

## A Rubric to Evaluate Preprint Peer Reviews

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**Context:** This rubric was created by undergraduates enrolled in a course on peer review, in which students learned about the peer review process and then wrote peer reviews on preprints. Peer review is considered by many to be crucial to the scientific process. Preprinting allows researchers to publish manuscripts on free, online preprint servers before or instead of through a journal's peer-review process. Preprinting offers many advantages, yet there is little guidance available as to how preprints could be peer reviewed. Our class aimed to demystify the peer review process for undergraduates, centering discussions of equity and thinking critically about bias, with the goal of bringing more people into the peer review process. Since preprint peer review does not have barriers to access in the same way that journal-curated peer review does, it allows for all members of the scientific community to participate including early career researchers and educators. We created this rubric to help reviewers think about how a review's structure, style, and substance can create an effective and humane critique. We hope that use of this rubric might improve the quality of the review and so the corresponding manuscripts. The rubric could be used by reviewers themselves to self-evaluate their review before publishing it and/or by educators who incorporate peer review assignments into their classrooms. We welcome your feedback, adoption, and/or adaptation of this rubric.

A Rubric to Evaluate Preprint Peer Reviews		
Criterion	Weight	Score
<b>REVIEW STRUCTURE</b> <ul style="list-style-type: none"><li>Review includes an objective summary of the manuscript (research question, approach, major findings)</li><li>Review includes a subjective summary of the reviewer's opinion about the manuscript (overarching strengths and weaknesses, novelty and potential impact to the field)</li><li>Criticisms are categorized as major issues that require changes or minor issues for which changes are recommended but not required</li><li>Review text is easy to read, organized, and concise</li></ul>	10%	
Explanation of score:		
<b>REVIEW STYLE</b> <ul style="list-style-type: none"><li>Review includes a balance of positive and negative feedback</li><li>Review critiques the manuscript itself and not the author(s)</li><li>Criticisms are well-justified with examples from the manuscript</li></ul>	20%	

<ul style="list-style-type: none"> <li>• Criticisms include specific, actionable requests for changes</li> <li>• Requests for changes are within the scope of the manuscript (directly related to the research question and approach)</li> <li>• Review acknowledges reviewer's limitations, as needed.</li> </ul>		
Explanation of score:		
<p><b>REVIEW SUBSTANCE</b></p> <p>The review addresses the organization and clarity of the manuscript.</p> <p>For the introduction, the review addresses accurately whether:</p> <ul style="list-style-type: none"> <li>• The background information is sufficient to understand the research question</li> <li>• The rationale for the study and/or overarching hypothesis is well-justified</li> <li>• The overarching study design is appropriate for the research question(s)</li> </ul>	20%	
Explanation of score:		
<p>For each section of results (methods &amp; results text, figure/table, legend), the review addresses accurately whether:</p> <ul style="list-style-type: none"> <li>• The methods are clearly described</li> <li>• The methods are appropriate to test the specific research question</li> <li>• The methods contain the appropriate controls, independent replicates, sample sizes, and/or statistical analyses</li> <li>• The hypothesis is well-justified</li> <li>• The results are clearly presented and explained</li> <li>• The results are appropriately interpreted</li> </ul>	30%	
Explanation of score:		
<p>For the discussion/conclusions, the review addresses accurately whether:</p> <ul style="list-style-type: none"> <li>• The overarching conclusions of the study are reasonable given the dataset</li> <li>• The study's findings are appropriately related to the relevant literature</li> <li>• The limitations of the study are sufficiently discussed</li> <li>• The implications of the study for future research and/or society are appropriately discussed</li> </ul>	20%	
Explanation of score:		
<b>TOTAL WEIGHTED SCORE</b>		

**Instructions:** Evaluate the review for the following criteria and score using the following scale: 4 = Review fulfills all criteria, all of the time; 3.5 = Review fulfills most of the criteria, most of the time; 3 = Review fulfills some of the criteria, some of the time; 2 = Review fulfills a few of the criteria; 0 = Review does not fulfill any criteria. Multiply the score by the criterion's weight, total the weighted scores, and multiply by 25 for a total weighted score of out 100%.