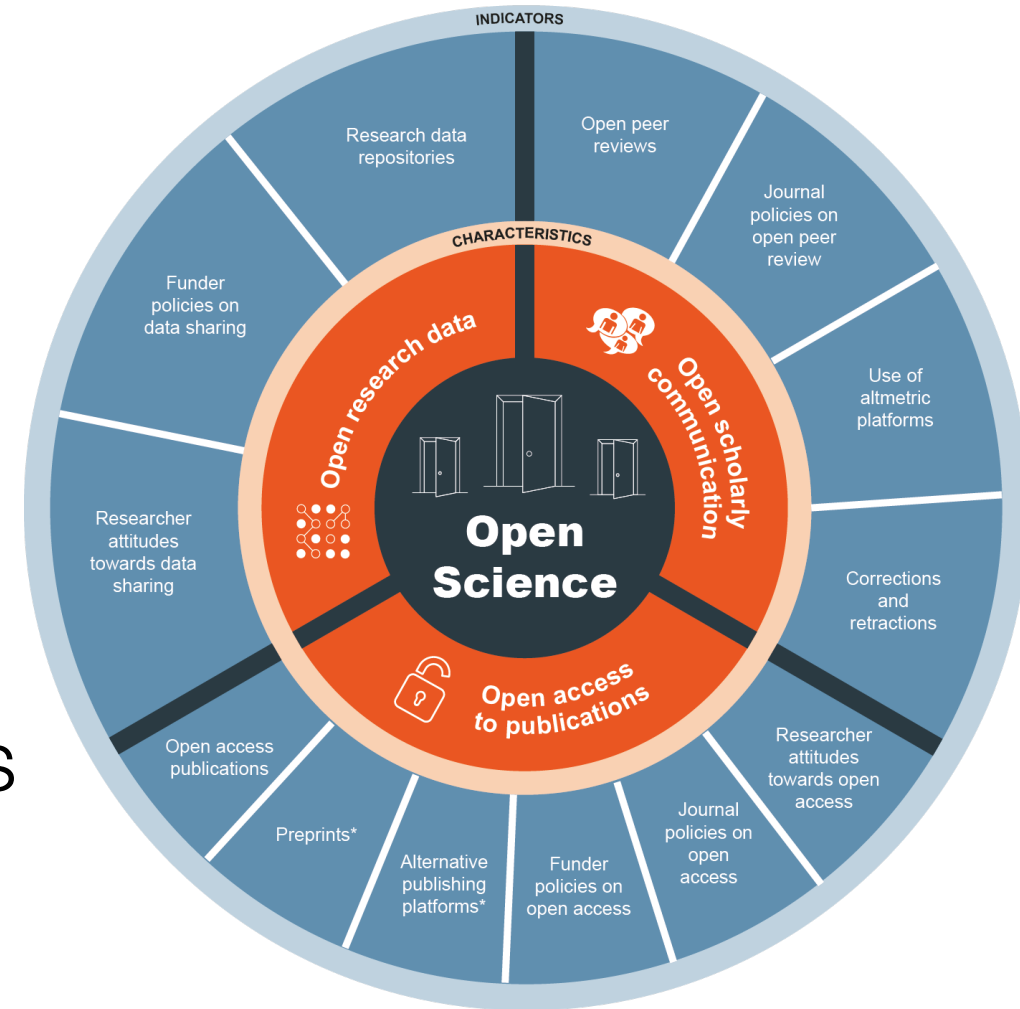


Open Science

Emily Nakkawita

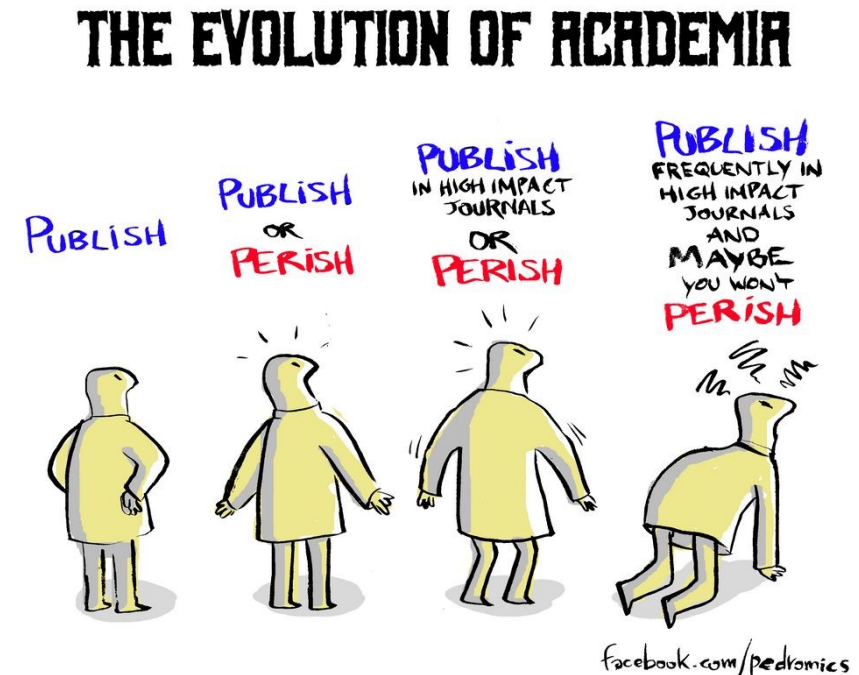
What Is Open Science?

- A movement to **make scientific research, data and their dissemination available** to all members of society
- By increasing **transparency** and promoting **reproducibility**, it aims to improve **research quality**



Why Did the Movement Start?

- **“Publish or perish”** incentive structure for academic researchers
- Tendency for **“positive” results** to be published in journals
- These factors can promote the use of **questionable research practices**



Questionable Research Practices (QRPs)

Collecting more data after not finding your hypothesized results

Ending data collection because you found a significant result

Excluding data until an effect is significant

Not reporting all dependent variables

Not reporting all study conditions

Falsifying data

Only reporting studies that “worked”

Rounding off p values (for instance, reporting p of .054 as $p < .05$)

Hypothesizing after results are known (saying you predicted it from the start)

Stating that results are unaffected by demographic factors (but actually unsure)

Why Do QRPs Matter?

- When questionable research practices are used, **false “positive” results** are more likely to emerge—and to be published
- These false “positives” may not even be discovered until **results fail to replicate** in other studies (or the real world)

Why Do QRPs Matter?

HALF OF CANCER STUDIES FAIL HIGH-PROFILE REPLICATION TEST

Barriers to reproducing preclinical results included unhelpful author communication.

Believe it or not: how much can we rely on published data on potential drug targets?

Florian Prinz, Thomas Schlange and Khusru Asadullah

Article | [Published: 20 May 2020](#)

Variability in the analysis of a single neuroimaging dataset by many teams

[Rotem Botvinik-Nezer](#), [Felix Holzmeister](#), ... [Tom Schonberg](#)  [+ Show authors](#)

[Nature](#) **582**, 84–88 (2020) | [Cite this article](#)

Replication, falsification, and the crisis of confidence in social psychology

Brian D. Earp^{1,2} and David Trafimow³*

Open Science as a Proposed Solution



The Open Science Framework (OSF)

- OSF is an online platform designed to **help support researchers practice open science** in every step of the research life cycle



Preregister your research plan

Prevent QRPs



Deposit your data and analysis code

Reproducibility



Share your study materials

Replication

What Is Preregistration?

- **Specify your research plan** that distinguishes between:
 - **Exploratory** research (hypothesis generating)
 - **Confirmatory** research (hypothesis testing)
 - *Both are important in science!*
- **Submit this plan** to a registry like OSF before collecting any data

Forms of Preregistration

Input Requirements



Open-Ended Registration: No requirements; summary description of project

OSF-Standard Pre-Data Collection Registration: State whether data have been collected or viewed and provide other summary comments

AsPredicted.org Preregistration: Eight questions covering the hypothesis, dependent variables, experimental conditions, data analysis, outlier handling and exclusion criteria, sample size determination, and type of study

OSF Preregistration: OSF's standard, comprehensive, and general purpose preregistration form spanning 25 subject areas

Registered Report: Preregistration is peer-reviewed via a journal; if accepted and the study is carried out as preregistered, it is guaranteed that it will be published, regardless of the result (300+ journals already participate)

Sharing Data and Materials

The screenshot shows the OSF project page for "Regulatory Focus-Specific Goal Pursuit Activities". The page includes a header with navigation links (Search, Support, Donate, Sign Up, Sign In) and a sub-header with tabs (Metadata, Files, Wiki, Analytics, Registrations). The main content area displays the project title, contributors (Emily Nakkawita), creation date (2019-09-10 03:21 PM), last updated date (2021-01-26 12:13 PM), category (Project), and license (CC-BY Attribution 4.0 International). A text block mentions supplemental materials for a paper on PsyArXiv. Below this, there are sections for Wiki, Citation, Components (listing Study 1A, 1B, 2A, 2B, and Supplementary Materials), and Recent Activity (showing various actions by Emily Nakkawita).

Name	Modified
○ Study 1A	
- OSF Storage (United States)	
+ brms Models	
- Data	
RFgoalpursuit_study1a_clean_deidenti...	2020-11-13 05:49 PM
RFgoalpursuit_study1a_stimlist.csv	2020-11-13 05:49 PM
- Manuscript and Analysis Scripts	
RFgoalpursuit_Study1A_Clean.Rmd	2020-11-13 05:49 PM
RFgoalpursuit_Study1A_ManuscriptAn...	2021-05-06 04:23 PM
RFgoalpursuit_Study1A_ManuscriptAn...	2021-05-06 04:23 PM
- Materials	
RFgoalpursuit_Study1A_Materials.docx	2020-10-11 06:36 PM
RFgoalpursuit_Study1A_Materials_Sor...	2020-10-11 06:39 PM

Sharing Paper Preprints

- **Publicly post your paper** when you submit it to a journal for peer review
- Preprints help to facilitate the **rapid dissemination** of scientific research while making it **more accessible** to the public



Open Science or #bropenscience?

- **#bropenscience** describes condescending and aggressive vigilante-style criticism of other scholars' work based on open science principles
- Such criticism often extends to **attacks on researchers' careers, intelligence, and character** (and often is levied by more powerful and privileged individuals)

Open Science, Equity, and Inclusivity

- Increases access to data and research tools
- Imposes constraints that may not always be practical (e.g., when working with sensitive populations or qualitative data)
- Can reflect societal power structures and privileges; online vigilantism often targets people with less power
- Care must be taken to ensure that open science enhances equity and inclusivity

Thank You!

Special thanks to Anna Vannucci, Hannah Tarder-Stoll, and Ana DiGiovanni for their contributions to these slides

<p>100% P-hacking Free</p>	<p>Here, check our numbers.</p>	<p>Here's how you can replicate our result.</p>
		
<p>https://osf.io/tvyxz/wiki/home/</p>		