

Writing Papers

Intro

- Start by introducing the topic/problem of interest, at a more general level – why should readers care about your study?
- Do not review literature that is very general, e.g., The brain has dedicated regions that process emotions, or perception works by such and such a process, etc...
 - Review work that pertains specifically to your research question
 - This will allow for a natural transition from talking about prior work, to your experimental question. There should be a seamless progression so that the reader feels like your experimental question is justified and would provide interesting results
 - To do this, highlight a question that has not been answered by prior research, or point out a limitation of prior work that makes you question their conclusions.
 - This will then make it obvious why you conducted your study.
 - Keep your introduction FOCUSED – do not meander by discussing studies that are sort of related, but do not directly lead to your research question
- End the intro with your research question, and hypothesis (if you have one), and a brief summary of how you will test it

Methods

- Participants:
 - Mean age of subjects and standard deviation or range
 - Number of males and females
- You may want to include separate sections for Participants, Materials, and Procedure
- Include as much detail as possible – someone reading your methods should be able to conduct the exact study.
 - However, it is okay to summarize instructions and unimportant details
- Exact steps of how data analysis will be carried out.

Results

- Be clear about what kind of analysis to do
 - When you have 2 separate groups use an independent samples t-test
 - When you have 3 or more separate groups, start with a One-way (between subjects) ANOVA. This will tell you if there is a difference between any of the groups.

- If you find a significant difference, then proceed to conduct t-tests comparing each pair of groups in order to determine which pair of groups actually differs.
 - When you have one group and each person is compared on 2 separate conditions, use a paired-samples t-test.
 - When you have one group and each person is compared on 3 or more separate conditions, use an *ANOVA: Two-Factor Without Replication* (within subjects) ANOVA. This will tell you if there is a difference between any of the conditions.
 - If you find a significant difference, then proceed to conduct paired-samples t-tests comparing each pair of conditions in order to determine which pair of conditions actually differs.
 - If you have more than 1 independent variable, stats will need to be conducted in SPSS, so come see one of us.
- Figures
 - Use the standard error (SE) not the standard deviation (SD) on graphs. SE = standard deviation / square root of number of subjects. $SE = \frac{\sigma}{\sqrt{n}}$

Discussion

- Start with a short re-cap of your findings
- Then discuss how your findings relate to prior work – circle back to your intro and talk about whether your findings are consistent or divergent from past work and what this means – don't be bombastic, but **suggest the possible significance of your work** for a theory of cognition/emotion, or an overarching question that the field is grappling with.
- The data are what they are – whether significant or not, do not say things like, “unfortunately our results were non-significant...”. We as scientists are looking for the truth of things - what is - not what we hope things will be. Let the data speak for itself.

Four possible cases:

1. If the data are statistically significant, discuss the potential implications
2. If the data show a trend in the expected direction, it could be that our small sample size did not provide enough power to detect the expected effect – if you think this is so, you can discuss the implications of your results as though they were significant (but with a little more caution)
3. If the data do not show any clear trends, you need to discuss why.
 - a. It could be that your methods did not effectively test your research hypothesis. For instance, if you only had one trial, this may not have been sufficient to detect any effects.
 - b. HOWEVER, if you think your methods were solid, it may be that there is no real effect there. You can discuss this possibility and its potential implications. Remember, though: you cannot prove the null hypothesis! You can only fail to reject it.

4. If the data show a trend opposite to the expected direction, you will need to decide on whether this trend is “real” (or merely random chance). If you think it could reflect a true effect, you will want to discuss the implications of your unexpected finding.
- Then you can get into the potential confounds and weaknesses of your design
 - ***Note: A sample that is not representative is a weakness, but not a confound
 - Similarly noise in the room affects all people in your sample equally and therefore is unlikely to specifically influence one of your groups or one of your conditions. Therefore it should not challenge your conclusions (see below).
 - A note on confounds:
 - You are in most cases trying to make a causal statement, e.g., a positive mood leads to better memory than a sad mood
 - Confounds are extraneous (uncontrolled) factors that could potentially provide an alternative causal statement, e.g., imagine you examined the influence of mood on memory and found no difference between a positive and sad mood, and therefore you make the causal statement that mood does not influence memory. A potential confound (or alternative explanation) is that your mood manipulation was not effective in eliciting different moods in people.
 - End with future directions – what new studies might logically follow up on or extend your findings?