

31 July 2019

Dear Dr. Saylor,

We hereby submit our revised manuscript entitled, “Early language experience in a Tseltal Mayan village”. We appreciate your and the reviewer’s additional comments to clarify a few more things in the paper and we are glad to hear that you think it’s much improved since the last round.

The main text of the manuscript is now 9217 words long (not including references). The 1 table, 6 figures, and Supplementary Materials are unchanged. In what follows, we address the individual points raised by yourself and by the reviewers. Please find our in-line responses below, marked with “>>” at the start of each one. Track Changes was not possible for our revision because we are using Rmarkdown to write this paper. Instead we have highlighted the changes to our main manuscript since our last submission as follows:

Green text = edits in direct response to Reviewer/Editor comment (see below for details)

Turquoise text = minor stylistic edits and updates to references in the text

Orange text = updated numerical information

█ = indicates that some text following this spot was deleted

Thank you very much again for your valuable feedback, and please do let us know if you need any other information.

Sincerely, The Authors

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Action letter from Dr. Saylor

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I am writing concerning the manuscript that you submitted for possible publication in Child Development. I asked both external reviewers to evaluate the manuscript and, in addition, read the paper very carefully myself. The reviewers' comments are below.

I am delighted to tell you that both the reviewers and I see potential for a significant contribution to the literature. Your response to the reviewers' comments was quite thorough. I'd like to commend you on your careful attention to their points and on a very strong manuscript. I look forward to seeing the work in print. Pending satisfactory attention to a few additional details raised in the reviews, I am pleased to say that I consider the manuscript to be substantively acceptable for publication. Before we proceed, I'd like you to address both Reviewers' minor comments (see below). I'd also like you to carefully edit the manuscript. Given that these changes are relatively minor, I will plan to review your revision carefully but will not send this out for further outside review.

>> We are very pleased to hear that we were able to adequately respond to the previous round of comments. We are grateful for your and their contributions, which have improved the paper greatly. Because you will not send the manuscript for further outside review, we have de-anonymized the text in this new version.

I would appreciate a brief cover letter explaining on a point-by-point basis how you have addressed each of the reviewers' comments, including the pages on which changes have been made. Please also include in your submission a track-changes version of your manuscript in addition to a clean version prepared in accord with APA style.

Please submit your revision electronically to the Child Development ScholarOne site at <http://mc.manuscriptcentral.com/childdev>. My hope is that the next version will be a final, acceptable one, but if not, I will let you know if further revisions are necessary.

>> Thank you for letting us know. Two of us will be away in remote Papua New Guinea, in a place where there is no electricity, from Aug 5–Oct 5, 2019 (developing annotations for a parallel analysis to this one, in fact). Therefore we may not be able to respond to further revision requests during that period. We will try to connect by satellite phone occasionally, but will have extremely limited access to the Internet.

Please note that final acceptance of your manuscript is also contingent on your fulfillment of all publication requirements of the Society for Research in Child Development and Wiley-Blackwell Publishers. Please do not send any of the final materials to the CD office until after your final acceptance. Details of the requirements are available at <http://www.srcd.org/publications/child-development/accepted-manuscript-requirements>

Please also note that Child Development has recently adopted a new sociocultural policy requiring authors to provide greater detail regarding their sample's characteristics and context. Full policy requirements and examples can be found

at http://www.srcd.org/sites/default/files/documents/sociocultural_policy.pdf

>> We believe our manuscript conforms to this policy.

Methodological Recommendations: In an effort to further Child Development's tradition of publishing rigorous research, we have put together a set of methodological recommendations for authors. Please review and ensure your paper adheres to them as fully as possible. The recommendations and more information can be found at

http://srcd.org/sites/default/files/documents/cd_methodological_recommendations.pdf

>> We believe our manuscript conforms to these recommendations.

I look forward to receiving your revision. Thank you for considering Child Development as an outlet for your work.

>> Thanks again for your consideration of our manuscript and for your helpful comments!

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Comments from Reviewer 1

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I found the revision to be much tighter and very enjoyable to read! What a fascinating line of inquiry, and the field will benefit from this contribution. I found the additions and cuts (paring back to sharpen the focus) to be spot on. The justification for only getting to 10 children is understandable in light of the massive work that went into the current data. I just offer a gentle warning to avoid what may appear to be piecemeal publications of the datasets as more data are analyzed (though I'm sure there will be many new stories to tell). In fact, the only thing that might be important to add is a statement on how this goes beyond the Cristia 2017 paper and others (beyond just being a different community- is there a new story told here? Or this a replication in a new sample? I wonder often how new papers of this important direction advance on the seminal work of Ochs & Schieffelin, rather than mirror the classics. NOTE I'm only stating this rhetorically, and by no means consider this to be a critique here, but I'd like to see a few novel take-homes highlighted if possible to point to what's novel)

>> We thank the reviewer for their positive comments and final piece of feedback to make the specific contribution of our paper clearer. We have added the following sentences to the conclusion: *“While this study substantiates prior ethnographic claims about the language environments of young Mayan children (and, indirectly, those of children in other small-scale traditional societies) it also adds important new complexity to prior quantitative descriptions of input (cf. Shneidman & Goldin-Meadow, 2012), particularly with respect to CDS over the course of the day and change with age. We use this new view of the children’s input to evaluate a number of mechanisms that could be used to explain how Tzeltal children extract language from their speech environments, setting up multiple avenues for future observational and experimental research.”*

Congratulations on such an impressive and thoughtful line of research.

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Comments from Reviewer 2

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Thank you to the authors for engaging so fully with the reviews. The manuscript is undoubtedly improved from their refocusing and reframing. This corpus is a valuable contribution to child language research and I look forward to reading more about the language learning environment in this community as the painstaking transcription work continues. A few points to consider:

>> We thank the reviewer for their positive comments and for their additional useful feedback!

Quantity of Other Directed Speech is one of the main measures analysed. This is not set up in the introduction, it would be useful for the reader if in the absence of a press of the literature that addresses this topic at least some allusion to this behaviour was made. For example, in the context of “(b) we should do more to explore other types of linguistic experience and other features of the learning environment that allow children to extract the information they need to learn language.” I would suggest a similar foreshadowing/justification from TCDS from other children.

>> Thank you for pointing out this gap in our background. We have added a foreshadowing note to this effect where you point: “..., for example nearby speech addressed to other people”. Together with the summary on other-directed speech in Shneidman & Goldin-Meadow’s paper, we hope that this will sufficiently foreshadow the purpose of our “other-directed-speech rate” measure.

The hypothesis that children's early vocal development would show no sign of delay is at odds with the interpretation of existing literature in this field proposed at the end of paragraph 1 on page 20.

>> The Reviewer is correct that we've written this in a confusing way. We have clarified as follows:

"Therefore, if we indeed find that Tseltal children hear relatively little CDS, prior literature would lead us to expect that the emergence of canonical babble would occur around the same age as it does in Western children, but that the emergence of single words and multi-word utterances would diverge from known middle-class Western norms. On the other hand, if prior ethnographic reports are accurate, then we should expect no sign of delay with respect to these vocal maturity benchmarks."

With respect to sampling, the following terms would benefit from some clarification (page 13):

(1) What does "best 1 minute clip" mean? How is this quantified, best in what respect?

>> We have added clarification as follows, *"the 'best' 1-minute clip (i.e., the clip with the most variable, most voluble interactive language use for that recording ..."*

(2) Is "turn taking" an appropriate proxy for input density. This is more a marker of interaction than purely input. Arguable any speech in the environment is input.

>> The Reviewer is correct that turn-taking clips pick out more than just 'input' alone; we are really looking for input where we are fairly certain that the child is attending and interactively engaged; thus we use turn-taking as a proxy. We have changed the phrase *"their most input-dense language environments"* to *"their most interactive-input-dense language environments"* to indicate this.

(3) Volubility and vocal maturity aren't the same thing, there is clarification of this later in the method that would be more useful at this point

>> We have added a straightforward clarification where we first introduce the idea of vocal maturity: *"Vocal maturity measures indicate children's use of adult-like syllables when they vocalize, and are distinct from their overall rate of producing vocalizations."* Thanks for this suggestion!

(4) Where vocal activity is mentioned, does this mean child or adult or both?

>> Thanks for this question! We feel this is already clearly defined in the text as follows: *"High-quality vocal activity clips were defined as periods in which the target child produced the most and most diverse spontaneous (i.e., not imitative) vocalizations"*. However, to avoid early confusion, we have changed *"their most mature vocal behavior"* to *"children's most mature vocal behavior"* where we first introduce the "vocal activity" sample.

This point is addressed somewhat in the discussion but there could be a better overall integration of findings from the random and high activity analyses. Without a sense of the number of peaks or bursty interactions that occur in a day, and given the assertion that these bursts may be especially important, it feels like an over-simplification of the findings to conclude that *"children were infrequently directly spoken to"*.

>> We agree with the Reviewer that our evidence is preliminary at best for this line of reasoning. Our first version of the paper featured more integration of the turn-taking and high-activity clips vs. the random ones in order to estimate the rate and duration of interactional bursts. I copy a brief segment from that original manuscript below. After some consideration, we think that we'll have to leave these analyses to a future paper. Our top reasons for deciding so are that (1) there are already quite some findings in the paper, (2) introducing the extra (and completely different style of) statistical analyses and processing pipeline associated with estimating the burstiness of the speech signal and the estimated baseline frequency and duration of interactional bursts would make the paper significantly longer, and (3) we think that our current estimates are on-track, but not yet reliable given the sparsity of the behavior—as a reminder, we have only been able to annotate ~11% of any given daylong recording. For the Reviewer/Editor's curiosity, here's the text from the original submission—removed from the current submission—summarizing what we have found so far on these data:

In total, 6 of the 10 children showed at least one minute of their random sample that equaled or exceeded the combined average contingent transition rate (12.89 transitions/min), and 7 of the 10 children showed at least one minute equaling or exceeding their own combined average turn transition rate from their turn-taking sample. Across the 6 children who did show turn-taking “peaks” in their random data, peak periods were relatively long, at an average of 88.95 seconds (median = 90.67 seconds; range = 71–103 seconds). Overall, children spent an average of 8.35 minutes per hour (median = 3.68; range = 0–34.98) in these peak interactions during the 45 scanned minutes. Assuming approximately 14 waking hours (Hart & Risley, 1995), we therefore very roughly estimate that the average Tseltal child under 3;0 spends an average of 116.85 minutes (1.95 hours) in high turn-taking, dyadic interaction during their day. Crucially, however, the range in the quantity of high turn-taking interaction varies enormously across children, starting at just a few minutes per day and topping out at more than 489.69 minutes (8.16 hours) in our 10-child sample. Much more data, particularly from other Tseltal children in this age range, is required to get stable estimates for the typical quantity and variance in peak interactional minutes experienced in a waking day.