



Dr. Jon Slate

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Subject: Manuscript submission

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Dear Dr. Slate,

please find enclosed our manuscript 'Egg size variation in a long-lived polyandrous shorebird in the context of senescence and breeding phenology' to be considered for publication in *Evolution Letters*.

Life-history theory predicts that investment into reproduction compromises somatic repair leading to senescence. However, other processes such as mating tactics—that are often age-dependent—may also shape within-individual variation in reproductive performance and result in variation for certain reproductive traits. Previously it has been shown that polygynous males typically senesce faster – yet, whether this also holds true for polyandrous females remains to be seen.

We used a 14-year longitudinal dataset to investigate the effect mating strategy and female age on egg size of a long-lived polyandrous shorebird, the snowy plover *Charadrius nivosus*. Despite the high maternal investment of this precocial species, we find no evidence for senescence. Instead, we found strong seasonal variation in egg volume both within- and between-females consistent with seasonal constraints on the polyandrous mating strategy of females and intense female-female competition. These empirical results support previous theoretical work on egg size variation and sexual selection (Andersson, 2004, *Evolution* 58: 24–34), which had not been tested before.

Please note that our current submission is a revision of a prior manuscript (EVL3-20-0082) that was accepted by *Evolution Letters* but withdrawn before publication per our request. In short, after acceptance of the prior submission, it was brought to our attention that our models had a parameter wrongly specified. After correction, the original results and our interpretation no longer held and we withdrew to re-evaluate the entire study. Although this was initially a disconcerting experience, we realized that this has prevented us from inadvertently publishing a false (positive) result. Since then, we have added another year of data collection (2020) to the analysis, giving the corrected analyses more power.

To enhance transparency and reproducibility during the review process and beyond, we have made the entire workflow of our analysis publicly available as an RMarkdown vignette on this project's OSF repository¹. Our previous experience has shown the value of this approach and we hope our publication will stimulate further open research in the evolutionary ecology community.

Our manuscript is not under consideration elsewhere, and all persons entitled to authorship are included and have contributed substantially to its current form. Please do not hesitate to contact us if you require any further information.

Sincerely,

Dr. Luke Eberhart-Hertel

¹ Eberhart-Hertel, L. J. (2021). *Open Science Framework*. doi.org/10.17605/osf.io/ucw6j