presence/absence of 7 behaviours across a day?

Lines 210-213: Clarification has been added. As indicated above, this exploratory study is the first to identify observationally the food preparation behaviors youth demonstrate beyond current self-report tools, which predominantly ask a single general question regarding children “helping” during food preparation. It is currently unclear how accurately adolescents or parents or can self-report food preparation behaviors.

19) Results: clarify if n=31 is before or after excluding those for whom data could not be analyzed.

Lines 199 – 202: This has been clarified in the manuscript, 31 participants were analyzed.

20) Lines 203-6. What kappa was reached for each subcategory? Were the disagreements mentioned in these lines resolved?

Kappa was not calculated by subcategory. Disagreements were resolved as per lines 189 – 191. After recoding, agreement was calculated. Final disagreements were discussed.
21) Lines 212-215. You state that food preparation activities were rare but for some of these you have recorded it for just under half the sample? This does not sound like 'rare' behaviour or 'low' as referred to in the early part of the discussion.

Lines 228 – 230: Language has been revised in the manuscript.

22) Lines 218-9 not clear where these analyses are, what they were, or what motivated them. The aim of the study did not mention examination of age differences. Please add the analyses to Table 3, or to a supplementary table.

Lines 222 – 224: Clarification has been added. Table 3 shows activity by age range (column). The table was organized this way given the potential variability in food preparation activities by age.

23) Phrasing of the interpretation of these analyses needs revision; it is stated that there are no significant differences but then the data are presented as if differences have been shown.

Lines 236 – 239: Language has been revised.

24) Please add a post hoc power analysis to justify the statement that small sample size drove the lack of significant differences in these analyses.
Lines 235 - 237: This has been added to the text. Post hoc power analysis shows variable power depending on activity observed and ranged from very low (3.1%) to moderate-low (70.4%). Neither of these percentages are adequate to observe significant differences between groups.

25) Discussion 249 and onwards: I was surprised not to see a major limitation with this study described: that of comparison of data generated by the eButton method to another method (self report, parent report). Please add this.

Lines 316 – 317: Limitation has been added.

26) Line 250: Assuming that shopping is a weekly event and no specific bias towards recording/shopping on a specific day, one could estimate that 7x 6.5% (45.5%) of your participants might engage in assisting with shopping? So this study is in fact plausibly entirely in line with yours?

Lines 267 – 273 / 315 - 316: Clarification and limitation has been added.

27) Line 258 clarify the study that the questionnaire data came from.

Line 274 – 276: Clarification has been added. Broad survey items, such as “In the past week, how many times did you help prepare food for dinner” have been used in past studies. The goal of the current study was to demonstrate how Ebutton images can help support, or show the limits of, such broad self-report assessment tools by adding detail with regard to specific behaviors.
28) Lines 267-9 refer to gender analyses that are not present in the paper nor supplementary materials. If you wish to include these please add a rationale for gender analyses and add the data and the appropriate analyses to a supplementary or main table.

Brief mention of gender analysis has been removed.

We hope these revisions are acceptable to warrant the publication of this manuscript. Please contact me with any further questions or concerns related to these revisions. Thank you for your kind consideration of this manuscript.

Sincerely,

Margaret Raber, MPH