

Publication & Reporting

*From Avoidance to Transparency in
Research*

GCC Rigor & Reproducibility Workshop
2/14/2018

S.L. Gorniak, Ph.D.
University of Houston

Why do we loathe Publication & Reporting?

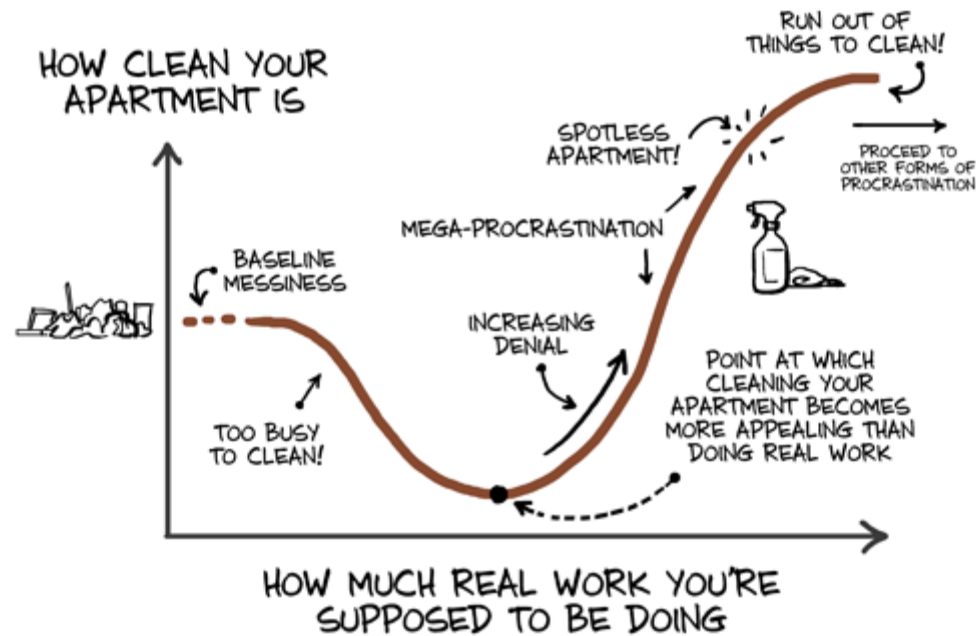
- **List 2-3 examples in which you personally have exhibited avoidance behaviors (eg. procrastination) with respect to publication &/or reporting in any of your current or past research projects**
 - *Why?*

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**



JORGE CHAM © 2013

WWW.PHDCOMICS.COM



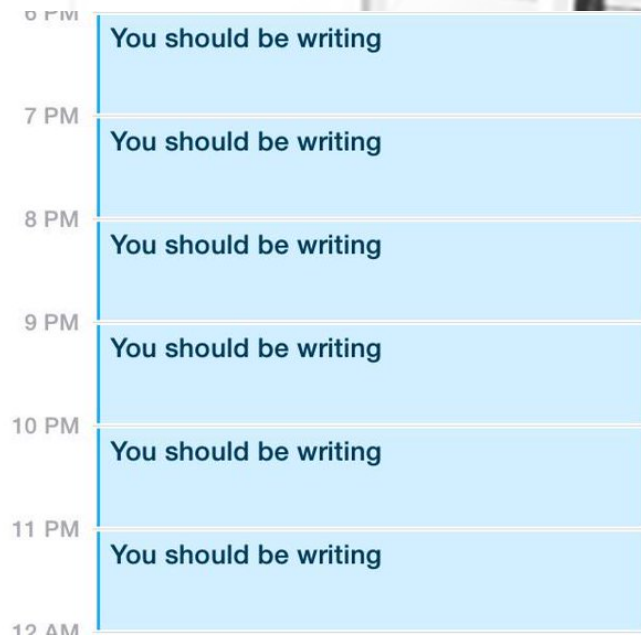
Why do we exhibit avoidance behaviors in P&R?

- **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

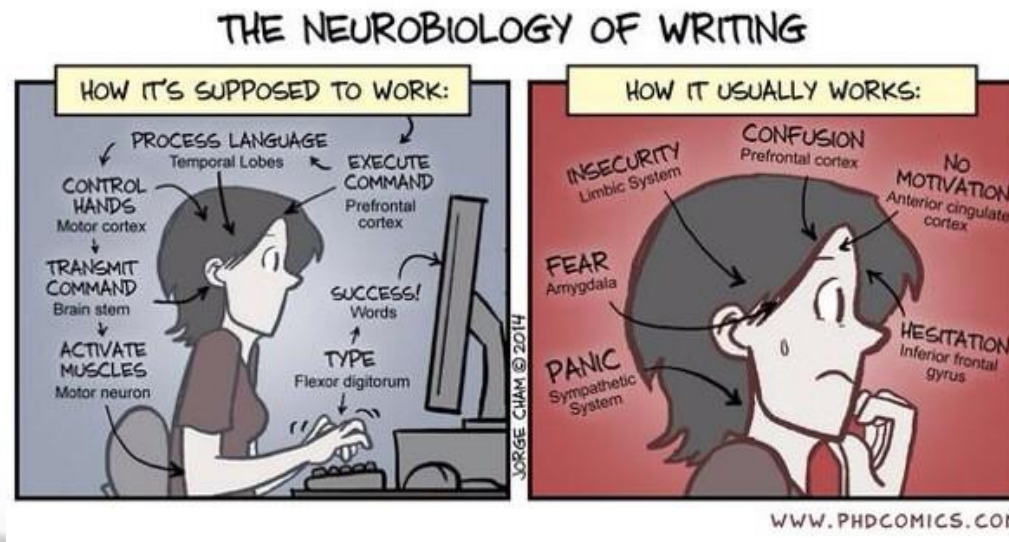


Avoidance Impacts P&R

- 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

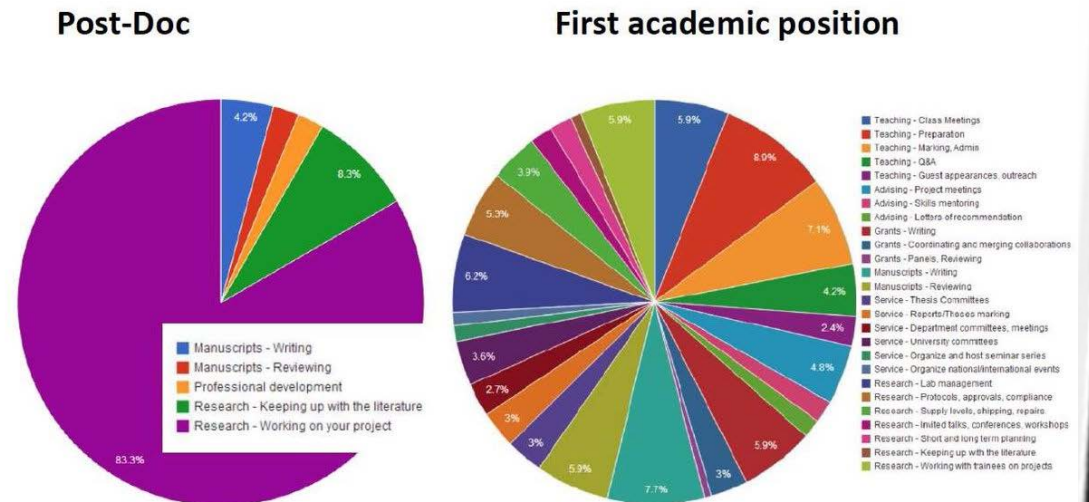
- **Who does the work?**
 - PI / Co-Is are typically senior authors
 - Post-docs, Research Assistants
 - Graduate Students, possibly Undergrad students
 - Lab Techs
- **Typically, these are team efforts which the PI supervises**
 - PI can ideally spend time to other projects and commitments
 - Majority 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)

Post-Doc vs. Assistant Prof.



<https://twitter.com/suchisaria/status/761919405995405312>

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, Challenges, & 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.

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.

Hurdles to P&R?

- **Project Changes, Challenges, & 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**

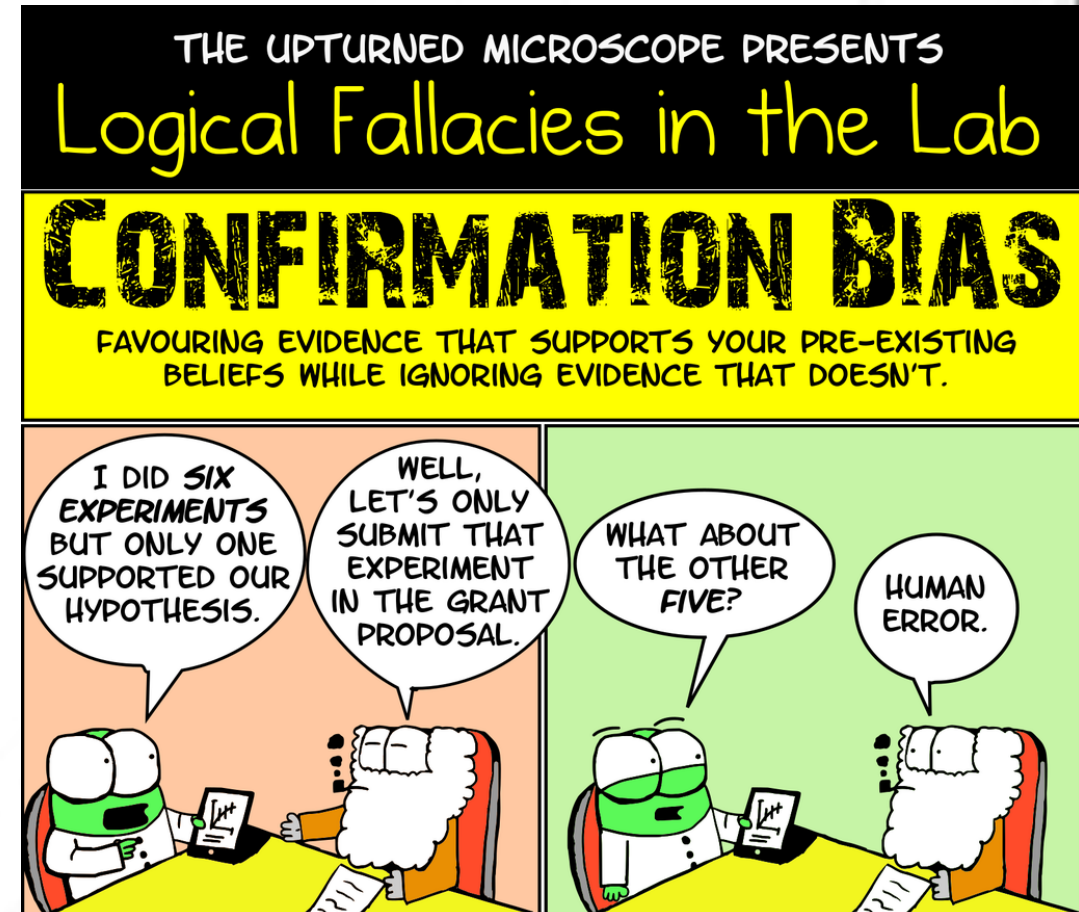
- Withdrawal of funding
- Inability to support current & future projects
- Inability to achieve promotion, tenure, career advancement, ...

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)

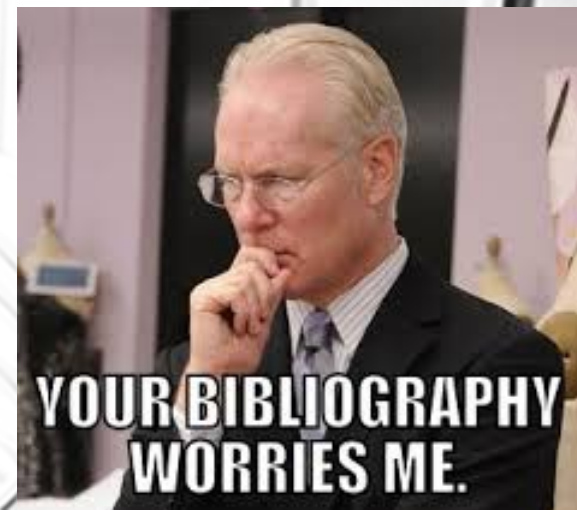
Reporting Biases associated with P&R

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

19th century scientist

I must find the explanation for this phenomenon in order to truly understand Nature...



21st century scientist

I must get the result that fits my narrative so I can get my paper into Nature..



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!

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.

