Yale NUS College | WRITERS' CENTRE

SCIENCE WRITING
Experimental Discussion and Evaluations Section
By Jolene Lum, Peer Writing Tutor

1. Refer to your methods and results section to explain successes and downfalls!

   Your discussion and evaluations section elaborates on how your research paper contributes to your specific field of. These elaborations are scaled for specificity depending on the scope of your research and results. In every research experiment, there are likely to be limitations to the results obtained or experimental set-up, which requires you to explain why parts of your method or results succeeded or can be improved. In this way, you add nuance to your initial research concerns by explaining lessons from the experimental process.

2. Seek an evolved (hypo)thesis and elaborate on how findings are in line (or surprising).

   Not all your findings and experiments may have gone as planned. Despite this, there are valuable lessons for how you wish to convey what these discrepancies may have meant. Other times, you might have had no idea what you were expecting, and you have to make meaningful connections between the results you have obtained and if they could be accurate and repeatable. In all of these scenarios, you are pivoting around your initial research question to report on how your experimental processes and data add nuance to and refine your initial research question, giving you information and understanding that may be new and valuable to your field.

3. Account for systematic and human errors!

   Errors emerge in both techniques (execution of experiment) as well as in data-processing (also see handout *Writing about Data, Graphs, and Charts)*. In your discussions and evaluations section, you want to discuss how systematic and human errors both contribute to the final set of results you obtained, and how they may be significant. Systematic errors often refer to errors inherent to instruments or the systems you may be using to conduct experiments, while human errors may include things like human reaction time, biases, or failure to optimally clean instruments. Accounting for these errors meaningfully (and ethically) will greatly help future researchers understand your work and build upon it.

4. Recommendations for improvement (Be practical!)

   Having accounted for different errors in your experimental processes, you may have recommendations to provide to future researchers or to the person reading your paper. There is no need to spend too much time providing recommendations for something that has already been proven by other experiments (but you may want to provide a reference), or to improve on a point in your experiment that you might have discovered to be irrelevant or a digression to more salient tasks at hand. In this way, this component of providing recommendations in the same research paper is a point of reflection and weighing out how the weight or significance of your research can be best built-upon, and not just an exercise of fixing all the problems in your own method!

5. Explain context for further research in relation to what has been achieved in your work.

   While everything about the research you did may have yielded interesting perspectives for future research, not all of it should be included here. Perhaps you discovered an entirely different direction of research due to one serendipitous finding—and you should definitely talk about that here—but you have to return to provide a conclusion to your initial intentions. The basis of potential research opportunities should be your research question and literature review—where your research becomes the direct link between what is already known and what might be most impactful or sequential in the field of research you work in. If you find your discussions section straying too far, you might need to return to perform more research in the literature review section to justify and make sense of your findings with a clearer 'thesis' of how your work comes together.

(Finally, check against grading rubric or journal guidelines to adjust these tips accordingly!)