



Selfish reasons to adopt transparent research practices

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Should I adopt open research practices?

- Scientists endorse openness, but most don't prioritize it
- Perceived to be a lot of work
- Rewards fuzzy:
- Idealistic only?
- Maybe important later, but not vital now?

Strategic concerns

Strategic concerns

- Won't it slow me down?



Strategic concerns

- Why should someone else benefit from my work?

Strategic concerns

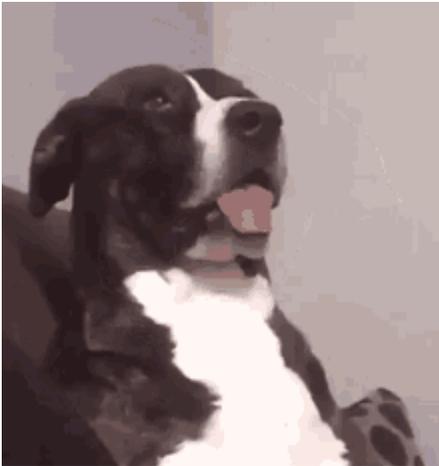
- What if I fail?



But what about the benefits?

- “Slower” often correlates with “better”
- Sharing materials marks you as a good collaborator
- Mistakes caught and corrected are surely better than unnoticed errors

Perhaps choosing transparency can be a good career strategy



Why I think openness is a good strategy

- You may not have much choice about it in coming years.
- Do we agree that transparency within our own lab is essential?
- Do we necessarily have that?
- What would we need to achieve it?

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What we need to improve in-lab workflow also increases confidence about sharing more broadly.

Transitioning to management

- As a PhD student or post-doc, you mainly manage yourself
- You are judged on your research skills
- As a PI, you are judged on *your team's* research skills
- You may face limited resources (shared lab space, limited funding, short-term personnel)
- You are the one bridging these limits - you need to know what your team is doing, and they need to know what you think

Why PIs need in-lab transparency

- To ensure consistency in training researchers
- To know the provenance and protect the security of data
- To stem the information loss that comes with personnel turn-over
- To make it easier to share publicly when the time is right

Why PIs need in-lab transparency

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Learning, Memory, and Cognition

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Spatial Sequences, but Not Verbal Sequences, Are Vulnerable to General Interference During Retention in Working Memory

^{MSc 2014}
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Why PIs need in-lab transparency

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We thank Tuulia Torppa, Josephine Steeghs, Sabine Kästner, and Leire Martin Mendez for assistance with data collection related to this project. Preliminary data influencing the experiments reported here were collected at the Heymans Institute for Psychological Research at the Rijksuniversiteit Groningen. Experiment 1 formed part of Monica Miron's Master of Science dissertation at the University of Edinburgh. Data, analysis scripts, and experimental software are freely available on our Open Science Framework page (<https://osf.io/s6w4b/>).

Each student thinks their project is theirs, but it is always part of something bigger.

Components of my open-lab workflow

1. Lab handbook
2. Open Science Framework
3. Scripted analysis
4. Pre-registration

1. My lab handbook

<https://ccmorey.github.io/labHandbook/>

- Written in *bookdown*, hosted on GitHub
- Easy to update
- Viewable and navigable in web browsers
- Contains practical and conceptual information

Why have a lab handbook?

- Make clear to new personnel in advance what they can expect
- Set milestones (and what completed work is associated with them)
- Explain workflows that new personnel can exploit

Too prescriptive?

- We don't know how a new lab member has worked previously.
- Theory of mind - I don't realize what you don't know
- An evolving document - lab members can change it

2. The Open Science Framework

- OSF: A tool you can use to organize, back-up, and eventually share finished components

Nice features of OSF

- It's free
- Private-to-public sharing model
- Control project members, visibility
- Can get DOI assigned to project
- Good tool for supervision - can see quickly where project stands

Why pre-emptive transparency?

- Organizing materials as you go is easy.
- Organizing materials years after you finish a project is difficult.
- Organizing is a communication skill trainees should learn.
- When you have curated the project all along, it is easier to make public when necessary.

3. Scripted Analyses

- Reproducible analyses are essential for knowing what you are publishing.
- Trainee might be responsible for analysis at one point. But what about after revision request?
- Scripted analyses make checking work easier, so that you can be more certain analysis and write-up are consistent.

4. Pre-registration

- Documenting details of method and analysis plan before analyzing (or collecting) data

Why it is helpful

- Prevents rushing into data collection
- Better ensures that everyone collecting data understand what they are doing (and can provide useful criticism ahead of time)
- Makes it clear how to proceed with data analysis
- Prevents *p-hacking*: reporting only the rare analysis chain that resulted in a significant outcome

Does pre-registration slow projects down?

- Maybe? But it also
- Prevents wasting time running sub-optimal designs
- Jump-starts the writing process, which often saves time later

Why these things?

- Adopted them because I saw they would solve specific problems:
 - Uncertainty months later about what was done in the lab
 - Or with the data
 - Wanting to make better use of my team's efforts
- Didn't adopt them wholesale, immediately

Sharing with others becomes easy

- When you are confident about
 - the provenance of the data
 - the reproducibility of the analyses
 - the quality of the design
- Less anxiety about sharing outwards

Sharing publicly has been beneficial for me

- Increases citations
- Reputation benefits
- Goodwill from others

Transparency is for your team



Transparency is also for Science

to and converfant in fuch matters, may be invited and encouraged to fearch, try, and find out new things, impart their knowledge to one another, and contribute what they can to the Grand design of improving Natural knowledge, and perfecting all *Philofophical Arts*, and *Sciences*. All for the Glory of God, the Honour and Advantage of thefe Kingdoms, and the Universal Good of Mankind.

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But it's mostly for you.

Thanks for your attention!

My data and materials are publicly available on Open Science Framework (<https://osf.io/4xwa8>)

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