

## How to write a research proposal

You are to write a research proposal of about 2000 words, maximum 8 type-written pages (including figures and tables), double-spaced. Fonts should be set at 12-point.

### Objectives

The idea behind this research proposal is I would like to see whether you are able to identify outstanding issues that more research could help to clarify. Writing the proposal will then help you achieve four important objectives:

- (1) to expand your knowledge of cognitive neuroscience by focusing on two areas that are of particular interest to you,
- (2) to further develop your skills as a critical reader of psychological research, and
- (3) to develop your scientific writing skills.

### General Requirements

In this research proposal, you are asked to demonstrate your ability to integrate information across topics covered in the course. In the proposal, you should critically review two areas of cognitive neuroscience and then propose an experiment that would help to address an integrative question or issue.

Choose **any two sections** from the course outline, such as Attention and Memory, and discuss how they are (or might be) related. For example, you might want to discuss the role of attention in memory. Alternatively, you might wish to discuss some general principles of cortical organization, such as modularity and central processing, and how they apply to two different areas you have studied. I guess you will find that there are a great number of potential topics you could pick. The best way would be to take something that interests you. You should then try to define what you picked narrowly. You need not deal with the entire topic area (e.g., all of language, all of perception), but choose smaller, more manageable topic (e.g., perception of living things and spatial attention; the function of the hippocampus and dorsolateral prefrontal cortex). If you define your topic too generally there will simply be too much relevant research, making it very difficult to decide which the most relevant papers are.

### Required sections of the proposal

The proposal must contain the following sections: Title page – Abstract – Introduction – Methods – Predicted Results – References.

#### • Title page

• **Abstract:** One (1) paragraph that briefly describes the area of interest and the research question that will be addressed in the proposal. Put the abstract on a separate page, immediately following the title page.

• **Introduction:** This section should describe the research area and findings from previous studies. Write in a goal-directed manner. By this I mean you will eventually be proposing some experiment in your proposal. Therefore, the literature review should be designed so that it discusses an issue or question that needs to be addressed in that area and provides a rationale for your proposed study. Moreover, you should structure your Introduction so that the motivation for your proposal becomes clear. To achieve that you should begin with a relatively big issue and then focus down to the specific issue you are interested in, highlighting the aspects of previous research (e.g. some methodological flaw in previous approaches) that your proposal is meant to address. By the end of the Introduction the reader should have a very good idea of what the central issue of your proposal will be. Your Introduction should reference at least three research articles (see the section about references). (Maximum length of the Introduction: 3 double-spaced pages).

• **Method:** Now you are actually talking about what you are proposing. Again, be sure that this follows naturally from the introduction in which you should have set up and highlighted some critical issue that needs to be resolved. What you should do now is to tell the reader how you would resolve this issue. The Method section should describe the proposed method for the experiment, including who the participants will be (ages and where they will be recruited from), what equipment will be used, and the procedure that will be followed. You should specify the variables (independent and dependent) that will be used in the experiment. You do not have to format this section with separate subject, apparatus and procedure sections, but having that in mind can help to guide your thinking and writing. A clearly structured Method section is very important. (Maximum length of the Method section: 2 double-spaced pages).

• **Predicted Results:** This section should describe the results you expect from your proposed experiment. (Maximum length: 1 double-spaced page). Please note: You should use the future tense. Do not create fake data and write the paper in past tense as if the experiment has already been conducted. Also, you may want to think about alternatives. That is, sometimes it is interesting to think about What if the results would turn out differently? Would there be any alternative interpretations?

• **References:** You must have **at least 3 primary sources** (journal articles from the same list of journals as for reaction papers, that is: Brain, Cerebral Cortex, Current Biology, Experimental Brain Research, Journal of Cognitive Neuroscience, Journal of Neuroscience, Journal of Neurophysiology, Nature, Nature Neuroscience, Neurology, Neuropsychologia, Neuron, Psychological Science, Science, Vision Research). The references should be from the last two years. You must format your references using the guidelines developed by the American Psychological Association's Publication Manual (5th edition).

### **Use APA Format**

You should use the guidelines for scientific writing that have been developed by the American Psychological Association (APA). There you will find more details about what I was talking about in the previous paragraphs. The 5th edition of the APA Publication Manual is available at the UTSC Bookstore and at the Bladen Library: CALL NUMBER: BF 76.7 .P83 2001 SCAR -- BOOK -- ShortTermLoan.

### **Evaluation of Research Proposals**

This form is what will be used to both grade your proposal, and give you feedback about your proposal. One of these forms will be stapled to each proposal after it is marked and, when we return the proposal to you, you can use this sheet to see what things you may want to work on with respect to other written work you do.

For each of the following, you will be given a 1-10 score, where 1 is very poor, and 10 is very well (perfect really). There are ten different issues outlined below. Thus, your final mark on the proposal (out of 100) will be calculated as you total score on these questions.

#### **Writing**

- How well did the author lay out the argument in the opening section of the paper? And, how obvious was it where the author was going with their argument as you read it. That is, was the information presented in a very scattered manner with no apparent direction, or was the argument (and the relevance of the sections of the paper to it) obvious throughout?
- How clearly did the author structure the Method section?
- How well did the paper conform to the APA writing standard?

## Research

- How appropriate was the chosen research papers with respect to the argument the author was suggesting?
- How well did the author explain the relevant aspects of previous research? Did you understand the research, and what point it makes with respect to the author's argument?

## Proposed Experiment

- How well do you think the experiment, as proposed, would deal with the argument the author suggested in the introduction?
- How well did the author use the introduction to motivate reasonable predictions about the potential outcome(s) of the proposed experiment?
- Was the experiment well designed? Did you see any obvious design flaws?
- How clever was the suggested experiment? That is, did the author simply suggest looking at some existing issue as a function of some other variable with no apparent motivation, or did the experiment represent a real attempt to either confirm or deny some theory, or discriminate between existing views or theories? Let's say, there is a lot of research on how quickly we respond to circular spots popping up on a computer screen. Then an experiment would be less clever if it just looked at how quick we are when the spots are square-shaped.
- How realistic is the predicted outcome of the experiments? Does the author mention any alternatives?