

Barbara Dancheck; NSF Graduate Research Fellowship Application Advice

There are three essays required for the NSF graduate research fellowship application (at least for 2005 there were): personal statement, research proposal, and previous research experience. I am attaching copies of my research and proposal and my previous research experience, but I feel that the personal statement is too personal to send. However, I learned a lot about the application process and what NSF is looking for while I was applying, and am listing advice here. Be sure to read both the Program Solicitation and the User Guide, most of your application questions will be answered in those. They can be found on the NSF GRFP webpage. Guidelines for the specific essays (content and format, this year they were limited to 2 pages each) are found in the user guide, and may vary from year to year.

Take these things literally. They want to see evidence of both intellectual merit and broader impacts in all three essays. Make sure to highlight broader impacts, as this is 50% of what they are looking for, and many people do not stress them enough in their application. Go ahead and use the exact language that they use in the program solicitation. One thing I learned while writing my application is that the reviewers have to read tons of these applications, make yours as easy and fool proof to read as possible, but also make it interesting to read. The reviewers are looking for certain criteria, and if you can feed it directly to them, it makes their job easier. I literally said in each of my essays, "Broader impacts of this work includes..."

They list exactly what they want to see in your essays, but you need to figure out what you have done in your life that is a good example of each of these things, and where to fit everything in. NOTE: These examples **do not need to be science related** (this is particularly important for people with less research experience). Also, if you have not already done something you can use as an example, mention something you would like to do instead. This shows them that you are aware of, and are interested in, things they feel are important. Lastly, try to echo as many of these points as possible in all three essays, it does not hurt to be repetitive. I'll list the points they want to see, and tell you what examples I used:

Under intellectual merit:

1. Ability to plan and conduct research. This will be directly evident in your previous research experience essay and your research proposal, but can also be slid into the personal statement. This one was easy for me, since I had 6 years research experience and many publications. For an applicant with less experience, perhaps emphasize a particular laboratory experiment which you designed.
2. Ability to work as part of a team, and also to work independently. I had worked in an epidemiology laboratory where we had groups of people all over the world, some physicians, some laboratory people, some public health people, phlebotomists, etc. I gave examples of how I played leadership roles at meetings with people from various backgrounds. I also described learning that teamwork was essential for our studies to run smoothly, and that the team benefited from people with different backgrounds.
3. Ability to interpret and communicate research findings. Another one that can be worked in to all three essays. List any examples you have. In my personal statement I discussed the impact that attending international scientific meetings, publishing my research, and being a reviewer for a scientific journal had on my desire to return to school. In my research experience essay, I mentioned the number of publications that resulted from my work at the end of each section. They also ask you to list any specific publications you have and any posters or talks you might have presented. My list was too long, so I chose my top three publications, and mentioned these were "recent" and out of a total of 10 publications. I then mention in a brief statement the meetings I presented posters at. In your research proposal this will be evident in your anticipated results.
4. They mention that panelists are asked to consider the academic record, research proposal, GRE general and subject scores, and choice of institution. I had pretty good general GRE scores, but my subject score was terrible. It just shows that grades / scores aren't everything when applying for something like this. Also, I mentioned in my personal statement and in my proposal why I had chosen to come to Brown, specifically for my advisor and why. This is not a bad idea unless your department is world renown for the research you want to do.

Under broader impacts (this is 50% of what the reviewers base their critiques on, don't take this lightly.):

1. Ability to integrate research and education at all levels, to infuse learning with the excitement of discovery, and assure findings and methods of research are communicated in a broad context and to a large audience. Examples I used were classes I had taken out of personal interest after college, both in the sciences and in other fields. I mentioned the importance of life long learning and pursuing passions and interests not only in your work but also in your personal life. I also spoke about my roles as a chemistry tutor in college and also after college, and about being a laboratory mentor for a medical student from Pakistan.
2. Ability to encourage diversity, broaden opportunities, and enable participation of all citizens in science and research. For four or five years I have been helping to organize this career shadow trip my college runs from Boston to NYC to DC every year. I helped find career mentors for students on the trip. In addition, I offered advice on how to find jobs in the sciences, on interviewing, CVs, cover letters, etc. I mentioned that while at Brown I would join WISE (Women in Science and Engineering, a mentoring and support type group), and would get involved in bringing current science issues to local high school students. I also mentioned having worked in Africa for a few weeks (diversity, opportunities).
3. Ability to enhance scientific and technical understanding. I felt this was covered by some of my examples above.
4. Ability to benefit society. I pretty much revolved my entire personal statement around this. NSF is crazy for broader impacts, make your whole essay centered around this with some intellectual merit examples and you will do well.

For the individual essays (see the applicant user guide for specific instructions, these may vary from year to year):

1. Personal statement. This is where you can score the most points for broader impacts. And no matter what your experiences / examples are, don't down play them. Don't exaggerate, but make them sound exciting and important. Show the impact they had on your life, as well as how these experiences will help you make an impact in the world. Specifically they want to see that you will become a knowledge expert, a leader who can contribute to research AND education. They ask for experiences that contributed to you wanting to go to graduate school, your competencies, and your career aspirations. It sounds like a lot, but you need to find a way to organize it, you need a unifying theme that runs throughout your essay, and then use your examples from the points above.
2. Research experience. After every individual experience there should be a broader impacts statement, why is this research important for the world? Also, if any publications came from this research, mention that as well. Specifically, they want to see the purpose of the research, your specific role, and what you learned; state these things directly. If you have multiple research experiences, organize what you say in each of them the same way, to make it easy to read.
3. Research proposal. IMPORTANT: this does not have to be research you actually plan on doing, and it does not have to be research that will take your whole graduate career to finish. They really want to see that you understand how to design a research experiment, and so are interested in everything down to what controls you need to show the results are true. One person who applied in 2004 told me that she proposed several experiments, and the reviewers thought it was too much, they would rather see her essay concentrate on one of those and really get into the minute details of it. So this is how I wrote my proposal. One of my reviewers thought that the essay was good, but that my proposal wouldn't take very long, and he would have liked to see more of what I would do with it. It is a toss up, it is really dependent on who you get as a reviewer. They list the format in the user guide, follow it. Title, key words, hypothesis, research plan, anticipated results or findings, literature cited, and a statement of originality. In addition: include broader impacts.