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Mistakes That Grant Proposers Make

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The moment has arrived. Your grant proposal is up for discussion. The buzzing in the room lessens and the committee becomes silent as the reviewers begin to speak. Each is clearly awestruck by your brilliance. There really is no score high enough to reflect the quality of the research you have proposed. Funding is not in question, only whether the review committee is free to recommend more than you actually requested . . .

The alarm clock rings harshly and you wake up to face the realities of another day of working on your grant proposal.

Writing grant proposals has become a ubiquitous part of academic life. Beginning prior to graduate school with fellowship applications, continuing during the predoctoral and postdoctoral years, and reaching a crescendo as you move up the career ladder, the drumbeat of drumming up funding to support yourself, your research team, and your work becomes increasingly incessant. In this chapter, I will offer a number of suggestions aimed at helping you avoid common mistakes and thus write better, more effective, and hopefully more fundable grants. All of the suggestions in this chapter come from personal experience, with many grants written (some successful, some not); many colleagues' and students' grants commented on; and many, many grants reviewed (again, some successful and some not). The structure and content of grant applications can differ greatly across funding agencies and grant types

(e.g., federal agencies versus private foundations, research versus training grants). For these reasons, it is impossible to write a one-size-fits-all tome on grant structure or content. Instead, this chapter focuses on the more common elements, suggesting generalized solutions based on the habits and practices of successful grant writers, topped off with a big dollop of common sense.

To help organize this chapter, I have created a "to-do" list of suggestions for dealing with a number of potential pitfalls and opportunities that every grant writer encounters. There are many other items that could be included, but these are some of the most basic.

Follow Instructions; Avoid Destruction

For about a decade, the Association for Psychological Science sponsored a session on grant writing at its annual convention called "Show Me the Money." Jane Steinberg of the National Institutes of Mental Health was the originator, and I had the privilege of serving as coleader and as one of the regular speakers. Over the years, the representatives from the federal agencies and foundations changed but, regardless of the individual speaker, there was one message that always seemed to emerge (most often as the first item on each speaker's list): "Follow the instructions."

You would think that this item would be so obvious that it would not need to be mentioned. After all, how can you write an application without knowing what the funders want to read? But, the consistency of this message, stated by so many different speakers representing so many different funding organizations, clearly suggests that there are many applicants who choose to commence writing without thoroughly and carefully reading the instructions. Nobody wants to be the voice of conformity, but in this case, that voice clearly needs to be heard. Improvisation may be a wonderful quality for jazz musicians, but grant applicants are better served by following the notes on the page. Page limits, section headings, required tables, minimum fonts, maximum margins, styles for references, and all of their brethren are best followed to the letter. Fortunately, for those who bristle at all of this conformity or who are severely instruction-resistant, the newer electronic formats for grant submission enforce some degree of compliance in many subtle and not so subtle ways. However, rest assured that even the most restrictive text field designed by the greatest geniuses at Adobe cannot foil the resolute efforts of the exceedingly "I-do-it-my-own-way" grant writer. So, before you start to put pen to paper, go to the relevant website, download the instructions for the grant you are applying for, read them over carefully (maybe even twice), and then COMPLY!

But, why is this so important? Why should you allow some silly instructions to silence your unique voice and cramp your unique grant-writing style? First, some violations of instructions are deemed sufficient by some funders to turn your application away without further review. This kind of outcome can be extremely costly to you in terms of time lost. Moreover, it can deny you the benefit of receiving reviewers' comments, which are the mother's milk when it comes to revising and improving your application. Second, even if your grant makes it to review, you run the risk that your tinier-than-tiny fonts, wider-than-wide margins, missing section on "innovation," or extra half-page of text "hidden" in a footnote in the appendix (thus cleverly circumventing the maximum length requirement) will be encountered by a reviewer who has entered the absolutely grumpiest phase of her or his fatigue cycle and who will soon cast an unwanted cloud of doom over your noncompliant but otherwise brilliant prose.

There's yet another reason for reading the instructions. They often parallel the guidelines given to reviewers to help them evaluate the extent to which applications realize the funders' mission and goals. So, if the instructions say to include a section on how your research reflects issues of diversity, or how it is innovative, or how it reflects the foundation's founder's vision of promoting world peace, you can be pretty sure that reviewers will be asked to score the proposal in terms of these very same things.

Try to Cull Mr./Ms. Excitement

You spend weeks on "flaw patrol," searching your application for anything that could serve as a launching pad for a negative review. Some minor bugs were found, but you have carefully exterminated each and every one. Surely, a flawless proposal like yours will turn out to be a true gem. You say to yourself: "What's not to like about a proposal with no fatal flaws?" You send out your unblemished masterpiece and wait to hear back. Finally, the reviews arrive and, true to your ministrations, no fatal flaws have been found. You scan ahead to the bottom line and, much to your surprise, your immaculate creation has not done well enough to be funded.

What is the point here? First, there is absolutely no doubt that grants that are fatally flawed are fated to fail. However, a lack of flaws is not always synonymous with success. For the latter to be the outcome, there needs to be something beyond flawlessness, something that elevates the proposal from the middle of the pack to nearer the top. If someone prepared verbatim transcripts of grant-review sessions, performed the requisite text analysis, and then correlated categorical word counts with outcomes, I'd wager an

indirect cost percentage or two that the category that would emerge as most predictive of ultimate success would be "excitement." Although truly egregious (a.k.a. "bonehead") mistakes are sometimes encountered in grant applications, most proposals manage to pass the fatally flawed test. However, proposals that generate true excitement among the reviewers are much less common.

One way to approach this "excitement thing" is to think about your grant application in a manner similar to how a writer might think about a novel. From the outset, the writer wants the reader to start caring about the characters and situations, and tries to hook them in so that they will eagerly work their way through the twists of the plot, reading page after page to find out how it all turns out. Similarly, with a grant application, you want the reader to be interested in and to care about your research questions early on and to be eager to know what the answers will be. So how do you make this happen?

Like Snoopy starting his novel with "It was a dark and stormy night," it's likely that every successful grant writer has her or his own tricks (and just as reading successful novels is a great way to become a better novelist, the same is true about reading successful grants). One thing that might be helpful is to think about your audience—the people who will be reading and evaluating your applications. Who are the typical grant reviewers? Well, you can be sure that they are going to be successful grant getters and good scientists. Granting agencies like to recruit reviewers who have strong grant-getting records and recognized expertise in the domains under review. Good scientists tend to be curiosity junkies. For them the drugs of choice are often unexplained anomalies, unexpected connections or disjunctions, interesting observations, and abiding mysteries. Viewed from this perspective, the first step in getting good scientists excited about your proposal is to get them thinking about your underlying questions.

A few simple observations are worth considering when selecting research questions and framing them in an application. First, fairly or not, research that aims to tweak paradigms, tidy up loose ends, or provide the one missing modification after hundreds of prior paradigmatic variations does not tend to generate a great deal of reviewer excitement. Of course, it may generate admiration and gratitude accompanied by statements along the lines of "someone should do this." But, these kinds of sentiments tend not to carry grants over the funding threshold. Second, and from the other extreme, research that is more grandiose than grand is similarly doomed. Science is ultimately incremental; thus, overpromising or overreaching can seem naïve at best and unseemly and arrogant at worse. Third, the fuse for igniting reviewers' interest is short; thus, you are best served by "getting to

the good part" quickly. Although there are many positive correlates of being able to delay one's own gratification, delaying reviewer gratification is not a very good grant strategy. So, if you start your proposal by excavating all of the areas that surround the issue but are not the real issue; if you endlessly dance around the point and never get to it; and if you obscure your research question in a fog of tangents and asides, you may find that you have missed the time-limited window for launching the reviewer on the royal road to excitement.

Aim High, Aim Often, Aim at Others

As far back as I can remember, NIH grants have always started out with a one-page specific aims section. Of course, there is always an abstract, and now there might be a mini-section with a few sentences on relevance, but the grant show doesn't really start until the specific-aims section appears. The specific-aims section is arguably the most important part of the grant for both you and for the reviewers. It provides a précis of the proposed work in one convenient place. I suggest that you be ambitious and work toward comprehensiveness, striving for a specific-aims section that states the underlying problem, explains its importance, sketches the methods that will be used, lists the hypotheses to be tested, and touches on the significance of the expected findings. Further, I suggest that you be extremely strict about limiting all of this to one page and not consider yourself done until all of those extra sentences that you plan to trim later are duly lopped off.

Why so much emphasis on making this section all-inclusive and combining this with a draconian enforcement of the length limit? Doing so provides a critical test bed for perfecting the underlying logic of your research proposal. It forces you to distill all aspects down to their essences and to find a way of piecing things together that is economical, coherent, logical, and compelling. A one-page, comprehensive specific aims section is totally unforgiving, revealing problems in the clarity of your thinking and presentation, weaknesses in the logic of your research, vagueness in your methods, and failures in the all important "so what" realm. If the rationale for the research is weak, its logic unclear, its hypotheses murky, and its grand purpose not so grand, all of this will be exposed. Given the luxury of length, additional verbiage has a way of camouflaging weaknesses (at least from the writer, but not so often from the reviewer). The brevity of the specific aims section works to reveal these weaknesses. But, when this section reaches the point of being clear, complete, cogent, and compelling, it provides a strong backbone and invaluable outline for writing the rest of the proposal.

In addition to helping you develop and refine your research logic, the specific-aims section also plays a critical role in the communal aspects of grant writing. Although it may not always take a village, many grant applications will be helped by input from at least some of the neighbors. Getting feedback on your grant applications from colleagues (especially those who have been successful grant getters) can be incredibly useful in helping improve your grant-writing skills and in increasing the likelihood that a particular proposal will reach that exalted and highly desired state of being fundable. Unfortunately, the lives of successful scientists and grant getters are extremely busy, and, thus, it can be quite difficult for them to find the time necessary to read your full proposal and give you extensive feedback. But, relief is on the way. Because the specific-aims section provides a taste of your entire grant in a single bite-sized piece, it is perfect for sharing. In my experience, most colleagues will be willing to read and give you feedback on a single page. And, some may even be willing to read several iterations of that page. Thus, it is a good idea to work on your specific-aims section first, to refine it to the point where it is ready to show to others, and then to ask key colleagues to read it. For those eager for immediate feedback, the one-page specific-aims section is an ideal length for real-time reading and feedback over a cup of coffee, but even sans beverage, it should be pretty easy to get feedback quickly.

Any specific-aims section worth its caffeine is worth rewriting numerous times, and you should plan to go through multiple cycles of feedback (from your own reading and that of others) and revision before you move on. It is worth remembering that, in addition to serving as a vehicle for getting feedback from colleagues, the specific-aims section is going to live many lives. It will provide a framework to help you craft the rest of your proposal. It will be used by reviewers when they need to quickly refresh their memories about your grant (e.g., often the last thing read before your grant is discussed and scored). It will be used by program staff when they have to explain the research and make the case for its being worth funding. And, hopefully it will be used by you many, many times as you share your successful grant application with admiring students, staff, and colleagues.

Be Ready for a Twosome

Rejection and failure are never welcome visitors when they arrive at our professional doorsteps. Although some develop thick skins and habituate to their sting, most of us never get to that point. Why, you may ask, am I starting off this section with such a gloomy, depressing thought? The reality is

that, unless you are one of those mythic creatures who encounter only success in their professional life, rejection and failure are inevitable parts of the grant-getting enterprise. Given typical percentile cutoffs for funding (in recent years sometimes falling below the 10th percentile at some NIH institutes), it is a simple, unarguable fact that most applications will fail. Moreover, among those grant applications that are ultimately funded, many (perhaps most) will not be funded on the first round, but will need to be revised and submitted again (and perhaps again and again). This is all pretty sobering when you consider that the group of scientists who are submitting these applications is already highly selected, a very impressive lot by any standards.

Okay, by now I hope you have read the preceding paragraph and wept. Before sitting down to write your grant application, before putting in the hundreds of person hours it takes to produce an application regardless of its ultimate fate, it is critical that you get to the point where you are ready for a twosome. Your proposal may well not be funded the first time around. However, this first-round failure will most likely be accompanied by two extremely useful consolation prizes: Reviews and resubmission! If your funding agency provides an opportunity to revise your grant application and resubmit, reviews are your lifeline. Reviews can provide valuable insights as to what went right and what went wrong, and even more importantly, illuminate a path that could lead toward greater success the next time around. Until recently, NIH grants could be revised and resubmitted three times. Although that third round meant more interim rejections with all of their attendant pain and misery, it also meant more reviewer feedback and additional opportunities to address the concerns that were raised in the reviews. Reading reviews, going to school on their contents, and revising your application accordingly has always been the royal road to grant-getting success. And, you can be assured that even the most highly successful grant getters have been down this multiple-submission road before and will continue to go down it in the future.

Having provided all of this background, there are two extremely unfortunate responses to initial failure that you clearly want to avoid. The first is *paralysis*, when the venomous sting of rejection causes you to give up and never try again. Like graduate students who never publish their dissertations, academia is rife with those who try grant writing once, fail, and never try again. This is a terrible shame. The effort to produce the first application is significant and it is likely that much of that effort will be very useful when preparing the revision or next application. In an ideal world, all unsuccessful grant writers would allow themselves a respectable period of mourning, dust off their slightly battered egos, and be ready to try again.

Another unfortunate and all-too-common unproductive response is to engage in "solipsistic review myopia" (to invent a term). Here, you read the reviews and then expend an incredible amount of time and energy convincing yourself that (a) the reviewers were ill informed and/or biased; (b) the grant-review process was unfair and/or corrupt; (c) you are so much smarter than the reviewers that they might never be able to understand or appreciate your brilliance; or (d) you are going to hatch an elaborate plot to seek revenge against all who stood in your way. There is probably a time and place for a quick dip into the shallow end of the miserable pool of failure and for railing against the unfairness of it all. But, however cathartic a place this is to visit, it's definitely not a productive place for a long stay.

One thing that can be immensely helpful is to show your reviews to a colleague who is experienced in the world of grants. Such a person can often read between the lines to help you see which issues are real and which are imagined, to help you determine if the surgery that is needed is minor or major (e.g., do you need to start over?), and to help you pick up any lifelines that are being thrown your way by helpful reviewers. One thing that savvy grant writers learn is how to gauge the excitement the reviewers had for the basic idea (flaws and issues notwithstanding). Reviews that signal excitement and an interest in seeing a revision are harbingers of likely success. Reviews that signal the opposite (boredom and disinterest) suggest a trip back to the proverbial drawing board. Over time, we all get better at reading our own reviews objectively. However, human nature being what it is, it's probably always worth getting a second opinion about your reviews from a dispassionate and savvy other.

Remember: People, People Who Need People Are the Luckiest People in the World

Someday, grants may be reviewed by machines, using advanced text analysis and artificial intelligence to provide completely objective and valid reviews. But, until that day (which is to say, probably never), it is worth remembering that grants are reviewed by people. Because of this, it is important that we not leave our knowledge of human nature at the door when entering the world of grant writing. To this end, I offer a few specific kernels of advice:

> *Progress in the field of emotion research has been greatly hampered by the theories of Kutcher and Ashton, which, in their murkiness, have impeded a generation of investigators.*

Don't bite the hand that feeds you. Academia is an incredibly small, inbred world. When you find yourself singling out particular researchers for your most caustic critiques and your most barbaric barbs, please realize that it is almost certain that at least one of your reviewers will either be, have collaborated with, have studied under, or have great admiration for one of those researchers. In service to your own well-being and likely success in grant writing, when it comes to anything remotely ad hominem, assume zero degrees of separation and temper your criticisms accordingly.

> *The proposed research is unique in being the first to examine bottom-up attentional control as a possible explanation for the social deficits found in autism and other related developmental disorders.*

There's nothing new under the sun. Stating boldly that nobody before you has done, said, thought, imagined, intuited, or studied something is the equivalent of throwing bloody chum into a tank of sharks. There's nothing quite as likely to wake up a drowsy reviewer (or room full of reviewers) as an assertion of primacy. Because of this, it will only take seconds before someone comes up with a purported prior instance. And, others are likely to chime in quickly with additional examples that counter your claims. Remember—regardless of whether these examples are ultimately on or off point, relevant or irrelevant, or real or imagined, you won't be there to argue the point. Most important, once these counterexamples are raised, extremely deadly aspersions of "sloppy scholarship" cannot be far behind. There is no winning strategy here, and no way to redeem yourself. Thus, a word to the wise: It's a good idea to make clear how your work differs from that which has come before but to avoid claims of absolute primacy.

> *The notion that adolescence is a time of accelerated neural development was refuted by Willis' empirical studies and the highly influential Magno-Contextual theory.*

We all live in silos. In some areas of science, large groups of researchers work on a single problem and everyone knows everyone else and their work. In social science, it is quite a different scenario. In many areas, small groups of scientists stake out separate territories and conduct their work blithely unaware of the work of those in other areas. Viewed from inside our own silos, the players, ideas, discoveries, and failures are all so well known that they assume mythic stature. Thus, it is impossible to think that others might not share our insider's knowledge. But, they don't. For this reason, when writing grants it is important to include all of the critical details about studies, theories, controversies, people, and findings. In the previous example,

more information is needed about those legendary studies (what was done and what was found), that renowned theory (what exactly did it propose and who proposed it) and how this work is relevant to the research you are proposing. Without this information, the reviewer might well be at a total loss when attempting to follow the logic of your argument. And here, the deadly aspersions are "hand-waving" and "name-dropping." Once this happens, you can be assured that the reviewer's loss will not be your gain.

> *The theory I have promulgated has the potential to revolutionize the field of comparative psychology and the studies I have proposed in this application will profoundly change our views concerning species differentiation.*

Be humble, live to eat the pie. I expect that there are times and places in life where arrogance might be an effective aphrodisiac, but grant reviewers are not likely to be turned on by the grandiose. Asserting that yours is the most scintillating theory, the most sophisticated method, and the shiniest light is an invitation for ridicule and scorn (especially when you are relatively new at the grant game). A more measured approached pointing to advantages and disadvantages of your approach and treating other approaches with respect is more likely to influence reviewers positively and garner you shekels rather than chuckles.

Follow the Bill of Writes

At some time, each of us has probably entertained the thought of writing the great American novel, publishing a brilliant memoir, penning a book of poems that touch the soul, or writing the lyrics to a hit song. These are the dreams that stir the writer within us all. In this section, in contrast, the writing goal is much more pedestrian, simply to produce a grant application that can be understood easily and be appreciated by our peers. For this reason, some of these points may seem embarrassingly obvious. However, after having reviewed many, many applications that were replete with these kinds of mistakes and seeing these proposals fare poorly in review, it seems important to spend a moment going back over the basics.

Obfuscate at your own peril. There is no such thing as a paragraph in a grant application that is too clear. Perhaps in junior high school one gets points for covering up poor thinking with overly fancy prose, but not in the grant world. Instead, it's just the opposite. When your prose obscures the points you are trying to make, the reviewer is not going to spend time rereading your paragraphs, diagramming your sentences, and parsing your phrases.

Unclear writing is going to be equated with unclear thinking, and nobody wants to fund that. Thus, the goal for every section of every grant should be to achieve clarity and simplicity. This is the best way to convey your ideas so that they are understood and appreciated by your reader.

Jargon, be gone. The silo problem raises its ugly, peaked head again. When communicating with our intellectual soul mates, we can assume a commonality of technical language. But, this in-group knowledge is unlikely to be shared by outsiders. If a highly critical point in a grant proposal depends on the reader knowing the meaning of a specialized term that is presented without translation, it is an invitation for disaster. For this reason, it is best to avoid jargon completely, or, if you use technical language, make sure to define your terms.

Abbreviate sparingly. Abbreviations have the virtue of saving space, which can be particularly important when working against length limitations. However, it is important to know that the capacity of reviewers to store these abbreviations in memory is extremely limited under the best of circumstances. And, this is made worse by the reality that the average reviewer will read multiple applications (each possibly replete with its own set of abbreviations) in a relatively short period of time. For this reason, you are best off not using any abbreviations other than the most widely recognized ones. Or, if you feel absolutely compelled to "roll your own," limit them in number and try to use abbreviations that are highly evocative (e.g., RUN for the condition in which people engage in vigorous physical activity rather than C7). To do otherwise engenders the risk that the critical thread of your argument will become lost in a tangled knot of forgotten abbreviations.

Check your grammar and spelling. Reviewers are incipient trait theorists. Errors in your writing are often viewed as being indicative of personal failings (and this is made worse by the ready availability of word processors with quite sophisticated spell-checkers and grammar analyzers). Thus, once judged to be characterologically careless, you are not likely to be judged grant worthy.

Final Thoughts

It would be wonderful if there were a simple formula for successful grant writing. Unfortunately, the reality is that this is a highly complex algorithm, with some variables and operations that are knowable and many others that

are not. What is known is that our grants are reviewed by our peers and that this process occurs in a highly social context. The reviewing process often unfolds over time, with the attendant waxing and waning of reviewers' attention, energy, and generosity of spirit. Despite the interpersonal context, the roadway that will hopefully connect your ideas with the desired funding is constructed from the written word. Although there are exceptions, you typically will not have an opportunity to present, refine, and defend your ideas in person. Thus, the words you write are your primary representative. For this reason, it is critically important that you craft them in ways that will best serve you, your ideas, and your research.

In this chapter, I have discussed a number of do's and don'ts for grant writers to consider. It is my hope that these comments will be helpful to those who are at various places along the path toward learning how to write effective grant applications. Good writing is not and should not be sufficient in itself for grant success. However, good writing does and should play a critical role in helping good science get the kind of positive reception and favorable outcome it deserves in the highly competitive grant world.