Author’s response to reviews

Title: Individual and Organizational Factors that Affect Implementation of Evidence-based Practices for Children with Autism in Public Schools: A Cross-Sectional Observational Study

Authors:

Jill Locke (jjlocke@uw.edu)
Gwendolyn Lawson (glawson@upenn.edu)
Rinad Beidas (rbeidas@upenn.edu)
Gregory Aarons (gaarons@ucsd.edu)
Ming Xie (xiem@upenn.edu)
Aaron Lyon (lyona@uw.edu)
Aubyn Stahmer (astahmer@ucdavis.edu)
Max Seidman (seidmanmax@gmail.com)
Lindsay Frederick (lkf3@uw.edu)
Cristine Oh (cristine.oh@gmail.com)
Christine Spaulding (cspaulding9311@gmail.com)
Shannon Dorsey (dorsey2@uw.edu)
David Mandell (mandelld@upenn.edu)

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Author’s response to reviews:

Dr. Justin Presseau
Associate Editor, Implementation Science

Re: 18-00452 titled "Individual and Organizational Factors that Affect Implementation of Evidence-based Practices for Children with Autism in Public Schools"
Dear Dr. Presseau,

We appreciate your thorough review of this manuscript and the thoughtful recommendations of the reviewers. We have revised the manuscript to incorporate the reviewers’ suggestions, and we believe that the revisions have made this a stronger manuscript. Attached to this letter is an itemized list of each item with a direct response in italics. Please let me know if you need any additional information to assist in your review.

Thank you very much.

Reviewers’ comments:

Dr. Presseau

1. While this paper has potential, it is largely an exploratory analysis that lacks a specific theoretical model to underpin hypothesized relationships between individuals and organizational factors beyond that they will independently predict EBP use. That said, the broader question of statistically testing organizational and individual factors in the same model is appealing and addresses silos in the literature, as does consideration of multiple different EBPs as opposed to only one. It is these broader contributions to implementation science that this paper may especially speak to and should be emphasized to a greater extent in the introduction and discussion.

We appreciate this feedback and have revised the manuscript to include the broader contributions to implementation science.

2. Given the reviewers’ comments, please reformat this paper as a ’short report’ which would more appropriately reflect its contribution and would help to concisely highlight the key messages of the findings (see: https://implementationscience.biomedcentral.com/submission-guidelines/preparing-your-manuscript/short-report)

We have reformatted this paper as a short report.
3. Clarify a priori sample size calculation details for the analyses presented.

The a priori sample size calculation was based on 150 participants with $\alpha = 0.05$, which would allow us to detect relatively small associations (Cohen’s $f^2 = 0.12$). We have added additional information about a priori sample size calculations for the analyses on page 12 of the revised manuscript.

4. Clarify the study design (cross-sectional?).

We have clarified that we used a cross-sectional observational study design on page 7 of the revised manuscript.

5. Drop the ‘sensitivity analysis’, which amounts to a post-hoc sample size calculation. It is generally well recognized as something to be avoided. If you did not run an a priori sample size calculation, state this as a limitation in the limitation section rather than conducting a post-hoc sample size calculation.

We have removed the sensitivity analysis in the revised manuscript.

6. Add effect sizes to abstract (p values not as informative).

We have added effect sizes to the abstract and removed the p-values.

7. Clarify contribution to implementation science in the discussion. At present, the finding seems to be ‘teachers with positive attitude towards EBPs report greater use of one of three EBPs”; that is not especially novel as a finding… the relationship between attitudes and behavior is well established. There are however two potential novel contributions that could be flagged in terms of broader implications for the field: a) the consideration of organizational and individual factors in the same model, which is not common (many approaches tend to take either organizational or individual approach); there is scope to underscore this and to discuss why individual factors were associated but organizational factors were not; and b) the consideration of multiple EBP use competing for limited time and teachers having to potential prioritize between multiple EBPs; there is scope for underscoring this concept and its implications more broadly for implementation science (and a few papers on the topic published in IS and elsewhere that could be used to make this point). Thus in sum, discussing the findings not only in relation to the specific setting in which the study was conducted, but also drawing conceptual implications for the broader readership would be valuable.
We appreciate this feedback. We have highlighted each of these contributions on pages 14-15 in the revised manuscript.

8. Add R-square values to Table 4 for each model, which would help to clarify the amount of variance explained in intensity for each EBP and would help to clarify how many different models were run as presented in Table 4 (I assume this represents 6 different models?).

We have added R-square values to Table 4 for each model in the revised manuscript.

9. Given that the models in Table 4 combine consideration of individual and organizational factors, why not present the bivariate correlations between individual and organizational factors in the same correlation matrix (i.e. combine Table 2 and 3), which would also help the reader to start to assess whether multicollinearity might be at play.

We have combined Tables 2 and 3 in the revised manuscript.

10. Minor point: Tables should stand alone and thus please add a foot note explaining all acronyms or spelling out in the table (this is done inconsistently).

We have added a foot note explaining all acronyms in the Tables in the revised manuscript.

11. Minor point: many acronyms make the paper difficult to read. Consider reducing the use of acronyms to as few as possible.

We have reduced the number of acronyms in the revised manuscript.

Reviewer 1

Abstract

1. Based on your study aims and findings it seems more appropriate to change this "school staff vary in their implementation of autism evidence-based practices (EBPs)" to simply be "but
implementation of evidence-based practices (EBPs) for autism vary." Either way, the phrasing "autism evidence-based practices (EBPs)" needs to be changed.

We have changed the phrasing per this reviewer’s recommendation.

2. If you introduce the EBP acronym in the Abstract, then be sure to use it thereafter (it appears multiple times in the Abstract all spelled out).

We apologize for our oversight. We now use the EBP acronym throughout the abstract.

Background

3. Missing parenthesis after "mental health providers" on page 5.

We apologize for our oversight. We have added the missing parenthesis on page 6 of the revised manuscript.

4. Current Study section on page 7 has a number of redundancies with the preceding paragraph. Please remove reference to "this study" in the preceding paragraph and focus on Background more generally.

We apologize for the confusion. We have revised this section to focus on the Background more generally.

Remainder

5. Seems that a reference for the term "EBP fatigue" is needed on page 7 as this is not a common concept.

A reference (Locke et al., 2018) for “EBP fatigue” has been added to page 7 of the revised manuscript.
6. Participants section (page 8). It seems that this study was conducted in both Washington and Pennsylvania, correct? If so, the teachers, schools, classrooms, etc. also need to be broken down by state as this is an important level to consider. This should also be considered in the analytic plan but the small sample size could make it challenging to fully explore.

The principal investigator switched institutions during the course of the study, which is why both university institutional review boards approved the study. Only data collected in Pennsylvania are reported in this study because this is the primary location in which this study was conducted.

7. One page 9, the authors state, "Ongoing training was provided to teachers and classroom staff in three EBPs (DTT, PRT, VS) for children with autism [44]." This makes it sound like the current study was conducted within a larger project. This needs to be clearly stated and additional information about the parent study needs to be provided in the Background. In fact, this entire paragraph should probably be in the Background with additional information to contextualize the parent study and how the current study fits in.

We apologize for the confusion. We have modified the manuscript on p. 7 to indicate that we conducted a cross-sectional observational study of factors related to implementation fidelity in school districts that had already decided to implement these 3 EBPs as part of their curricula in accordance with a national trend in the United States to improve school services for children with autism. On p. 8, we now indicate that, based on the school districts’ decision, training and coaching were already set to be provided by a purveyor organization to teachers and staff.

8. Page 9. What does it mean, "Following Pellecchia and colleagues" does this mean using their method or were their results used (this assumes the same trial for this paper and their study but this isn't clear to the reader)?

We apologize for the confusion. We used the same method that was described in the Pellecchia and colleagues’ article. This has been clarified on pages 9-10 of the revised manuscript.

9. Page 11. Reliabilities and other psychometrics for this study need to be presented for the ICS and ILS. [I see now that ICCs are presented for these scales in the Data Analysis section - they need to be moved to the measures section as establishing their reliability etc. was not a central aim of the study].

We appreciate this feedback. We have added reliabilities and other psychometrics for the ICS and ILS to the measures section on pages 11-12 of the revised manuscript.
10. Page 12. The Sensitivity Analysis section seems unnecessary. Is there a reason this is included?

We have removed the Sensitivity Analysis from the revised manuscript.

11. Regression analyses and reporting of the results are well done. One question, to improve measurement properties, was a composite measure considered for the three EBPs? This seems appropriate given that it could be argued that they are non-independent and analysis of them individually has the potential to inflate Type I error (thus, a Bonferroni correction or similar would need to be used).

We appreciate the reviewer’s comment. A composite measure was not considered for the three EBPs because each practice was unique in its implementation and independent of the other.

Reviewer 2

Background

1. I would suggest this be completely re-structured as it makes many assumptions about reader’s existing knowledge. I recommend that this should begin with setting the scene/context of the research much earlier. This could be done by moving the paragraph on page 7 commencing at line 12 with the sentence "Schools are the primary setting....." to the beginning of the Background section, making sure to define ASD. After the definition of EBPS (currently on page 5 - line 14), there should be a brief explanation of types or examples of these in relation to ASD. Page 5 - Line 24 - the closing bracket is missing after "system"?

We appreciate the reviewer’s suggestion. We have re-structured the manuscript per this reviewer’s suggestion.

Participants

2. Replace single numerals 9 and 1 with written numerals i.e. "nine" and "one'.

We have replaced single numerals with written numerals throughout the revised manuscript.
Procedure

3. What study design was employed? My initial read of the manuscript to this point suggested a cross-sectional study but later references to "months 5 - 9" suggested otherwise. Is this an intervention trial? If so, the exact study design employed needs to be spelled out. If it is an intervention trial, what about a control group?? More details are required about the total number of schools approached and consent rates. Page 9 - line 14 - "Ongoing training provided to teachers" -- also suggests an intervention trial. More information is required - Who provided the training? For how long? Intensity, duration, frequency etc.?? What was the time period or timeframe between "training" and conducting the surveys?

We apologize for the confusion. This was a cross-sectional observational study and not an intervention trial. We have elaborated on our study design on page 7 of the revised manuscript. We also provide additional details about the number of schools approached and consent rates on page 8 of the revised manuscript. Additional information regarding the training has been added to pages 8-9 of the revised manuscript along with a timeline of study activities (e.g., data collection).

Measures

4. Page 10. Line 29. Please insert a statement after listing EBPAS, ILS, ICS - that these will be explained in the section below.

We have included a statement that explanations for each measure will be forthcoming on page 10 of the revised manuscript.

Reviewer 3

1. Since Implementation Science has an international audience, suggest editing the manuscript text to make clear that the context of this study is American, especially in Abstract and Background sections, and to explain contextual factors that non-Americans may not understand.

We have indicated that this study was conducted in the USA and have explained contextual factors that are unique to the USA.
Abstract

2. Background: "Children with autism receive most of their care in public schools…": Clarify what you mean by "care."

We apologize for the confusion. We replaced “care” with “intervention services” on page 3 of the revised manuscript (abstract).

3. First two sentences of Results section refer to methods, so would move them into the Methods section.

We appreciate this feedback and have moved the first two sentences of the Results section into the methods on pages 11-12 of the revised manuscript.

4. Make clear in Results section that divergence and appeal are individual factors, and that there were no significant findings for any EBP other than DTT. Also since divergence was one of only two significant findings, you may wish to elaborate briefly in the Abstract on what divergence means, particularly acsince it does not seem intuitively to be an attitude, and this may cause confusion for some readers.

We have clarified the results section per the reviewer’s feedback. We also have defined divergence and appeal in the abstract to ensure clarity.

5. Conclusions: "Future implementation efforts ought to consider the type of EBP…": Why? Explain so that the reader understands how you are drawing this conclusion from the results listed above.

Because this study examined the simultaneous use of three EBPs in one study, and the results highlighted significant relationships for some EBPs over others, it is important to consider the type of EBP that is implemented. We have elaborated on this point on pages 16-17 of the revised manuscript.
Background

6. In the first two paragraphs of this section, explain the context of the literature you are citing. Which of these studies are focusing on school-based autism EBPs versus EBPs in other contexts? We have clarified the context of the literature cited in the introduction of the revised manuscript.

7. p. 6: What is the difference between implementation climate (characterized as easier to change) and organizational climate (characterized as difficult to change)?

Implementation climate is defined as “staff beliefs on whether use of an innovation is expected, rewarded, and supported by their organizations.” Organizational climate is defined as “shared perceptions of the psychological impact of the work environment on employees’ well-being and functioning in the organization.” We have clarified the difference between implementation and organizational climate on page 6 of the revised manuscript.

Current Study

8. p. 7: How is "greater use of autism EBPs" distinct from "intensity of use of EBPs"? In the same sentence, I don't understand the distinction you seem to be making between how individual and organizational factors will affect the former versus the latter. In particular, can you be more specific about what you hypothesize in terms of how the individual and organizational factors will affect intensity of use? Separate, more formalized statements of each hypothesis may help to clarify them for the reader.

We apologize for the confusion. “Greater use of autism EBPs” is equivalent to “intensity of use of EBPs.” To maintain consistency, we use “intensity of EBP use” throughout the revised manuscript. We have clarified our hypotheses for how individual and organizational factors will affect intensity of use on page 7 of the revised manuscript.
Participants

9. What is the difference between teachers and staff in terms of their classroom roles and how they may have been trained in EBPs and in how they were expected to implement EBPs? Why did you choose to include both types of practitioners in the study?

The difference between teachers’ and staff’s roles and training has been added to page 7 of the revised manuscript. Both types of practitioners were included in this study because they play a critical role in implementation of the three EBPs examined in this study.

10. Explain why there are more staff than teachers.

In these schools in the northeastern USA, there is generally one teacher per classroom; however, because the classrooms in which this study took place are self-contained autism-support classrooms, there are more staff members to support instructional activities in each classroom. This has been noted on page 7 of the revised manuscript.

11. Why detail the demographic characteristics of the teachers in the text, but not the staff’s? Suggest treating both sets of demographics similarly.

We reference Table 1 for both teachers’ and staff’s demographic data on page 7 of the revised manuscript.

Procedure

12. Did all schools and classrooms within the targeted study population agree to participate in the study? This information needs to be included, and if some schools and classrooms declined, the numbers of targeted versus declined schools and classrooms should be reported.

We have added information regarding study participation on pages 7-8 of the revised manuscript.

13. Similarly, what was the response rate of the teachers and staff to the survey?

We have added the response rate of teachers (67/70 teachers; 96% response rate) and staff (85/96; 89% response rate) to the surveys on page 8 of the revised manuscript.
14. Is there anything unique about this school district that would limit generalizability of the results to other U.S. school districts?

We appreciate this question. The school district in which these data were gathered is one of the largest school districts in the United States and represents a racially/ethnically and socioeconomically diverse population of families and students. We have noted that generalizability to other US school districts may be limited on page 16 of the revised manuscript.

Measures

15. p. 10: "A research assistant visited each classroom monthly to assess intensity of EBP": Why was this done and how was the RA's assessment of intensity reconciled with the teacher's assessment? Why were classroom staff's assessments not used?

We apologize for the confusion. A research assistant visited each classroom monthly to gather data on intensity of EBP via teacher and classroom staff report. This has been clarified on pages 9-10 of the revised manuscript.


We have spelled out the acronyms in the revised manuscript.

17. p. 10: Please provide definitions for appeal, requirements, openness, and divergence.

We have added definitions for each of these subscales on page 10 of the revised manuscript.