

Writing a Student Research Proposal

February 25, 2016



Timeline

- Now: Should be meeting (regularly) with mentor soon, if you haven't already done so
- April 1: Written proposals due in our office
- Early April: Two reviewers will be assigned to review each proposal
- April: One of the reviewers will meet with the student & mentor
- Early May: Committee ranks proposals and decides funding

Proposal Requirements

- Limit = Face page + six single spaced pages
- Signed Face Page
- Aims, Objectives & Significance (1/2 page +)
- Background & Rationale (2 pages)
- Materials & Methods (3 pages)
- Future Directions (a paragraph)
- References
- Budget (if supplies, expenses needed – likely \$250 limit)

Acknowledgement

- Some of the ideas and concepts were adapted from “Writing Winning Grants” developed by Stephen W. Russell and David C. Morrison, Grant Writers’ Seminars and Workshops, LLC.
- More information at:
<http://www.grantcentral.com>

Writing A Proposal

Preliminaries

- Talk to your mentor – have regular meetings
- Develop a project that you will complete
- Pick a project that is worthwhile
 - Review the literature
 - Something that really contributes to science is most likely to be funded
- Pick a project that is feasible (i.e., ~6-8 weeks), but not too “easy”.

Review of Proposals

- By a committee
- Similar to the process for NIH – proposals receive a score based on merit
- Competitive – We will have many proposals; possibly more proposals than we can fund or fully fund
- Individual reviewers assigned to review a small proportion of total (3 or 4) – only read a little (if any) of those grants assigned to other reviewers

Review of Proposals

- No one will read all of the proposals carefully (too time-consuming)
- **Limited expertise of reviewers** – they may not be familiar with your line of research
 - That is, **don't assume** your reviewers know much about your topic

Review of Proposals

- So, the student/mentor must gain the genuine confidence and enthusiasm of the assigned reviewers
- The student/mentor must be sure that the reviewers also understand the science and the importance of the research AND.....
- Impress committee members not assigned to review their proposal

Thus, one has to *sell* their idea to the reviewers and *educate* them!

Writing the Proposal

To maximize effectiveness, it is essential to spend the most time working on the portions of the grant that reviewers read first, and all reviewers are likely to read.....

The Aims, Objectives & Significance Section

Specific Aims/Hypotheses

- Begin writing these first, and take time to refine them
- Be very careful with wording
- Should set the stage for the rest of your proposal and gain the attention of the reviewers
- A “blueprint” for your project

Aims, Objectives & Significance Section

- Suggested Elements:
 - Introductory Paragraph – broad (public health) significance of the research
 - Long-term research goal (of this line of research)
 - Overall objective/hypothesis of this project
 - Rationale (brief)
 - Specific Aims/Objectives or Hypotheses to be tested
 - Expected outcomes & future opportunities

Specific Aims/Hypotheses

While the prevalence of dental caries has declined for the majority of U.S. children in recent decades, there are profound disparities in dental caries experience where children from low-income or minority families suffer a disproportionate share of the disease burden.

The *rationale* for this study is that ...

Thus, the *goals* for the proposed study are to

We plan to accomplish our objectives by addressing the following *specific aims*:

1. To determine the prevalence of cavitated and non-cavitated carious lesions as well as visible plaque in a sample of 1-year-old children enrolled in southeastern Iowa WIC programs.
2. To determine the prevalence of *Streptococcus mutans* (SM) carriage and salivary SM levels in children and their mothers among southeastern Iowa WIC-enrollees.

The results will be *significant* because.....

Specific Aims/Hypotheses

- Brief and specific
- Generally, not too many – no more than 2-3 aims (and maybe only 1)
- Carefully worded
- In order, but should not be dependent on preceding aim(s)
- May be helpful to have a working hypothesis for each aim

Specific Aims/Hypotheses

An example:

- Specific Aim:

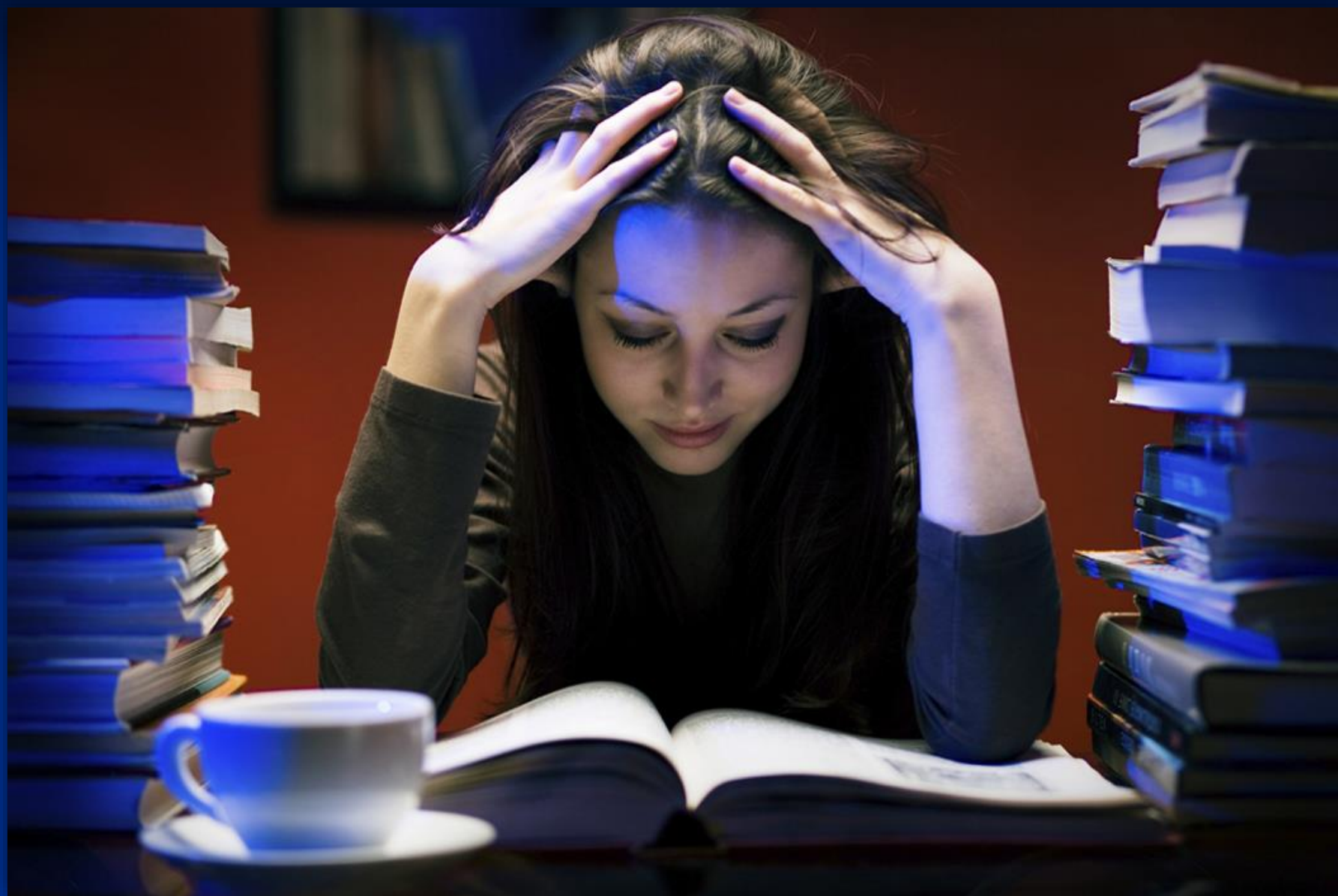
- To compare micro-tensile bond strength obtained by using two different adhesive systems – A & B

- Hypothesis:

- Our hypothesis is that system A, which relies on displacing water with ethanol, will produce stronger short- and long-term bond strengths than system B.

Background & Rationale

- Literature Review (Background)
 - Not meant to be exhaustive – just enough so you can demonstrate that you know what you're talking about and enough to support your research
 - Meant to provide background for your research
 - Be sure references are up-to-date
- Rationale
 - How does your research fill a gap in or contribute to the literature?
 - Why is it important?



Methods

- Describe what will be done – how data will be acquired and what materials to be used
- How many subjects/samples to be included & why this number was chosen
- Describe any measurements to be made:
 - Instruments used
 - Who is doing the measuring
 - Training (if student to do measurements)
- **Very Important – Make sure student's role is clearly described**

Methods

- Helpful to have summary description of overall protocol – A list of steps, a flow chart or diagram may also be helpful
- Should have a timeline
- Include data management and analyses plan
 - Statistical tests
 - Power calculations (i.e., justification for sample size)
 - Ideally, work with statistician in advance
- Again, be sure to make clear what your (the student's) role will be in the project – specific tasks

Future Directions

- Describe what this research will lead to for you in future years, or how it will help your mentor develop further research – what's the next step??
- What related projects/area of research could possibly stem from the proposed project?
- This section can be very brief – a couple of sentences

Bibliography & Budget

- No more than about 1/2 page each
- Bibliography should reflect relatively brief Background section – use a standard reference format as found in a scientific journal
- Budget limited to about \$250 for supplies, expenses, such as chemicals, reagents, specimens, expendable lab supplies. Also can include things such as copy costs, postage necessary for project. Poster costs OK, too.
- Itemize and justify expenses

Other Issues

- Be kind to your reviewers – use reasonable type size and margins; shouldn't have to squeeze everything in to meet page limits
- Appendices are allowable, but not to circumvent page limits
- After submission, you will need to arrange a meeting or meetings with one of your reviewers, you and your mentor
 - We'll send out available times that reviewers have set aside for meetings

Other Issues

- Human Subjects & Institutional Review Board (IRB-1) approval:
 - If research involves human subjects or identifiable human tissue, you need training:
 - CITI course on IRB website:
 - <http://research.uiowa.edu/hso/index.php?get=edu>
- Need to complete IRB application and have it approved prior to conducting human research
- Thus, it may be prudent to do training and submit IRB application concurrently with developing proposal

<http://www.dentistry.uiowa.edu/student-research-proposals>

Questions??