**Author’s response to reviews**

**Title:** Describing associations between child maltreatment frequency and the frequency and timing of subsequent delinquent or criminal behaviors across development: Variation by sex, sexual orientation, and race

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**Author’s response to reviews:**

Our formatting responses were addressed as follows:

- A figure and table legend was added into the manuscript rather than as supplementary material
- Author contributions were changed to have initials.
- Figure 2 was added to the text.
- Figures were uploaded in the correct order.
- The clean version of the file was uploaded and the tracked changes version was added as supplementary materials.
- The waiver request was removed.
- The remaining footnote was added to the main body of the text.

Our responses are below and we also attached this as a word document in case it's easier to view that way:

March 26th, 2019

Dear Editor,

A point-by-point response letter is below. We provide a detailed response to each reviewer/editorial point raised, describing what amendments have been made to the manuscript text and where these can be viewed (e.g. Methods section, line 12, page 5). All changes to the manuscript are indicated in the text by track changes. We have included a track changes version as well as a clean PDF version of the paper in the online portal.

Thanks,

Hannah Lantos, Andra Wilkinson, Hannah Winslow, and Tyler McDaniel
Reviewer reports:
James Garbarino, PhD (Reviewer 1)
We wish to express our gratitude to Dr. Garbarino for reading and approving of our article.

Joshua P. Mersky (Reviewer 2):
Thank you to Dr. Mersky for his thoughtful and constructive feedback. We’ve done our best to address it point by point below. Reviewer comments are bulleted and our responses are in italics.

• To begin, the title of the manuscript implies that the study addresses the effects of maltreatment by timing (when) and frequency/dosage (how much). However, the measurement and analysis plan does not answer the question as to whether the effects of maltreatment vary as a function of timing (i.e., when the events occur). Frequency is estimated as a retrospective, point-in-time count. This is a fair way to measure maltreatment in general, but it is unable to tease apart the effects of frequency from the effects of chronicity and severity (on p. 5, the manuscript mistakenly contends that frequency and chronicity are the same, but they are distinct nosological features).

Thank you for pointing this out, it is an important point to note that chronicity and severity are different. We understand that a child could be yelled at regularly or beaten occasionally and that these are very different experiences. In the title, we meant for this to refer to delinquency (when, how much, and for whom) rather than maltreatment. We have made edits to the title to hopefully clarify this. On page 4, we have made edits to the introductory sentences in the first full paragraph in order to better capture these two distinct types of experiences. (Background section, approximately line 18, page 4). Also, on page 5, we clarified these two concepts. (Methods section, line 9, page 5).

• The manuscript repeatedly confuses moderating effects with basic group differences. To wit, the abstract states: "Evidence of moderation was found across sex and sexual orientation such that males were more likely than females to engage in both violent and nonviolent offending behavior…” This is not an example of moderation.

Thank you for catching this error in the abstract. We changed the abstract so that moderation is used to describe differences in the association between maltreatment and offending behavior by different demographic groups. Differences in offending or maltreatment alone are no longer described this way in the abstract (Abstract Results, lines 28-42, page 2). In the body of the text, we also made changes when moderation was discussed incorrectly (Results section, line 20, page 7).

• The Background section of the manuscript does not establish a strong or coherent rationale for the study. It does not appropriately synthesize the mature body of interdisciplinary scholarship in this area, and it does not identify an important gap in the evidence that the current study aims to address. The literature review shortchanges the prospective, longitudinal research that has been conducted in this area over the past 4 decades, including the many studies that have mined the Add Health dataset. As a result, the manuscript makes exaggerated and unfounded claims regarding the unique contributions of current study. For instance, the manuscript indicates that the use of self-report maltreatment data enhances the study's validity and novelty. Both points are debatable. Self-report data, like administrative CPS records, have limitations, and the Add Health dataset certainly does not offer rich and nuanced information on child maltreatment. Plus, again, scores of similar studies have used self-report measures of maltreatment.

We have included an explanation of the value of self-report data and still strongly believe that the racial and economic biases in the administrative data warrant continued studies with self-report data. This is not because the administrative data is not useful but rather because both have weaknesses and strengths and our scholarship contributes to the ongoing discussion of what the “truth” likely is (Background, approximately line 25+, page 4).
We have also integrated more citations that describe the existing, robust scholarship in this area into our literature review in the introduction (background, approximately line 5+, page 4  this now included at the end of the background section).

We have also highlighted some of the specific components of our study that are really important about our contributions but have removed broader statements about uniqueness.

• The study would be strengthened substantially by articulating research questions and hypotheses at the end of the Background section. As it stands, the study's aims are unspecific. The large number of analyses that were performed leaves the impression that the study was a methods- and results-driven expedition rather than a conceptually grounded one.

The two research questions and their hypotheses that we included in our initial proposal to OJJDP are now included at the beginning of the last paragraph in the background section and we include hypotheses in the text. (Background, approximately line 15, page 4). Note that we also included two subsequent RQs and hypotheses about protective factors in our OJJDP proposal and the results from those analyses have been submitted to BMC Public Health as a separate paper.

• Owing perhaps to the study's lack of specific aims, the Discussion section is diffuse and suffers from overgeneralized claims that stray too far from the data.

In this discussion section we have worked to streamline the summary and also refer back to the specific aims and hypotheses that are now discussed in the background section. (Discussion section, after line 59, page 9).

• Study limitations should be moved from the Conclusion to the Discussion. Additional limitations should be acknowledged such as the substandard reliability of the outcome measures.

We have moved the strengths and limitations section into the discussion section and added two more sentences to the conclusion about the importance of this work. (pages 11 and 12, line 43 and line 12 respectively, discussion and conclusion sections respectively). Though Add Health did issue a data correction for errors in the Wave IV measures of some of the violent delinquent behaviors, we employed their data correction and they do not believe it effected more than a small number of respondents. We investigated this error thoroughly in the data before addressing it and agree it affected a very small number of respondents. This, combined with the overall evidence of low social desirability bias in the data, give us confidence in our outcome measures. Additionally, as stated above we find value in study self-report data of delinquent and criminal behavior. Administrative data is also appropriate to be studied and should be used but our analyses add nuance to other studies.

Monica Malta (Reviewer 3):
Thank you to Dr. Malta for her careful comments about making the manuscript more readable. We’ve made edits and described them below for each point.

• However, and perhaps due to the breadth of data, the manuscript might be hard to follow for clinicians, policy makers, school teachers and nurses, among other key professionals working with neglect and/or abused children. BMC Public Health has a large audience, and a significant percent of readers are not statistically savvy to follow all tables and figures.

Thank you for bringing this to our attention, it is very important to us that the manuscript is accessible for BMC Public Health’s large audience. In order to make the manuscript easier to follow, we’ve removed the multivariate analysis tables and these will now be presented as supplemental materials. These were really meant to be viewed by people who wanted to understand the math behind everything
a bit more and we appreciate the argument that this might make the paper hard to follow for folks who are less interested in the math! We’ve removed Table 1 completely and then moved Tables 4, 5, and 6 to supplemental materials. We also made edits throughout the paper to change table numbers and remove table references for the tables that we removed. These small edits to table and figure numbers are throughout the results section from line 41 on page 6 to the end of page 8.

• Therefore, and trying to contribute somehow, I would argue that there is too much information for a single manuscript here. There are six tables and six figures (and some figures won't be easy to read in gray scale). Table 1 (mean and SD in offense frequency) is not necessary. Just highlight key information in the main text.

In addition to removing one table and moving three to supplemental materials, we also revised Figures 1a, 1b, and 4 to be more amenable to grey scale. We have made edits in the results section (page 8, line 31) to align with these changes. There were no changes needed for Fig 2 and Fig 3a/3b. In sum, these are the changes we made to tables and figures:

Fig 1a/1b: Changed solid to dashed line
Fig 4: Changed solid to dashed line and changed dotted line to mix of dots and dashes.

Table 1 – removed
Table 2  * now table 1
Table 3  * now table 2
Table 4  * now Supplemental Table 1 (S.1)
Table 5  * now Supplemental Table 2 (S.2)
Table 6  * now Supplemental Table 3 (S.3)

• Your first table should be a simple/basic SES Table. The study and all statistical analysis are fascinating, but keep in mind you are trying to publish on BMC Public Health. Therefore, a broad range of 'public health' professionals might read your manuscript, and not only researchers/statisticians. Try to keep it as simple and readable as possible; this is not a statistical journal. For every key finding, perhaps the authors could include either one figure OR a table. There is no need to present, for instance, two tables and two figures (Table 4 & 5, Figures 1a & 1b) to demonstrate the impact of sex on violent and nonviolent offending - choose the best method.

We have removed the complex tables and have summarized Figures 1a and 1b in the text and removed them (page 7, lines 22-28, results section).

• DISCUSSION: Try to avoid the use of colloquial phrases (e.g. "boys will be boys"), as this statement might have completely different meanings, depending on who is reading your comments. We removed this colloquial phrase. (line 12, page 10, discussion section)

• ABSTRACT: Please rewrite your results to better highlight (1) the large sample size you analyzed and (2) the key results, trying to avoid statistical concepts such as moderation, intercept, slope... Keep your abstract as simple and straightforward as possible. Clinicians, foster care professionals, educators etc. should be able to understand your key message here, even if they don't understand the statistics behind it. You could add mean/SD, p-value, if it seems necessary - but try to keep it as 'clean' and accessible as possible to a broad public health audience.

We removed key statistical terms from the abstract and also highlighted the large sample size and key findings.
• Reference #16 seems to be missing something. Is it a book? If it is, please add full citation. If that's a report, please add website (if available).
This is a website and for some reason several of the websites show up in our version of the paper but not yours. We’re including both a word version and a PDF version of the paper in order to hopefully address this if it happens again.

• Footnotes should be avoided. Try to move the information into the main text or the reference list, depending on the content.
We have removed the footnote that explained the terminology we used and included this in the main body of the text (Background, footnote is now in text, page 3).