Title: Must replication attempts be battlegrounds?

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Publishing failed replications can be like throwing down the academic gauntlet: we enter into a combative narrative, where either the original study's finding was "false" or "unreliable", or the replicators did a poor job, having missed a crucial methodological detail, sampled their participants differently, or so on. This combative approach towards replications is evident in the article by Huber, Potter, and Huszar (2018), who argue that reviewers of a replication must necessarily be different from the original authors of a study. One can appreciate that having an original study author amongst the reviewers may lead to hostile reviews that halt publication, if the replication has not produced the desired result. Of course, this problem does not just apply to replications, but to all studies that pose a threat to a researcher's pet-theory, or a shining publication. As scientists, we are supposed to take an objective approach to data, not allowing biases or vested interests in particular theories or papers to cloud our judgement. It follows that discussion about conflicting findings should be constructive, not destructive. Blocking the publication of a "failed" replication of one's own work is obviously not aiding scientific progress, but I am not convinced that banning original authors from the chance to review, comment on, or contribute to replication attempts is constructive either.

Indeed, while clearly Huber et al.'s (2018) experience having the original study authors as reviewers on their replication was negative, this is not the case for all. In a recent discussion of their experiences doing a registered report (Chambers, 2016; for the report see Ratner, Burrow, and Thoemmes, 2016), a different group of authors note the positives of having one of the original study's authors as a reviewer of their replication. These are two very different experiences: Huber and colleagues battled with their reviewer, while Ratner et al. (2016) entered into a collaborative enterprise with theirs. Arguably the publication format of a registered report may offer a protective environment for those conducting a replication; the original authors have the chance to point out any methodological differences to their original paper prior to data collection, and rejection of final

papers after the final results are known is not allowable if reviewers have agreed in advance that the methods are sound.

Replications (or more broadly studies that challenge previous results or theories) do not have to be battlegrounds, and frameworks exist to help scaffold more cooperative working. One such framework is "adversarial collaboration": intentional partnerships between research groups who have different predictions for the data. These inter-group arrangements were recently discussed as a potential solution to poor reproducibility resulting from scientists' own biases towards their data (Nuzzo, 2015; though these ideas are not particularly new; see Kahneman, 2003). In theory, projects arising from these collaborations may be more likely to be designed in such as a way as to actively test competing hypotheses. In addition to more rigorous designs, intentionally including rivals' inputs should allay some of the "story-telling" Huber et al. (2018) decry: having multiple perspectives dilutes the "just-so" story being told, as now there are multiple competing stories that will need to be weighed objectively in the project's final reports.

In the field of neuroscience, adversarial collaborations appear to have been rarely entered into. One potential reason for this could be a lack of strong theoretical frameworks in neuroscience (as discussed in Krakauer, Ghazanfar, Gomez-Marin, MacIver, & Poeppel, 2017), as the adversarial collaborative model relies on the presence of competing hypotheses generated from theory. Examples of adversarial collaborations can be found in cognitive science; the example that is oft cited is that by Mellers, Hertwig, and Kahneman (2001), which contains broad tips for establishing and conducting an adversarial collaboration. Another recent example in cognitive science of such an arrangement is the study by Matzeke et al (2015).

Undoubtedly these arrangements require careful planning and sensitive diplomacy, and sometimes may be impossible to set up, but wider adoption of this practice has much to offer the field of neuroscience. To promote such models of working, some incentives and support structures will be necessary: these could include special issues that explicitly invite adversarial collaborations for publication, or research funding set aside for proposed adversarial collaborations to apply for.

Prompting neuroscientists to approach their work in this way may also encourage stronger theorizing with more explicit linkage of neuroscientific experiments to cognitive theories, linkage that has been argued to underpin most significant advances in understanding of neural basis of behaviour (Frank & Badre, 2015).

In conjunction with the explicit division between confirmatory and exploratory research, as outlined by Huber et al. (2018), I propose a wider move towards these collaborative frameworks. These arrangements actually lend themselves well to preregistration, given that clear and formalised predictions are required to be agreed upon by all parties in the collaboration. Indeed, we can expect to see a preregistered, adversarial collaboration published in Cortex very soon (Sassenhagen et al., in principle acceptance).

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References

Chambers, C. (2016, December 2). Meet the authors: Ratner et al. talk Registered Reports. [Blog post]. Retrieved from: https://blogs.royalsociety.org/publishing/meet-the-authors-ratner-et-al-talk-registered-reports/

Huber, D. E., Potter, K., & Huszar, L. D. (2018). Less “Story” and more “Reliability” in cognitive neuroscience.

Frank, M. J., & Badre, D. (2015). How cognitive theory guides neuroscience. *Cognition*, *135*, 14–20. https://doi.org/10.1016/j.cognition.2014.11.009.How

Kahneman, D. (2003). Experiences of Collaborative Research. *American Psychologist*, *58*(9), 723–730. https://doi.org/10.1037/0003-066X.58.9.723

Krakauer, J. W., Ghazanfar, A. A., Gomez-Marin, A., MacIver, M. A., & Poeppel, D. (2017). Neuroscience Needs Behavior: Correcting a Reductionist Bias. *Neuron*, *93*(3), 480–490. https://doi.org/10.1016/j.neuron.2016.12.041

Matzke, D., Nieuwenhuis, S., Slagter, H. A., Molen, M. W. Van Der, & Wagenmakers, E. (2015). The Effect of Horizontal Eye Movements on Free Recall: A Preregistered Adversarial Collaboration. *Journal of Experimental Psychology. General*, *144*(1), e1–e15. https://doi.org/10.1037/xge0000038

Mellers, B., Hertwig, R., & Kahneman, D. (2001). Do Frequency Representations Eliminate Conjunction Effects? An Exercise in Adversarial Collaboration. *Psychological Science*, *12*(4), 269–275. https://doi.org/10.1111/1467-9280.00350

Nuzzo, R. (2015). Fooling ourselves. *Nature*, *526*(7572), 182–185. https://doi.org/10.1038/526182a

Ratner, K., Burrow, A. L., & Thoemmes, F. (2016). The effects of exposure to objective coherence on perceived meaning in life: a preregistered direct replication of Heintzelman, Trent & King (2013). *Royal Society Open Science*, *3*, 160431. https://doi.org/10.1177/0956797612465878

Sassenhagen, J., Bastiaansen, M., Lewis, A. G., Eisenhauer, S., Gagl, B., & Fiebach, C. J. (in principle acceptance). Does Gamma index semantic predictions? An adversarial collaboration. Registered Report, *Cortex*.