NIH
Grant Writing Seminar

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Faculty Research Development Office (FRDO)

Seeking Extramural Research: Grant mechanisms And Processes

The Big Secret

NIH Mentorship is Critical

- Guidance in formulating the "narrative" or story.
- Relationships with NIH Institute staff
- Understanding of review process – scoring, interpreting, responding
- Sharpening specific aims
- Awareness of UNM policies & procedures

Initial Steps: You have a clear research idea

Identify Possible NIH institute (www.nih.gov)

Use NIH Reporter data base to identify related research and investigators

Identify review panels and panel members

Find current and past RFA, RFP, and PA's for the selected NIH Institute.

NIH Grant Mechanisms:

R Series: R13, R21, R03, R01, …

K Series: K01, K02, K23, K24, …

U Series: Collaborative research

F Series: Training grants

Good initial mechanisms:

R03:   Pilot study, 2-year 50k per year
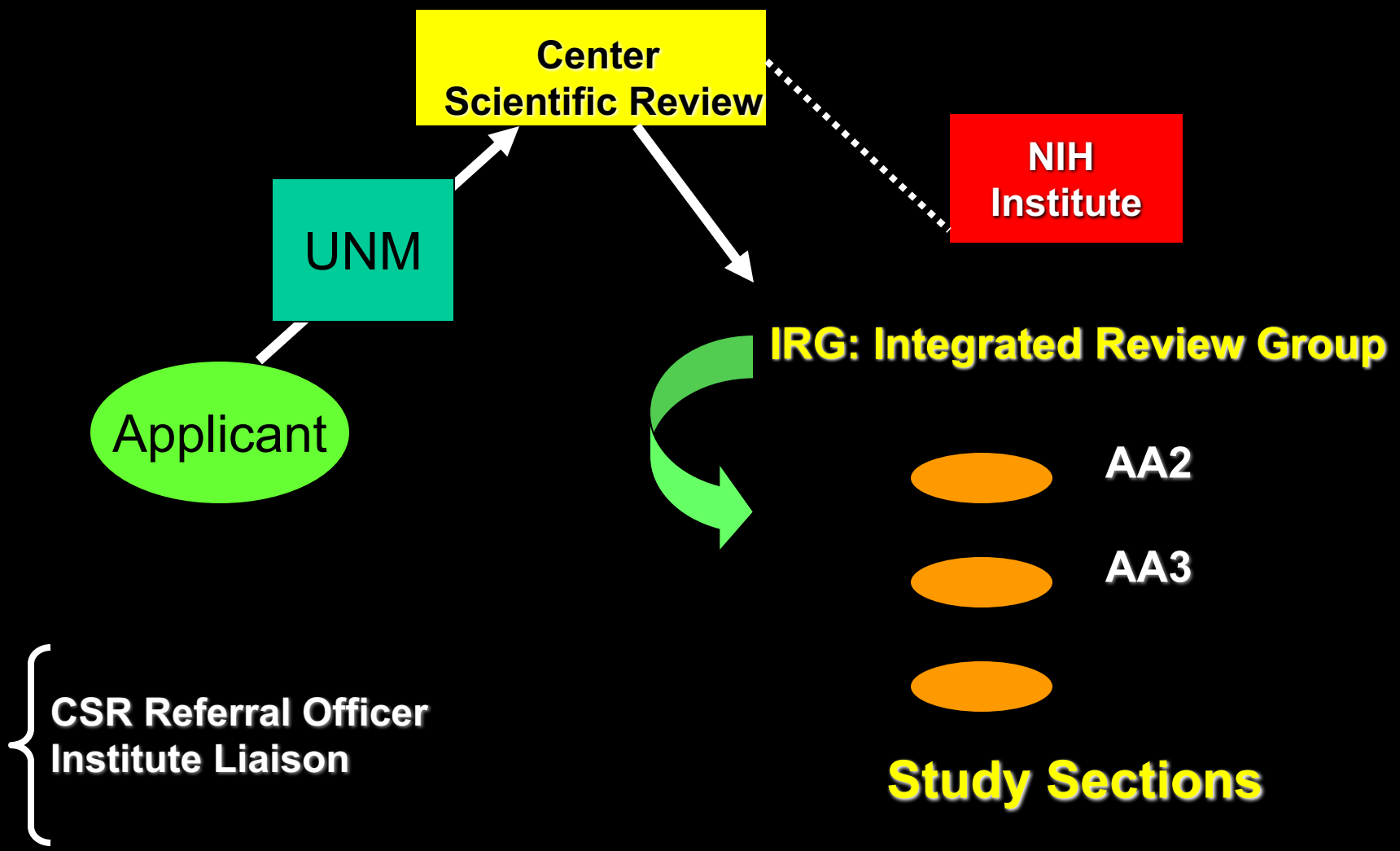
R21:   Development studies 2-yr 275k

K's: Investigator development.

The Grant Review Process

Simplified Flow Chart of NIH Review

Center Scientific Review

NIH Institute

UNM

Applicant

IRG: Integrated Review Group

AA2

AA3

CSR Referral Officer Institute Liaison

Study Sections

"Typical" Grant Reviewer

Demographics:

Modestly overweight
Requires Reading Glasses
Recognizes "Research Fads"
Mean Age, 48 (SD = 10.5)

Professional Interests:

Has Independent Funding
Always has Power Notebook
Critical but Fair
Field Reviewer for Many Journals

Typical application review

Context of "reviewing" applications

Application "triage" before meeting

Potential for "saving" an application

The actual "review" and "recalibration" process

How many reviewers on the committee actually read the application?

Critical Points:

Study section assignment
Streamlining
Institute representation at review

10 Common Pitfalls
Research Applications

Failure to *understand* **and** *capitalize* **on the process of the application review.**

1. **Pre-award activities, processes, and application assignment**

2. **Resubmission considerations**

Pitfall #1: Visual presentation

Complex graphs do not scan well

Poor use of sub headings
     1. Use subheadings to clarify logic
     2. Sub-headings provide roadmap

DO NOT pack as much text on a page
     that is allowed, omitting blank lines
     between paragraphs, etc..

Avoid excessive use of acronyms, especially
     ones that vary by a single letter.

Pitfall #2: Abstract & Biosketch

Typically the last elements completed, often under extreme duress and sleep deprivation.

Abstract: Used for study section assignment *and* only portion of application many reviewers will view.

Biosketch: Carefully reviewed, forms deep impressions, concordance between biosketches

R01 Abstract (Tonigan, PI): A Transtheoretical Model of AA-Related Behavior Change

Little is known about how behavior change is mobilized and sustained in AA, and even less is known about how co-occurring psychiatric severity may mediate such changes. This is remarkable given that Twelve-step (TS) therapy is the prevailing alcohol treatment model in the United States and a majority of persons receiving alcohol treatment (TS and non-TS) will attend AA, if only for a limited time. Significant gains have been made in identifying the: (1) characteristics of people most likely to attend AA, and (2) understanding the nature and magnitude of benefits associated with AA exposure. What actually occurs in AA, and how these specific behaviors may predict improved functioning, however, remains poorly understood and rarely investigated. The overall aim of this study is to test a transtheoretical model of behavior change in AA, and to identify the specific AA-related behaviors that mobilize such change. This application proposes a 2-year longitudinal study (N = 300) of AA-exposed individuals, with participants recruited from AA and outpatient treatment. The study has five aims that prospectively test how prescribed AA-related behaviors mobilize AA-specific and non-specific change mechanisms, and how such mechanisms once mobilized predict reductions in drinking and other drug use.   A theme in this application is to argue for ecologically sound AA studies, but not at the expense of sacrificing rigorously designed and executed science. To this end, AA-related behaviors, behavior change mechanisms, and substance use are each defined multidimensionally, using assessments with strong psychometric properties. New knowledge of the general and mediational processes of behavior change in AA is critical for improvement of TS-based therapy. Study findings will provide TS oriented therapies with evidenced-based feedback that is instrumental for improving intervention strategies.

Pitfall #3: Unnecessary, Tacit, & Unsubstantiated Advocacy (Background and Significance)
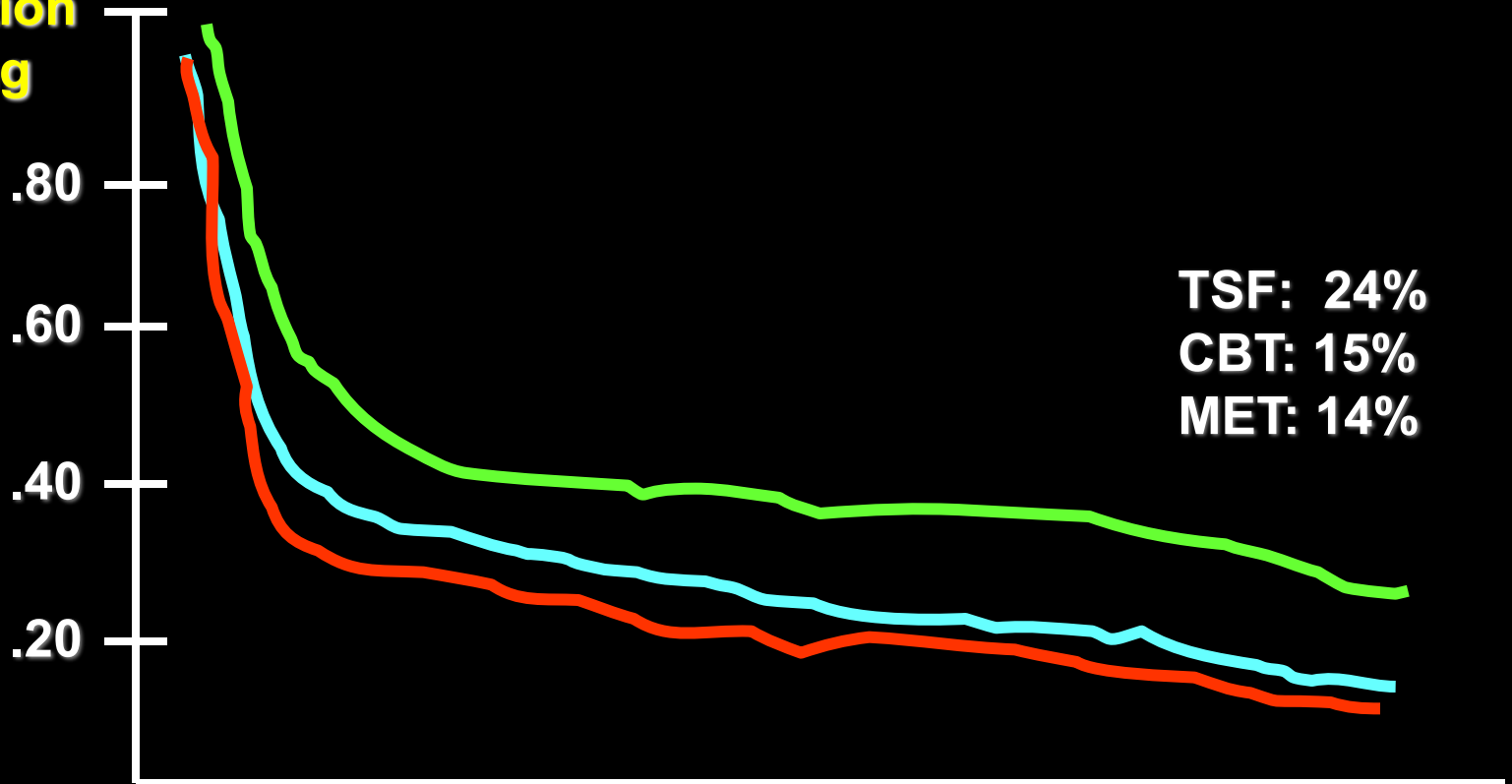

Forms of undesired advocacy:

1. Alcoholism is a big problem

2. MH exposure/ participation is unidimensional

3. Drinking behavior is unidimensional

Communicate *fairly* the extant MH Literature

Significant Delay in Days to First Drink For TSF Outpatient Clients
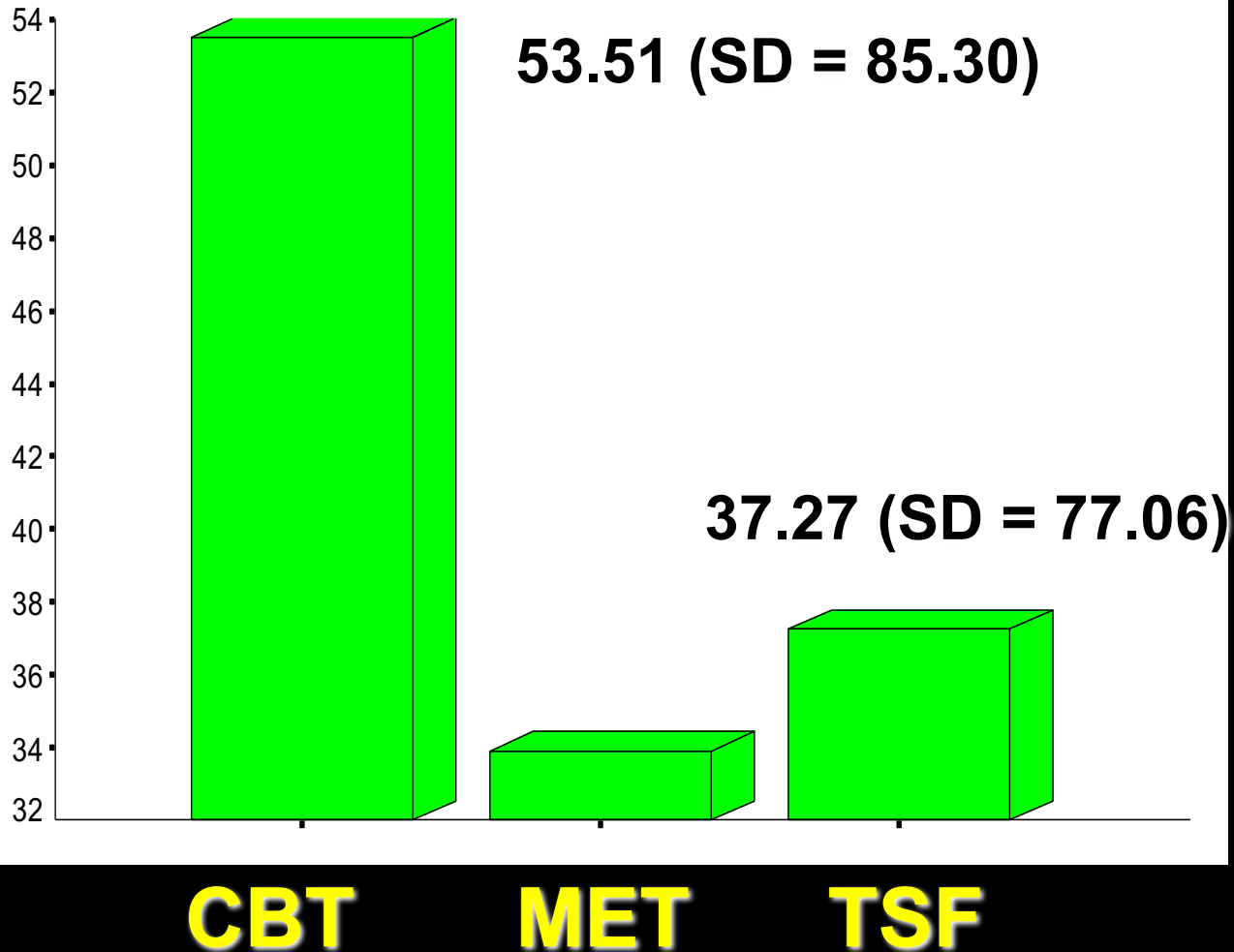
Number Days Between First Drinking Day And First Heavy Drinking Day

Pitfall #4: Boilerplate Letters of Support

Well intentioned efforts to ease the burden of

indicating grant support, e.g.,consultant,

institutional support, by boiler plate letters

communicates a lack of commitment.

Pitfall #5:

Failure to justify selected *Design* and *Sampling Procedures*, discussing why alternative choices were less desirable from the perspectives of external and internal validity.

Concordance between study aims and sampling procedures

Pitfall #6: Loose-to-Poor Linkage Between Study Aims and Statistical Analyses.

Need a 1-to-1 correspondence between aims and analyses.

Need a clear description of the measures in each aim, and the assessments used to produce measures.

Justification for the selected analytical approach.

Pitfall #7: Weak Plan re: Attrition, Spurious Results & Statistical Power

Especially salient concern with self-selected Participant research.

1. Internal and external validity and attrition.
2. Type I error rate.
3. Type II error: Study attrition, effect size estimates, and cell sizes associated with study aims.

Your Application is Scored!

Reviewer Guidelines

50% applications unscored

Pitfall #8: Decide not to resubmit, Decide it is better to wait, (Decide to change career).

Known cases of 200-260 scored applications that were not resubmitted.

Time may increase the probability of different reviewers.

Scores can improve dramatically with re-submission, e.g., 210 ⟶ 124.

Pitfall #9: Thoughtless Response To Reviewer Comments

High responsiveness without recognition how revised changes may impact other, highly valued, aspects of the application, e.g., psychopathology and ethnicity.

Misunderstanding Reviewer Comments

1. Get feedback from Institute Rep.
2. Post-it Technique

Pitfall #10: Poorly Constructed Page (Letters of Response)

Fail to acknowledge *theme(s)* of reviewer concerns, and how specific reviewer comments related to these themes.

Fail to explicate how responding to reviewer comments impacted other, highly valued, aspects of the application (and how this was dealt with).

Fail to concisely describe your response, and identify location(s) of revisions in application.

Conclusion

Avoiding described pitfalls will not salvage a weak application.

However, excellent applications that ignore these pitfalls are less likely to receive outstanding scores.

Remainder of Presentation

1. NIH BioSketch & Abstract
2. NIH Specific aims
3. NIH Approach
4. NIH Resubmissions

NIH Reviewer

NIH Biosketch

...FIRST IMPRESSIONS DO MATTER

Off-the-record remark

Be sure that your webpage (s) (departmental and/or personal) are:

1. Current; listing all productivity
2. Free of any typos, etc..
3. Do not contain "compromising" material/pictures

Why the Bio is Important

- Increased visibility in reviewer rating system:
- Are the PD/PIs, collaborators, and other researchers well suited to the project? If Early Stage Investigators or New Investigators, or in the early stages of independent careers, do they have appropriate experience and training? If established, have they demonstrated an ongoing record of accomplishments that have advanced their field(s)? If the project is collaborative or multi-PD/PI, do the investigators have complementary and integrated expertise; are their leadership approach, governance and organizational structure appropriate for the project?

Biosketch

Four Parts (now 5 pages instead of 4 pages)

A. Personal Statement (two new options)

    1. may include up to 4 citations

    2. explanation for productivity "impediments"

B. Positions and Honors (unchanged)

C. Contributions to Science (new; required; 4 cites)

D. Research support (current and past 3 years)

E. No Figures, Tables, Graphics

What qualifies as a "Citation"?

- **Peer-reviewed publications**
- **Research Products:**

  1. Audio/video products
  2. Conference posters, abstracts, proceedings
  3. Patents, protocols, software, educational aids, and curricula

Citations and Research Products can be reported in both the Personal Statement and Contributions to Science Sections

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What the Reviewer is Considering regarding papers

- **Is there a steady progression of papers?**
- **Are there gaps in productivity?**
- **Are papers focused?**
- **Quality of journal's (impact score)?**
- **Is funded past research represented?**
- **Does the assembled team publish together?**

Title and Educational Background

- PI must enter an ERA Commons user name (other key personnel should).

- Education/Training Block:

  Start with Baccalaureate, list all postdoctoral, residency, and clinical fellowship training.

Personal Statement

- How do the study aims match past and on-going research by the investigator?
- History: Is there a track record of achieving related aims?
- Feasibility: Does the PI have the right stuff?
- With shortened applications, load new information into the personal statement
- Does it flow logically?

Considerations in Personal Statements

- Do statements match budget justification?
- Related, is allocated FTE consistent with personal statement of goals?
- Do statements match narrative description?
- Do statements reflect deep understanding of the proposed aims and methodology?
- Are statements integrated?

Positions and Honors

- **Work history, listed past to present**
- **Awards & recognition**
- **Professional service**

  Journal reviews

  Institutional recognition

  Institutional Committee's

  Professional Recognition

Contributions to Science
(All Key Personnel must complete this)

Briefly describe five areas of (your) scientific contributions that illustrate your competence, expertise, and ability to conduct the proposed research.

Each area cannot exceed ½ page, including references (4 cites or research products per contribution).

URL listing all publications: NIH recommends, "My bibliography"

On-Going and Completed Research

- **Emphasis is on funded research: NIH, NSF, Foundation, Institutional seed money, State contracts (past three years).**

- **Title, PI, Funding Dates, Grant number**

- **2-6 sentences: aims, progress to date, role on project, products generated.**

Project Summary (Abstract)

- Limit length to 30 lines or less of text
- Include the project's broad, long-term objectives and specific aims
- Include a description of the research design and methods for achieving the stated goals
- Do NOT include proprietary or confidential information, or trade secrets
- Write in plain language, so even a non-scientist can understand the importance of the project -

From a utilitarian perspective, it is hard to understand the current direction of research on alcohol behavioral interventions for Native Americans (NA). Today, about 90% of NA's live in cities yet NIH sponsored research disproportionately focuses on the development of culturally-adapted interventions that are intended to be integrated with reservation-based health care services. Further, a majority of urban NA's seeking treatment will receive 12-step treatment or, at a minimum, will be encouraged to attend Alcoholics Anonymous (AA). In a recent review of 24 studies on interventions for NA problematic drinkers, however, not a single study investigated the effectiveness of 12-step treatment or AA (Greenfield & Venner, 2012). The proposed study addresses these significant gaps by conducting a nine-month single-group prospective investigation of early AA affiliation among alcohol dependent urban NA adults (N = 150). Participants will be recruited and consented as they present for outpatient treatment and directly from AA. Participants will then be interviewed at baseline, 3, 6, and 9-months. While important, study aims move well beyond the documentation of the trajectories of AA attendance and the lagged associations between AA attendance and later drinking. Specifically, prospective hypotheses will test the combined moderating effect of acculturation and enculturation on urbanized NA self-selection into, participation in, and outcomes associated with attendance at "mainstream" and "NA specialized" AA meetings. Related, there is substantial evidence that gains in abstinence self-efficacy, social support, and spiritual practices account, in part, for the salutary effects of AA, at least among "mainstream" AA members. The proposed study will investigate whether these change processes are mobilized and also predict increased abstinence among urban NA's attending AA. The achievement of study aims will have a broad impact on "standard" care for urban NA's that includes AA referral.

Specific Aims

Matching Application Sections
with Reviewer Scoring

Application Sections

Reviewer Scoring

Specific Aims

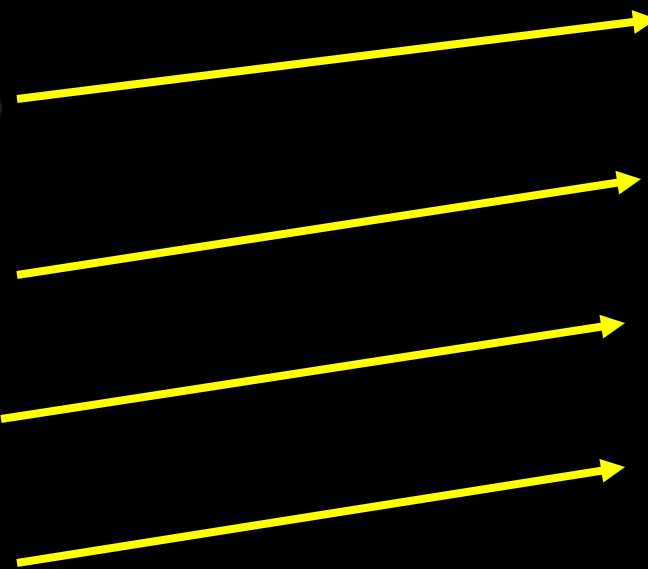*Significance* → *Significance*

Innovation → *Innovation*

Approach → *Approach*

Biosketch → *Investigators*

Environment

Specific Aims

- **Most important page of application**

- **Most likely revised 5-10 times**

- **Structure**

- **Common pitfalls**

Specific Aims: Structure

2-4 Paragraphs, ending with numbered aims

Within this framework address, "what will be accomplished and how this is significant and have impact"

Begin with specific problem, then move to:

Paradox
Advancement in methods
Unaddressed question

Specific Aims
(1 page: key paragraphs)

- **Begin with something to spark interest in the significance of study.**

- **The aims of this study are…..Clearly articulate why these aims are important**

- **To achieve aims this study will … (describe design and sampling strategy)**

Paragraph right before the listing of specific aims

Describe study design, assessment points, & sample size:

To achieve study aims we propose a single-group 9-month longitudinal study (*N = 150) to investigate the AA careers of treatment seeking problem drinkers as they move into, through, and out of AA.* Specific Aims are sequenced to inform subsequent analyses, thus providing for the most statistically powerful and meaningful tests of the prospective hypotheses. This naturalistic study will recruit 150 urban NA alcohol dependent adults during early AA affiliation. Participants will be consented and interviewed at baseline, 3, 6, and at 9-months. No intervention will be offered although the treatment experiences of participants will be carefully documented

The specific aims (3-5) need to be listed at bottom of page

- Are aims consistent with narrative?
- Do the aims flow logically? Does achievement of aim 1 inform the study of aim 2?
- Aims listed in active voice, e.g., "To determine", "To prospectively"….
- Are the aims "specific"?
- What happens if a prior aim "fails"

Example of specific aims

- To determine if treatment A and B differ in effectiveness to reduce number of cigarettes used in a three-month period.

- To determine if abstinence self-efficacy accounts for reductions in cigarette use.

- To determine if participant gender moderates the effectiveness of treatment with outcome defined as increased quality of life.

Common pitfalls in Specific Aims

- Leading with course "101" Statements
- False statements, significant omissions, and faulty logic.
- Poorly constructed aims: aims that do not   correspond to the text, poor ordering, "Achilles heel" aim.
- Vague aims with poorly defined variables.

Common Pitfalls in Specific Aims (Cont)

- **Too ambitious, too much work proposed**

- **Unfocused aims, unclear goals**

- **Limited aims and uncertain future directions**

Common Pitfalls (cont).

Aims stated in passive voice, e.g., "We will seek to explore…." or "If successful…"

Excessive use of acronyms in Specific aims.

Failure to leave blank line between aims.

Identifying statistical tests to be used in testing aims

Do Not Make

This Mistake!

"The" Approach Section
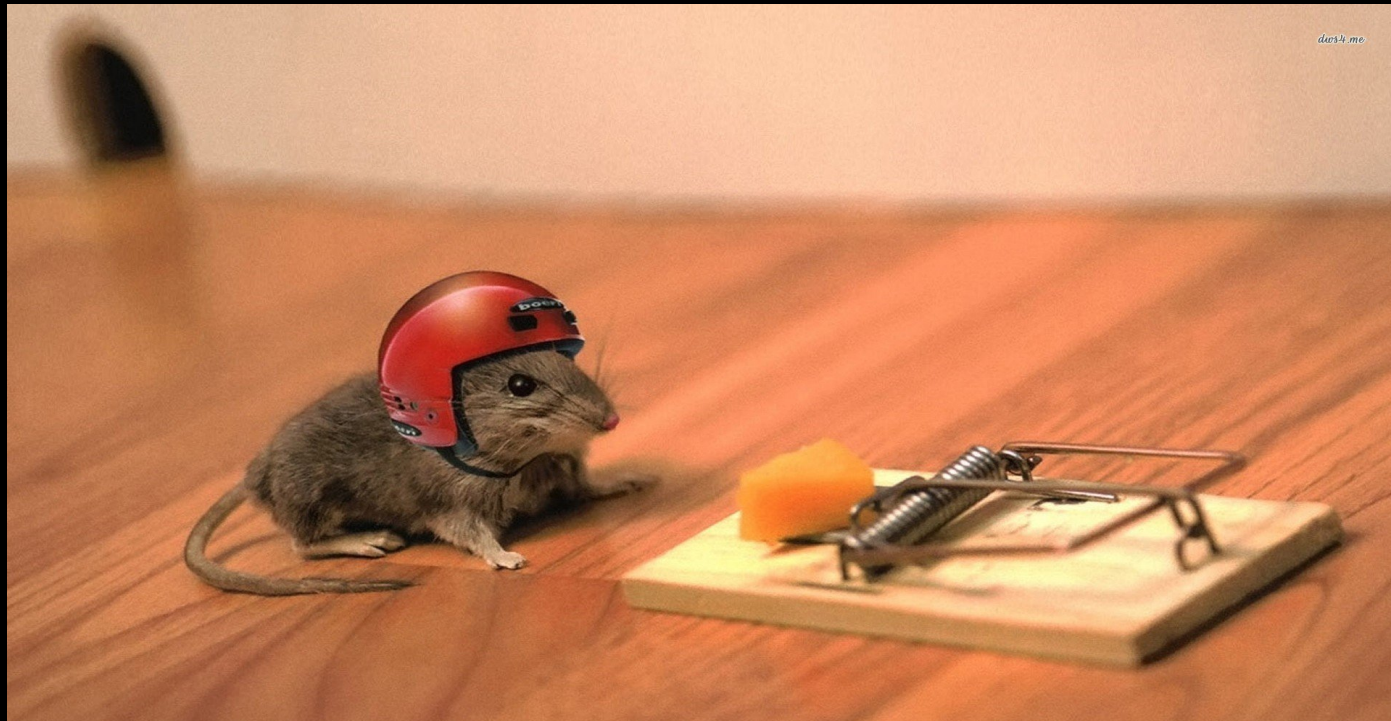
Approach Addresses:
How are aims to be accomplished?

- In a 6-page application (R21) you may dedicate 2-3 pages to Approach section.

- In a 12 page application (R01) this section may be between 4-6 pages

- Number of aims and complexity of the planned intervention will strongly influence length of this section.

Emphasis on Feasibility

- Can they successfully recruit?
- Do eligibility criteria compliment study aims?
- Can they successfully implement intervention?
- Can they successfully administer assessments?
- Can they successfully engage participants in the research and clinical protocols?
- Can they successfully "track" participants?
- Does the analysis plan support aims?

Organization of "Approach"

- **Two ½ distinct models at the beginning of the Approach section (where's Preliminary Studies?)**

- **Model 1: Describe investigative Team**

- **Model 2: Overview paragraph**

- **Resubmission format**

Model 1

- **Generally one paragraph on each key member**

- **Highlight relevant work**

- **Describe contributions each member will make.**

- **Launch into model 2 organization**

Model 2

- Overview paragraph, describe design
- Design Considerations (why this design was selected)

- Anticipate reviewer concerns or "pet" procedures

- State key assumptions

Elements to Approach

- Recruitment procedures
- Inclusion/exclusion criteria
- Clear statement of assessment schedule
- Measures (several options here)
- Training and fidelity monitoring for "intervention"
- Feasibility (tacitly expressed throughout section)
- Follow-up/ reimbursement
- Statistical Analysis Plan
- Statistical power analysis

The recruitment strategy will result in a sample having a broad spectrum of substance use problem severity and diverse treatment and AA histories. Adults will be recruited as they present for outpatient treatment, detoxification centers, and enter AA. We have recruited from the proposed sites and we have always achieved our recruitment goals (R01AA014197; R21AA016974; R21AA13073).

Eligibility criteria will generate a sample of individuals in early stages of changing alcohol use with a high probability of some AA-exposure during study participation. We will recruit and consent 7 participants a month. Recruitment efforts will begin in month 4 (year 01) and will continue until midway through year 03. Recruitment will be unrestricted with regard to gender and minorities, with the exception that Spanish reading only individuals will not be eligible. We expect that racial/ethnic diversity will be consistent with our past recruitment efforts in studies with similar inclusion/exclusion criteria. Specifically, in R01AA014197, about 65% (n = 162) of the participants were male and 41% (n = 104) were Hispanic. Very similar figures were obtained in R21AA023042 with 54% (n = 70) male participants and 43% (n= 56) were Hispanic.

Sample Inclusion/Exclusion statement

Inclusion Criteria. Inclusion criteria are liberal to reflect the heterogeneity of AA membership characteristics. In this regard, individuals with co-occurring DSM V diagnosis of illicit drug abuse or dependence will be eligible. In addition, DSM V dually diagnosed persons are eligible and the use of prescribed medications for psychiatric care or acute or chronic health problems will not a basis for exclusion.

(1.) DSM V diagnosis of <u>recent</u> alcohol use disorder (past 12 months),
(2.) Alcohol consumption in the past 4 months,
(3.) Attended at least one AA meeting in the past three months,
(4.) 18 years of age or older,
(5.) Read English at the six grade level, determined by the.

Exclusion Criteria.
(1.) Past 120 days of continuous abstinence (from alcohol),
(2.) Unable to provide the name of one locator,
(3.) Active psychosis or other condition that would impair ability to understand
                                                consent or in the study,
(4.) Pending legal convictions that involve more than 90-days incarceration, and
(5.) Plans to relocate to another state in the next six-months.

Assessment schedule

- **Summary of Study Design**. This application proposes a single-group longitudinal study (N = 275). No intervention will be offered in this "assessment-only" study although clinical referral will be made if requested or deemed appropriate. Participants will provide daily EMA data for the first six-months of the study and they will also be scheduled for in-person interviews at intake and 3, 6, and 9-month follow-up.

The Conundrum of Measures Section

Table X. Proposed In-Person Assessment Battery

Assessment	Type of Assessment	Intake	3-mo	6-mo	9-mo
Screening Form	Structured Interview	X			
Informed Consent	Structured Interview	X			
Locator Form	Structured Interview	X	p.r.n.	p.r.n.	p.r.n.
Demographic Interview	Structured Interview	X			
Alcohol Dependence Severity (ADS)	Self-Report	X			
Form 90 – (Healthcare/Substance Use)	Structured Interview	X	X	X	X
Drinker Inventory of Consequences (DrInC)	Self-Report	X	X	X	X
Twelve-Step Participation Questionnaire	Self-Report	X	X	X	X
Important People and Activities (IPA)	Structured Interview	X	X	X	X
Sponsor Alliance Inventory (SAI)	Self-Report	X	X	X	X
General AA Tools of Recover (GAATOR)	Self-Report	X	X	X	X
Religious Practices and Beliefs (RPB)	Self-Report	X	X	X	X

D.10. Follow-Up Procedures. Our research staff specializes in assessment and follow-up tracking of clinical samples. We have contributed to guidelines for the maintenance of research retention and compliance in clinical trials, (e.g., Zweben et al., 1998), and our staff are well versed in using state-of-the-art techniques in locating and scheduling clients for interviews, e.g., multiple locator information, postal system and MVD checks, reverse phone directories, house calls, internet credit searches, county, state, and national death registries. All our procedures are IRB approved, and are explained to prospective study participants before obtaining informed consent.

D.11. Follow-up Timeline. There will be three follow-up interviews. We project that from the last month of year 01 to midway through year 3 (month 43) we will be simultaneously recruiting and conducting 3, 6, and 9-month interviews. On average, we expect to conduct about 7 FU interviews per week during this time of peak activity. Taking into account the substantial amount of time required to locate and schedule interviews (and prepare assessment packets), we have XX FTE allocated to achieve an acceptable and high follow-up rate.

D.12. Participant Reimbursement. Participants will be reimbursed $40 after the completion of each in-person assessment (total $160 for 100% compliance). Participants will be reimbursed up to $210 per 3-months of EMA data. This incentive scheme provides about $2 per day for completing the surveys with $10 of "bonus" incentives for each month with excellent compliance (>90% compliance). Similar incentive schemes have been used effectively in EMA studies in the addictions field (Piasecki, Alley, & Slutski, 2012; Serre et al., 2012; Setodji, Martino, Scharf, & Shadel, 2013; Witkiewitz et al., 2012).

Statistical Analysis Plan

- Preliminary Analyses
  - Attrition analyses
  - Variable distributions
  - Convergence, veracity analyses

  Aims : One paragraph apiece, don't forget an aim!

What to avoid in Statistical Analysis Section

- Silence on Type I error rate

- Poorly described measures

- Associations between key dependent measures

- "Kitchen sink" aim

- Tutorial discussion of selected statistics

Statistical power

- Identify "lowest" powered analysis and discuss

- Provide statistical power analysis for each aim

- Go beyond "derive estimates of effect size"

Revision and Resubmission: Process and Strategies

Steps Before the Initial Review

- **ERA commons account**

  Coordinating with the Project officer
  - Will they attend the review?, and
  - When can you arrange for a call AFTER the review?

Process of Review Committee Feedback

- **Era commons, Overall Impact Score**

- **2-4 Weeks later, Summary Statements (pink sheets)**

- **Project Officer Discussion (may precede or follow pink sheets)**

Summary Score Sheets

- **Assign a score 1-9 for each category (Sig, Investig., Innov., App., Envir) and an overall score.**

- **Reviewer identifies strengths and weaknesses for each category**

- **1-3 Outstanding to Excellent**
- **4-6 Very Good to Modest**
- **7-9 Fair to Poor**

Constructing the "Grid"

	Rev #1	Rev.#2	Rev#3	
Significance	3	2	3	
Investigator	2	1	1	
Innovation	4	3	3	
Approach	3	3	3	
Envir.	1	1	1	
	2.6	2.0	2.2	2.27

Gather Key Personnel

- **Discuss Summary Comments and Grid**

- **Seek to clarify ambiguous (conflicting) statements**

- **If necessary, assign new tasks for response**

- **Put aside for 2-4 Weeks**

A Revised Application

- **One month later than "scheduled" submissions**

- **One page introduction explaining responses to round one comments**

- **Considerations in timing of re-submission**

- **How will you identify "revised" material?**

Letter of Introduction

- Put aside the "poison pen".

- Avoid combative and defensive statements.

- Avoid "just getting over the bar" and consider the implications of your changes (responses) and how you will address these new challenges.

- Determine structure of letter (By reviewer, By Theme, By Specific Concern)

Letter of Introduction

- **Introduction**

  We are pleased to have the opportunity to respond to reviewer comments. As a preliminary remark we were struck by the consistency across the reviewers in their judgment of the overall merits of the application as well as the areas in the application that required attention. We will not dwell on the favorable comments of the reviewers other than to note that the application was assigned an overall impact score in the outstanding range, albeit barely (i.e., 3.0). We believe that our responses to reviewer comments significantly strengthen our proposal to meta-analytically review the literature on AA. In general, reviewer comments fell into one of four categories, areas that are specifically addressed below.

Changes in the application and how to identify them

Underline, bracket, bold, use of headers.

Be sure to update Bio, and other material impacted by changes in the revised application (e.g., Project Narrative, Human Subjects). If important, mention in letter of introduction.

Revise Personal statement.

Putting the Pieces of the NIH Application Puzzle Together

Grant writing Timeline

- 6 months before submission: idea stage. What do you want to do? Do you have preliminary data or related publications? Does your biosketch show that you could execute the project? Start thinking about the team. Get a grantwriting mentor. Get feedback on your idea. Is it fundable? Talk to a program officer (PO) at NIH. (note that PO enthusiasm is necessary but not sufficient)

- 5 months: Write! Put together a 1-page concept to clarify your goals and get a head start on your Aims page. Get feedback on this (many POs are willing to read and provide feedback on Aims). Line up co-Is and consultants

- 4 months: Have initial meeting with project team

- 3 months: Get feedback on your fully-written proposal draft. Integrate feedback. Plan your budget (more info next month!). Start your human subjects section. Start letters of support.

Grant writing Timeline

- 2 months: If submitting through CASAA, complete the initial proposal questionnaire. If not, find out who will be handling your submission. Refine proposal. Collect biosketches from co-Is and consultants; provide feedback or edit these as necessary.

- 1 month: Assemble the pieces (public health narrative, final biosketches, budget justification, UNM internal documents, etc.)

- 5 *full* business days: final documents must be at OSP via Cayuse. Allow 1-2 days to route out of your department.

- No later than 2 business days before deadline: upload finalized technical piece (research strategy).

- 1 business day: submit proposal! Look for confirmation email from era-notify. View proposal in eRA Commons, check for and fix any errors.