Transparency in Scientific Literature

Garland Xie

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Part 1. The article

Urban meadows can represent a viable alternative to heavily-mowed grasslands as their biodiversity (i.e., many forb and graminoid species) have potential to support multiple ecosystem services (e.g., pollination services, aesthetic value). In two cities located around Southern England, the the authors of this experimentally manipulated nine treatments across two axes of variation (species richness and plant height) to determine its effect on invertebrate and soil microbial communities (Norton et al. 2019). Overall, they found that both high plant height and high species richness for vegetative meadow communities strongly affected multiple facets of biodiversity (i.e., community composition, richness, and abundance) for invertebrates and soil microbes. These findings provide support that a mosaic of varying meadow types can replace mow-amenity grasslands if local authority partners and city residents wish to maximize the benefits of urban meadows.

The checklist

The journal of this chosen article does not any form of checklist with respect to transparency and reproducibility.

In that case, I will evaluate the article based on a previous checklist (Parker et al. 2018).

Questions to promote transparent reporting of methods and results

Q1. Were all sample sizes fully reported, including exact values for all subsets of data and for all statistical analyses?

A1. No, it's unclear what the exact sample sizes were for subsets of data.

Q2. Are the methods reported in sufficient detail to allow another researcher to gather the same data and run the identical analyses?

Q2. Yes.

Q3a. Are statistical results for each test reported in sufficient detail?

A3a: Yes.

Q3b. Are results from all variables and from all models reported?

A3b: Yes.

Q4. Were observers kept unaware of the experimental treatment imposed on the samples when recording observations or measurements so as to minimize unconscious bias?

A4: Yes.

Questions to check biases of reviewers and authors

Q5. Did the authors explain how sample size was decided, or when an experiment with pre-set sample sizes was terminated?

A5: Yes.

Q6. Did the authors develop their analysis plan, including choices of variables, without looking at the data, for instance prior to gathering data or with a dummy data set?

A6. No, the authors did not include a published pre-registered report associated with this article.

Q7. How suitable do you find the research methods without considering the outcome?

A7. The methods are suitable, independent from the results, as the authors conducted tests to determine the method's effectiveness (e.g., testing for multivariate homogeneity of variance for ordination techniques).

Q8. Are the sample sizes large enough to justify the authors' conclusions?

A8. Yes.

Q9. What does the size of the estimated effect suggest about its biological or practical importance, and what does uncertainty around that effect estimate suggest about the estimate's precision?

A9. The size of the estimated effects from the linear mixed-effects models suggest that high plant height and high species richness of the vegetative meadow communities increases invertebrate richness and biomass two-fold compared to unmanipulated controls. The uncertainty around these effect sizes suggests the amount of variation in raw data for the given response variable.

Q10. How unexpected would you judge these results to be in light of prior empirically derived understanding?

A10: I would not find the results to be unexpected since the authors supported them with previously published findings and theory.

References

Norton, Briony A., Gary D. Bending, Rachel Clark, Ron Corstanje, Nigel Dunnett, Karl L. Evans, Darren R. Grafius, et al. 2019. "Urban Meadows as an Alternative to Short Mown Grassland: Effects of Composition and Height on Biodiversity." *Ecological Applications* 29 (6): e01946. https://doi.org/https://doi.org/10.1002/eap.1946.

Parker, Timothy H., Simon C. Griffith, Judith L. Bronstein, Fiona Fidler, Susan Foster, Hannah Fraser, Wolfgang Forstmeier, et al. 2018. "Empowering Peer Reviewers with a Checklist to Improve Transparency." *Nature Ecology & Evolution* 2 (6): 929–35. https://doi.org/10.1038/s41559-018-0545-z.