**Cover letter**

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Dear editor(s),

Following up on our pre-submission enquiry and ensuing email conversation, we hereby wish to submit an original research article entitled *‘Replication value as a function of citation impact and sample size’* for consideration by Meta-Psychology.

We confirm that this work is original and has not been published elsewhere, nor is it currently under consideration for publication elsewhere. A preprint version of the article has been uploaded to MetaArXiv: <https://doi.org/10.31222/osf.io/knjea> (version 6). Data and analyses files relevant to the manuscript can be found in the following OSF project: <https://osf.io/e35pu/>. The manuscript should be eligible for the open data and materials badges.

**Article abstract:**

*Researchers seeking to replicate original research often need to decide which of several relevant candidates to select for replication. Several strategies for study selection have been proposed, utilizing a variety of observed indicators as criteria for selection. However, few strategies clearly specify the goal of study selection and how that goal is related to the indicators that are utilized. We have previously formalized a decision model of replication study selection in which the goal of study selection is to maximize the expected utility gain of the replication effort. We further define the concept of replication value as a proxy for expected utility gain (Isager et al., 2020). In this article, we propose a quantitative operationalization of replication value. We first discuss how value and uncertainty - the two concepts used to determine replication value – could be estimated via information about citation count and sample size. Second, we propose an equation for combining these indicators into an overall estimate of replication value, which we denote RVCn. Third, we suggest how RVCn could be implemented as part of a broader study selection procedure. Finally, we provide preliminary data suggesting that studies that were in fact selected for replication tend to have relatively high RVCn estimates. The goal of this article is to explain how RVCn is intended to work and, in doing so, demonstrate the many assumptions that should be explicit in any replication study selection strategy.*

We believe Metapsychology would be a natural fit for this article given the scope of the journal. Though our article is not targeted at researchers in psychology specifically, we believe it would be of substantial interest to Meta-psychology’s audience given the significance of replication research to metascience in psychology, and due to the promotion of this research practice by Metapsychology itself. We hope you will agree with this assessment.

Assuming you agree, and assuming the article passes rigorous peer review, we would like to invite independent researchers to write commentaries on our article which could be published alongside (in the same issue as) the main manuscript. We believe there is much room for critical discussion of the study selection strategy we propose, and have already seen some differing viewpoints about the technical aspects of the measurement model that supports *RVCn,* about the underlying theoretical model, about potential alternative operationalizations of *replication value*, etc. We would like to facilitate this discussion by inviting stakeholders with no personal stakes in our proposal to give comment on the strategy we propose. Please find a list of suggested invitees at the end of this letter. Naturally, the decision of who to invite should be left with the editorial team.

**Possible conflict of interest:** Daniël Lakens is a member of the Meta-Psychology editorial board. He will not to be involved in any aspect of the review process of this manuscript, or of any commentary articles.

We look forward to hearing your thoughts on our inquiry.

Sincerely,

Peder Mortvedt Isager, Daniël Lakens, and Anna van ‘t Veer.

**List of possible commentary invitees:**

* Gilad Feldman.
  + Has expressed interest in writing a commentary.
  + Expert on running and organizing replication efforts. He has been quite sceptical of our previous work on this topic, and I am fairly sure he would offer a critical view on our current proposal.
* Sarahanne Field/Merle Pittelkow/Don van Ravenswaaij.
  + Has expressed interest in writing a commentary.
  + Current co-authors on a project related to our manuscript.
  + Have written several independent articles relevant to the subject, including <https://doi.org/10.1525/collabra.218> and <https://psycnet.apa.org/fulltext/2021-72420-014.html>.
* Jordan Wagge (or other member of the CREP team).
  + Has expressed interest in writing a commentary.
  + Expert on running and organizing replication efforts.
  + CREP is exactly the kind of organization that may find itself in need of choosing which of several proposed replication studies to focus available resources on.
  + Importantly, CREP has already implemented procedures for prioritizing studies for replication. As far as I know, this has happened completely independently of our own work.
* Youyou Wu/Yang Yang/Brian Uzzi.
  + Currently working on a machine-learning method for estimating *uncertainty*, which offers an alternative to the sample-size based method we proposed:
  + Relevant publication: *Estimating the deep replicability of scientific findings using human and artificial intelligence* (<https://doi.org/10.1073/pnas.1909046117>)
* Collaborators from a previous joint effort to create replication value indicators: <https://osf.io/83yan/>.
  + Collaborators disagreed substantially about how replication value should be operationalized.
  + Some but not all collaborators ended up as co-authors on the theoretical paper that our current manuscript is based on: <https://osf.io/preprints/metaarxiv/2gurz/>
* Aurélien Allard/Simine Vazire.
  + Authors of commentary relevant to the subject: <https://psyarxiv.com/wusdr/>
* Rob Heirene.
  + Has written article on replication study selection in addiction research: <https://doi.org/10.1080/16066359.2020.1751130>
* Fiona Fidler (or other member from the RepliCATS project).
  + Experts on researchers' assessment of uncertainty/replicability.
* Nicholas Coles (or other member of the Psychological Science Accelerator).
  + PSA is exactly the kind of organization that may find itself in need of choosing which of several proposed replication studies to focus available resources on.
* Rolf Zwaan (or another coauthor from article).
  + Relevant article: *Making replication mainstream* (<https://doi.org/10.1017/S0140525X17001972>)

* Anton Kühberger/Michael Schulte-Mecklenbeck.
  + Relevant article: *Selecting target papers for replication* (<https://psyarxiv.com/wuh8t/>)
* Tom E. Hardwicke (or another coauthor from article).
  + Relevant article: *A Bayesian decision-making framework for replication* (<https://psyarxiv.com/n3yah/>)

* Alcino Silva/Nicholas J. Matiasz
  + Silva and collaborators have written extensively on the broader issue of deciding which research to conduct based on existing research.
  + Have previously proposed alternative operationalization of *uncertainty* as entropy minimization in a causal equivalence class: <https://doi.org/10.3389/fninf.2017.00012>