Reviewing Papers: Evaluating Methods

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Disclaimer

I am not sure what conflicts I could have.

Are the Methods Sound?

- We will assume you are an expert on the topic or you would not have been asked to review.
- Some questions to ask as you read the paper:
  1. Does what the authors do make sense?
  2. Are derivations sound – Can you connect all the steps?
  3. Are quantities defined? (Do the authors use existing standard terminology?)
  4. Are experiments described so they could be reproduced?

Some More Questions

5. Do the experiments prove what the authors claim?
6. Do the authors consider uncertainties?
7. Do the experiments prove what the authors claim *within the uncertainties*?

A Common Situation

- Monte Carlo
  - Everyone and his brother and sister do Monte Carlo these days.
  - There is a fine line in the Methods for this, where the authors tell as much as needed so a knowledgeable reader understands what they did, but not going into details all knowledgeable readers would know.
  - Have the authors benchmarked their manifestation of the program?
  - Were their simulated conditions appropriate?

Another Common Situation: Significance

- Authors frequently use "significant" when things are not.
- It should be avoided if not in the statistical sense.
- Just having enough histories in MC does not make the results significant.
- Just using a standard statistical package and finding $p < 0.05$ does not make the results significant.

What to do about Issues

If you think that the paper is good but has some problems, make suggestions:

- General sweeping comments do not help the authors or the editor.
- Keep suggestions limited – don't suggest revising the experimental work (see the premise above).
- Do make suggestions on different interpretations.

What to do about Issues

If you think that the paper is seriously flawed:

- Give specific reasons. The editor will need that information.
- Reject the paper rather than call it Major Revision.