Why do we loathe Publication & Reporting?

- List 2-3 examples in which you personally have exhibited avoidance behaviors (eg. procrastination) with respect to publication &/or reporting in any of your current or past research projects
  - Why?
What is Avoidance - Motivated Behavior?

- Our behavior when we distract ourselves from doing a task that is associated with an unpleasant emotion, typically fear
  
  - 3 main types of behaviors:
    - Complete Avoidance
      - No showing at a presentation, Failure to submit documents, Quit a responsibility
    - Escape
      - Leaving early from a commitment, Ending a talk abruptly, Hiding in one’s office
    - Partial Avoidance
      - Daydreaming, Avoiding eye contact,

  - Worry, Anxiety, Panic

- These behaviors do not reduce anxiety, rather they can fuel it or cause difficult situations to “snowball”.
What is Avoidance - Motivated Coping?

- We do something else instead to bring momentary relief
  - #1 way....Procrastination
Why do we exhibit avoidance behaviors in P&R?

- **Time Management**
  - Administration & writing can take a significant amount of time away from productivity
  - P&R deadlines can create time conflicts with other commitments (family, teaching, service, travel, ...)

- **“Lack of Progress”**
  - Often, we feel like we have not been productive enough... which can be paralyzing
  - Progress can feel like a moving target
Avoidance Impacts P&R

- Missed Deadlines
- Delayed Publications
- Late Reports to Regulatory & Funding Entities
- May Impact Promotion & Tenure, Career Advancement

“Procrastination makes easy things hard and hard things harder.”
— Mason Cooley
Publication & Products of Research

• **Most commonly sought products of research**
  • Peer-review publications in top-tier journals
    • *May require open access agreements for data produced*
  • Conference papers / podium presentations
  • Abstracts / conference posters
  • Technology Development &/or Techniques
  • Inventions: Patents, patent applications (NPA, PPA), licensing agreements
  • “Other”
    • *Databases*, physical collections, A/V products, software, instrumentation, interventions, educational aids
Publication & Products of Research

• **Who does the work?**
  - PI / Co-Is are typically senior authors
  - Post-docs, Research Assistants
  - Graduate Students, possibly Undergrad students
  - Lab Techs

• **Typically, these are team efforts which the PI supervises**
  - PI can ideally spend time to other projects and commitments
  - Majority of work likely done by junior scientists / trainees***
Research Reporting

• **Common types of reporting in research**
  - Department/Center/University Annual Reports
  - IRB / Human Subjects Protection
  - IACUC / Animal Research Oversight
  - Federal Regulatory Bodies (eg. FDA)

• **Funding / Grants**
  - Federal (NIH, NSF, etc)
  - State (CPRIT)
  - Local (Dunn Foundation)
  - Private Foundations (AHA, ADA, etc)
Research Performance Progress Reports (RPPRs)

- **Federally mandated format required by NIH**
  - Similar formats & information required by other funding bodies
  - Typically done on an annual basis

- **Only the PI or a noted delegate can initiate**
  - This can require a major time & resource commitment by the PI
  - Majority of work likely done by PI
    - May have to formally submit the document to the funding body & institution
RPPR Required Components

• **Accomplishments**
  - What were the major goals and objectives of the project?
  - What was accomplished under these goals?
  - What opportunities for training and professional development did the project provide?
  - How were the results disseminated to communities of interest?
  - What do you plan to do during the next reporting period to accomplish the goals and objectives?
RPPR Required Components

• Publications & Products

• Patient (or Animal) Recruitment and Safety Reports

• Collaborative Efforts
  • Collaborating Institution Reports
  • Multi-site projects?

• Impact
  • Are you producing a sustained powerful influence in your research area with your progress?
RPPR Required Components

- **Project Changes, Challengers, & Problems**
  - Changes in approach and reasons for change
  - Actual or anticipated problems or delays and actions or plans to resolve them
  - Changes that have a significant impact on expenditures
  - Significant changes in use or care of human subjects, vertebrate animals, biohazards, and/or select agents

- **Financial / Budgetary Reports**

- **Future Plans?**
Core Reporting Standards - Manuscripts

• **Randomization**
  - Animals &/or human subjects should be assigned randomly to the various experimental groups, and the method of randomization reported.
  - Data should be collected and processed randomly or appropriately blocked.

• **Blinding**
  - Allocation concealment: Investigator(s) should be unaware of the group to which the next animal taken from a cage will be allocated.
  - Blinded conduct of the experiment: Animal caretakers and investigators conducting the experiments should be blinded to the allocation sequence.
  - Blinded assessment of outcome: Investigator(s) assessing, measuring, or quantifying experimental outcomes should be blinded to the intervention.

*Landis et al. 2012 - Nature*
Core Reporting Standards - Manuscripts

• **Sample Size & Estimation**
  - An appropriate sample size should be computed & utilized; the statistical details of computation should also be reported

• **Data Handling**
  - Rules for stopping data collection should be defined in advance.
  - Criteria for inclusion and exclusion of data should be established prospectively.
  - How outliers will be defined and handled should be decided when the experiment is being designed, and any data removed before analysis should be reported.
  - The primary end point should be prospectively selected. If multiple end points are to be assessed, then appropriate statistical corrections should be applied.
  - Investigators should report on data missing because of attrition or exclusion.
  - Pseudo replicate issues need to be considered during study design and analysis.
  - Investigators should report how often a particular experiment was performed and whether results were substantiated by repetition under a range of conditions.
Hurtles to P&R?

• **Project Changes, Challengers, & Problems**
  - Difficulties in starting &/or running a project
    - *Instrumentation, Participants, Lab Staff, Time, Funding, ...*
    - *Lack of progress due to such difficulties*

• **Difficulty organizing required information by stated deadlines**
  - Time conflicts, communication challenges, ...

• **Little to no institutional support**
  - Some PIs need to fill out the report and submit it in its entirety
  - A lot of time can be devoted to understanding what info is required, especially without administrative support

• **Competition**
If P&R is so tough, why bother?

- **Negative Consequences**
  - Withdrawal of funding
  - Inability to support current & future projects
  - Inability to achieve promotion, tenure, career advancement, ...
If P&R is so tough, why bother?

- Lack of P&R means that biases can be introduced into the evidence base
  - Reporting Bias
    - Selective revealing (or suppression) of information/outcome of a study
    - Reporting some results, but not all results
    - “Spinning” of unexpected or undesirable results
      - Attributed to sampling or measurement errors
Reporting Biases associated with P&R

**Publication Bias**
- Essentially this is non-publication of results
- Typically due to failure of an intervention
  - Lack of “positive” or “significant” results

**Time Lag Bias**
- Rapid publication of exciting, but not full results
- Delay in publication of negative or non-significant findings
- Delayed publication can also occur if a PI is trying to boost “productivity” under a specific grant
Reporting Biases associated with P&R

**Duplicate Publication Bias**
- Publication of the same results in multiple journals or journal supplements
- Typically higher incidence for “positive” or “significant” results
- Incidence may be decreasing due to widely searchable electronic databases (eg. Pubmed)

**Location Bias**
- Refers to journal of publication & impact factors
- Studies with “positive” and “significant” results tend to be
  - Published in journals with higher impact factors
  - Published in journals with better access (eg. indexed)
Reporting Biases associated with P&R

Citation Bias

• Tendency to cite positive findings more frequently

• May lead to perception that an intervention is more effective than it truly is, due to differential in number of citations

• Over-representation of positive findings

Language Bias

• Publication of positive findings in a specific language
  • eg. English

• Non-significant results may be published in non-English language journals

• May impact meta-reviews and systematic review results
Reporting Biases associated with P&R

Knowledge Reporting Bias

• The frequency with which actions, outcomes, or properties are reported is not necessarily a reflection of actual incidence
  • Location of study, SES, or other factors may significantly impact results

Outcome Reporting Bias

• Selective reporting of results
• Modification of hypotheses to fit findings
• Less likely to report adverse outcomes
  • Suppression
  • Highly problematic for drug & device trials
Reporting Biases associated with P&R

**Funding Bias**

- Tendency of a scientific study to support the interests of the study's financial sponsor
- Predetermined conclusions may bias researchers into an expectation bias
- Some sponsors require PIs to waive the right to publish findings that do not support the sponsor’s interests
  - Associated with *publication bias* & *outcome reporting bias*
- Study design may be flawed from the start
Strategies in Addressing Bias in P&R

• Build a case in which negative results can provide a positive impact on the evidence base

• Don’t suppress results, particularly negative results or “non-significant” results

• Don’t rush or delay publication, also don’t “dual submit”

• Avoid publishing the same results in more than one manuscript unless there is a very good reason to do so (new analyses, etc)

• Carefully consider the impact factor, scope, and audience of the journals you submit to
  • International? Clinical?

• Try to balance the story you tell with respect to citations

• Use references from journals that adhere to NIH R&R guidelines
Strategies in Addressing Bias in P&R

Report on the following:

- Randomization techniques
- Use of blinding
- Sample size estimation
- Data handling

*Look for these hallmarks in the literature you use to build your studies!*

Landis et al. 2012 - Nature
Strategies in Addressing Bias in Reporting

- Know the strengths & weaknesses of your team
- Familiarize yourself with expectations of editors, review boards, funders, & your institution
- Know your deadlines
- Know what components are needed for reporting
- Know your resources
  - Do you have administrative support? How much? What type?
A New Year’s Resolution...

What can you (&/or your lab) do this year to improve your relationship with publication, reporting, & bias?

• Come up with 2 - 3 resolutions with implementation strategies to share & discuss with your breakout group.