

Open Research What's in it for me?

Melissa Thye

What word comes to mind when you hear Open Science?



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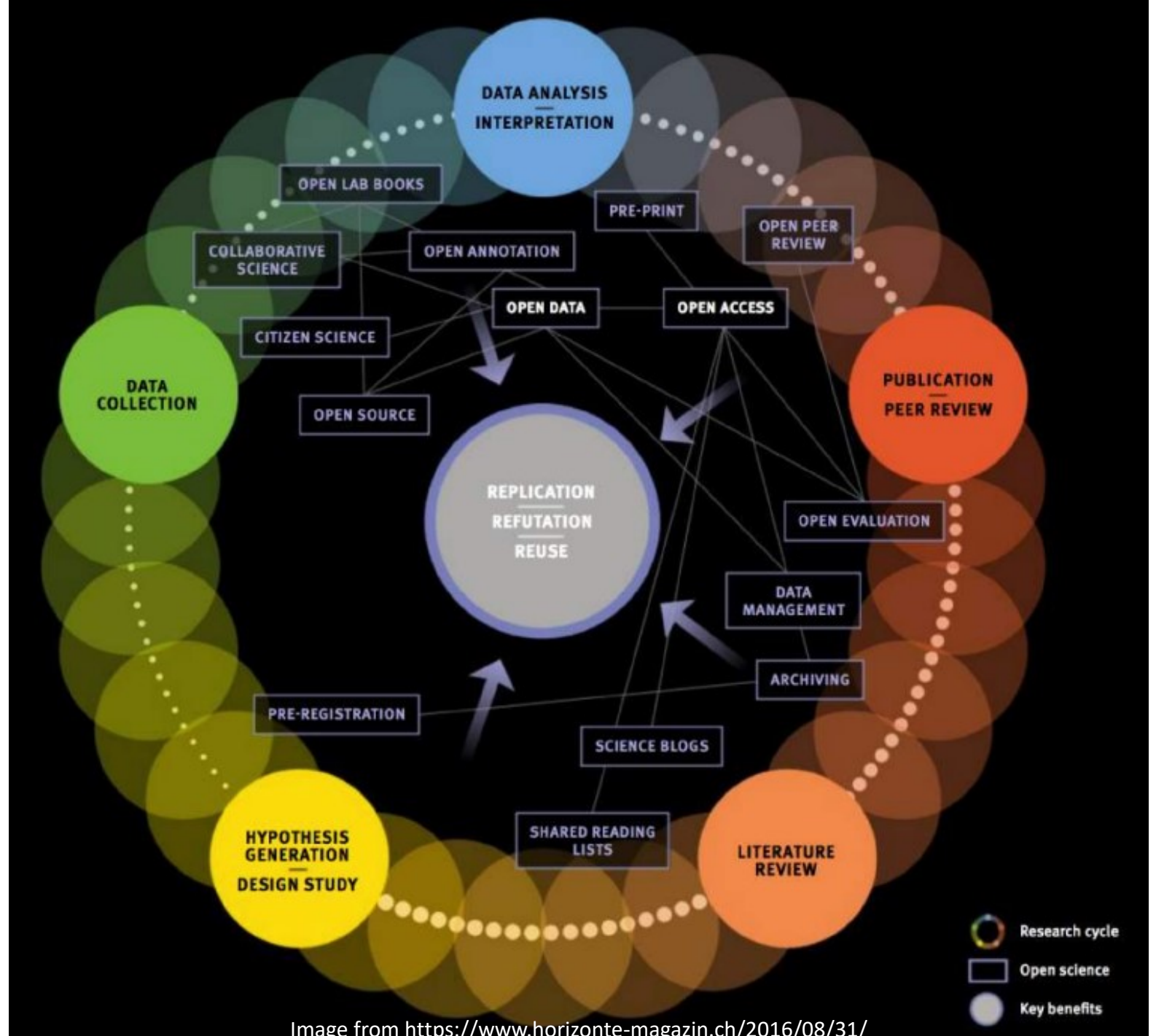
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What is Open Research?

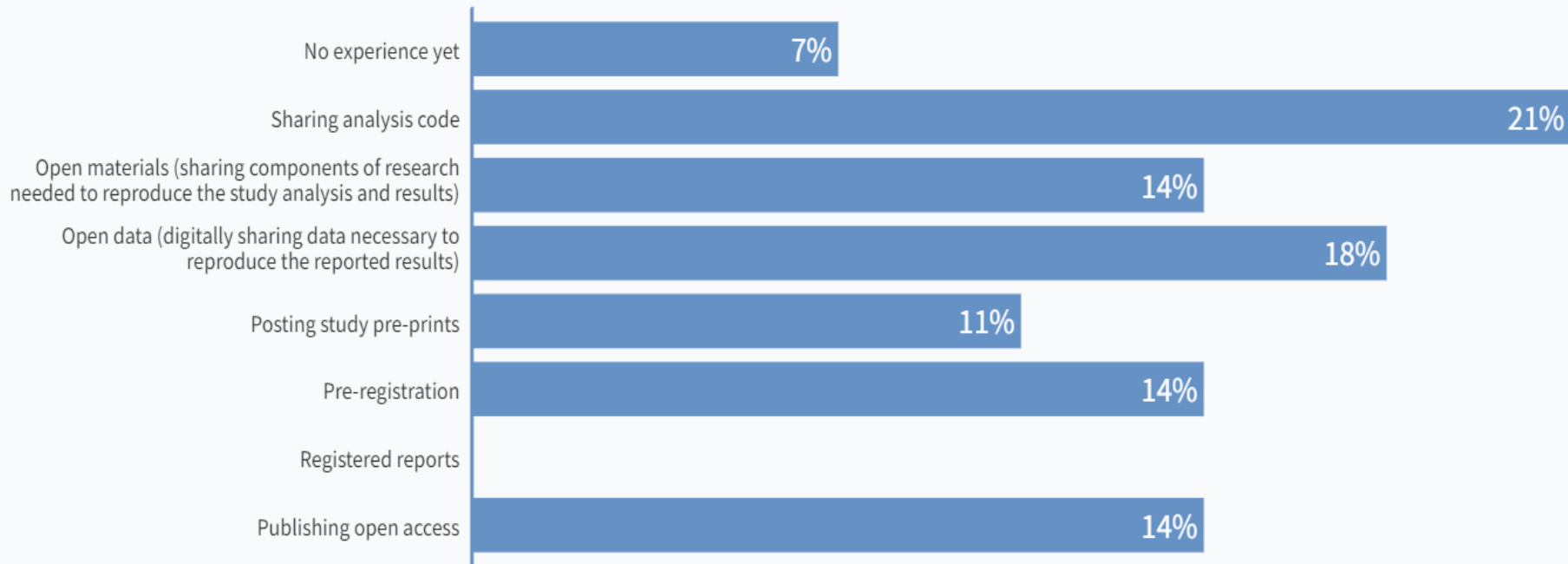
An umbrella term for practices which increase the transparency of scientific research

Includes many research practices:

- Making study materials available
- Making study data available
- Using/developing open source software
- Preregistering analyses
- Posting study preprints
- Publishing open access



Experience with Open Science practices (select all that apply):



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Why do Open Research?

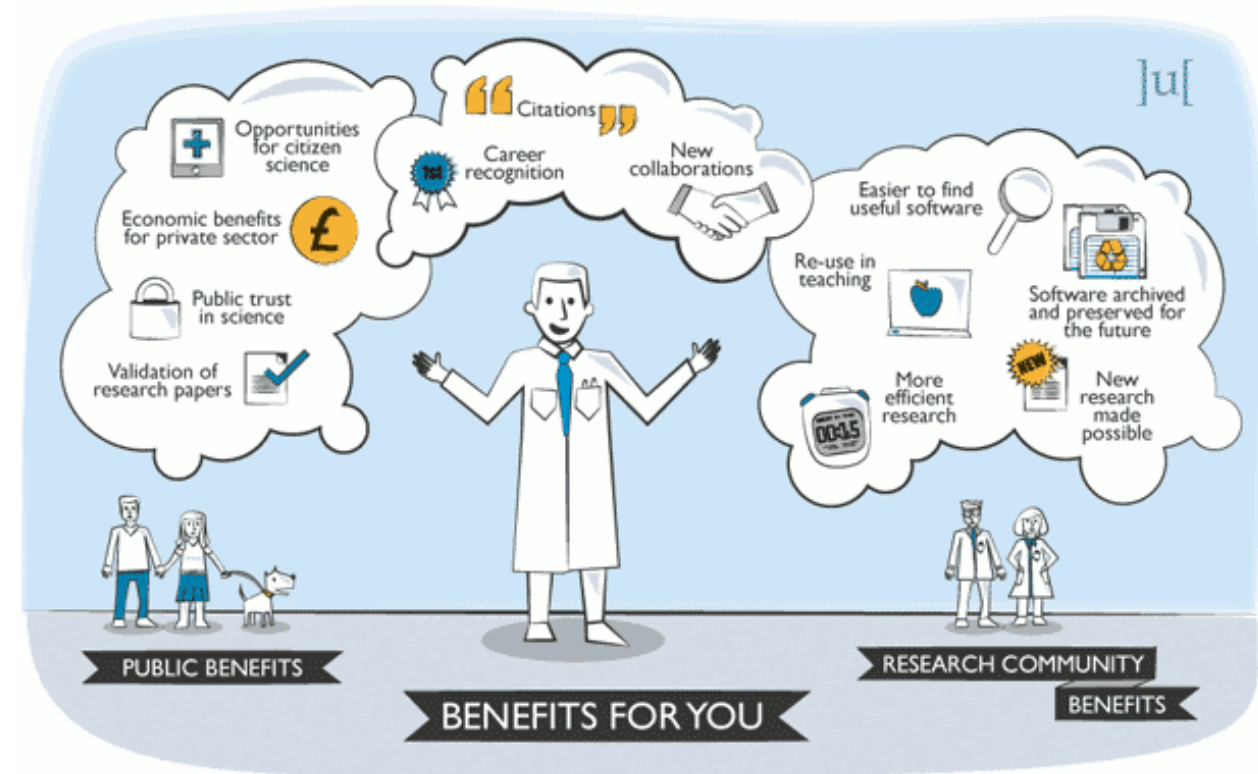
Common concerns & fears:

- **Being scooped**
 - Share the data/variables you've already analysed
 - View as an opportunity for credit
 - More on this later
- **No one is interested in my data**
 - Limits research reach + ability to do integrative analyses
- **It's too difficult to share data and/or materials**
 - OSF, OpenNeuro, Github, Figshare (posters/figures), personal site
- **Not wanting to give away hard-earned data**
 - Sharing data directly benefits scientists
- **Someone will spot an error**
 - Errors are inevitable and transparency limits their long-term impact

Why do Open Research?

Work reproducibly for **selfish** reasons (Markowetz, 2015)

- 1) Helps to avoid disaster**
 - Recognizing errors too late
 - Wasting time failing to replicate a result
- 2) Makes it easier to write papers**
- 3) Helps reviewers see it your way**
 - Analyses are more clear and documented
- 4) Enables continuity of your work**
 - Forgetting project details when staff leaves
 - Documenting long-term projects
- 5) Builds your own reputation**



Copyright Ubiquity Press

How to do Open Research?

- Start somewhere and build from there
 - Avoid framing as dichotomous outcome (fully 'open' or fully 'closed')
 - Do as much as you can



- Getting started with Open Science Framework (OSF)
- Preprints, Preregistrations, & Registered Reports



There's a better way to manage your research

OSF is a free, open platform to support your research and enable collaboration.

Get started

Discover public research

Discover projects, data, materials, and collaborators on OSF that might be helpful to your own research.

🔍 Search discipline, author...

Create a free account

Sign up using:



OR

Full name

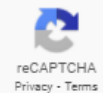
Contact email

Confirm email

Password

I have read and agree to the [Terms of Use](#) and [Privacy Policy](#).

I'm not a robot



Sign up

OSF: Setting up a project

Option 1: Use a pre-existing project structure

- Previous project
- Publicly available projects or templates (example: <https://osf.io/q29nf/?s=03>)

Research Template to Start New Project (Exploratory)

Contributors: Hans IJzerman, Richard A. Klein, Olivier Dujols, Alessandro Sparacio, Patrick S. Forscher
Date created: 2017-11-17 09:08 AM | Last Updated: 2019-09-10 08:57 AM
Category: Project
Description: This template is intended to guide researchers in the CO-RE lab to run exploratory studies. Please use this template alongside the Research Milestone Sheet.

Please DON'T change this page, but copy the page into a new project.

Duplicate template →

0.0B Public 24 ...

Fork this Project
Duplicate template
View Forks (24)

Wiki

This is the workflow for running an exploratory study. Where needed in the [Research Milestones Sheet](#) indicate that you are running an exploratory study. Follow these steps, using the existing components for organization:

- Fork this template into a new project.
- Name your project.
- Add your co-authors on this page (in the order that they will likely appear on the paper)
- We want all our data to be sto...

[Read More](#)

Files

Name	Modified
Research Template to Start New Project (Exploratory)	
OSF Storage (United States)	

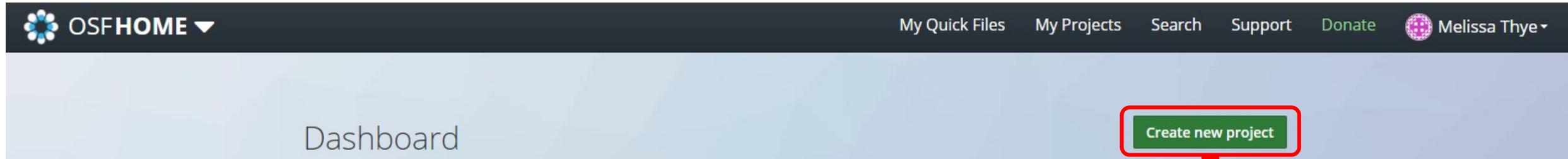
Citation

Components

- Theoretical Background (Before data collection)
Ijzerman, Klein, Dujols & 2 more
- Methods, Procedures, Scales (Before data collection)
Ijzerman, Klein, Dujols & 2 more
- Data (After data collection)
Ijzerman, Klein, Dujols & 2 more
- Analytic Code (After data collection)
Ijzerman, Klein, Dujols & 2 more

OSF: Setting up a project

Option 2: Create your own project from scratch



Create new project ×

Title

Storage location

▼ More

Description

Template (optional)
Start typing to search your projects. Selecting project as template will duplicate its structure in the new project without importing the content of that project.

OSF: Setting up a project

OSF Overview

0.0B Private Make Public P 0 ...

Contributors: [Melissa Thye](#)
Date created: 2020-12-14 02:51
Category: Project
Description:
This project is intended to provide an overview of how to use OSF
License: Add a license

Add new contributors with view and/or edit privileges

New projects are private by default

Wiki

Include all relevant project information in the wiki

Files

Click on a storage provider or drag and drop to upload

[+ Create Folder](#) [Upload](#) [Download as zip](#) [Filter](#) [i](#)

Name	Modified
OSF Overview	
OSF Storage (United States)	

Create folders and upload (or drag and drop) files here

Citation

Components [Add Component](#) [Link Projects](#)

Add components to organize your project.

Tags

Add a tag to enhance discoverability

Recent Activity

[Melissa Thye created OSF Overview](#) **All activity on the project is recorded here** 2020-12-14 02:51 PM

OSF: Benefits of OSF

- Most file types can be uploaded and many can be viewed easily

lesionFunctions.R (Version: 1)

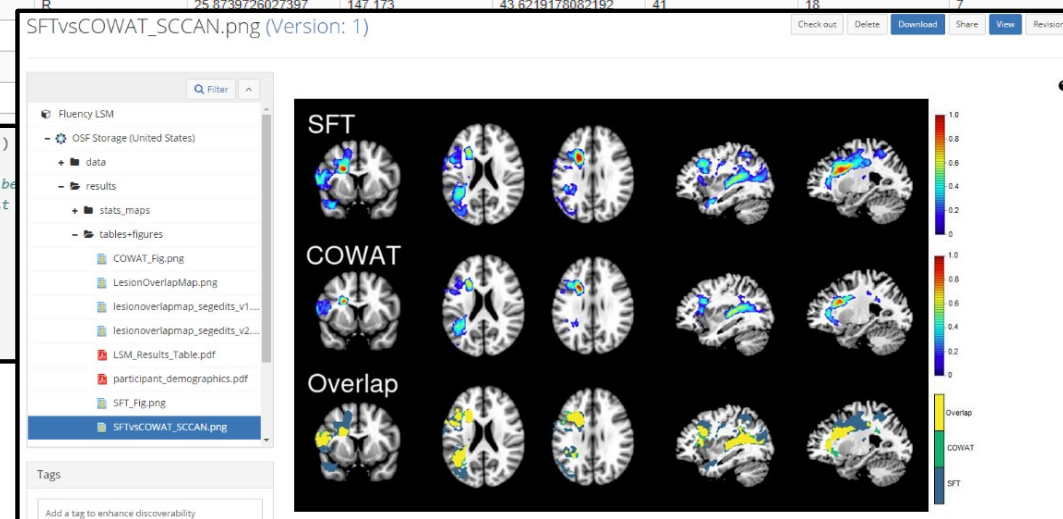
```
Fluency LSM
- OSF Storage (United States)
+ data
+ results
- scripts
  cerebellum_dilated.nii
  cerebellum_mask.nii
  dilatemask.tcsh
  fixsegmentation_v1.tcsh
  fixsegmentation_v2.tcsh

readLesions <- function(IDs, maskDir, reg = 'Rigid'){
  # function to read lesions using subj IDs
  setwd(maskDir) #move to lesion mask directory
  lesions <- list() #make list of lesions
  filename <- paste0(as.character(IDs), "_lesionmask.nii") #make

  for (i in 1:length(filename)){ #for each lesion
    print(filename[i])
    lesions[[i]] <- antsImageRead(filename[i]) #read in lesions
    if (!is.na(reg)){
      lesions[[i]] <- antsRegistration(fixed = ch2, moving = lesions[[i]], typeOfTransform = c(reg))
      lesions[[i]] <- lesions[[i]]$warpedmovout #save transformed image
      lesions[[i]] <- thresholdImage(lesions[[i]], 0.1, Inf) #binarize the lesions masks (if it is b
    } else{lesions[[i]] <- thresholdImage(lesions[[i]], 0.1, Inf) #binarize the lesions masks (if it
  }
  return(lesions)
}

segmentLesions <- function(id, study, studyDir){
```

ID	Sex	EHI	TSS	LesionSize	Age_at_Scan	BNT	SFT	COWAT
001	F	R	40.8986301369863	102.264	79.0164383561644	58	21	9
002	M	R	167.934246575342	151.1	64.586301369863	55	36	18
003	M	R	13.2493150684932	210.929	22.6520547945205	27	13	7
004	F	R	18.1150684931507	118.919	71.8767123287671	0	0	0
005	M	R	34.8493150684931	135.232	49.6328767123288	0	0	0
006	F	R	25.939726027397	221.317	66.5808219178082	6	3	2
007	F	L	53.3589041095891	49.527	61.8821917808219	43	21	20
008	F	R	25.8739726027397	147.173	43.6219178082192	41	18	7
009	M							
010	M							
011	M							



- Built in version control for all files and wiki pages
- Create view-only, anonymized links for peer-review
- R package for downloading data directly from OSF (**osfr**)

```
# download data from OSF
fluencyLSM <- osf_retrieve_node("crv4f") # retrieve project node
osf_retrieve_file("https://osf.io/kwa7p/") %>% # script with lesion functions
  osf_download() # overwrite = TRUE
osf_retrieve_file("https://osf.io/8qbxu/") %>% # raw behavioral data
  osf_download() # overwrite = TRUE
osf_ls_files(fluencyLSM, type = "folder", path = "data") %>% # lesion masks
  osf_download()
```

Preprints

Fully drafted research papers made public prior to peer review

- Get feedback from broader scientific community
- Beneficial for students and early career researchers to disseminate research quickly
- Increases visibility of work
- Potential outlet for “hard to publish” results

bioRxiv

THE PREPRINT SERVER FOR BIOLOGY

Search

[Advanced Search](#)

Ψ
A X PsyArXiv

A free preprint service for the psychological sciences
Maintained by [The Society for the Improvement of Psychological Science](#)

Powered by [OSF Preprints](#)

Preregistration

Submitting a study plan (often including analysis plan) to a registry before conducting the study

- Increases transparency of planned versus exploratory analyses
- Reduces HARKing & P-hacking
- Time-stamped (addresses scooping concerns)

Many publicly available templates (<https://osf.io/zab38/>)



**OSF
PREREGISTRATION**

Improve your research with [preregistration](#). By writing out specific details such as data collection methods, analysis plans, and rules for data exclusion, you can make important decisions early on and have a clear record of these choices. This can help reduce biases that occur once the data are in front of you.

Use [OSF Registries](#) to discover previously registered work.

Start a new preregistration

Preregister a project you already have on OSF

Registered Reports

A peer-reviewed preregistration

- Provide sufficient detail for an independent researcher to replicate study and analysis plan
- Almost 300 journals currently accept registered reports
- Includes secondary data analyses
 - Additional constraints on prior data access
- Get started: <https://www.cos.io/initiatives/registered-reports>

• Introduction

- Review relevant literature
- Describe research questions & hypotheses

• Methods

- Ethics Information
- Pilot Data (if applicable)
- Study Design (all experimental procedures)
- Sampling Plan
 - power analysis
 - inclusion/exclusion criteria
 - how outliers will be handled
- Analysis Plan
 - Pre-processing steps
 - All planned analyses (no exploratory analyses)

• Data/Code Availability

• Design Table (below)

Question	Hypothesis	Sampling plan	Analysis Plan	Interpretation given to different outcomes
Research Question 1				
Research Question 2				

Traditional Peer Review



Registered Report Review



Advantages of Registered Reports

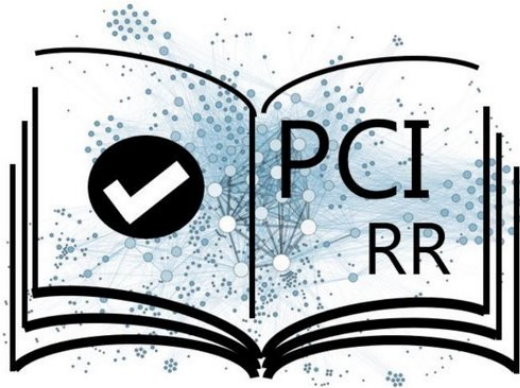
- Pre-study review when feedback is the most useful
- Acceptance after Stage 2 regardless of results
- Reduces publication bias
- Beneficial for PhD students & early career researchers
- Increases credibility of study results

Disadvantages of Registered Reports

- Stage 1 in-principle acceptance can take awhile
- Significant workload shift to the start of the project
- Journal policies, timelines, editing requirements vary
- Not all journals accept secondary data analyses
- Challenging when proposing new (to you) analyses

Peer Community in Registered Reports

PEER COMMUNITY IN REGISTERED REPORTS



*Free and transparent pre- and post-study
recommendations across research fields*

- Alternative option for Registered Reports (launched in April)
- Choose from PCI-RR friendly journals (currently 20)
 - <https://rr.peercommunityin.org/about/pci-rr-friendly-journals>
- Provide reviewer training
- Offer scheduled review
 - Reduces Stage 1 review from weeks to days

A COMMUNITY, NOT A JOURNAL >

PCI RR doesn't publish Registered Reports but instead manages peer review of Registered Report preprints across STEM, medicine, the social sciences and humanities

ESTABLISHED BENEFITS >

Rigorous and constructive pre-study review at a point in time where it helps the most, with in-principle acceptance to neutralise publication bias and reporting bias

TRUST >

Led by the architects of Registered Reports, with the review process managed by accredited recommenders

INDEPENDENCE >

Peer review independent of journals but endorsed by a growing list of journals that accept PCI RR recommendations

POWER TO AUTHORS >

Once a submission is recommended by PCI RR, authors can choose any eligible PCI RR-friendly journal to publish the article without further peer review

FLEXIBILITY >

No need for authors to decide which journal to publish in – or any journal at all – until after a final Stage 2 recommendation

TRANSPARENCY >

Recommended preprint remains citable on a preprint server, with peer reviews published under a DOI by PCI RR and reviewers having the option to sign

INNOVATION >

Unique policy features including Scheduled Review and Programmatic Registered Reports to accelerate peer review and widen access to different modes of research

ZERO COST >

PCI RR is a non-profit, non-commercial platform that is free to use for all, including authors, readers, and supporting journals

Resources

- Check out **ReproducibiliTea**

- OSF page: <https://osf.io/kh5px/>
- Mailing list: <https://forms.gle/5cvxAjh4h2z6jRCfA>
- Twitter: [@Edinburgh_Tea](https://twitter.com/Edinburgh_Tea)



- **Relevant Paper:** [Easing Into Open Science: A Guide for Graduate Students and Their Advisors](#)
- University **Open Access** Publishing Agreements
 - More information: <https://www.ed.ac.uk/information-services/research-support/publish-research/open-access/request-apc-payment/publisher-discounts>

Questions?



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