Updated 4 Mar 2021

PAPER/PROPOSAL REQUIREMENTS AND FORMATTING DETAILS
PSY 401A/501A, *PSYCHOPHYSIOLOGY SEMINAR*

PAPER DUE 3 MAY, 2021(2 PM)

PURPOSE

The paper requirement is structured to address several goals. First, the paper will provide you with an opportunity to investigate an area of human psychophysiology that is of particular interest to you. Second, in the course of writing this paper/proposal, you will have the opportunity to apply the knowledge acquired during the psychophysiology course as you read original research reports. Third, the paper will serve as an impetus to become very familiar with the details of signal acquisition and analysis in a particular area of psychophysiology. Fourth, this paper may serve as an opportunity for you to propose a study that you may subsequently conduct using psychophysiological measures. Fifth, this may serve as an opportunity to analyze pilot data or to obtain results that you can later use for preparing a manuscript or thesis.

The topic of your paper is limited only by your imagination and by the fact that you will need to approve the general topic with me before you write the paper. To have your topic approved, *submit a one or two paragraph prospectus on D2L no later than Monday April 19*.

FORMAT

The overall length requirement is 10-20 pages, double-spaced with a standard (e.g. 12-point) font. You can either propose a research study or present results of data analyses you have done with existing data. The format varies a bit depending on which option you choose.

The first two sections are the same whether you are writing a proposal or a synopsis of data analysis.

A. Rationale and Hypotheses (Recommend 2-3 pages double spaced, but 5 pages absolute maximum):
- What is the area you wish to investigate, why is it important, what do you intend to do and what specific hypotheses do you have?
- This is your literature review and setting up the rationale for what you will to do or propose to do. This provides a succinct description of your topic and what you will do.
- At the end of the section, the reader should be able to appreciate what specific hypotheses you will test, and why they may be important. As a general guideline, you will want to test approximately one to three specific hypotheses, which you will list at the end of this section.
- So, in short, you say the equivalent of "*here's an interesting topic, and here's why it is interesting and might need a psychophysiological approach,, and here's what I'll do, specifically testing the following hypotheses."*
- Do not write this section in haste – it orients the reader (in this case me!) to what will come next, helping the reader appreciate the merit of the paper/proposal!
- In your literature that you review, original research reports in addition to reviews; stated in the negative: do NOT review only review pieces.

B. Methods (Recommend 3-5 pages):
- How are you going to acquire and process your data?
- This is a crucial section, in that you will describe *in detail* what are you going to do. In short, the proposal needs to be clear that *you are clear* in understanding what you intend to do. You should be very specific about the following:
  - The basic paradigm and task(s) you used (or propose to use) to address the research question (including number of trials in each of whatever conditions you include, specifics about the stimuli, instructions to subject, etc.).
  - Methodological specifics: type of electrodes, placement of these electrodes, type of gel used, recording specifics (e.g., amplifier type, amplification factor), reference site(s), filter setting(s), digital sampling rate, length of sampling epoch, number of samples prior to stimulus onset, how will you deal with artifacts (eye blink, muscle...), would you use any off line filters (digital, woody). You should look to published papers using your measure(s) to get a good idea of all the relevant details that need to be presented. You should also consult the "guidelines" papers (link on class website) for best practices in reporting

recording and processing details.
    - Your plan for processing the raw signals to derive the key metrics that will form the basis of your analysis to test your hypotheses. If this is vagal control, describe the process of obtaining a specific metric (or metrics) of heart rate variability from the EKG signal. If this is ERP or EEG, discuss the steps from raw signal to component amplitude or power in a frequency band.
- Related to this last point, please provide somewhere in this methods section a brief explanation of what measures or features would be of interest (e.g. which component of the ERP, what frequency band in the EEG, what features in the EKG, what measures of SC, etc.). Specify also why (based on the literature) these measures would be expected to be responsive to your experimental manipulation or to be sensitive to individual differences that you seek to investigate.
- Do not detail the statistical procedures or plan here. Integrate those into Section C (see below).

The final section will differ depending on whether you are writing a proposal or a synopsis of data analysis.

C. Analysis Plan (for Proposal) (Recommend 2-4 pages):
- Provide a description of your analysis plan: For example, will you use a repeated measures ANOVA, MANOVA, MLM, correlation, multiple regressions, or a discriminant function analysis, or Fisbee's foolproof test? Just detail how you would make sure your data can address your research questions. As you detail how you intend to analyze the data, be sure to make it clear how your analyses will test your specific hypotheses that you listed in Section A. What kind of finding would support your hypothesis? What would refute it?
- By reading this section, we should know whether your analyses can reasonably test your hypotheses.

C. Results and Discussion (for Data Analysis) (Recommend 3-6 pages):
- Provide descriptive statistics on your measures, and any analyses (as appropriate) that demonstrate the validity of your data. For example, is there an expected effect that would show your paradigm and measures are functioning as expected, such as the emotion modulation of the startle effect?
- Organize your results by hypothesis. Detail what statistical procedure you used, and what parameters were selected in cases where parameter selection may influence the results. This section reads best if you can link the results to the hypothesis. It helps to let the reader know if a finding was expected or contrary to expectation as you present it.
- Make ample use of figures. If you are presenting ERPs or Time-Frequency data, a plot is required, or else Reviewer 2 will launch Armageddon.
- If along the way, you developed ideas for exploratory analyses, detail your rationale for those and describe these procedures and results next.
- Provide a brief discussion (1-2 pages) that highlights whether your findings support your hypotheses, and be sure to consider alternative explanations and limitations.