

# ***Interactive comment on “Ideas and Perspectives: When ocean acidification experiments are not the same, reproducibility is not tested” by Phillip Williamson et al.***

**Phillip Williamson et al.**

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The supportive comments by McCoy are appreciated. Whilst they do not seem to include specific issues requiring responses or text corrections (and are therefore not re-included here), they helpfully draw out two key messages. First, that the occurrence of different or controversial results from replication experiments reveal gaps in our understanding; second, that consensus science is what matters as the “big picture”, with single studies providing the surrounding confidence envelope. We appreciate those insights, and now reflect them in the following revised and additional text:

“... any single study does not disprove the consensus, since broadening the concept

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of replication has the clear corollary that novel outcomes need to be interpreted using all available lines of evidence, with awareness of both similarities and differences in relation to previous work”.

“Under what conditions should conclusions derived from one study be considered applicable (generalizable) to another, therefore enabling the underlying hypothesis to be tested, and potentially disproved, by the latter? The scientific benefits of that framing are greatest when the outcome of a replicability test is accepted by two research groups that initially favour different hypotheses - thereby requiring a more nuanced, non-confrontational framework for experimental planning, analysis and interpretation (Fanelli, 2018; Nosek and Errington, 2020a,b)”.

#### REFERENCES CITED IN RESPONSE:

Fanelli, D.: Is science really facing a reproducibility crisis, and do we need it to? Proc. Natl. Acad. Sci. USA, 115, 2628-2631, <https://doi.org/10.1073/pnas.1708272114>, 2018.

Nosek, B. A., and Errington, T. M.: What is replication? PLoS Biol. 18, e3000691, <https://doi.org/10.1371/journal.pbio.3000691>, 2020a.

Nosek, B. A., and Errington, T. M.: Argue about what a replication means before you do it, Nature, 583, 518-520, <https://doi.org/10.1038/d41586-020-02142-6>, 2020b.

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