**Peer Review and Communication History**

**MS Title**: Are cognitive ability and conscientiousness really more important for educational attainment than SES? A replication and extension of O‘Connell and Marks (2022)

**Author Name**: Felix Bittmann

**Submitted:** May 18, 2022

**Editor First Decision**: Revise & Resubmit

June 30, 2022

Dear Dr. Bittmann,

Thank you for submitting your work to Collabra: Psychology. I sent the paper to two experts who are well qualified to review this paper. I thank these individuals for their service to this journal and for their timely reviews. I independently read the paper and then consulted the comments from the two reviewers.

As you will read below, the Reviewers and I think this work has promise. I believe a revised manuscript would likely meet publication expectations at this outlet providing there are changes that address the questions/concerns raised by the Reviewers and in my letter. The Reviewers did an excellent job so please attend to each of their points either in the revision or in the letter of response. I will outline my reactions in this letter. I acknowledge that you might disagree with some (or all) of our points so feel free to pushback against any suggestions you believe will harm your work. Just describe your counterpoints in the letter.

My reactions in rough order of appearance in the paper.

1. The Introduction is well organized and efficient. However, I think more could be included about possible processes behind why certain variable are considered confounders. Indeed, I think a additional few sentences explaining the logic of the concerns about each specific variable will enhance the paper. In other words, explaining why it is important to control for specific variables and what that means for the inferences drawn from the analyses would enhance the paper.
2. A few minor issues in the Introduction/Method section:
a. I think you mean scales on page 3 rather than Big Five items?
b. I think the discussion about confidence intervals on page 4 should specify that you mean CIs on standardized coefficients.
c. It might be useful to spell out the implications (if any) of moving from 5,778 to 4,607 students).
3. It might be useful to note potential concerns with attenuated effect sizes when using short measures of the Big Five domains. Crede et al. (2012) is an almost classic citation now:

Credé, M., Harms, P., Niehorster, S., & Gaye-Valentine, A. (2012). An evaluation of the consequences of using short measures of the Big Five personality traits. Journal of personality and social psychology, 102(4), 874.

1. Would including path coefficients in a version of Figure 1 make sense? I know this is complicated because there are 5 personality trait domains, but I thought I might be worth considering so readers get a picture of the effect sizes in question and an understanding of which personality domains are most relevant to the current discussions.
2. I think Reviewer #1 raises a good point about alternative models. What would happen if SES and cognitive ability were simply considered as correlated predictors of educational attainment rather than assuming SES as a statistical predictor of cognitive ability?
3. I think the point about the importance of maternal cognitive ability on page 17 being included or omitted from models needs to be explained a bit more for readers.
4. I appreciate the Discussion of limitations in the paper, but it might be too brief. For example, it might be helpful to readers to spell out if there are plausible untested alternative models that could be considered in future research. Likewise, I think you might be able to flesh out concerns with secondary data analysis and with causal inference using observational data. This way readers are crystal clear about the strengths and limitations of the current work.
5. I think the suggestion from Reviewer #1 to specify models with interaction terms would be worthwhile. These just need to be indicated as exploratory analyses to readers and presented with appropriate caveats. This paper might be interesting to consider:

Damian, R. I., Su, R., Shanahan, M., Trautwein, U., & Roberts, B. W. (2015). Can personality traits and intelligence compensate for background disadvantage? Predicting status attainment in adulthood. Journal of personality and social psychology, 109(3), 473.

That was it for my reading.

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Thank you for trusting us with your paper. If you have any questions or difficulties during the revision process, please do contact us. Good luck revising this work.

Kind Regards,

Brent Donnellan

**Reviewer 1**

**Rating scale questions**

|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
| --- | --- | --- | --- | --- | --- |
| The study/studies in this manuscript have strong construct validity (good measures and/or manipulations of the constructs the authors wish to study). (Choose “Neutral” if this is not an empirical manuscript) |  |  |  | ✔ |  |
| The study/studies in this manuscript have strong statistical validity (appropriate statistical tests, assumptions are clear and reasonable, no statistical errors, appropriate statistical inferences, etc.). (Choose “Neutral” if this is not an empirical manuscript) |  |  |  | ✔ |  |
| The study/studies in this manuscript have strong internal validity (any causal claims or implications are well-justified, alternative explanations are thoroughly considered, etc.). (Choose “Neutral” if this is not an empirical manuscript, or no causal claims are made or even vaguely implied.) |  |  |  | ✔ |  |
| The study/studies in this manuscript have strong external validity (authors appropriately constrain their conclusions based on the limits of the generalizability of their findings to other contexts (including from lab to real world), other populations, other stimuli or measures, etc.) |  |  |  | ✔ |  |

**Open response questions**

Please write your review here. The author(s) will see this review. Your identity will not be revealed to the authors unless you also include your name (i.e., sign your review) in this box. It is up to you whether to reveal your identity or not, either is fine.

The purpose of the research reported in this manuscript was to further investigate relative influences of socioeconomic status (SES) and psychological traits (cognitive ability, personality) on educational attainment (EA). Using dominance analysis, the author shows that cognitive ability and conscientiousness each account for about twice the amount of variance in EA as SES does (roughly 5% vs. 2.5%). This is an important, newsworthy finding, and the study has much to recommend it, including validated measures of the psychological traits and a large-N (from Germany).

I have two major comments:

(1) The present analyses consider main effects of the predictor variables on EA, but it would also be interesting to consider interactions. The interactions that seem particularly interesting are: SES x g, SES x C, and g x C predicting Grades. For example, does a high level of g compensate for a lower level of SES (an under-additive interaction)? or vice-versa: Does g amplify the effect of SES (an over-additive interaction)? I think it woudl be interesting to include these analyses under an “Additional Analyses” section.

(2) It appears that the author has access to multiple indicators for each presumed latent construct, e.g., reasoning, speed, and mathematics reasoning for g. Why not include, in addition to the analyses presented already, latent-variable models?

And one other comment:

(3) Is it worth considering alternative models? The present anaylses assume SES influences g (see the path model figure). But this model may not be correct: one could make an argument that the variables should just be correlated, or perhaps even that the path goes from g to SES based on gene-environment correlation, i.e., that the g variable reflects genetic variance, and that some of same genetic factors driving this contribute to SES in parents (bright parents are able to earn higher wages and go farther in school, and pass these genes along to their kids).

That’s it.

**Reviewer 2**

**Rating scale questions**

|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
| --- | --- | --- | --- | --- | --- |
| The study/studies in this manuscript have strong construct validity (good measures and/or manipulations of the constructs the authors wish to study). (Choose “Neutral” if this is not an empirical manuscript) |  |  |  |  | ✔ |
| The study/studies in this manuscript have strong statistical validity (appropriate statistical tests, assumptions are clear and reasonable, no statistical errors, appropriate statistical inferences, etc.). (Choose “Neutral” if this is not an empirical manuscript) |  |  |  |  | ✔ |
| The study/studies in this manuscript have strong internal validity (any causal claims or implications are well-justified, alternative explanations are thoroughly considered, etc.). (Choose “Neutral” if this is not an empirical manuscript, or no causal claims are made or even vaguely implied.) |  |  |  |  | ✔ |
| The study/studies in this manuscript have strong external validity (authors appropriately constrain their conclusions based on the limits of the generalizability of their findings to other contexts (including from lab to real world), other populations, other stimuli or measures, etc.) |  |  |  |  | ✔ |

**Open response questions**

Please write your review here. The author(s) will see this review. Your identity will not be revealed to the authors unless you also include your name (i.e., sign your review) in this box. It is up to you whether to reveal your identity or not, either is fine.

This is a strong paper. It takes as a starting point a different recently published paper, with a model that makes claims around the relative weights of personality traits and cogntive ability in predicting educational outcomes for a large representative sample of British students. Using a large sample of German students, it replicates the original model. However, it then goes further by employing a more sophisticated statistical design, and demonstrates that school placement within the German system is a mediating variable. This- as the title suggests - both replicates but also extends the original model. Detailed sophisticated statistical analyses, with a large representaitve sample, robust measurements, and a clear interpretation.

**Author Response**
July 7, 2022

See a separate PDF file in supplemental materials (v2\_1723420-response\_letter).

**Editor Final Decision:** Accept

July 14, 2022

Dear Felix Bittmann,

I have now had a chance to read your manuscript “Are cognitive ability and conscientiousness really more important for educational attainment than SES? A replication and extension of O‘Connell and Marks (2022)”, along with the letter describing the changes you made in response to feedback. Thank you for your responsiveness to the concerns raised in the review process. I am happy to say that your paper is now officially accepted for publication in Collabra: Psychology. Congratulations on this excellent work, I think it will make an important contribution to the literature and I look forward to seeing it published. I hope your experiences with Collabra: Psychology have been positive and that you will continue to consider it as an outlet for your work.

As there are no further reviewer revisions to make, you do not have to complete any tasks at this point.

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You will have an opportunity to check the page proofs before we publish your article. Thank you again for publishing in Collabra: Psychology.

Sincerely,
Brent Donnellan