

Good Grantsmanship

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Who Are We?

❖ Karen Dodson

- ◆ Instructor for the *Grantsmanship and Scientific Writing and Publishing* courses taught to pre- and postdoctoral clinical research trainees in the Washington University Institute of Clinical and Translational Sciences
- ◆ Coordinator of Faculty Development Programs and Director of Academic Publishing Services in the Office of Faculty Affairs

❖ Kate Woerheide

- ◆ Grant writer for the Strategic Applications Support Services (SASS) team. SASS provides assistance with large, interdisciplinary, strategic proposals.

Good Grantsmanship

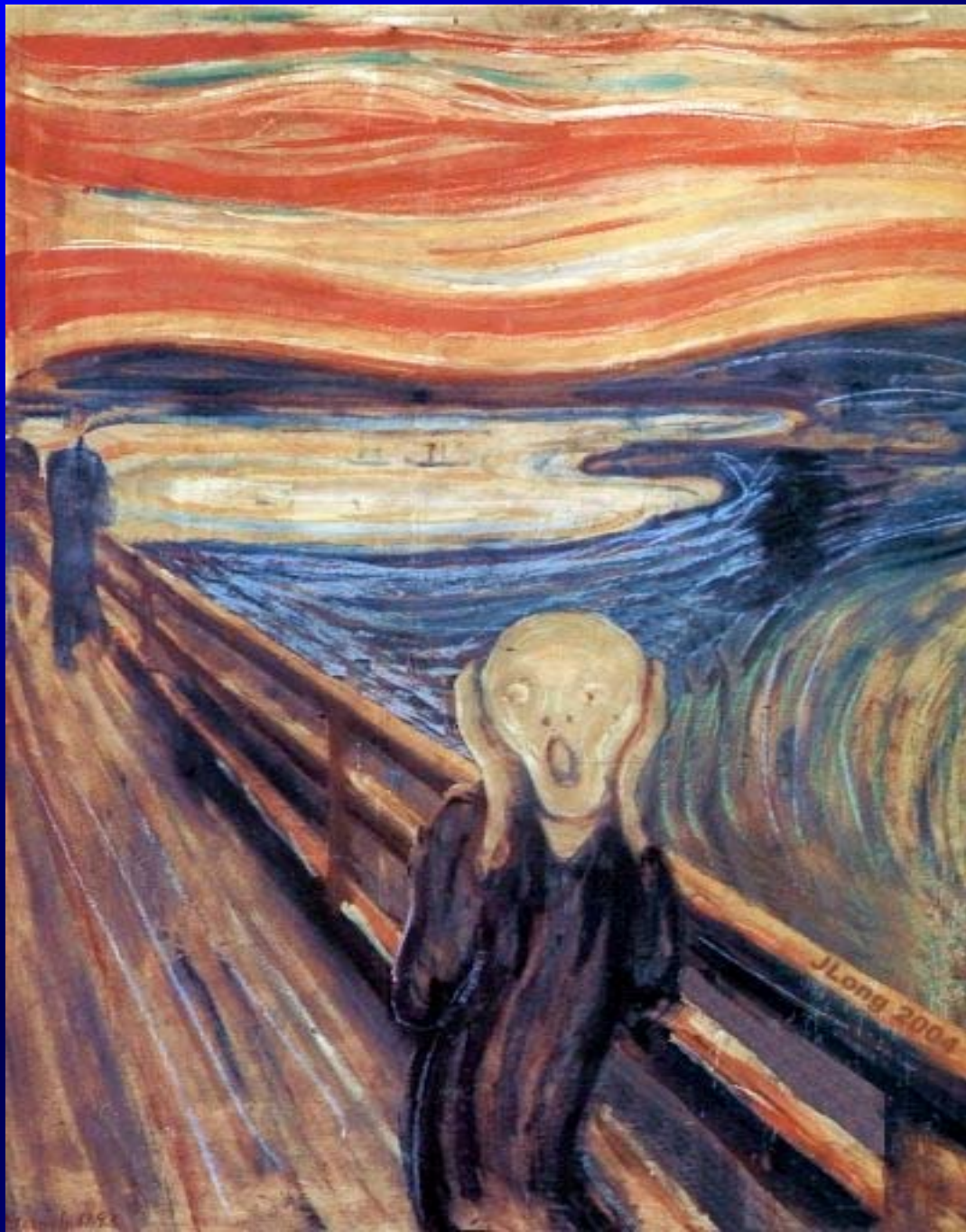
featuring

The NIH Short Form

The NIH Short Form: R01 and K Mechanisms

- ❖ Research (R01) Proposals:
 - ◆ Specific Aims: 1 page
 - ◆ Research Strategy: 12 pages (formerly 25 pages)
- ❖ Individual Career Development (K) Proposals:
 - ◆ Specific Aims: 1 page
 - ◆ Candidate's Background, Career Goals and Objectives, Career Development/Training Activities During Award Period, Training in the Responsible Conduct of Research *and* Research Strategy: 12 pages

So, what have we learned about
the NIH short form?

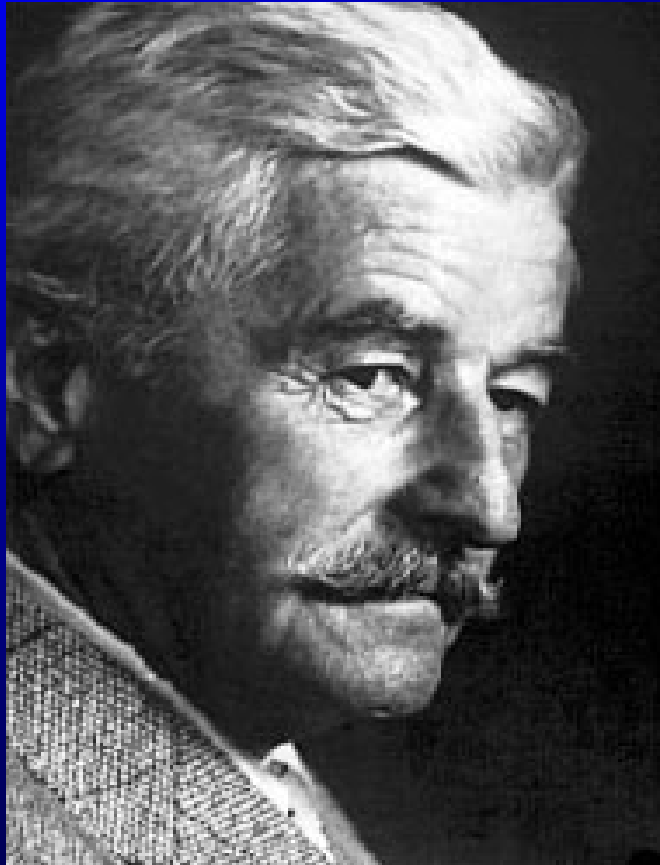


Challenging to Write
Challenging to Review

Step 1: Writing Your Proposal

A Grant Proposal is a News Story

Clear and Concise Scientific Writing featuring



William Faulkner



Ernest Hemingway

Faulkner: The Artist



“Loving all of it even while he had to hate some of it because he knows now that you don’t love because: you love despite; not for the virtues, but despite the faults.”

Hemingway: The Journalist



“All you have to do is
write one true
sentence. Write the
truest sentence that
you know.”

Hemingway: The Journalist



When challenged to
write a full story in six
words, he responded:
“For Sale: baby shoes,
never worn.”

--Courtesy of Jay Piccirillo, MD

Beware of the Squid Technique

“The author is doubtful about the facts or reasoning and retreats behind a cloud of ink.”

(Doug Savile, Tableau, September 1972)



Writing the Proposal

- ❖ Your application tells a story.
- ❖ Write like Hemingway, not like Faulkner.
- ❖ Balance clarity and depth.
- ❖ Be succinct, yet thorough.
- ❖ Use correct grammar and punctuation.
- ❖ Proofread! Make a good first impression.
- ❖ Be clear and concise.

Clear and Concise: Word Choice

- ❖ Use common words outside of the scientific terminology.
- ❖ Define technical words early.
- ❖ Never assume that your reader will understand “jargon.”
- ❖ Always spell out abbreviations at first mention.
- ❖ Don't trust spell check.
- ❖ Proofread, proofread, proofread!

Clear and Concise: Word Choice

Use the word that conveys your meaning most accurately. When deciding between two such words, choose the shorter word:

Approximately

About

Commence

Begin

Finalize

Finish

Prioritize

Rank

Terminate

End

Utilize

Use

Word Choice Problems

The problems that copyeditors see most frequently are *words carelessly interchanged*.

Word Choice Problems

Ability vs. Capacity

- ◆ *Ability* is the mental or physical power to do something, or the skill in doing it.
- ◆ *Capacity* is the full amount that something can hold, contain, or receive.

Word Choice Problems

Continual vs. Continuous

- ◆ *Continual* means intermittent, occurring at repeated intervals.
- ◆ *Continuous* means uninterrupted, unbroken continuity.

Word Choice Problems

Insure vs. Ensure

- ◆ *Insure* means to provide or obtain insurance for.
- ◆ *Ensure* means to make sure, certain or safe (guarantee).

Word Choice Problems

Affect vs. Effect:

Affect: (verb) influence or modify

Effect: (noun) result

Among vs. Between:

Among: used with more than two choices

Between: used with only two choices

Word Choice Problems

Compose vs. Comprise:

Compose: make up or create

Comprise: consist of, be composed of, be made up of

Decrease vs. Reduce:

Decrease: lessen in number

Reduce: lessen in amount

Sentence Structure

Sentences are clearest, most forceful, and easiest to understand if they are **simple** and **direct**.

Sentence Structure

- ❖ Therefore, write short sentences like Hemingway, not long sentences like Faulkner.
- ❖ Put parallel ideas in parallel form.
- ❖ Simplify by using “active voice.”
- ❖ Use strong verbs, not nouns.
- ❖ Tighten your writing.

Put parallel ideas in parallel form.

Balance individual elements of the sentence. For example:

Instead of: “Tissue samples were weighed, then frozen, and analyses were performed.”

Write: “Tissue samples were weighed, frozen, and analyzed.”

Simplify by using active voice.

To simplify, use active—not passive—voice:

“The new drug **caused** a decrease in heart rate.”

Revised:

“The new drug **decreased** the heart rate.”

Use strong verbs, not nouns.

Make an adjustment

Adjust

Make a judgment

Judge

Make a decision

Decide

Perform an investigation

Investigate

Make a referral

Refer

Reach a conclusion

Conclude

Tighten your writing.

At the present time...

Now

Due to the fact that...

Because

It may be that...

Perhaps

In the event that...

If

Prior to the start of...

Before

On two separate occasions...

Twice

Sentence Structure

When two or more words are combined to form a **compound adjective**, a hyphen is usually required, e.g., *disease-related sleepiness*.

Sentence Structure with SpongeBob SquarePants



Sentence Structure

- ❖ Bob is a sponge, and he has square pants.
- ❖ Square pants Bob has sponge like qualities.
- ❖ Bob's sponge and square like qualities make him a great cartoon character.
- ❖ Bob's a sponge and square like cartoon character who aspires to be famous.



Sentence Structure

- ❖ Bob is a sponge, and he has square pants.
- ❖ **Square-pants** Bob has **sponge-like** qualities.
- ❖ Bob's **sponge-** and **square-like** qualities make him a great cartoon character.
- ❖ Bob's a **sponge-and-square-like** cartoon character who aspires to be famous.



Example

The outcome of adults with acute lymphoblastic leukemia remains poor. While 90% of adult patients will achieve initial remission with chemotherapy, the majority will relapse and only 30-40% will achieve long term disease free survival.



Example

The outcome of adults with acute lymphoblastic leukemia remains poor. While 90% of adult patients will achieve initial remission with chemotherapy, the majority will relapse and only 30-40% will achieve **long-term disease-free survival**.



Sentence Structure

Check your syntax:

- ◆ “After standing in boiling water, we examined the flask.”
- ◆ “We examined the flask after it had been standing in boiling water.”
- ◆ We examined the flask after it stood in boiling water.

Sentence Structure

Check your syntax:

- ◆ “Having completed the study, the bacteria were of no further interest.”
- ◆ We were no longer interested in the bacteria after we completed the study.
- ◆ We completed the study and no longer cared about the bacteria.

Tip:

Ask **a colleague who has worked with** you to read your grant proposal to see if he or she can understand your message and to see whether you have left anything out.

Tip:

Ask **someone who is unfamiliar with your research** to proofread your proposal. Ask them if the significance and innovation of your work is clear. Ask them to correct grammar and punctuation errors.

Paragraph Structure

Organization: Overview first, then details.

- ◆ **Overview:** topic sentence, keep it short and simple.
- ◆ **Details:** supporting sentences.

Step 2: Selling Your Work

Your Grant Application is Driving
Me to Drink

Writing Strategy

- ❖ Capture the reader's attention (advertising, marketing).
- ❖ Present a lucid, well-argued, persuasive summary.
- ❖ Use solid logic—no missing steps.
- ❖ Create a compelling case.
- ❖ Make the significance of your work crystal clear.



Significance of the Problem

Alzheimer's disease (AD) is a fatal and progressive brain disease with no current cure. It is estimated that 5 million Americans have AD, and that changes in the brain may occur as early as 20 years prior to diagnosis. With the largest group of individuals in the United States about to enter the "vulnerability period" for dementia, AD and associated disorders will become profound public health problems.

Courtesy of Gina D'Angelo, PhD; John Morris, MD



Significance of the Problem

Alzheimer's disease (AD) is a **fatal and progressive brain disease with no current cure**. It is estimated that **5 million Americans have AD**, and that changes in the brain may occur as early as 20 years prior to diagnosis. **With the largest group of individuals in the United States about to enter the “vulnerability period”** for dementia, AD and associated disorders will become **profound public health problems**.

Courtesy of Gina D'Angelo, PhD; John Morris, MD



Significance of the Problem

One can hardly overstate the critical importance of improving our understanding of the pre-symptomatic pathobiology of AD which, when accomplished, can help determine whether prevention is possible and when interventions should occur.

Courtesy of Gina D'Angelo, PhD; John Morris, MD



Clearly Identify the Gap and Your Goal

fcMRI **has shown promise** to elucidate AD pathobiology in brain networks and their changes over time, **yet current statistical methods are inadequate** to evaluate group differences in resting-state functional connectivity while incorporating the complex temporal and spatial characteristics of fcMRI data. **Our goal is to develop novel inferential methods to fill this critical gap.**

Courtesy of Gina D'Angelo, PhD; John Morris, MD

Step 3: Presenting Your Work



Good Presentation

- ❖ Organize the application:
 - ◆ What do you want to do?
 - ◆ Why do you want to do it?
 - ◆ How are you going to do it?
 - ◆ What is the expected outcome?
 - ◆ Why is it a good thing?



Good Presentation

- ❖ Develop a logical outline.
- ❖ Use section headings to help reviewers “find things.”
- ❖ Use both major and minor section headings.
- ❖ Make it easy for reviewers. Don't make them work hard.
- ❖ Tip: Read aloud to a friend to catch mistakes.



Good Presentation

- ❖ Do not include a lot of narrative and graphics just because you have the space.
- ❖ Reviewers like white space and boldfacing to help them find things.
- ❖ Address criteria early in the section.
- ❖ Tip: *Write completely*, then cut back to the most important points.

Who is Your Audience?

❖ Your Reviewers

- ◆ Are very intelligent, but may be uninformed about your specific field
- ◆ Have 10-15 other grants to review
- ◆ Are often reading quickly, under distracting, sub-optimal conditions
- ◆ May be
 - ◆ Tired
 - ◆ Hungry
 - ◆ Grumpy
 - ◆ Tired, hungry and grumpy



Specific Aims Page: Why is it Important?

- ❖ The most important page in the proposal
 - ◆ Most read
 - ◆ Opportunity to capture and keep the reviewer's attention
- ❖ Is the work significant, novel and innovative?
- ❖ Are the aims achievable?
- ❖ Is the work proposed congruent with the specific aims?

Specific Aims Page: Why is it Important?

- ❖ It may be the first or only thing that reviewers read
- ❖ Showcases your ideas—is an opportunity to get the reviewer's attention
- ❖ Provides a conceptual framework to tell the reviewers why your data and objectives are important
- ❖ Can make the difference between a bored or excited reviewer who can advocate for you.

Specific Aims Page: Why is it Important?

- ❖ Many reviewers do not read the Specific Aims page until it comes up for evaluation at the review panel meeting. Thus,
 - ◆ They will be playing “catch up” by reading parts of your proposal to determine whether they agree with what they are hearing, and
 - ◆ They will be reading while others are speaking, so the significance of your work should be compelling and your logic should be very clear.

Specific Aims Page: First Paragraph

Should immediately establish the relevance of your research to human health to meet the goals of the NIH, which is to improve the control of disease, enhance human health, and advance understanding of biological systems.



Relevance of your Research

Alzheimer's disease (AD) is a **fatal and progressive brain disease with no current cure**. It is estimated that **5 million Americans have AD**, and that changes in the brain may occur as early as 20 years prior to diagnosis. **With the largest group of individuals in the United States about to enter the “vulnerability period”** for dementia, AD and associated disorders will become **profound public health problems**.

Courtesy of Gina D'Angelo, PhD; John Morris, MD



Formatting: Flow of Logic

Poor adherence to prescribed therapy remains a formidable barrier to improving outcomes for all patients, but especially the economically disadvantaged.^{1,2} Approximately half of all patients do not adhere to their prescription medication regimens, and the result is increased mortality, avoidable hospitalizations and skyrocketing healthcare costs.³ Patients with heart failure are particularly susceptible to the detrimental effects of medication nonadherence.^{4,5}

Courtesy of Michael W. Daly, PharmD



Formatting: Flow of Logic

Efforts to improve the management of patients' chronic diseases are hampered by an overstressed primary care system, a lack of interoperable computerized records, dysfunctional financing, and a lack of integrated systems of care.⁶ Innovative solutions are desperately needed that utilize health information technology (HIT) to improve adherence to medications for patients with chronic illnesses.⁷

Courtesy of Michael W. Daly, PharmD



Formatting: Flow of Logic

Pharmacists are in an ideal position to solve these problems due to their accessibility to patients, medication expertise, and new healthcare reforms by the Centers for Medicare and Medicaid Services mandating increased enrollment **medication therapy management (MTM)** services.^{8,9} Furthermore, pharmacist-directed MTM has improved adherence, medication safety, and patient outcomes for multiple chronic diseases, including heart failure.^{5,10,11} However, a significant obstacle to expanding pharmacist-based services is the lack of tested technological tools to facilitate **MTM**.¹²⁻¹⁴ This obstacle now appears surmountable for patients enrolled in Medicaid fee-for-service plans.



Formatting: Flow of Logic

Specific Aim 1: Develop and refine a protocol to study the impact of a DirectCarePro (DCP)-based intervention to improve medication adherence in Medicaid patients with heart failure at Washington University's Wohl Clinic.

Specific Aim 2: Collect preliminary data to determine feasibility of a subsequent, randomized, controlled trial.

Courtesy of Michael W. Daly, PharmD



Formatting: Flow of Logic

If the specific aims are achieved, we will have the necessary pilot data and methodologies in place to take the next critical step of soliciting external research grant support to conduct a randomized, controlled trial to compare the effectiveness of this pharmacist-driven, DCP-supported approach to standard care for heart failure patients in terms of medication adherence and persistence, clinical outcomes, and resource utilization. Further, we believe the methodologies involved will be generalizable to other chronic diseases and to the community pharmacist level, thus bringing the proven outcomes and patient satisfaction benefits of MTM services to the large, underserved Missouri Medicaid population.

Other Important Sections for Potential Review



Budget Justification, Appendices, Biosketch

- ❖ All provide a potential opportunity to circumvent the page limitation in the research strategy
- ❖ Reviewers
 - ◆ Typically read the budget justification
 - ◆ May read the biosketch
 - ◆ Do not typically read the appendices so could be annoyed if you force them to go there



Budget Justification

The budget justification should include at the minimum *all of the information* required by the funding opportunity announcement. Additional information is okay, but it could also work against you by confusing the grant management specialist.

Helpful Resources

Templates

<http://medofa.wustl.edu>

Click on Faculty Resource Library, then Grant Writing

NIH Center for Scientific Review Grant Review Process Videos

<http://cms.csr.nih.gov/ResourcesforApplicants/InsidetheNIHGrantReviewProcessVideo.htm>

Washington University NIH Short Form Seminar

September 8, 2010

<http://crtc.wustl.edu/>

Thank You

Washington University School of Medicine

Dr. Laura Bierut

Dr. Gina D'Angelo

Dr. Michael Daly

Ms. Diana Owyong

National Institutes of Health

Dr. Anthony Coelho, former Review Policy Officer



Data Management Plans

- ❖ NSF released a new requirement for proposal submissions, regarding the management of data generated using NSF support.
 - ◆ Went into effect January 2011
 - ◆ Up to 2 pages in length
 - ◆ Will be reviewed and included in your Broader Impact score

- ❖ name of the person responsible for data management within your research project
- ❖ description of the data and the methods used to collect or create the data
- ❖ data will be documented throughout the research project
- ❖ data quality will be assured
- ❖ backup procedures
- ❖ data will be made available for public use and potential secondary uses
- ❖ any exceptional arrangements that might be needed to protect participant confidentiality or intellectual property

- ❖ Who is the person responsible for the data management?
- ❖ What method will you use to collect or create your data?
- ❖ How will you document the data?
- ❖ What are your back up procedures?
- ❖ How will you assure your data quality?
- ❖ Will your data be available for the public? How?
- ❖ How will you protect participant confidentiality or intellectual property?

Writing your Plan

- ❖ Think your plan through
- ❖ Be concise and straight forward
- ❖ Read the FOA for specifics required in your data management plan.
- ❖ Keep to the requirements--this is not the place to embellish.

Questions?

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