The Rhetorical Nature of Academic Research Funding

Brad Mehlenbacher

Abstract—To better understand the complex relationship between academic researchers and funding agencies, the author interviewed 15 academic researchers regarding their views, suggestions, and difficulties in coordinating the proposal process. Data suggest that academic research funding is highly rhetorical, and that successful researchers have well-developed managerial, organizational, and communication skills. The author concludes by describing the competitiveness and complexity of contemporary research relationships, and by briefly outlining guidelines for improving collaboration between researchers and funders.

INTRODUCTION

RECENTLY, scholars of the rhetoric of science and technology have described the intense competitiveness that is a part of the process of constructing new knowledge and innovative artifacts [1–6]. In light of these developments, traditional characterizations of scientists and technologists as disinterested and objective observers and tool-builders have been supplanted by a vision of science as an intensely social and political activity. And the scientific funding process is perhaps the most explicitly political aspect of all [7–10].

The statistics surrounding federal research funding reveal the competitiveness facing contemporary scientific and technical researchers. De Bakey [11] and Novello [12] estimate that 50–60 percent of all grants received by the NIH in 1972 and in 1976 were funded, as compared to 37.3 percent in 1984. And Mitroff and Chubin [10, p. 199], referring to the National Science Foundation (NSF), attribute the growing interest in scientific peer review, in part, to “the new competitive funding situation.”

Given reduced funds, increased research competition, and the recent focus on the funding of science and technology, it is particularly ironic, as Suzanne Roberts of Applied Technology Associates, Inc. has pointed out, that, despite the U.S.’s huge investment in research and development (more than $100 billion in 1990), “the commercial return on our investment is inadequate, particularly with regard to the lion’s share of this tab of about $30 billion sponsored by the federal government” [13, p. 336]. Stephen Doheny-Farina, as well, has argued that the relationship between universities, start-up companies, and research incubators has, at best, been relatively unsuccessful: the dreams of quick and widespread success of university incubators have not been realized. In the 1990s we are beginning to see headlines like the following from the Chronicle of Higher Education: “Wariness Dampens 1980s Craze for Building University-Sponsored Technology Parks” and “Pitfalls of Research Parks Lead Universities and States to Reassess Their Expectations” [14, p. 35].

To gain insights into ways of strengthening the interaction between university researchers and federal and corporate funding agents, I asked academic researchers about their experiences seeking research funding, about their successes and failures in dealing with particular funding agencies, and about their general perceptions of the funding situation in North America.

METHODOLOGY

The Participants

I conducted an interview-based survey to uncover context-specific information about proposal writing and funding in the academy. The data consist of a series of open-ended interviews with 15 academic research scientists and engineers from various disciplines, including physics, cognitive psychology, electrical and computer engineering, and computer science. The 15 researchers (14 males and 1 female) were located at the same Ivy League school and held an impressive range of positions: 4 were directors of prestigious, well-funded research centers, 2 were vice provosts in charge of academic computing concerns, 12 were full professors, and 1 was a Nobel Prize winner. I audiotaped all 15 interviews and transcribed them, omitting any references to the names and locations of specific academic institutions or funding agencies. All 15 researchers were encouraged to cite particular research relationships and were ensured that their interviews would remain anonymous.

The Open-Ended Interviews

The open-ended interview questions focused on the process of getting research funding, on perceptions about the differences between funding agencies and the academy, on how academic researchers communicate with research funding agencies, and organizations, and on the researchers’ backgrounds and interests. The questions emphasized the processes surrounding proposal writing and funding activities, as well as the social and contextual factors that enable and constrain those activities. The study was exploratory and aimed at determining some of the disciplinary, institutional, and cultural constraints confronting academic researchers and proposal writers.

Because the survey relied on open-ended interviews for its data, I was aware of the constructive nature of the information
[15, 16]. That is, I understood that, as Brown and Canter warn, “events may be reconstructed to answer questions that informants may not have conscious awareness of, or provide and overview of an experience beyond the knowledge of any one participant” [17, p. 222].

In the interviews, I focused on eliciting information about the research scientist; his or her research team, facilities, and equipment; and perceptions of his or her research field and agenda. The interviews, which lasted between one hour and an hour and a half, were organized loosely around the following questions:

- From whom do you seek research funding?
- How does dealing with industry differ from dealing with government agencies?
- What motivates you to choose one funding agency over another?
- How do you usually communicate with funding agencies?
- When did you start working with funding agencies?
- What do you think funding agencies hope to gain from your research?
- How do you think your research will be used by funding agencies?
- How could funding agencies improve their relationship with you?
- What would you change about working with funding agencies?
- How will the relationship between academic researchers and funding agencies change in the future?

RESULTS

The Organizational Politics of Proposal Writing

The first and most prevalent representation of the proposal writing and funding process, by all 15 academic researchers, was that it is a highly political, multi-institutional enterprise. One researcher, characterizing his personal experience, describes the magnitude and complexity of some funding situations:

I think the proposal we had was a five year budget of about $15 million. We decided what we would do is we would attempt to build a full-scale online library using today’s technology. And...they had, I think, 800 proposals and they funded four and, in fact, it turned out to be pure politics and they didn’t fund any in states where there were already engineering centers, and since we had two engineering centers in [this state], none of the science centers went into [it], which I think was a pity because there were at least two other proposals from [this university] which were really good.

The same researcher points out that his being a part of a large project is the result of years of contacts that span numerous universities and corporations:

...when I was at University A, one of our star students introduced me to his father, who was, at that stage, working for ABC publishing company, and his job was involved with electronic printing publishing. Some years ago, after I was at University B, we wanted to get an online dictionary for the computer system... Knowing that ABC publishes dictionaries, I called up this fellow...and said—to cut a long story short—it’s through that contact that we came to the arrangement to put the ABC dictionary online. About the time that the project was taking place, what we call the Uranus Project, he transferred from ABC to GHI corporation, and got involved in trying to set up a group in his area. We knew him already, he was very keen to support our work, so it was a joint contact, which led to us sending a proposal to GHI.

Also, as one might expect, given the complex and extensive types of negotiation that are part of the funding process, the academic researchers referred to numerous situational factors that constrained their ability to successfully obtain funding (for example, yearly budget requirements):

So it was a lot of people who have been working together in the same areas, and that’s basically how we did it, and we spoke with our contact and, you know, he visited here, we visited there... He has to put up some money from his budget and, being new to GHI, corporation, he spent some time trying to figure out what was the appropriate way to go about things. We took his advice and we put in an equipment proposal, which would have been last June because...they wanted it actually to get funded from last year’s budget... And they funded it partly from the previous year and partly from this year. And that went through very smoothly... He has also funded some specific projects. He’s funded some work by two researchers in computational linguistics. That’s not a formal external research grant, that’s from his departmental provisional budget.

In this excerpt, the researcher explains that numerous individuals collaborated to provide the funding, that repeat visits were a part of the process, and that, even though both parties were interested in pursuing a research relationship, proper allocation of funds required intense and creative attention from the funding agency.

And finally, one researcher talked at length about his experiences with what he referred to as “experimental funding arrangements.” In one such case, the NSF refused to fund any proposals that did not provide evidence that the research scientists could obtain their own equipment:

So part of our proposal process was, not only to propose to do the work, but to line up promises of equipment from manufacturers... This was kind of a new idea for NSF. They were trying to leverage their money in the sense that the head of NSF said, we’re not going to pay for equipment anymore, we’re going to coerce the manufacturers to give it. So, in many ways, when they first announced...that they were going to give these grants, there were people from [four large corporations], they were all there too, even before we submitted the proposals. So, ultimately, the way it works is we prepare this proposal and talk with multiple companies about supplying equipment for it, and they
were going to supply the equipment—partly for the people doing the software to use, but partly to put this equipment in critical places in the universities. ... And ABC corporation, out of all the companies, ... was extremely straightforward and supportive in the way they handled this one. ... And, in this particular case, it was almost as if ABC corporation was saying, look, we're going to support the National Science Foundation, whoever the universities are who get the money.

In conclusion, more than half of the 15 academic researchers indicated that getting proposals accepted had more to do with the political "talk" that took place between researchers and interested individuals within funding agencies than with the actual proposals that researchers eventually submitted for review. Certainly, this finding confirms what other researchers have pointed out: as Mukerji indicated that getting proposals accepted had more to do with the political "talk" that took place between researchers and interested individuals within funding agencies than with the actual proposals that researchers eventually submitted for review. Certainly, this finding confirms what other researchers interested in the funding process have suggested; as Mukerji points out:

If you look just at the proposals and research reports sent to agencies, it looks as though the center of the communication system lies in scientists writing documents for the government about their proposed and actual projects, but that is not the whole story. Even more information is gathered informally by scientists and agency personnel. Scientists use their connections to figure out how to make their proposals as fundable as possible [18, p. 62].

This, of course, does not negate the importance of understanding how to produce an effective proposal but, rather, points to the importance of oral communication skills (such as the art of negotiation and fact-finding) in proposal writing. That is, proposals are never written in isolation; they are written, submitted, and funded as part of a complex social process.

The Interaction Between Proposals, Funding, and Research

Proposals are not only intertextual in the sense that they borrow from, and are influenced by, a broad body of scholarly research, they are also generated and regenerated across a series of corporate and government funding agencies. As one researcher pointed out, the boundaries between different sources of funding

[are] fuzzy in the sense that, if one project is funding me ten percent, and another project is funding me ten percent, and another ten percent, and another one ten percent, I have ideas that transfer across all of them. Okay, so where do I create an idea, you know? If I had this idea...that could be used in a variety of places, I just list them all [the sources of funding]...I don't write down every hour that I'm here, you know, the three great ideas I had, and this hour was brought to you by ABC funding agency and the makers of Stouffer's frozen food.

Researchers differed on the ethics of receiving multiple sources of funding for their research. One researcher, for example, felt that how much or little projects overlapped in terms of the research results that his team produced was an important issue:

What we would not do is enter into a relationship with a different funding agency that focuses on the same kind of problem. We would tend not to do that. Not that it's illegal or anything like that, it's just that...sort of two things. One is it wouldn't make ABC company very happy—it's not proprietary, we're publishing this stuff—but also...it's not clear what the benefit to us would be. It's sort of easier to work with one motivated partner than...with competitors, each as partners. On the other hand, there are other funding agencies that we do talk to and get funding from on very different things. Right now we're talking with some other companies about potential funding for some other work. Quite different. The practical effect of that would be very different from the practical effect of this, and so it's not really in any sense a conflict.

Along with expressing concerns about the audiences for different proposals and different sorts of research, almost all of the 15 researchers emphasized that proposal writing required the ability to achieve group consensus, effectively manage large documents with multiple authors, and resolve conflicts between the proposal writers and the intended audience for the proposal. Perhaps this explains why the researcher quoted here preferred working with "one motivated partner" rather than with "competitors, each as partners"; that is, the single relationship allowed him to channel his communication efforts with a single party and to focus on the research being carried out. Another researcher characterized his experience writing a large proposal as follows:

Actually what happened, in this case, and this is fairly common, is that one person will write a draft of the proposal. That is, we all sit around in a room and talk about what ought to go in this proposal. Then we make sort of a one-page outline—what are the key ideas, sections, and so forth. And then one guy goes off and writes a draft of it. And it's online. And then somebody else will take a turn at going through that draft, and just change anything they don't like. Or, if they think that there's a serious conflict, then they'll sort of go and argue it out or whatever. And then it...cycles to the next person. And so it...gets iteratively refined. And then, usually the person who wrote the first draft is the first author on the proposal and really has the strongest statement of how the proposal really turns out. Because the rest of the people just sort of push it one way or another. But that's really standard. The other mode is that you say, you write this section, I'll write this section, he'll write this section, then we'll glue them together. That happens, but it's less common.

Although he does not indicate why one collaborative strategy is more common than the other, the key is that the proposal-writing process described by this researcher involves multiple writers' negotiating with each other through a single document. And, interestingly, this collaborative model of proposal writing has been generally ignored by most contemporary research on proposal writing [11, 19–22].
Differences Between Funding Sources

Five of the researchers discussed their experiences in dealing with two different types of funding groups. The first observation was that working with corporate funding agencies and working with government funding agencies represented very distinct types of interaction. As one researcher stated, with ABC corporation we’re really working very directly, that is, [our contact] is here every two weeks... I mean, he is a participant in this research project, so that’s very good. The higher bandwidth the communication, the better you are. There’s no doubt about that. Both in terms of the company being aware of what’s going on, and getting something out of it, and in terms of us understanding... the thing is that we get something very important out of this relationship that we wouldn’t get if we were funded by NSF or some government agency. And that is, we get ABC company’s insight into what are the practical problems that they face which, if we could come up with some breakthrough, would really have an impact... This way, since we’re so tightly coupled, we really get something important out of that.

“Having an impact” and solving practical problems was very important to all 15 researchers, and this may be more a function of their disciplines (largely engineering and computer science) or of the particular university environment that they were working in. As one researcher pointed out, ABC University is largely a “federation of entrepreneurs.” In this respect, working with corporate funding groups was described in a much more positive light than might have been expected. Unfortunately, one researcher lamented, academic scientists are being forced to turn increasingly to federal and other government agencies for funding: “It turns out that, even though maybe ten years ago there was a big push to get money from industry... in fact, that hasn’t come about, anywhere near as much as... some people were hoping it would—including me.”

Finally, 4 of the 15 researchers expressed strong concerns that our North American funding situation is problematic when compared with that of foreign researchers. They stressed the need for a process that strengthened the interaction between them (as academic researchers) and other academic and nonacademic researchers. One researcher told the following troubling story:

This year, in my research group, we have visiting researchers...[from Japanese, British, and French corporations and government agencies] come here as visiting researchers. They come at the expense of the company and spend a year or a year and a half here working on some kind of research project that’s of interest to them, and us, and so what they get out of it is some exposure to a lot of work going on here; what we get out of it is some very bright people who will become full-time researchers for a year or more, and who provide very important manpower and brain-power for getting our work done. And it’s a great arrangement. U.S. companies seem to never do this... and it just strikes me as a real big mistake. And I’ve talked about this with people from various U.S. companies, but it’s a very strange situation, because when I tell them that people are coming here from DEF, and last year we had people from JKL and various Japanese companies—they especially like to do this—then the U.S. company people tend to get upset about that. They tend to say, well, you know this is crazy, here’s the federal government and people supporting U.S. universities, and people are coming in from other countries and getting all the good ideas and then next year there’ll be some product that comes out that markets this idea. Now, at the same time that they’re upset, for some reason, it doesn’t occur to them that they could do the same thing, the fact that we would welcome them doing the same thing.

The goal of this study was not to learn about the entire funding process but, rather, to determine how academics interact and communicate with funding organizations. All 15 researchers tended to see the actual research proposal as a very small part of a much more important and ongoing process (such as establishing what types of political and social factors are influencing a funding agency’s interest in funding one branch of research instead of another). This viewpoint was not entirely surprising since the actual written proposal is an integral part of an extended process designed to support meaningful research in academic and nonacademic organizations. The next section, therefore, highlights some of the researchers’ discussions of the long-term implications of working out funding arrangements—particularly as they relate to transferring ideas, technology, and processes into governmental and corporate organizations.

The Continuum from Proposal Funding to Technology Transfer

The majority of the interviewed researchers (9 of 15) felt that it was important not only to strengthen the communication between academic researchers and potential funding groups but also to maintain communication over long periods of time. Their real concern was that ideas and products would “get lost in the shuffle” if such communication channels were not well-established. In the words of one researcher regarding the minimal interaction between his research group and that of a funding group:

It worries me, because I would actually like more of an interaction, because I would feel more comfortable about the fact that they are benefiting from [our research] and, therefore, will continue to support it. And that’s the thing that concerns me. They don’t... interact with us as much as I’d like to see.

And, surprisingly, the researchers felt such failed attempts to move ideas and products out of the academic context occurred both with federal and corporate relationships. As one researcher observed about his interaction in one funding situation:

He [the contract monitor] drops by, it seems to me, two or three times a year and asks how the research is going. He hasn’t explicitly asked me about deliverables. This has been a fairly loose arrangement. I think he’s come by with a bunch of people from the group, and they’ve asked me what we were doing, and I gave them
Another researcher, describing what she felt had been a very successful funding relationship, described problems that she had had with other corporations with which she had worked:

What you quite often find at other companies is you'll do a project which the company sponsors but there's nobody in the company really interested in picking up the ideas. So what you do is you do a project which is your own project and it's financed by the National Science Foundation or something like that, and the company loses the benefit.

The consensus among the researchers, therefore, seemed to be that, while they valued working on nonacademic problems, corporate funding agencies tended not to "think long-term." One researcher stated this explicitly and described how some corporations are seeking federal support to overcome this shortcoming:

The only difficulty is that, dealing only with industry...you have a difficult time putting together one coherent program that has a long-term focus to it, because all the companies have different views of what they'd like to see done and, therefore, you can't put together one nice coherent program, without reasonably trying to get...support from the NSF for a long-term push, and then we would have a more long-term push of both the support from ABC company as well as the National Science Foundation.

Short-term thinking is not caused simply by the general structure of corporate organizations. Another researcher identified what he felt was an even more important cause of the problem:

...it always boils down to, there's no one who has on his schedule anything related to getting ideas from someone else. Nowhere in their design and their development process is there a mechanism for transferring technology.... And I don't know why that's true.

Referring to the same corporation, he added:

ABC corporation has probably been the poorest at translating what we do back into the company. And I think that's because, again, there's no established conduit, there's no way to get stuff back to them. If, by accident, someone at ABC corporation happened to discover it's relevant to them and, by accident, they happened to get it, that's fine. And that occasionally happened. It never happened to me personally, but I'm sure it will happen to someone. . . . They don't have in place the mechanisms for tracking what gets done in the universities, and trying to—you know, I never had a guy from ABC corporation, never in my entire life, come into my office and say, we would really like to get some of your ideas into our system. It never happened, never ever happened.

Rather than dwelling on the long-term ramifications of what the 15 academic researchers revealed about the strengths and weaknesses of their current research funding relationships, I will turn in the concluding section to what I have learned about funding relationships in general. This, in addition, will lead to a brief overview of strategies funding agencies might incorporate to solidify the relationships they hope offer them promising research findings and profitable technological developments.

CONCLUSION

My look at proposal writing and the funding process relied on the retrospective accounts of 15 academic researchers. My intention was not to prove or disprove established hypotheses but, rather, to generate insights into the proposal-writing process and its role in the larger, institutionalized funding process. This survey focused on the organizational politics of proposal funding, and on the intense interaction between written proposals, funding processes, and academic research.

Despite the data-collection concerns mentioned earlier, the data are illuminating for several important reasons. First, the 15 researchers point to the importance of oral communication in the overall funding process, and they highlight the need for academic researchers to acquire management and organizational skills. Second, they establish the importance of viewing proposal writing and research funding as a long-term endeavor, and not as something that can be studied effectively in isolated writing incidents.

In describing their funding relationships, for example, the academic researchers rarely limited their remarks to descriptions of the particular proposal documents that had resulted in their being funded; rather, proposal writing and funding were one part of a greater interaction that involved internal concerns (for example, departmental- and college-level as well as research-related) and external concerns (such as the number of funding relationships available to them, and the need to foster and maintain on-going relationships). These external constraints may make a well-written document fail or a poorly written one succeed.

In short, the 15 interviews revealed four insights:

(1) Funding is a complex social interaction, in which numerous players negotiate for money, technology, organizational resources, and research opportunities in an effort to reach an agreement that satisfies both the recipients and the funding agencies.

(2) Productive academic researchers often juggle multiple funding relationships to best leverage their own research situations.

(3) Funding relationships often differ dramatically in the intensity of the interaction between the research partners and in the benefits gained, over the long term, for the funding agency.

(4) Intense research partnerships do not necessarily translate directly into real-world "products," even though this might have been the funding agency's major goal.

As Stephen Doheny-Farina correctly asserts, . . . at their core [technology transfer] processes involve individuals and groups negotiating their visions of technologies and applications, markets and users in what they all hope is a common enterprise. This means that
the reality of a transfer does not exist apart from the perceptions of the participants. Instead, the reality—what the transfer means to the participants—is the result of continual conceptualizing, negotiating, and re-conceptualizing. Thus, technology transfer is a rhetorical dynamic...[14, p. 4].

Funding agencies that wish to increase the dividends they receive from entering research funding relationships should consider the following five interrelated strategies:

(1) Make your criteria for (proposal) success as explicit as possible.
(2) Develop a research liaison office that has, as its major charge, the goal of developing, maintaining, and strengthening new and existing research relationships.
(3) Encourage intense single-partner relationships that commit entire researchers/teams to your research goals or agenda.
(4) Explore the benefits of locating your researchers/employees inside productive research think-tanks or institutions to increase technology transfer.
(5) Follow-up, as rigorously as possible, research developments that you have funded for possible incorporation into existing products or processes within your organization.

Given these observations and guidelines for strengthening funding relationships, let me conclude with a brief example of a failed funding relationship in which I participated some years back. As part of my graduate work, I was funded to produce a dissertation from the document that the academy had, apparently, lost me to the complexity that represents the reality of a transfer. Over one year later, I received a phone-call from a local sales representative who worked for the company and, nervously, I collected the twenty to thirty pages of writing and rough notes I had produced and met him for lunch. Much to my surprise, the sales representative apologized for the inconvenience and asked whether all my needs had been met. I thanked him for the much-appreciated support and handed him the one thousand dollar per page document. We parted amicably.

What the relationship taught me is that funding relationships (like personal relationships) are fostered by constant attention to their parties’ mutual needs and to the dynamics that were set up in the beginning to gauge success or failure. If funding agencies want effective technology transfer, they need to take special care to follow through on each research relationship.

ACKNOWLEDGMENT

The author wishes to thank Carolyn R. Miller for her detailed and thoughtful comments on earlier drafts of this article. Also, research on this article would not have been possible without generous funding provided by Digital Equipment Corporation and Carnegie Mellon University.

REFERENCES


Brad Mehlenbacher, Ph.D., is a professor at North Carolina State University, where he teaches undergraduate courses in Communication for Engineering and Technology and Technology for Science and Research, and a graduate course in Advanced Technical Communication. Brad is co-author (with Thomas M. Duffy and James E. Palmer) of Online Help: Design and Evaluation, published in Ablex’s Human–Computer Interaction Series, in 1992.