Grants
An Introduction

ST 810A, Spring 2005

Why?

Facts of life 1: A statistician in academia has multiple responsibilities, demands on time
- Collaborative research, teaching, service, consulting
- Methodological research

...But: career advancement and personal satisfaction often come from success in methodological research

Reason 1: For yourself
- Grant funding allows one to "buy time" for research
- Success is a form of peer review

Facts of life 2: Most universities and other institutions do not run solely on tuition, endowments, gifts, appropriations, etc., and there are bills to pay
- Salaries, infrastructure, supplies, staff, administration, graduate student funding, ...
- Although a major (although not the only) objective of a university is to promote research, funding for this is inadequate (computers, equipment, travel, time)

Reason 2: For your institution
- Contribute to support of the institution and its research enterprise
Facts of life 3: Continuing innovations in statistical methodology are essential to advances in science

- New complications, data structures, questions, . . .

Reason 3: For science

- Free time to do research allows contribution to advance of knowledge

Result: Most of the funding to support research activities within a university come from outside sources

GRANTS

Luckily: Agencies and organizations offer sources of funding to support (statistical) research, for example

- Federal government: National Science Foundation (NSF), National Institutes of Health (NIH), Environmental Protection Agency (EPA), . . .
- Private agencies and industry: Sloan Foundation, Howard Hughes Medical Institute, Health Effects Institute, Burroughs Wellcome Fund, . . .

Submit a grant application: A grant application is a document describing

- A research problem, justifying why it is important, how its resolution will advance science, why the approach is sound, and what the impact will be
- The qualifications of the individual(s) submitting the application
- A plan describing the research and how it will be carried out, including a timetable, need for personnel and their responsibilities
- A budget request for funds to support the research activities, and how these funds will be allocated
Mechanisms for submission:
- May be in response to a particular research initiative of the funding agency, e.g., Request For Proposals (RFP), Request for Applications (RFA), Program Announcement (PA)
- RFPs and similar requests are generally posted on web sites and in publications of the agency, have specific guidelines, deadlines
- The agency may also support investigator-initiated research (investigator chooses topic)
- Investigator-initiated applications may be accepted on a regular, cyclic schedule posted by the agency

General structure of an application: Usually, agencies have specific forms to complete and requirements on how the package is to be organized
- Principal Investigator(s) (PI)
- Abstract or summary
- Personnel (including CVs of all key players), research assistants (graduate students)
- Budget, details on other research funding
- Sign-off by university officials (grants are awarded to the university, not to you!)

Preparing a grant application:
- Administrative stuff
- The research plan/project description

Administrative stuff first...

Budget: Direct costs are the funds that go directly to support research activities
- Funds to support a portion of salary to free the faculty member from other responsibilities
- Fringe benefits (social security, health insurance,...)
- Travel, supplies (e.g., books), equipment (e.g., computer)
- Research assistants, consultants
How?

**Budget:** Facilities and Administration (F&A) costs (aka indirect costs, overhead)
- Support for institutional infrastructure – buildings, phones, copying, libraries, postage, network, tuition...
- Typically calculated as a percentage of direct costs (excluding certain items such as equipment, tuition)
- Percentage is negotiated with the agency (NCSU's rate is 46%)

**Internal processing:**
- Application must be approved by the university
- Is the budget correct? Are forms filled out correctly?
- Application must go through processing and be signed by an authorized official
- Agency deadlines for submission are cast in stone, so must allow adequate time for university to process

How?

That's the easy part...

**What to write?**

**General considerations:**
- Almost always a strictly enforced page limit (e.g., 15 pages for NSF, 25 pages for NIH)
- Must describe background, context for why research is important, and the research itself within this limit
- **AS USUAL**, clarity, logical flow, organization, accessibility, completeness, ...

**The Important Part:** The research plan/project description
What to write?

Research plan/project description: Format and specific requirements vary by agency, but in general must
- State the specific objectives and expected significance
- Provide background, place the work in context of the current state of knowledge and explain how the work will advance it
- Describe results of previous grants, relevant work already done by the PI, qualifications
- Lay out in detail what will be done – should be the main focus of the plan!

What to write?

How much detail: Depends on the agency, e.g.,
- NIH grants – excruciating detail
- NSF grants – can be more vague

What happens?

Evaluation of applications: Just like journal articles, grant applications are peer-reviewed
- Sent to individuals familiar with the area who read, submit a review, assign a score (NSF)
- A review panel of experts in the discipline is identified, members are assigned to review a subset of applications, write reviews and assign scores, discuss at meeting (NIH, NSF)
- Generally two–three main reviewers per application
- Review criteria depend on agency...

What happens?

What makes a “fundable” application? Main criteria
- NIH: Relevance to real problems, no “theory for theory’s sake”
- NSF: Theoretical, computational advances, more general
**What happens?**

**Decision:** Agency awards grants to applications receiving the highest scores
- NIH: formula-driven, small chance for “special consideration”
- NSF: Program directors have latitude on how to distribute the $
- Number, extent of awards limited by $ available
- All applicants (funded or not) receive reviews, score

**Good idea:** Get to know Program directors/officers
- Can sometimes help in borderline cases

**Grant award:** If good news
- University, PI are notified, agency sends funds
- An internal university account is set up, funds dispersed into categories (e.g., salary, travel, equipment)
- PI must determine how to allocate and spend the $
- Some changes in budget allocations are allowed, must be approved
- The university must justify and document all activity to the funding agency

**Progress:** Most agencies require annual reports of accomplishments, budget expenditures, changes in plans, changes in personnel, explanation for unused funds

**Next time:** Success in obtaining one grant is not guarantee that future applications will be funded!
- Some agencies require new applications
- Others allow “renewals” (which must compete like any other application)

**Opportunities:** There are numerous grant programs available
- Ordinary research
- Pilot studies; new research area
- Training, fellowship
- Conferences

**Miscellaneous**
Nowadays: Obtaining outside funding is **strongly encouraged** in almost all academic settings

- As university budgets shrink, faculty grants become more and more important
- “Soft” versus “hard” money: in some academic settings, grants are the **main** source of funding (e.g., medical schools, schools of public health)

**Advice for new faculty:**

- The best place to learn about grants is from someone who has been successful at getting them!
- Ask a senior colleague for help!
- Obtain and study successful applications, note writing style, level of detail
- Visit agency websites

**Summary:**

- Success in getting grants is a form of peer review
- Success in getting grants allows faculty time and bargaining power
- Grant writing is hard work, but is a wonderful way to focus one’s research ideas!