UNDER REVIEW

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[Re] When groups of diverse problem-solvers outperform groups of highest-ability problem-solvers: expertise matters

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Many debates around diversity are concerned with the performance of diverse teams when it comes to creativity and problem-solving. If diverse teams outperform homogenous teams, this would offer an additional argument for broader inclusion, and hold clear practical lessons for decision-makers. Some of the most important research in this field has been computational, yet replications are lacking. This paper offers a direct replication of the most influential model in the field[1], and a replication of a recent paper that offered important qualifications[2]. By doing so with the use of an agent-based modeling framework that easily allows for extensions and adjustments to the model, this will hopefully be helpful for future research into the conditions under which diversity trumps ability.

Seventeen years ago, Hong and Page[1] proposed that diversity generally trumps ability when it comes to the composition of groups of problem solvers. To support this argument, their paper, which has been cited more than 1,400 times, presented the results of an agent-based model. While similar models have been used in further research[3,2,4], no direct replication has been published, and neither the original paper nor any of the derivations provide software code. Recent research has proposed qualifications to the original conclusions, and by replicating one of the most critical recent papers[2], I show that these concerns are warranted.

The basic model — In order to explore the process of problem-solving, Hong and Page tasked teams of agents with finding the highest value in a ring of 2,000 random numbers, which can be thought of as peaks in a landscape. Each agent approaches this task with a distinct heuristic that consists of a set of non-repeating integers {}

A flexible implementation — For this paper, I implemented the model in Python, using the mesa framework[5].

A simplified publishing process — In ReScience, we have have been using a combination of markdown and pandoc for producing both the draft and the final version of all the published articles.

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The authors have declared that no competing interests exist.
Code is available at https://github.com/LukasWallrich/diversity_abm_replication..

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