Enhancing Scientific Reproducibility through Transparent Reporting - A researcher (early career) perspective

Yarimar Carrasquillo, Ph.D.

Behavioral, Neurocircuitry and Cellular Plasticity
Section of the PAIN Branch
National Center for Complementary and Integrative Health
National Institutes of Health

@YarCarLab

September 25, 2019

Effects of transparency in previous reports on the ability of junior investigators to set up a lab

✓ Not unique to PIs starting a lab

- Counting on literature to establish models to address your scientific questions
  - What was bad?
    - Inability to replicate previous findings was a setback to establish a research program
    - Guessing experimental conditions and analysis parameters while troubleshooting can take a very long time
  - What was helpful?
    - Detailed methods papers were invaluable and instrumental
    - Papers that included raw values and individual data points

Obstacles faced by junior investigators to establish a lab/institutional culture of reproducibility and transparency

What is bad:

- ✓ Tenure process values quantity and impact factor of papers
- ✓ Rigor, reproducibility and transparency take time and are often not evaluated or rewarded
- ✓ Trainees in your lab will compare themselves with trainees in other labs and will resist rigorous processes if proper rewards are not in place
- ✓ Junior PIs tend to have less resources, admin and technical support and are often the only senior person in the lab - establishing a culture of rigorous science and transparency in reporting involves a lot of one-on-one work
- ✓ Publishing process is much longer and involves more interactions with the editorial teams – tenure clock is clicking and there is pressure to publish faster

Obstacles faced by junior investigators to establish a lab/institutional culture of reproducibility and transparency

Things that can help:

- Restructure tenure evaluation to equally value efforts in reproducibility and transparency for the community (i.e. methods papers, negative data, ect)
- Are the studies conducted by the tenure track rigorous? Is the community replicating the findings and following up on the studies independent of the impact?
- Create awards to recognize PIs and trainees that have exceptional reproducibility and transparency practices

Our Lab Practices

Things that have been easier to establish:

- Keep track of experimental procedure details and include in methods section
- All experiments are performed blind to experimental conditions
- Keep detailed records of the materials used (vendor, lot number, etc)

Things that have been challenging to establish:

- Keep all raw data labeled, easily accessible and organized
- It is ok to report data that doesn't fit perfectly with your model
- Analyze and write methods as you collect data to avoid forgetting details

What we are not doing in my field: pre-registration

Thank you!

Funding Source: Intramural Research Program of the NCCIH, NIH

@YarCarLab