Preparing Competitive Research Grant Proposals

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Introduction

Beyond the academic duties of teaching, research, publishing, and service, expectations that faculty should generate external funding are increasing – and increasingly important. Tenure and promotion evaluations of faculty may or may not explicitly review dollars won, but are clearly influenced by successful grant-getting as a measure of contribution to one's field, especially for peer-reviewed proposals. In nearly every type of academic institution, from small liberal arts colleges to state public universities, the pressures of shrinking state budget allocations coupled with increasing proportions of organizational revenue coming from outside sources (Lee & Clery 2004), makes grantsmanship an ever-critical aspect of professional life for tenure-track research faculty, lecturers, and part-time faculty alike. Graduate students, as well, seek outside monies to conduct their research activities, not only to garner additional financial support, but also to demonstrate their abilities in fundraising and gain early grants experience that will serve them well in their budding careers.

Even if a grant is not awarded, the process of writing research grant proposals can help you solidify your research ideas, and make them tangible, realistic and programmatic. Proposals, funded or unfunded, can themselves become sources for publishing journal articles (Brunn, this volume). Writing to external donors can aid you in thinking through your rationale or finding ways to connect with others in the scientific community or with the broader society – whether you end up with the money or not.

This chapter aims to give you some advice for how to do that successfully. Admittedly, there have been a great many articles and books written on the subject of grant proposal preparation, and at the end of this chapter you'll find an annotated list of those which I deem among the best. Themes adeptly covered include everything from choosing research topics, mechanics of writing, necessary elements of proposals, hallmarks of successful proposals, obstacles to overcome, strategies for locating funding sources, perspectives of donor agencies, effective research design, and much more. Most treatments deal with the topic in such a way that the subject of interest is the proposal or research itself. In this chapter, I include a focus not only on practical recommendations that will help you prepare competitive research grant proposals, but also on habits of mind and action that will prepare YOU as a researcher who is successful at generating external funding.

Here then are: **Ten Actions You Should Take**. These of course do not represent everything you need to know but will help you develop your own strategies and tactics for success to incorporate into your professional practice.

1) START WITH A GOOD PROBLEM.
2) CREATE THE RIGHT FIT.
3) ASSEMBLE A WINNING TEAM.
4) DESIGN TO DELIVER.

5) BE PERFECTLY PERSUASIVE.
6) MAKE IT REAL.
7) DEMONSTRATE YOUR UNIQUE VALUE.
8) GO THE EXTRA MILE.
9) ACHIEVE AND COMMUNICATE COHERENCE.
10) LIVE IT.

This chapter explains each of these ten imperatives and includes some suggested concrete actions you can implement either as a novice to begin preparing winning proposals or, perhaps as a seasoned grantwriter trying out some new ideas and tools to refine your skills – ultimately to become a more effective research grant proposal writer. The text refers to real exemplars from geographers whose proposals were funded by the National Science Foundation, and are reproduced in their entirely in the Appendix. The set features a range of work from graduate students, early career faculty, and experienced geographers from a diversity of sub-disciplinary perspectives. We are grateful for their permission to use their text as models to learn from.

Most research grant writing skills must really be learned by practice, and unfortunately trial and error. To this end, in-depth activity guides are provided for two of the actions, "Start with a Good Problem" and "Achieve and Communicate Coherence." The first is designed to help you turn your research idea into a clearly communicated thesis paragraph. The second activity is designed to aid you in the revision of a relatively complete proposal draft, providing a set of relational questions in the form of a matrix of elements that your proposal should contain.

Ten Actions You Should Take

1   START WITH A GOOD PROBLEM.

No amount of writing skill will compensate for a poorly developed research problem. A good problem is more than just a topic; it encapsulates some kind of tension, contradiction, unresolved issue, challenge, question, or even a mystery of sorts. A particular problem makes for a good proposal if it is very specific, precise, and focused. You should be able to clearly express what this research problem is in no more than three to five sentences, in a style that could be understood by a 9th grader.

Good problems lead to good questions, which underlie the scientific enterprise, be it theoretical or applied, quantitative or qualitative. The objective of a research project is always to answer those question or questions. This set of problem-question-purpose should be explicit as your thesis. Clarity, lucidness, and a sharp thesis will allow you to develop a sound project and a convincing proposal. It will leave your reviewers with something to remember after reading all of the many other competing proposals.

A good problem is properly contextualized. A critical element of grant proposals is a summary of the current state of knowledge that is supported by references to relevant scholarly publications. You should carefully and explicitly position your work relative to this context. This entails a different literary approach than a traditional "literature review," especially as you consider that most likely not all of your reviewers will be familiar with your specialized literature. A good rule of thumb is to precisely answer this series of questions: "What is already known? What don't we know that is worth finding out? What will be learned from this research?" Or "What [have others] done to address the problem and why wasn't that sufficient?" (Gerin 2006:73).

> **HINT:** Keep an ongoing list of problems and research questions as they pop up that can serve as a reserve to develop at a later time into "fundable" projects in response to a particular grant opportunity. Having these in writing and located in a "brainstorming" file will help you generate winning ideas more quickly when deadlines loom.

To communicate this contextualized problem, it is helpful to consider three general models of what research is supposed to accomplish with respect to existing knowledge. These include that research might 1) advance an existing line of research; 2) resolve a contradiction; or 3) develop a new line of inquiry.

> The following excerpt of a funded proposal from Lawson & Jarosz (Appendix v) eloquently demonstrates how research can start as grounded in an important empirical problem and can contribute to our understanding by resolving a contradiction:
>
> > "All across the American West, rural families are dealing with rapid changes to their livelihoods and communities. Many rural places are experiencing dramatic social and economic transformations as urban middle and upper class migrants bring new politics, new aesthetics and new economic activities into contact with longer-term resident populations (Nelson, 1999; Beyers and Nelson, 1999; Rudzitis, 1997). These changes have brought the *paradox of both income growth and rising poverty rates*. Along with these new income distributions within rural counties, shifts in the class composition of communities and new social tensions between residents are emerging. While there is a growing volume of research on the demographic and economic dimensions of these changes (Rasker and Alexander, 1997; Nelson and Beyers, 1998; Shumway and Davis, 1996; Barrett and Power, 2001), *less attention has been devoted to the social and cultural tensions surrounding this process* of rural restructuring and how poverty is understood within this context of transformation and change (Rudzitis, 1993; Cloke, 1997; Nelson, 1999)." *(emphasis added)*
>
> Note that the use of terms like "paradox" and "tensions" emphasize the function that this research intends to perform and help create a focus on the interplay of factors that the study will address.

This proposal exemplar simply and elegantly opens up space for a new line of inquiry (Patel, Appendix vi):

> "In a recent review, Tuan (2004) contends that "cultural geography remains almost wholly daylight geography" (Tuan 2004,730) and that more attention needs to be given to the "after hours." This contention makes particular sense as the "second shift," namely a night shift labor force, emerges in the global economy. The hyper-growth of the transnational call center industry in India is the quintessential example of this nightscape. . ."

There are certainly other functions of research, but these three are common models to begin thinking about how your idea contributes to the academic enterprise of knowledge production. Activity I and Appendix i provide additional discussion and practice.

2   CREATE THE RIGHT FIT.

Like people, institutions have their own personalities, and funding institutions do as well. Whether they are private, federal, state, foundation, or other kinds of organizations, each has their specific mission, goals, and program objectives. Each donor organization also has particular preferences on operational protocol, including whether they invite unsolicited proposals or not, whether they issue call for proposals that are clearly or vaguely defined, whether they prefer formal or informal inquiries, whether program officers should be contacted prior to deadlines, and other tacit protocol. You should make it an integral part of your research proposal preparation process to find out about the individual characteristics of potential resource providers. In other words, do your homework before you write. Many organizations now have easily available data online where you can research past funding history and current priorities. If information about previously funded projects is available, you would be wise to study it. If only the contact information of their previous awardees are listed, you might consider talking to funded PIs about their own projects and experience with the donor organization. Do talk to program officers if possible, but have a clear objective for your conversation.

There are also general guides available about how the funding process works with donors from different sectors. For instance, it is very important to aspiring academics to know about the federal government in general (see CFDA n.d.), given that the federal government remains the largest donor to US universities (Lee & Clery 2004); and about the National Science Foundation in particular (see NSF 2005). Private enterprise donors are increasing in importance for geographers, and resource requests to businesses call for a specialized approach that understands the sector's perspective (see Schumacher 1992). Similarly, foundations often require more insider knowledge and they conduct calls that are very unlike the competitive proposal processes of public institutions (Geever 2001).

The purpose of knowing your potential funding organization well is to be able to write to the right audience and create what I call the "Right Fit" – that is finding the overlap between your own research agenda and the goals and mission of the funding organization. Alternatively, you might think of a good fit as a temporary alignment in the same general direction to advance goals together. You will need to consider how to "package" your research idea, which as Michael Watts (2001) notes, is not the same as to "compromise" it.

The way you go about searching for potential funding opportunities is itself an opportunity to ensure the right fit. One approach is to follow the path of leaders in your field. The CVs of experienced researchers in your area are a gold mine of potential funding sources for your own research. Many scholars now publish their resumes online, or at least some kind of list of recent projects. Look up the name of a senior scholar in your subfield, using a search engine to find their homepage, or find them through their department's faculty page if you know their institution. Locate their CV or resume, and make a list of all of the names of organizations where their research has been funded or where they have conducted projects in collaboration. Odds are that your research will be eligible for funding from those same organizations. They also are more likely to be a better fit than less focused searches.

Organizing and systematically prioritizing which funding opportunities align best with your work – rather than jumping at the nearest deadline – will help you focus on the best fit and by extension, the highest probability of success. Create a spreadsheet of possibilities from a variety of sources, listing the potential donor organizations' name, address, website, contact person, email, telephone, published funding program priorities, grant funding ranges (minimum to maximum amount of awards), eligibility criteria, deadlines, and so on. Annotate each record with a reference to a particular research problem or question (not just a topic) that might be developed into a proposal. Rate the likelihood you believe you have in receiving funds from each potential source, using a percentage scale. This is a bit of an instinctive process, weighing a multiplicity of factors such as the level of competitiveness, how good the "fit" is, how amenable the timeframe is to your research agenda, how well you match the eligibility profile, whether the request limits will meet your resource needs, and other factors. In this way, you can prioritize the list of possibilities according to the likelihood of success and your own preferences for research questions.

For discovering and creating the "Right Fit" as you design and write the proposal, you might find common ground in one or more of the following areas: Organizational mission: There may be some shared vision between the goals of the organization and your respective research goals. These will clearly not align perfectly, so the objective is to discover where they overlap and exploit those connections fully. Targeted beneficiaries and research subjects: Pay special attention to shared constituencies and their needs (e.g. both you and the funder are interested in youth populations) or relationships between respective constituencies (e.g. your interest in youth and their interest in retired professionals possibly connecting through mentoring relationships). Operational Approach: The means of executing your projects may coincide with those that funders prefer or promote (e.g. the use of geographic technologies, mapping, communication technologies, community

participation, or shared markets). <u>Mutually Beneficial Deliverables:</u> What might your project produce that serves both you and the funding organization? (e.g. a tourism brochure for them that includes a community map you seek to create). <u>Global Objectives</u>: What global or international targets might you both care about? (e.g. demonstrating progress toward the Millennium Development Goals).

This example proposal (Solís, Appendix vii) generates and communicates a rationale for the project to be conducted within a professional society, deviating from the norm that the agency makes awards under this program to university-based researchers. It first establishes common ground in the missions of the organizations:

> "As producers of knowledge in a globalized society, scientists and scholars must reckon with a world where economies are increasingly connected, where country boundaries are ever-shifting, where communication technology enables information to traverse the globe with great speed, where workplaces are increasingly internationally distributed, and where cities and towns are growing in ethnic and racial diversity. These phenomena impact the activities of knowledge producing enterprises, a fact which has prompted research-oriented organizations such as universities, R&D business, and federal agencies to promote international research collaboration (IRC) as a means to build intellectual capacity and increase competitiveness, among other goals (See National Science Foundation NSB 03-69; NSB 00-217; Association for the Advancement of Science Teich 2000; Social Science Research Council 2000)."

It subsequently explicitly evokes a shared constituency:

> "Because the disciplines are the intellectual home of faculty members, disciplinary professional associations can play a central role in any effort to understand and enhance the international dimensions of academic research (Lawson 2005). However, research on IRC has focused on primarily two sets of actors, the individual scholar and universities or groups of institutions and seems to neglect the influence that disciplinary professional societies wield or potentially could bear upon facilitating productive IRC."

And finally offers a mutually beneficial deliverable in the form of:

> "An <u>International Model</u> that can be applied to other disciplines and other regions to advance scientific cooperation in research and scholarly inquiry, to be broadly disseminated . . ."

Communicating in the language of the donor is critical for the "Right Fit" that you have shaped to actually result in a funded proposal. Scholars should recognize that the style of writing for a grant proposal differs sharply from that of an academic journal article, for instance, and different modes of expression are called for.   Even proposals to scientific funding agencies like the NSF should avoid scientific jargon and use an appropriate style that reflects the manner in which the funding agency communicates. Namely, when key terms are used in the proposal announcement, use those same terms in your proposal. Don't

leave reviewers guessing if your research meets their specific objectives; tell them exactly, in *their* own words how it does. To practice, read through an entire proposal announcement carefully and identify "buzzwords" that in the language of the donor express important key concepts significant to their organizational mission or the goals of the granting program. These might be words, word-combinations, or phrases. List them, then define each of them using the kinds of language that your research would normally use to express ideas to create a kind of glossary, a handy reference when you are writing and revising your proposal.

Beyond the horizon of one particular grant proposal, long-term success in generating resources for your research rests upon your ability to build and maintain solid mutually beneficial relationships with providers, funders, and/or donors. You should be willing to invest in developing these relationships over the long term. Start planting seeds with a good understanding of who the donor is and with what language they communicate. Resource requests, including everything from informal inquiries to formal proposals, themselves often both draw from and generate relationships, whether they ultimately are short or long term, whether intimate or formal or casual. Doing it right may make the difference not only for a positive response to your current proposal, but also for the long-term success of your research agenda.

3 ASSEMBLE A WINNING TEAM.

The saying goes that "no man is an island." Grant preparation is no different. Assemble a winning team on your side to increase your chances of success. This advice holds for experienced faculty, early career faculty, and graduate students alike.

There are at least three kinds of help you might need in preparing your research grant proposals. First, you should early on ask for help from your university's Sponsored Research Office or Program (SRO), where they can provide a wealth (and often literally a library) of information, including funder directories, model proposals, writing services, human subjects advice, and so on. In most cases, consulting with them from the start can also help you get through university review more easily and quickly.

University review is often required because most grants are contracts between the granting agency and the university (or a unit within the university), not between the agency and the researcher. A typical university review will consist of a series of forms and procedures, including some kind of researcher information form, a proposal or abstract form, budgeting forms (including your final budget with justification), human subjects approval, and other information. Generally a litany of signatures is required, from you as the PI, your department chair, your dean, the university office of grants and contracts, and finally the SRO. If your university does not specify the time frame by which you must submit all materials prior to the granting agency deadline, it is recommended that you provide your complete written proposal (and all related documents) at least 3 to 5 business days before, but at some universities a much longer approval period is needed. You should check with your office well ahead of time to know what their internal deadlines and requirements are.

Any research that involves human subjects must also undergo a review by your university's Institutional Review Board, for which you should leave at least a couple of weeks' time if the granting organization requires final approval prior to submission. Finally, a common required element of the research grant narrative is some general information about the applicant institution (i.e. your university). Your SRO should be able to assist you with standard responses to those requirements.

Secondly, you might seek out the aid of a seasoned grant writer that can help you keep on task and on time and cover all of the bases. This person can play the role of practice reviewer for later drafts of your proposal. If willing and available, scholars experienced in grant winning can serve as critical mentors as you develop your skills.

Thirdly, when appropriate, you might invite these same scholars to team up with you on the research project as a co-Principal Investigator. Nothing breeds success like success, and if you can develop collaborations and partnerships with other successful researchers, you will see your own success expanding. By building a team, you may also be able to be eligible and competitive for larger funding programs than you otherwise might be.

If you are not quite ready yet to call a team to arms around a particular research proposal, you could simply make an appointment with a scholar or two in your subfield who are experienced in writing and getting grants. Interview them, share your ideas and questions with them, invite them to mentor you on specific aspects of the process, or generally consider developing joint proposals with them. If you do not find an experienced colleague, you could also benefit greatly from doing the same even with a less-experienced peer.

4   DESIGN TO DELIVER.

The actual research activities and methodologies that you will undertake should be very carefully designed and clearly organized to instill confidence in your reviewer that you can deliver on your promises. As Krathwohl (1988:15) advises, "while projects typically start with an idea, sponsors fund activities, not ideas." Focus on what you will *do*. Keep your scope realistic and doable within the granted time period. Think carefully through your entire plan, step-by-step from start to finish to ensure that you will be able to administer the research project on time and on budget. Practice good time management (Foote, this volume), not only in your writing process but also in the design of the project; determine how long and at what point in time each of the set of activities will need to occur.

To be clear about what you will do when, how, and with what resources, you should as a matter of practice always include a separate section called "project design" where you identify the specific *activities* needed to carry out your research methodology, a *timeline*, and a bulleted list of "*deliverables*" or products or outcomes expected -- even if the call for proposals does not specifically request these items.

This example timeline for a multi-year project is clear and succinct, and summarizes the more detailed methodology section (Song, Appendix viii). Notice how each quarter's activity domain is focused and follows from one time period to the next:

Year one	1st Quarter	Data acquisition and preprocessing, including geometric correction and radiometric calibration, to build a GIS database
	2nd Quarter	Finish preprocessing and GIS database development, test running RHESSys for the Blackwood Division of Duke Forest
	3rd Quarter	Start developing spatial algorithm to map tree size and density with high-resolution remotely sensed data.
	4th Quarter	Validation of tree size and density derived from 1993 B&W DOQQ, 1998 DOQQ and recent Ikonos/QuickBird data
Year two	1st Quarter	Modify RHESSys to take tree size and density over the landscape to simulate carbon cycle.
	2nd Quarter	Calibrate RHESSys with flux tower measurement and error analysis. Start transferring GORT-ZELIG to the local area
	3rd Quarter	Continue work on model simulation with GORT-ZELIG and develop algorithm to map stand ages with ARTMAP.
	4th Quarter	Validating stand age map and integrating stand age with RegCarb to simulate carbon cycle
Year three	1st Quarter	Error analysis for age effect on carbon cycle; mapping subpixel tree cover and LAI with MODIS/MISR.
	2nd Quarter	Evaluate subpixel LAI and tree cover products; test running a light-use-efficiency model
	3rd Quarter	Error analysis for subpixel LAI and tree cover with Radiosonde measurements and other simulations.
	4th Quarter	Publication preparation, and project report.

This second example timeline for an NSF Career award, not only specifies which activities will occur when, but also creatively uses two activities columns that help show how the project will achieve the important donor-program goal of integrating research and education (Elwood, Appendix ii).

Year 1	Research Activities	Education Activities
Fall 2003	• Inventory/collect all relevant data held at DePaul to be included in data library • Gather local government and community data for data library • Initial spatial analysis project planning with community organizations • Finalize Human Subject approval for Geo333/Geo245 • Purchase and set up hardware & software at community sites	• Finalize new course approval for Geo 245, experiential learning approval for Geo333. • Student recruiting
Winter 2004	• Finish data library development for first iteration of courses • Observation of student-community working sessions, roundtable discussions • Evaluation of goals and procedures	• Geo 333 (creation of spatial analysis project plans and goals for each group) • Student-community working sessions and roundtable discussions • First 2 community participants enroll in DePaul's Introduction to GIS course
Spring 2004	• Observation of student-community working sessions, roundtable discussions	• Geo 245 (implementation of spatial analysis project plans with each group) • Student-community working sessions and roundtable discussions
Year 2	Research Activities	Education Activities
Summer 2004	• Interviews with organization participants and local government officials • Compilation / analysis of in-progress field notes and student field journals • 1st projects/maps added to web site • Acquire/learn qualitative data analysis software program • Update / expand data library for upcoming year	• Revision of course plans / activities based on student and community evaluation • Produce community report • Prepare Human Subject renewal for upcoming year's activities
Fall 2004	• Analysis of data gathered to date • Finish interviews from summer • Continue collection / analysis of any organizational documentation using spatial analysis project results	• Planning meetings with participating organizations to evaluate / revise course activities and spatial analysis project outcomes
Winter 2005	• Begin writing journal articles of preliminary results.	• Continue as in Winter 2004
Spring 2005	• Continued writing and analysis	• As in Spring 2004

Table continues . . .

Designing to deliver also means that you will be able to realize your project with the requested resources. Above and beyond serving as your formal request for a particular dollar amount, your budget section should demonstrate your resource plan. The single most important key to designing a good budget you can live with and get approved is to be very clear first about what you will *do*, then ask for the resources you will need according to each activity. Ask yourself for each activity, what do I need to perform this task? Convert how much time it will take into dollars, since most budgets also pay for salary or wages.

You may ultimately have to negotiate a final budget with some donors, so be sure that each item in the budget is fully justified and necessary, or you may find that it gets cut. Most novice grantwriters need some guidance on deciding how much to ask for and how to ask for it. A good rule of thumb is to use the guidelines and limits in the call for proposals, remembering that you do not have to ask for the full amount available, but you should ask for the full amount you need and can appropriately justify. For travel expenses, look up current federal government guidelines; for equipment expenses, get some quotes from vendors to provide evidence of costs; for indirect rates that differ widely among universities, be sure to check with your SRO for proper procedure and documentation.

In short, basic criteria for designing a budget that delivers includes the following:
- Is each item eligible for funding according to donor rules?
- Is each item necessary for the project and linked to a particular activity?
- Is each amount properly justified?
- How much "bang for the buck" can your project deliver? Put your request in perspective according to what impact your research will have.

For more details on budgeting basics and how to test a budget to ensure that it is reasonable and sound, see Henson 2003 and The Foundation Center 2006.

What you ultimately propose to deliver should strive to meet the expectations of the granting organizations, or at least of your reviewers. These of course differ by field, with research in the humanities, social science, and physical science having their own unwritten codes of expectations of their communities of scholars. Conform your proposal to the appropriate context. If you don't know much about that set of unspoken assumptions, talk to a mentor. In any case, this usually means that you should deliver some kind of impact – be it impact on practitioners of the field, impact on our knowledge about the problem, or impact on a community affected by the issue. Clearly identify what that impact is and show how you will deliver it. (See also section 7). Be prepared to prove that you delivered it, incorporating an evaluation component in your project design (See also section 8).

5   BE PERFECTLY PERSUASIVE.

Grant writing uses persuasive communication, aiming to convince the reader that the project is worth investing in. This means that you should use carefully crafted arguments backed up by evidence, not unfounded assertions that your reviewers might doubt or worse, challenge. It also means that the language should exude confidence, eschewing grammatical

formulations that are overly reliant on "might" or "could," opting instead for simple present or future tenses as often as appropriate, like "is" and "will be." Be sure to avoid passive voice unless completely necessary, to convey the sense of action that you will perform as you carry out your project.

Excellent persuasive proposals distinguish themselves by anticipating opposing arguments, or identifying points of contention in your research plan. By preparing a positive response to defend likely criticisms, rather than avoiding them, you demonstrate thoroughness in your thought process and can convince reviewers that might otherwise remain skeptical about how your research will contribute to the field. Mentors and colleagues can help identify opposing arguments. Or consider reviewing your proposed work in a seminar where the discussion might raise ideas about possible responses to your work.

> This excerpt aptly addresses a potential concern from reviewers (Song, Appendix viii). After introducing the concept of "successional stages" on which the research methodology relies, the author anticipates and dismisses a possible objection to its use:
>
>> "Forest succession is closely related to tree size and density, but it also incorporates the individual replacement process. Stands at different forest successional stages are usually composed of trees at different ages, and sometimes different species composition. Though the mechanisms *are debatable* (Yoder et al., 1994; Ryan and Yoder 1997), *the fact* that forest productivity strongly depends on its successional stage *is well accepted as it is confirmed* in numerous studies from different perspectives (Birdsey et al., 1993; Law et al., 1999; Barford et al., 2001; Law et al., 2000). Therefore, knowledge of forest successional stages over space should lead to improved estimation of carbon budget over the same area." *(emphasis added)*
>
> Similarly, this example silences a possible contention over the choice for her study area by addressing it in advance (Patel, Appendix vi):
>
>> "Arguably, as call center operations emerge throughout India, the question becomes why focus on Mumbai versus Bangalore, Chennai, or Hyderabad. When asked 'Why setup in Mumbai versus Bangalore?' Sharon, a call center executive, contends that Bangalore is the IT hub, but not necessarily the call center hub. The presence of an educated, English-speaking population and the space available to build call centers in the outlying areas of Mumbai are the key magnets drawing companies to this area. Mumbai is also viewed as more cosmopolitan and professional, and is ahead of Delhi in terms of fiber-optic connectivity and its electricity infrastructure (Patel 2002). At the same time, during pre-dissertation research I discovered that some families are hesitant about women working for a call center in Mumbai because, unlike Bangalore, Mumbai is viewed as a city of ill-repute, danger, and sin. In this context, focusing on Mumbai provides a complementary understanding of how the local conception of a cityscape intersects with the global demand for a night shift labor force."

Being persuasive is not only about what you say, but also how you say it. Be sure that your document is perfect, error-free, and looks great. First and foremost, conform *exactly* to the formatting specifications published in the call for proposals. Use the very same headings and subheadings for proposal narrative elements in the same order as requested (e.g. Introduction, Significance, Methodology, etc.) Don't cheat line spacing or margins; use standard, black color and readable fonts and font-sizes (never less than 10 points) and stick with the same choice throughout all of the proposal documents. Leave plenty of white space and break up long paragraphs of text. Use but don't overuse bullets, tables, and graphics to draw attention to particular elements of your proposal. Don't rely on automatic spell check in word processing programs to catch all spelling or grammar errors. Don't allow widow or orphan lines, always number your pages, and use a common paragraph justification for the whole document.

When you finish, step back from your document to check for possible formatting problems by using the "zoom" feature of your word processing program – scroll through to look for inconsistencies.

These sample pages demonstrate how to "zoom out" and check that your work also looks professional. The text to the right is packed too densely, and is not justified cleanly. There is not enough white space to smoothly lead your eye through the narrative. Ten or fifteen pages of this style will surely irritate your reviewer.

Using graphics, bullets, bold facing, double justification, and white space judiciously greatly enhances the readability and flow of your narrative, as these two sample pages show:

Print out a hard copy to see what it looks like, even if you will be submitting electronically. Leave enough time in your writing schedule to let your proposal gather a little dust and re-read it fresh again, or ask a colleague to proofread for you. (See also Foote, this volume).

In short, a good rule of thumb is to avoid any kind of presentation problems that might irritate your reviewer or distract from your content. Similarly, follow all submission guidelines precisely and on time. Leave extra time for using online submission systems, especially if it is your first time preparing an electronic proposal for that agency. By paying attention to these details, you not only produce a polished proposal, but you will instill confidence in your reviewer that you can deliver a well-conducted research project.

6 MAKE IT REAL.

Related to the idea of persuasion, is the strategy of making your project real. The discipline of geography has a distinct intrinsic advantage of being intimately connected to the actual phenomenon that we study, phenomenon that generally intersect with our everyday lives in a real way, whether it be about income distribution patterns in a major city or linkages between rural land use and groundwater quality or statistical evaluations of global climate change models. Even theoretical research often draws from and has implications for very real everyday matters. Take advantage of this perspective to connect to your reviewers by providing them with real life examples and connections that avoid jargon. Infuse your narrative with *one or two* (don't over do it!) carefully selected maps or photographs that validate the adage of a picture being worth a thousand words. Writing with passion (but not hype) also makes it real for your reviewers, as Abler (1989) so elegantly enjoins. Flip through newspapers and magazines for inspiration on compelling examples. Explain your unique geographic work in a way that will implant an image into the minds of your reviewer to remember you as they wade through the other scores of proposals they still have to finish reviewing this afternoon. . .

"Many decades ago, Americans observed the effects of wildfires on the composition and structure of hardwood forest environments (the kind of natural environment where most people lived at the time). Based on those observations, people drew the plausible conclusion that fires in nature were harmful, and that policies were needed to "protect" forests from wildfire. Well-intentioned applications of fire suppression policies in other environments – e.g., the Plains grasslands, Rocky Mountain coniferous forests, or southern California chaparral – have proven unwise.

We now know that fire is an integral part of many natural environments, and that the suppression of normal fires in those environments will lead inevitably to an altered ecosystem, often accompanied by a buildup of fuel and a more catastrophic fire. Similar examples could be cited in such diverse fields as urban planning, natural hazards, counterterrorism, agricultural biotechnology, infectious disease control, and energy policy. In each case, activities and policies that work well in one place may be less effective or even counterproductive in another place."

Excerpted from Solem 2004

7 DEMONSTRATE YOUR UNIQUE VALUE.

Speaking of the competition, the proposals that are successful are the ones that stand out from the crowd. Explicitly state what is special about your work. Usually every call for proposals requires a special section to describe the "significance" of the project, where you identify what is unique about the proposal. Brainstorming answers to the following questions may help you pinpoint what aspect or combinations of characteristics are valuable in the work you plan to do:

- What is special about the problem I have chosen to address?
- Is my work conceptually innovative?
- Does the field know less about my case than other similar cases elsewhere?
- Have there been any recent critical breakthroughs in the field that my work draws from or seeks to build upon?
- What about my methodology might represent a contribution to the field?
- How is my approach different from the way others have looked at the issue?
- What's the payoff? (Przeworski & Salomon 1995)
- What is new about what my expected research results?

Use words that signal difference, uniqueness, and the special quality of your work.

This example excerpt (Song, Appendix viii) compares the proposed approach to others to demonstrate its unique value:

> "We propose to expand the scope and depth of existing studies at Duke Forest by scaling up carbon fluxes from stand to landscape through integration of remote sensing, ecological modeling and ground observations. Our scaling up strategy **differs from the traditional** 'big-leaf' model as we explicitly incorporate spatial vegetation heterogeneity into ecological models to simulate landscape carbon cycle." *(emphasis added)*

Another example integrates compelling vocabulary to show its special character (Wasklewicz, Appendix x):

> "The proposed education and research activities are **a significant shift away** from the compartmentalization of techniques and concepts found in many disciplines. A holistic approach, like the one proposed, will compel students to develop sound habits in project design, fieldwork, data collection and management, analysis, synthesis, and articulation (written, spoken, and visual). A student immersed in this learning environment can provide **innovative approaches** to broaching integrative subject material. The application of these systematic practices will permit students **to go beyond** lecture and lab to conduct publishable original field- and computer-based research because they have a clearer view of science and its applications" *(emphasis added)*

Certainly, as Przeworski and Salomon (1995) point out, "disciplinary norms and personal tastes in justifying research activities differ greatly: Some scholars are swayed by the statement that it has not been studied (e.g., an historian may argue that no book has been written about a particular event, and therefore one is needed), while other scholars sometimes reflect that there may be a good reason why not." In any case, justifications should be based upon evidence and argumentation rather than assertions or opinions about what is appealing about the subject matter.

Generally, another effective approach is to capitalize upon trends in your field or recent events worthy of note. For instance, in response to interdisciplinary calls for proposals, the broader trend of a "geography rediscovered" can give contextual importance to your work. Over the last decade, the discipline of geography has undergone a renaissance that has moved it to the academic center (NRC 1997; Pfirman 2003) and has generated an importance for geographic research in society at large (Richardson & Solís 2004; NRC 2006). Consider the fact that geography majors have increased by 32 percent in the past five years (NCES, various years), dozens of new geography programs have been initiated, including at prestigious universities such as Harvard and Howard (AAG Guide, various years), geographic information technologies are diffusing rapidly in all sectors of the economy (Gewin 2004), and job opportunities are multiplying rapidly as demand rises for workers who are globally literate, knowledgeable of geographical concepts, and skilled in interdisciplinary research methods (Jackson 2005). As you make your case for the importance of your own geographic research, it may serve your purposes to point out one or more of these aspects of a growing discipline (Pandit 2004). A few well-placed bullet points can impact your reviewers and increase the likelihood that they will understand your research as significant. Consult the AAG website (www.aag.org) for updates on such trends.

> Wasklewicz (Appendix x) positions his research as a timely intervention, taking advantage of new developments coupled with a rich empirical tradition:
>
> > "Form analysis in geomorphology has *languished for decades*, mired in studies of 2D shape as opposed to interpreting 3D and 4D landform characteristics. This produced a situation whereby our current understanding of continuous terrain is not equated with repeatable, measurable form attributes, but rather with qualitative observations or simplified empirical interpretations. *Recent developments* in geomorphometry have promoted the concept of numerically characterizing form by analyzing geomorphometric structures. Structure arises from a quantitative understanding of the spatial arrangement of morphometric point data and represents a numerical signature of the topographic form. *Historical analyses* of alluvial fans, which have produced *a solid literary foundation*, the ubiquitous nature of fans, and an exposed surface expression of fans *make them an ideal feature for establishing* a morphometric structure approach." *(emphasis added)*

If you do choose a problem that is unique because it is a topic of current salience, you should take care to convince your reviewers that "such topics are not merely timely, but that their current urgency provides a window into some more abiding problem." (Przeworski & Salomon 1995).

> Lam, Campanella, and Pace (Appendix iv) explain the intellectual merit and broader impacts of their proposed project in the immediate aftermath of Hurricane Katrina. Note that both short and longer term benefits of their work are featured in this justification:
>
> > "Very little research has focused on collecting *time-critical, empirical data* on how businesses make spatial decisions on whether they remain or relocate after a catastrophe, *especially a catastrophe as deep and wide as we have seen* that affects an entire metropolis of New Orleans. The time-critical data that we collect for this project will provide *unique information* on how decisions among businesses are made in this *unprecedented* case. The coupling and tracking of street and telephone surveys over time will provide vital information for research on human-social-economic dynamics over space and time. The data we collect will also serve as an important *benchmark dataset for subsequent research* and for comparisons with other studies (e.g. studies on decisions made by individuals) . . . The time-critical, integrated GIS data set collected in this project can be made available to other researchers and planners, and can be used as a *basis for further related research*, such as modeling the impacts of Katrina on health, poverty, and crime. Our preliminary analyses of the data will be published and widely disseminated. Our data will provide a first-hand, *rarely captured view* of how a city recovers, literally from ground zero, and how businesses make decisions in post-catastrophe uncertainty. This information will help governmental and planning agencies in devising effective policies for economic recovery in the region." *(emphasis added)*

However, beware of the fact that "hot topics," whether theoretical or applied, will likely also attract more competitors. If everyone is writing about it, you may be better advised to develop or stick to a quality research niche that is your own. "By the time you write your proposal, obtain funding, do the research, and write it up, you might wish you were working on something else. So if your instinct leads you to a problem far from the course that the pack is running, follow it, not the pack: nothing is more valuable than a really fresh beginning" (Przeworski & Salomon 1995). Doing so will not only distinguish your particular proposal, but will also set you apart as a researcher in your own right.

8 GO THE EXTRA MILE.

Turn up the notch on your competitiveness by including one or more strategic elements that may not be required but can help round out your proposal. While some of these ideas apply better to faculty proposals, including others in student proposals may demonstrate early professional maturity. All should be applied to enhance your work, not distract from it. Be sure to check that your target donor agency allows these items in proposals; some funders

have very strict guidelines. At best, incorporating these strategies regularly can help you transform individual research projects into a solid research program.

An advisory board is a group of people who can help you ensure quality and provide a sounding board for ideas and problems. If you can identify and convince experienced scholars to agree to serve on such a board (pending acceptance of your proposal), referring to their tentative agreement to participate in your proposal also lends a measure of credibility to your efforts. Advisors usually serve on a volunteer basis, but if it is allowed by your donor agency, you might consider writing in a budget line item to cover a small amount of basic communication or travel expenses. A cost-effective strategy is to plan your advisory board meeting(s) during a national conference where you and your advisors are already likely to be in attendance. If you are a student, form your board now, inviting scholars from inside and outside of your home university, and establish a track record to support your career development goals.

Letters of support are also good means of demonstrating the importance of your proposed research. Even if not required, a key endorsement from a leading scholar, a partnering agency, or other group can help your proposal stand out. To get these letters, be prepared to write each letter draft yourself, and tailor every single one to each individual supporter. Do not use a form letter, or you will receive five letters back with exactly the same wording. Do be sure that the letter refers to the exact, correct title of your project and is addressed to the right person or department at the funding organization, or generally to the "Review Committee." If unknown, have them addressed to you.

A research agenda is a common way to demonstrate that you anticipate how this project contributes to a larger and broader knowledge generating enterprise. By proposing to develop one during the course of your research project (and even better, in conjunction with your advisory board), you set yourself up for possible future funding opportunities. Later you can then point to the research agenda as the source for new questions you wish to raise in subsequent proposals. (For an example of a research agenda publication, see AAG 2003.)

A sustainability plan is a tool to allow you to continue making progress beyond the grant period. Many granting agencies like to see that you are thinking about how to leverage their resources as a way of launching new, long-term efforts. Say a few words in your proposal about how you envision sustaining your work after the funds are gone (Carlson 2002:47).

Matching funds or in-kind contributions are another way to demonstrate to funders that you will be using their resources efficiently and stretch them to their highest impact. Even if not required, if acknowledgement of outside contributions is permitted, it is valuable to explicitly name what other resources you or your institution will bring to bear upon the effort, if nothing more than pointing to the use of facilities, extra faculty time spent working or writing on the project, or so on.

References to your own publications in your proposal narrative and bibliography can help demonstrate your competence in the field and position yourself relative to other scholars. Having publications that relate to the work you propose certainly reinforces credentials in the eyes of proposal reviewers (See Brunn, this volume), but be sure that the references are relevant and appropriate to the project. Furthermore, even unfunded proposals themselves may later become a source of future articles, creating a synergy between your grantwriting and scholarly publication writing activities.

Memorable project titles or acronyms can help reviewers recall your proposal over others, particularly in discussions among review committees. Proposal titles in fact make the first impression, so be careful to choose wisely, or the memory reviewers have may not be a positive one. For a thoughtful guide on prudent title selection, see Locke, et al. 2000, pp. 126-129.

> **Example Title Acronyms:**
>
> AAMIGA – Advancing Academe: a Multidimensional Investigation of Geography in the Americas
>
> EDGE – Enhancing Department Graduate Education in Geography

Dissemination activities include ways that you will ensure that your research results are broadly known. Donors are often interested in investing in work that will be widely recognized and continue to have further impact on the scientific community or the public. It is easy to add a few strategic dissemination activities like publishing your work in a journal, writing a newspaper op-ed about the results, holding a workshop or seminar or a panel at a conference to consider the results, creating a website, or other similar venues.

The following dissemination plan from Elwood (Appendix ii) demonstrates a commitment to both academic and public/community dissemination:

> "I will disseminate results of the project in academic forums, the Humboldt Park community, and broader Chicago community development forums. Scholarly dissemination will take several forms and target several research areas in geography. I expect to produce multiple manuscripts for dissemination in urban geography, GIS, and geographic education journals. In the 2 years following completion of the project, I plan to produce a book focusing on the research results of the project, targeting the book toward an audience in urban geography, urban politics, community development. Throughout, I will make presentations at academic conferences focusing upon the project's research and educational initiatives. In terms of community dissemination, all data developed for the spatial analysis data library and materials produced in the spatial analysis projects will be available to the partner organizations, and will be disseminated in local community development and neighborhood organizing forums such as the Great Cities Conference – an annual gathering of scholars and practitioners to share results of research and action throughout Chicago. Data and results will also be shared with Humboldt Park's many other community organizations in presentations, and through the project website. This process will be facilitated by the ongoing partnership between DePaul's Egan Urban Center and the Humboldt Park community. I am particularly committed to this local dissemination of data and results, given the underdeveloped infrastructure of local support resources for community-based spatial analysis."

Evaluation processes are often required for major research projects, but even if yours is not mandatory, it is advisable to incorporate some kinds of evaluation procedures into your work. This ensures quality and effectiveness and will allow you to map outcomes to original goals. It also provides excellent material for future proposals that build upon the same line of research. You may only need to include a few statements regarding how you plan to assess success. Or you may be required to contract with a professional evaluator that is external to the project. Formal, external evaluations generally should be budgeted at about 10 percent of the overall budget (before overhead percentages are applied). Be sure that the evaluation utilizes a valid and reliable evaluation design, referring to methods that are appropriate to the kind of funding agency you are seeking support from. For example, foundations may prefer Logic Model Evaluations (Kellogg 2004), international organizations may require that you adhere to ISO standards (e.g. ISO/IEC 19796-1:2005, the accepted reference criteria for evaluation of scenarios for Information and Communications Technology), or agencies such as the U.S. Department of Education may promote following any number of methodologies depending upon grade level, subject content, or other factors. The National Science Foundation makes available a number of guides that are helpful specifically for NSF directed proposals (NSF 2007).

9   ACHIEVE AND COMMUNICATE COHERENCE.

The whole is truly more than the sum of its parts. While writing each section of the narrative, completing the budget, putting together your biographical sketch, and all of the other parts of the proposal, you should strive for coherence among all of the elements. While you will not be able to eliminate all possible contradictions from any text, the idea is to create a complete package that minimizes a sense of the disjoined.   Don't leave this to chance: systematically structure your proposal to generate this coherence by using a matrix or other device that helps you to question the relationships among elements.

Figure 1. Make a convincing case using a Coherency Matrix. Use this conceptual tool to design your project and again before submission to check for completeness and coherency.
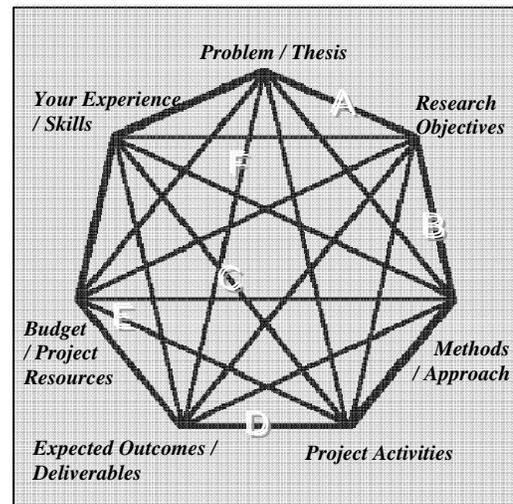
For example, following line A as marked in Figure 1: Do your research objectives actually address the problem or need you identify? Line B: Will your methodology really enable you to answer the question(s) you pose? Line C: Do your skills match up with the demands of the research activities that you propose?   Line D: Will the project activities suffice to produce the deliverables that you promise? Line E: Do budget items line up with the activities? Line F: Will your expected results actually inform the research context?   Do all of these elements overlap with the goals and perspective of the donor organization? And so on.

You can create your own matrix using required elements of the specific call for proposals you are responding to.   Or you can create a general matrix tailored to your research by incorporating your own research questions.   Activity II outlines a procedure on how you might create and use this kind of tool not only to design your project and in turn, structure your proposal, but also to review written drafts for completeness and coherency.

With limited space in the proposal narrative, you can create a sense of coherency by lining up goals/purpose, activities, the timeline, and deliverables as shown in this example table (Solís, Appendix vii):

	ACTIVITY	PURPOSE	M	A	M	J	J	A	S	O	N	D	J	F	Deliverable
Regional Status	Initial Advisory Board & Planning Session at AAG Annual Meeting in Chicago	*To review research plan, identify additional collaborations*	X												Advisory Board
	Gather departmental data	*To inventory geography in the Americas*	X	X	X	X	X	X							
	Develop survey respondent listings	*To identify IRC activities and participants*			X										
	Draft and pilot survey instruments; translate				X										
	Implement surveys					X									
	Mail reminders to non-respondents	*To increase response rates*					X								
	Conduct follow-up telephone interviews to non-respondents						X								
	Create and input data into GIS	*To visualize and understand spatial patterns*				X	X	X	X	X					
	Analyze data (spatial and statistical)								X	X	X				
	Publish data in Directory and online	*To share information and facilitate linkages*										X	X	X	Directory of Geography in the Americas
Local Contextual Dynamics	Research local case study information sources	*To discover and understand qualitative context of IRC*	X	X	X										
	Participant observation at CoK		X	X	X	X	X	X	X	X	X	X			
	Investigate disciplinary history					X	X								
	Devise focus group methodology/participants					X	X								
	Conduct focus groups						X	X							
	Data analysis of focus groups								X						
	Devise interview methodology/respondents	*To test assumptions, determine extent or quantify findings*								X					
	Conduct interviews										X				
	Data analysis of interviews										X				Case Study
Broad Facilitation Assessment	Research presentation at US geography conference	*To share results and gather geography community feedback, seek input for recommendations*							X						
	Plan Geography Summit									X	X				
	Send invitations for Geography Summit and Advisory Board meeting										X	X			
	Conduct effectiveness model evaluation analysis	*To develop recommendations*										X	X		
	Write project reports / NSF report	*To disseminate results and catalyze future IRC*											X	X	Set of Best Practices; Sustainability Plan
	Hold Geography Summit													X	Geography Summit
	Dissemination to geography community and other disciplinary societies													X	International Model

10   LIVE IT.

Preparing competitive research grant proposals is just as much about preparing yourself for a successful career as it is about getting resources for one particular project. Writing grants successfully is a continual process that is best practiced as integral to your professional life - not just parallel to it. Here I highlight a few simple organizational tools you can employ to create a constant state of readiness that will allow you to respond to funding opportunities as a matter of professional practice, rather than approaching it as a project (or chore!) in itself.

- Keep files / folders (either digital or hard copy) on possible research questions or problems that interest you. A research idea diary can help you focus on lines of work that you would like to elaborate, without having to flesh them out completely in the moment. You will be surprised in reviewing past entries just how your thoughts develop over time. This can then be a source for responding quickly to new funding opportunities.

- Keep similar but separate files / folders on possible funders amenable to your work. Organize this information, as you gather it, into a spreadsheet, so that you can find what you are looking for at a glance and you can see relationships between opportunities. Information on these funders can come from a variety of sources, including your university's Sponsored Research Programs Office. You can also simply use any search engine on the Internet combining key words for your research and the word "funding" or "grant" to dig up potential opportunities. Or mine the CVs of scholars in your field, as suggested above in section 2. Be sure the spreadsheet includes a column for deadlines, plan ahead, and prioritize.

- When you have identified a match between a funder and one of your research questions, or when you have a sufficiently developed research question arising in response to a particular call for proposals, you should launch a special writing operation.   Start with a proposal writing timeline for each proposal working backwards from the deadline, and identify key dates for finishing certain benchmarks.

- Write for 15 minutes a day. Whether or not you have a particular funding opportunity, call for proposals, or resource donor in mind, your writing skills to address this special audience will develop by frequent practice. Successful grantseekers almost always have one or more proposals in development, with draft documents saved on their hard drives specifically designed to capture ideas, arguments, and thoughts as they occur. This reduces the need to create the research proposal completely from scratch once you find a suitable donor agency. This reinforces the advice from Foote (this volume), who points out how people working in shorter, more frequent periods are better able to sustain momentum and continue progress as opposed to "bingeing" around deadlines. This approach is not only more productive, but also less stressful.

Finally, as with all other aspects of an academic life, there are clear ethical considerations that must be taken into account when writing grants. These are familiar refrains against plagiarism, integrity, honesty, informed consent, reciprocity, conflicts of interest and other stances appropriate for aspiring scholars to live up to. (See Locke, et al. 2000; Chapin 2004).

Now What?

It can be an exhilarating moment to finally submit a grant proposal for consideration after all of the hard work involved in preparing it. However, soon the realization hits that you will have to wait sometimes as long as six months for a decision. At these moments, turn to the next proposal and do not continually ask for updates from the program officers. Reject the temptation to make grammatical corrections or substantive updates and resend. Meanwhile, prepare yourself realistically for what to expect next: actual funding rates are indeed quite low, and even experienced grantwriters can expect success rates on the order of 30 percent or less. Instead focus on the other benefits that the writing process brought you. Reflect on what you might do better next time, regardless of whether you receive a positive or negative response for funding.

After proposals are submitted, they enter some kind of formal review process. Often this includes peer review, but for some foundations, the staff or a board of directors considers the applications. In any case, once you receive notification of a decision, you will usually also receive copies of the feedback from reviewers. If you do not, you should certainly request them. In the event of a negative review (a likelihood given the competitiveness of many programs), looking carefully through the feedback will help you understand that the process itself is instructive. A rejection of a proposal does not mean your ideas are not worthy of future consideration, it may simply indicate temporarily limited funding or unusually heavy competition. Read all reviews and use them to revise and resubmit rejected proposals, or to reformulate the next one (Ogden & Goldberg 2002:181). Even the reviews of accepted proposals should be carefully considered, since they often include very helpful comments that will improve your funded project.

Kenney and Patton (Appendix iii) revised and resubmitted their proposal three times to NSF before receiving the award. Note that the overall rating for funding priority in the unfunded proposal sample is the same as the proposal that was ultimately awarded (medium priority), although considered by two different panels. There are discrepancies or disagreements among individual reviewers that are important to consider together. It is worth comparing the proposals, especially the summaries, to see how the authors utilized feedback constructively to craft a winning proposal. In particular, look at the difference in the opening paragraphs in response to reviewers' comments, reflecting a transformation from a project focused primarily on database construction to one that has the analysis front and center:

(unfunded proposal text):

"This study examines the spatial relationships between successful startup firms and various constituents of a startup's institutional support network that contribute to its birth and growth. In particular, this project requests funding to extend an existing database to include data on all domestic firms that went public between June 1996 through 2000. The existing database includes geographic information on the firms themselves, and five members of their support network: lawyers, venture capitalists, investment bankers, advisors in terms of members of the board of directors, and the universities that trained the management team of these firms."

(review excerpts):

"It is unclear if the study will result in theoretical verification since few details on how the hypotheses will be tested are provided. . . It is primarily focused on the collection of data (although a number of hypotheses are laid out it is not clear how the researcher will proceed in answering them). . . it is primarily a database building proposal which the author plans to share with the research community. . . the major weakness of this proposal is the lack of analysis. Though hypotheses were described, no information was provided to explain how the data will be analyzed and how the hypotheses will be tested. The methodology section is just the method to complete the database."

(revised, funded proposal text):

"The role of social actors supporting entrepreneurship has recently been recognized as critical, yet their geography is not well understood. This is true despite the fact that the literature has recognized the importance of entrepreneurship for the birth and growth of industrial clusters. Drawing upon the results of research in high-technology clusters, there has been a general assumption that supporting actors, such as lawyers, venture capitalists, and others, should be located in close proximity to the entrepreneurs because of the necessity for face-to-face interaction to transmit tacit knowledge. More recently, some spatial scientists have remarked that even in highly clustered industries characterized internally by "local buzz," "global pipelines" to actors outside the cluster exist and are important. The proximity and role of these support network actors across industries and regions will be explored through testing a variety of propositions derived from the literature on clusters and entrepreneurship."

In conclusion, the entire process of writing research grant proposals – from developing ideas to writing convincing text to considering reviewers' feedback -- can be conducted in a way that solidifies your research ideas and shapes your academic career in positive directions. Integrating these practical recommendations and habits of mind and action into your professional life can help you prepare yourself as a successful researcher *and* grant winner.

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Recommended Reading

Abler, Ronald. 1989. How to win extramural research awards. In *On Becoming a Professional Geographer*, ed. M.Kenzer. Caldwell, NJ: Blackburn Press, pp. 170-182.

Although written some time ago, Dr. Abler's advice is salient and timeless. Coming from this renowned geographer, in an elegant and witty style, the text itself is a good example of clear and persuasive writing. A short and easy piece to cover a good deal of conceptual ground.

Chapin, Paul G. 2004. *Research Projects and Research Proposals: A Guide for Scientists Seeking Funding*. Cambridge, MA: Cambridge University Press.

A more recent and comprehensive treatment written by a former NSF Program Officer is right on target for an aspiring academic audience, which is likely to try a submission to this funding agency. Chapin's approach is to contextualize the process of proposal writing within the broader practice of planning and implementing a research project. Beyond its clear guidance on designing and writing the proposal, it includes discussion of managing awarded projects, ethical responsibility, and dealing with proposal rejection.

Geever, Jane C., 2001. *The Foundation Center's Guide to Proposal Writing, 3rd edition*. New York, NY: The Foundation Center.

A widely read classic and indispensable general resource for proposal writing, especially for applied projects, but also appropriate for studies. The perspective is particularly valuable for researchers seeking to submit proposals to private foundations or donors that are non-traditional in terms of academic research proposals.

Locke, Lawrence F. , Spirduso, Waneen Wyrick, Silverman, Stephen J. 1999. *Proposals That Work : A Guide for Planning Dissertations and Grant Proposals*. Thousand Oaks, CA: SAGE Publications.

For graduate students, this book not only reliably advises on key aspects of developing a research thesis, but also navigates through the dissertation proposal process itself, including how to form a dissertation committee and make the oral presentation. Its organization is particularly creative around nine functions that proposals must perform. The sections on writing a literature review, designing budgets, and discussing qualitative research will make this a valuable reference work in any academician's library.

Hall, Mary and Howlett, Susan. 2003. *Getting Funded: The Complete Guide to Writing Grant Proposals, 4th edition*. Portland, OR: Portland State University Press.

Although written for a much broader audience than just academic researchers, readers will find plenty of practical value in this volume. This edition includes a section for instructors teaching proposal writing, including a sample syllabus for 11-week and 3-week courses, and suggested assignments related to each chapter.

ACTIVITY I: PREPARING COMPETETIVE RESEARCH GRANT PROPOSALS: START WITH A GOOD PROBLEM

Goal: To shape an idea for a research project into a clear draft thesis paragraph from which to develop a grant proposal.

Overview: Before approaching the writing process for a grant proposal, you should prepare a clear thesis for a research project to begin with and elaborate from. The actual process of writing this down explicitly is a good way to develop your kernel idea into a clear expression of your research, well ahead of any effort at securing funding. This activity aims to take apart the various steps of the process of transforming an idea into a clearly written (fundable) thesis, beginning with a good problem, translating it into a question, turning that into a research purpose statement, and shaping it as a hypothesis, whether formally scientific or qualitative in nature. Finally, these expressions should be placed into an existing research context in such a way as to demonstrate the contribution of your research to the current state of knowledge. Modeling this function by revising an existing example paragraph, sentence by sentence, is a good way to practice how to effectively communicate your own thesis.

Activity Type: Can be used in a seminar or workshop setting, taking advantage of participants giving feedback on each other's writing. It is also a good exercise to complete on your own individually, although it is highly beneficial to share the final product with a colleague or mentor for feedback before proceeding with further writing.

Time: At least 1.5 hours, but the time allowed for completing each step can be extended to permit more reflection during the writing process. Alternatively, the two exercises in the activity can be conducted in two separate sessions, allowing some time for reflection between steps and a fresh look at the output of the first exercise before it becomes the input for the second exercise.

Readings / Advance Preparation: Have participants come to the activity with an idea in mind for research they wish to develop into a grant proposal. This may be a concept taken from your dissertation proposal, your dissertation or thesis, a rejected research proposal, or a topic for further research that arose from results of previous research.

Have them also read in advance one or both of these selections:
- Preparing Competitive Research Grant Proposals chapter from this book, *Aspiring Academics*.
- Locke, Lawrence F. , Spirduso, Waneen Wyrick, Silverman, Stephen J. 1999. *Proposals That Work : A Guide for Planning Dissertations and Grant Proposals.* Thousand Oaks, CA: SAGE Publications. Read pages 8-19; 41-49.

Procedures: Exercise A (45 minutes)

1. Identity goal for this session: By the end of this exercise each participant should have a set of clear expressions of their research that they can build upon for developing a thesis statement for a grant proposal. (2 minutes).

2. Begin with 3 minutes of quiet reflection, asking participants focus on their research idea. After a few moments into the reflection, encourage them to visualize themselves conducting the research and to imagine the kinds of problems that the research would help to solve.

3. Have participants group into pairs. Ask the pairs to briefly explain to each other what is their general research idea. (3 minutes).

4. Have each participant write a title or a list of key words for that topic in general (that is, non-jargon) terms in less than 7 words (2 minutes):

⎯⎯⎯   ⎯⎯⎯   ⎯⎯⎯   ⎯⎯⎯   ⎯⎯⎯   ⎯⎯⎯   ⎯⎯⎯

5. Ask each participant to describe the apparent puzzle, contradiction, *problem** or unresolved issue around that topic by filling in the following sentence (5 minutes):

The main problem this research seeks to address is . . . ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

*Problem – "the experience we have when an unsatisfactory situation is encountered" (Locke et al. 2000)

6. Have participants return to their pairs and reach each other's problem statement. After reading, have each participant indicate to the other what they understood to be the unsatisfactory situation the research would encounter (i.e. problem). (5 minutes).

7. Taking their own problem statement, have each participant rephrase it into one to three *questions**, creating a sentence that begins with a question word (5 minutes):

    Who⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯?
    What⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯?
    Where⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯?
    When⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯?
    Why⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯?
    How⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯?
    To what extent⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯?
    What is the relationship between⎯⎯⎯⎯⎯⎯⎯?
    Which is the (quickest/shortest/optimal/etc.) way to⎯⎯⎯?
    What would happen if⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯?
    What is the perspective of⎯⎯⎯⎯⎯⎯⎯⎯⎯?

*Question – "a statement of what you wish to know about some unsatisfactory situation" (Locke et al. 2000)

8. Each participant should then develop a *purpose** statement that describes the intention to answer the question or questions in part (7) by filling in the following sentence (5 minutes):

The purpose of this research is to (examine/study/understand/determine/answer/ etc.)

_____ .

*Purpose – "the explicit intention of the investigator to accumulate data in such a way as to answer the research question posed as the focus for the study. " (Locke et al. 2000)

9. Have participants return to their pairs and reach each other's questions and purpose statement. After reading, have each participant indicate to the other what they understood to be the explicit intention of the research in their own words (i.e. purpose). (3 minutes).

10. Instruct participants to construct one or more *hypotheses** that operationalize this purpose and help answer or approach one of the questions (5 minutes). (You may use the excerpt example on the following page to illustrate, if time allows.) This does not have to be formally scientific and quantitative or statistically testable. It can also be adapted for qualitative and interpretive research. The main idea is to express some statement around which reviewers can understand how you will know what results or outcomes arose from your research activities.

To practice expressing this idea, fill in the following blanks:

_____ will be positively related to_____ .
_____ will be negatively related to_____ .
_____ will not be related to _____ .

*Hypothesis " an affirmation about the nature of some situation in the world. . . a statement to be confirmed or denied in terms of the evidence." (Locke et al. 2000)

11. Have participants look at their pair's hypotheses and discuss how the statements relate to the original problem expressed. (7 minutes).

This excerpt from Ward (Appendix ix) demonstrates how hypotheses can be derived from clear questions:

"Research Question One: How does the adoption of IWRM [Integrated Water Resource Management] affect the ability of Paraguay's Ministry of the Environment (SEAM) to set resource management priorities?

Hypothesis One: By forcing SEAM to accept input from "local" NGOs, scientists, and environmentalists about the substance and wording of Paraguay's new water law, IWRM reduces the ability of the state to set resource management priorities.

Research Question Two: The proposed research asserts that understanding how these managers translate laws into action is critical to understanding the outcomes of these laws like the IWRM-based 799/96. This raises the second research question: *How do managers responsible for implementing IWRM at state, regional, and community scales translate the IWRM-based 799/96 into regulatory action?*

Hypothesis two: Investigations of governance systems in post-structural political ecology and anthropology suggest that managers translate standards into action according to a variety of factors, including their own expertise as well as their perception of risks, local management conditions, and the standards themselves (c.f. Bowker and Star 2000, Kull 2005). The proposed research assumes that all four of these factors interact with each other as they influence how managers implement Paraguay's new *ley de agua*, the IWRM-based 799/96. Hypothesis two is divided into four sub-hypotheses in order to trace out the individual effects of each factor on managers at different scales.

Sub-hypothesis One: Managers translate the IWRM-based 799/96 into action according to their different expertise.

Sub-hypothesis Two: Managers translate the IWRM-based 799/96 into action according to their different perceptions of IWRM.

Sub-hypothesis Three: Managers translate the IWRM-based 799/96 into action according to their perceptions of risks associated with water use and management.

Sub-hypothesis Four: Managers translate the IWRM-based 799/96 into action according to their perceptions of local conditions.

Research Question Three: Preliminary research suggests that if these new managers translate the IWRM-based Ley 799/96 into regulatory action in a way that forces Pantanal inhabitants to observe net fishing and license regulations, it will make many Pantanal households more vulnerable to natural hazards, such as droughts and flooding. This raises the question of how individual water users use 799/96 in their day-to-day activities and what its concrete effects are. The third research question asks: *How do Pantanal households' adaptive responses to the IWRM-based 799/96 make them more vulnerable to natural hazards?*

Hypothesis Three: The third hypothesis is that *Pantanal households whose practical use of 799/96 forces them to alter the ways that they access protein and income and interact with community-scale water managers and service providers will be the most vulnerable to droughts and floods."*

Procedures: Exercise B (45 minutes)

1. Identity goal for this session: By the end of this exercise each participant should have a thesis statement (written paragraph) designed to elaborate and incorporate into a grant proposal. (2 minutes).

2. Begin with each participant reviewing their set of expressions produced in Exercise A. (If this activity is conducted in two separate sessions, participants may be given the interim assignment of revising the expressions for clarity). (3 minutes).

3. Review the three annotated models of research thesis statements in Appendix i.   As a group, have participants answer and discuss these questions: With which of the three approaches listed does your research most strongly correspond: advancing existing research, resolving a contradiction, or developing a new line of inquiry? How? (7 minutes).

4. Have each participant pick one of the three models with which they identify their research most strongly.   Form three groups, one around each model.   Working individually but encouraging consultation within the three small groups, have participants recreate *each sentence* of the chosen model paragraph to reflect their own research, when appropriate using the text of their set of expressions from Exercise A. If participants are unfamiliar with the literature, or do not know exactly which citations from their field to use, give them creative license to make some temporary assumptions or to include placeholder citations (e.g. Jane Doe 2008) for the sake of practicing the model. (15 minutes).

5. Have participants exchange their draft paragraphs with one another and critique them, either in writing, by marking up drafts, or through vocal discussion in pairs. (8 minutes).

6. Return to the whole group and ask for two or more volunteer examples to be read aloud, time permitting. Discuss the merits of each paragraph. Discuss ways that the paragraphs could be improved. (10 minutes).

Wrap-up/Follow-on: Encourage participants to continue revising their expression sets and thesis paragraphs until they are satisfied that the text clearly and faithfully represents their research idea. Urge them to share revisions with colleagues or mentors for further critique and feedback.

ACTIVITY II: PREPARING COMPETIVE RESEARCH GRANT PROPOSALS: ACHIEVE AND COMMUNICATE COHERENCY

Goal: To apply the concept of coherency to a research proposal draft using a matrix of questions designed to improve relationships among elements of the proposal.

Overview: Research proposal writers may underestimate the importance of *systematically* ensuring that your proposal is as complete and coherent as possible. Sometimes during the writing process, separate elements may "wander" a bit from the central thesis, or connections between parts of a proposal are left implicit and not clearly communicated to generate a sense of a whole. A useful tool is a Coherency Matrix, to ensure that all of the various parts of your proposal – from the introduction to methodology section to the letters of support to your biographical sketch – are coherent parts contributing to a whole. This may be nothing more than a spreadsheet that you design to systematically integrate the components of your proposal. It will not only ensure that you have completed a response to the call for proposals in the most thorough manner, but also that you have issued the most competitive response because all of the pieces are working together to create coherency. This activity leads participants through the initial steps of creating a Compliance Checklist based upon a call for proposals, and then practices review of a proposal using questions from the Coherency Matrix example provided.

Activity Type and Variations: Can be used in a seminar, workshop, informal group setting, or most effectively and completely by an individual. If conducted in a group, depending upon the preparation level of the participants, each may work through the activity using their own research proposal draft. Alternatively, a group can work together on one common example practice proposal; if for instance, not all participants have their own draft proposal at hand. (See Appendix for example proposals from which to choose).

Time: About 1.5 hours, but can be extended or abridged by altering the time for each step and/or completing more or less of the set of matrix questions provided. For shorter time periods, the activity can end after step 5, or skip steps 3 to 5, moving directly from step 2 to 6.

Readings / Advance Preparation: Have participants come to the activity with a printed copy of a relatively complete draft of a research proposal. It is also important to have on hand the call for which the proposal is targeted. If working as a group, the activity works best if all participants are referring to the same call for proposals. These procedures and matrix are based upon the NSF Geography and Regional Science Division General Program Guidelines.

Have them also read in advance these selections:
- Preparing Competitive Research Grant Proposals from this book, *Aspiring Academics*.
- National Science Foundation Grant Proposal Guide. Chapter 2, Proposal Preparation Instructions (pp. II.1–II.36).
  http://www.nsf.gov/pubs/policydocs/papp/gpg07140.pdf
- A copy of the proposal to be reviewed for coherency.

Procedure:

1. Identity goal for session: to practice and apply the concept of coherency to a research grant proposal draft. (2 minutes).

2. Begin with a discussion of the concept of coherency and why it is important to the competitiveness of a research grant proposal. Be sure to include consideration of both how the proposal responds to the target call for proposals and how it is internally coherent. Note how much easier it will be for reviewers to remember your proposal among the competing others, if it is presented coherently. Raise some specific examples of how a disjointed proposal leaves a poor impression on reviewers, leaving openings for easy criticism or dismissal. For instance, poor reviews can result if activities are not closely related to the research objectives or if the timeline is unrealistic to address the specified problem. (8 minutes).

3. Have participants form pairs or small groups and refer to the NSF Grant Proposal Guide. Ask them to develop a Compliance Checklist, a list of all of the required parts of the proposal, in the order specified by the call for proposals. (8 minutes).

4. Compare the results of the groups with the following list, and discuss any differences among groups and with the example below, talk about how these lists were generated, etc.: (8 minutes).

Example (based upon NSF Geography and Regional Science Division General Program Guidelines)

- ☑ Grant application cover sheet
- ☑ Project summary/abstract
    - ☑ Summary of proposed activity
    - ☑ Statement of objectives
    - ☑ Methods to be employed
    - ☑ Intellectual merit criteria
    - ☑ Broader impacts criteria
- ☑ Project Description
    - ☑ Objectives
    - ☑ Expected significance
    - ☑ Relation to longer term goals
    - ☑ Relation to present state of knowledge in field
    - ☑ Relation to work in progress by PI
    - ☑ Relation to work in progress elsewhere
    - ☑ Workplan or timeframe
    - ☑ Broad design of activities
    - ☑ Methods and procedures
    - ☑ Broader impacts criteria

- ☑ Intellectual merit criteria
- ☑ Integration of research and education
- ☑ Participation of underrepresented groups
- ☑ Enhancement of research/education infrastructure
- ☑ Dissemination plan
- ☑ Potential benefits to society
- ☑ Prior NSF Support Statement
- ☑ References Cited
- ☑ Biographical Sketch
- ☑ Budget Spreadsheet
- ☑ Budget Justification
- ☑ Current and Pending Support Form(s)
- ☑ Facilities and Equipment Description
- ☑ Letters of Support
- ☑ List of Suggested Reviewers
- ☑ University Review Form
- ☑ Human Subjects Review

5. Instruct participants to map the outline of their draft proposal to this Compliance Checklist. They should ensure that all elements are included or at least a placeholder (such as a narrative subtitle). (5 minutes).

6. Introduce the Coherency Matrix (spreadsheet). Point out how both the rows and columns are adapted from the Compliance Checklist. [An extension to this activity would be to tailor a Coherency Matrix from a different call for proposals by creating a similar spreadsheet and composing individual questions to elicit relationships among proposal elements.] Demonstrate how answering the questions in each cell facilitate connections among the elements. The example highlighted features the intersection of "Outcome/Deliverables" with "Relation to Longer Term Goals." Using the draft proposal, ask participants to consider the question "How might my outcomes inform or advance my longer term research goals?" One possible way would be to include a research agenda as an explicit deliverable in the project. Brainstorm other ways or identify text in the draft proposal that communicates this connection. (10 minutes).

7. Proceed in the same manner with as many of the cells/questions as time allows. (45 minutes).

8. Wrap up the session by returning to the concept of coherency. Briefly review whether the proposal draft was sufficiently coherent or how the systematic process of examining relationships among elements improved the proposal. (4 minutes).

About the Author

Dr. Patricia Solís, (PhD in Geography from The University of Iowa) is a certified, award winning grant writer, administrator, evaluator and researcher. She specializes in sustainable development, water resource issues, geographic technologies, and international-intercultural affairs, particularly with respect to Latin America. Dr. Solís has had experience writing at least fifty major grant proposals, has won more than $4.7 million in external grants, and has administered or evaluated projects in excess of $6 million. Her list of awards includes corporate, foundation, government sources, fellowships, and international donors, such as the Ford Foundation, state block grant programs, the US Department of Transportation, US Department of Agriculture, the InterAmerican Development Bank, the Kellogg Foundation, the Fulbright Program, the US National Science Foundation, and others. She has an overall funding success rate of 82 percent and her funded projects have earned national recognition and awards. Dr. Solís is a Certified Grants Specialist by the National Grant Writers Association and is a member of the International Association of Grant Writers and Nonprofit Consultants. She is currently Director of Research and Outreach for the Association of American Geographers where she designs and implements special projects to promote studies, education, and public understanding of geography. She coordinates efforts to strengthen and develop programs that build upon various strategic initiatives and numerous core activities of the association, including AAG grants and awards, enhancing diversity within the discipline, careers projects, improving graduate education, international outreach, applications of geography for sustainable development, and others.

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