Preregistration of research studies

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Roadmap

- Why should we consider preregistration?

- What is preregistration?

- The benefits and challenges of preregistering studies

- How to preregister research? A primer

- How to get the most out of preregistration?

- Q&A time!

Credibility of academic research is under debate

BuzzFeed News

A Famous Honesty Researcher Is Retracting A Study Over Fake Data

SCIENCE

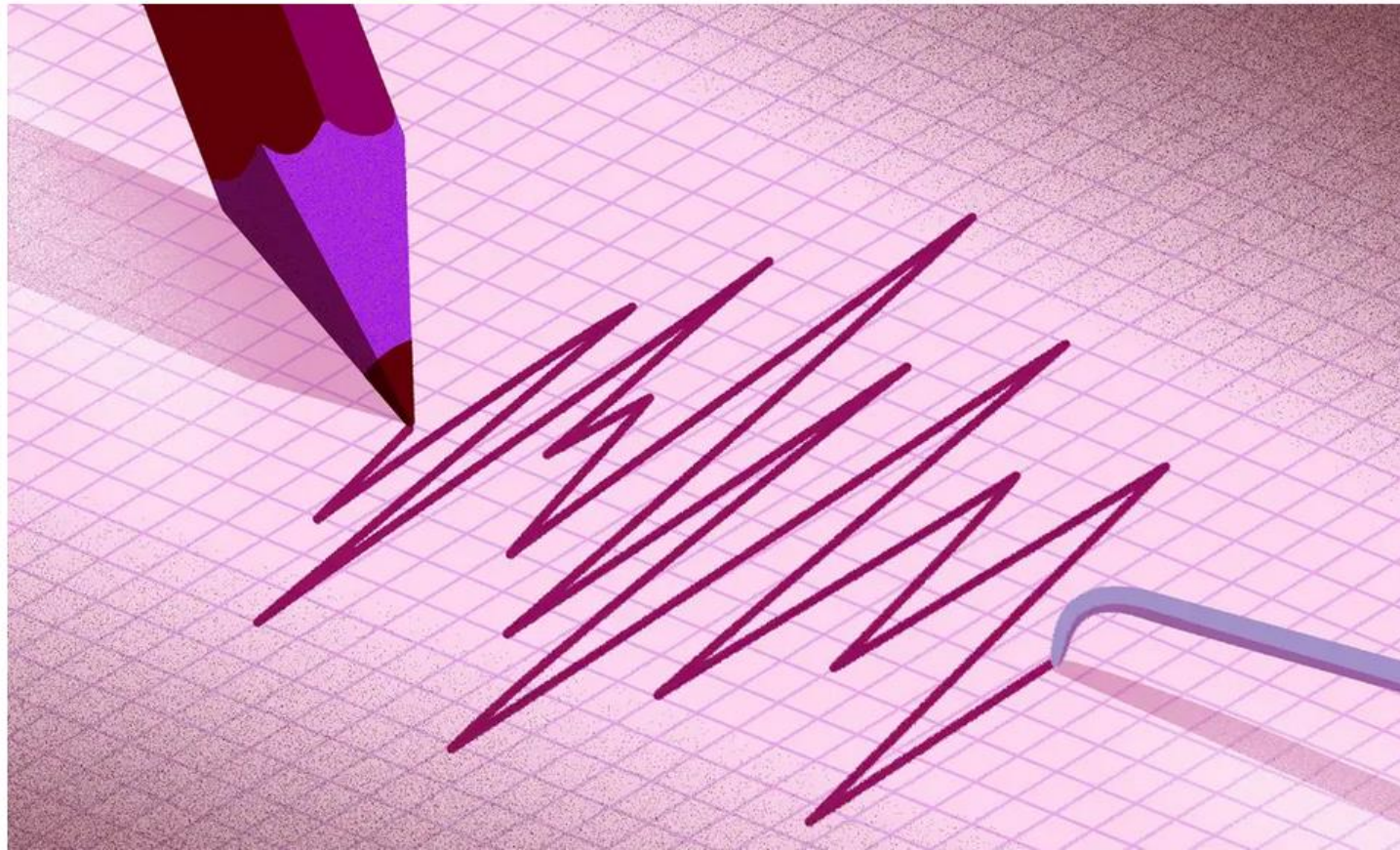# A Famous Honesty Researcher Is Retracting A Study Over Fake Data

Renowned psychologist Dan Ariely literally wrote the book on dishonesty. Now some are questioning whether the scientist himself is being dishonest.

Stephanie M. Lee
BuzzFeed News Reporter

Posted on August 20, 2021, at 2:40 p.m. ET

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🔓 OPEN ACCESS

ESSAY

Why Most Published Research Findings Are False

John P. A. Ioannidis

nature

How scientists fool themselves – and how they can stop

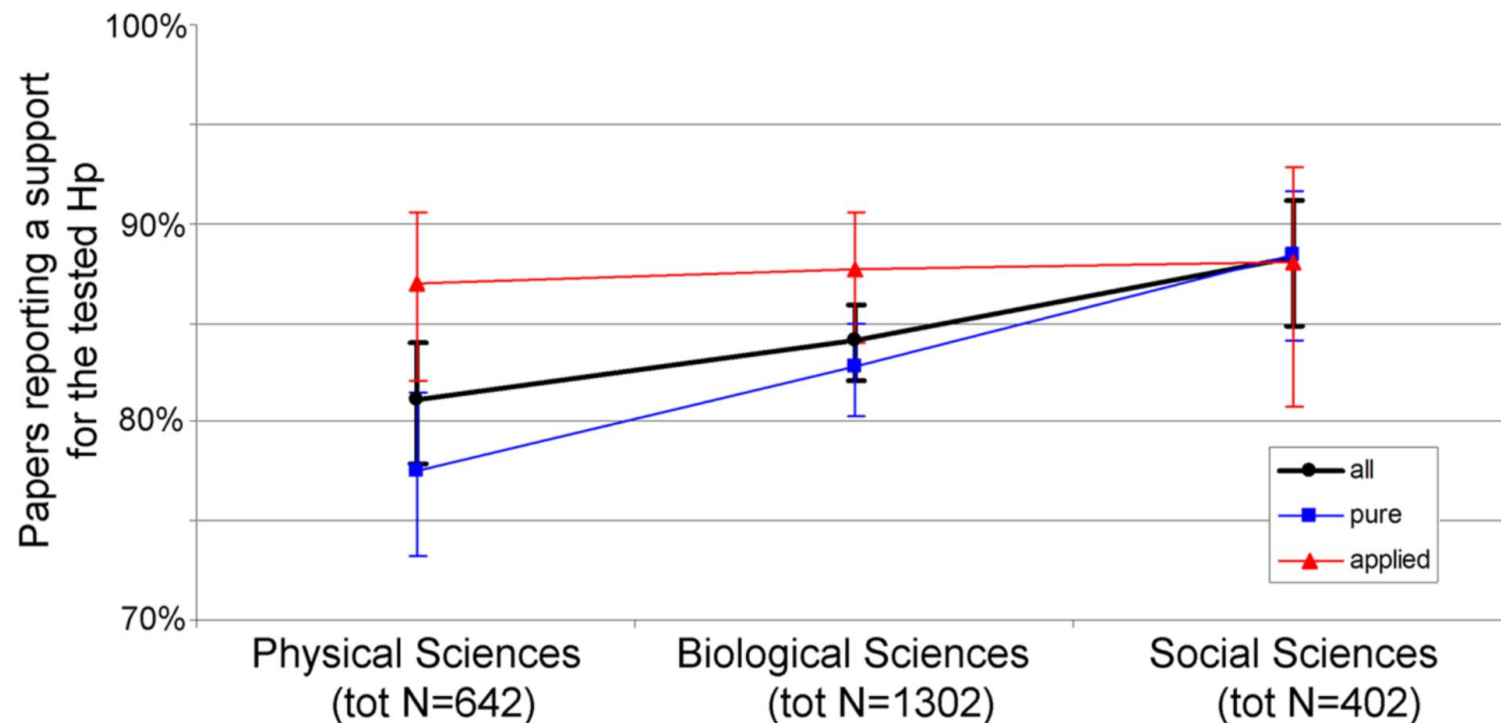Regina Nuzzo

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Negative or "boring" results are less likely to be published

(and more likely to end up in a file-drawer)

Negative or "boring" results are less likely to be published

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Fanelli (2010) *PLOS ONE*

Researchers are biased and make arbitrary decisions

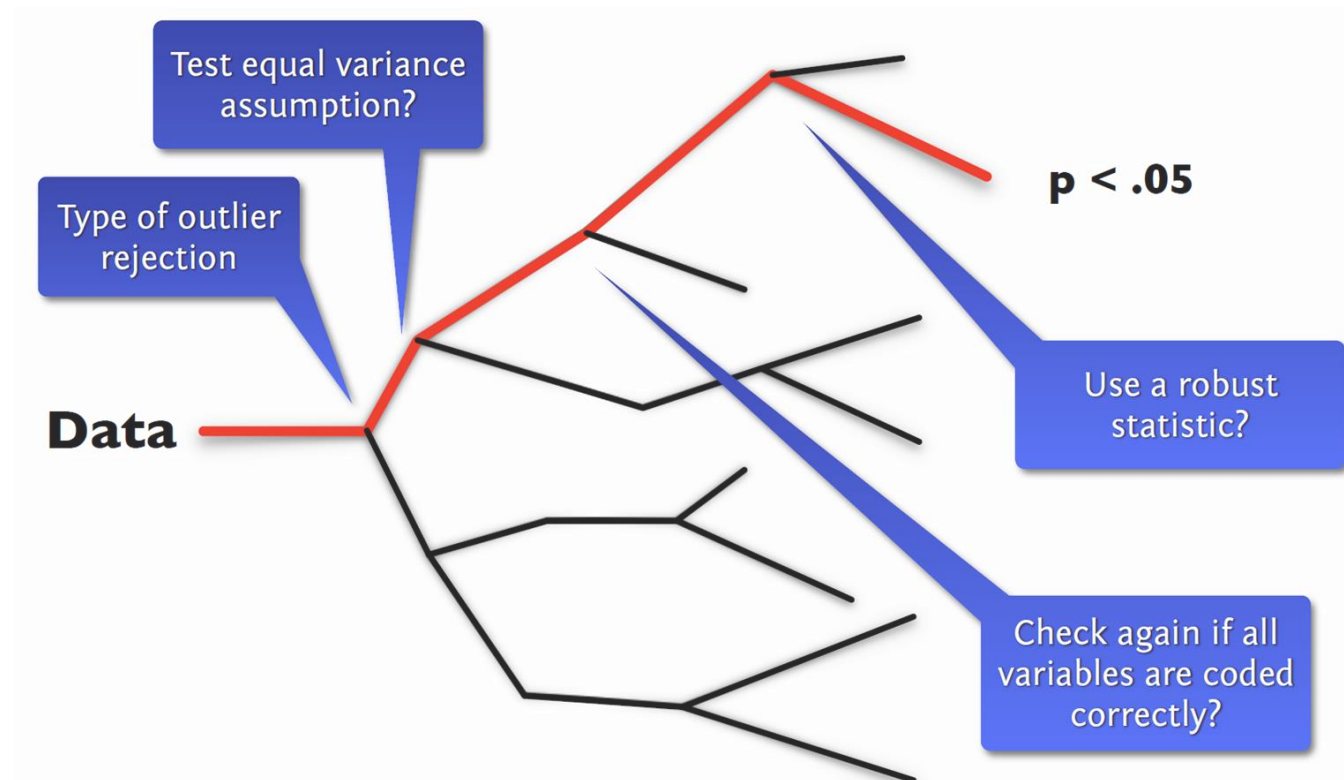(also called "Researcher degrees of freedom")

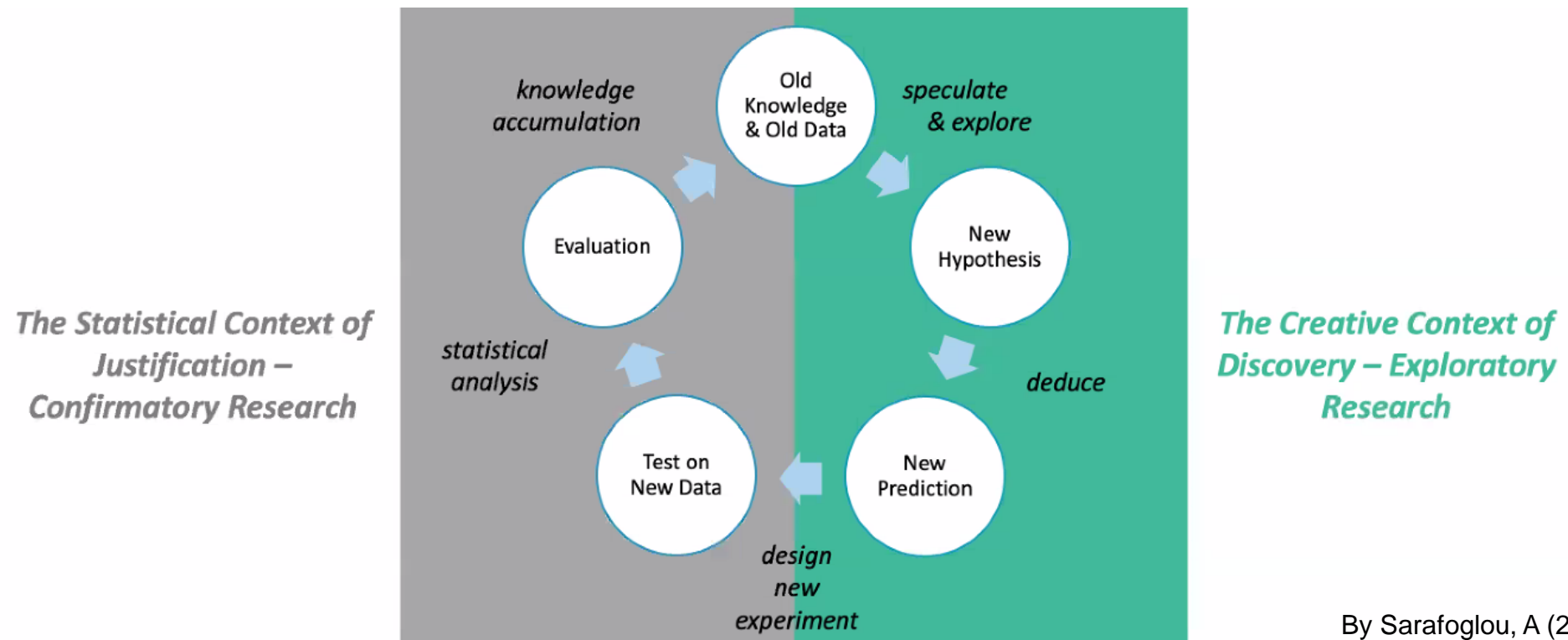# Researchers are biased and make arbitrary decisions

(also called "Researcher degrees of freedom")

p-hacking?

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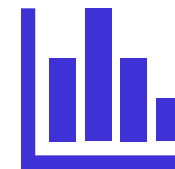# Confirmatory and exploratory research is being mixed up

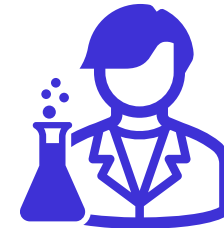# (and prediction is confused with post-diction)

File-drawer problem and publication bias

Researcher degrees of freedom

Confirmatory vs exploratory research

Successful replication — Not replicated

	Successful	Not replicated
Psychology (2015; n = 97)	36%	64%
Social Science (2018; n=139)	42%	58%
Economy* (2015; n = 67)	49%	51%
Economy (lab exp.) (2016; n=18)	61%	39%
Cancer research 1 (2011; n = 53)	11%	89%
Cancer research 2 (2012; n = 67)	21%	79%
Experimental Philosophy (n=40, 2018)	78%	22%
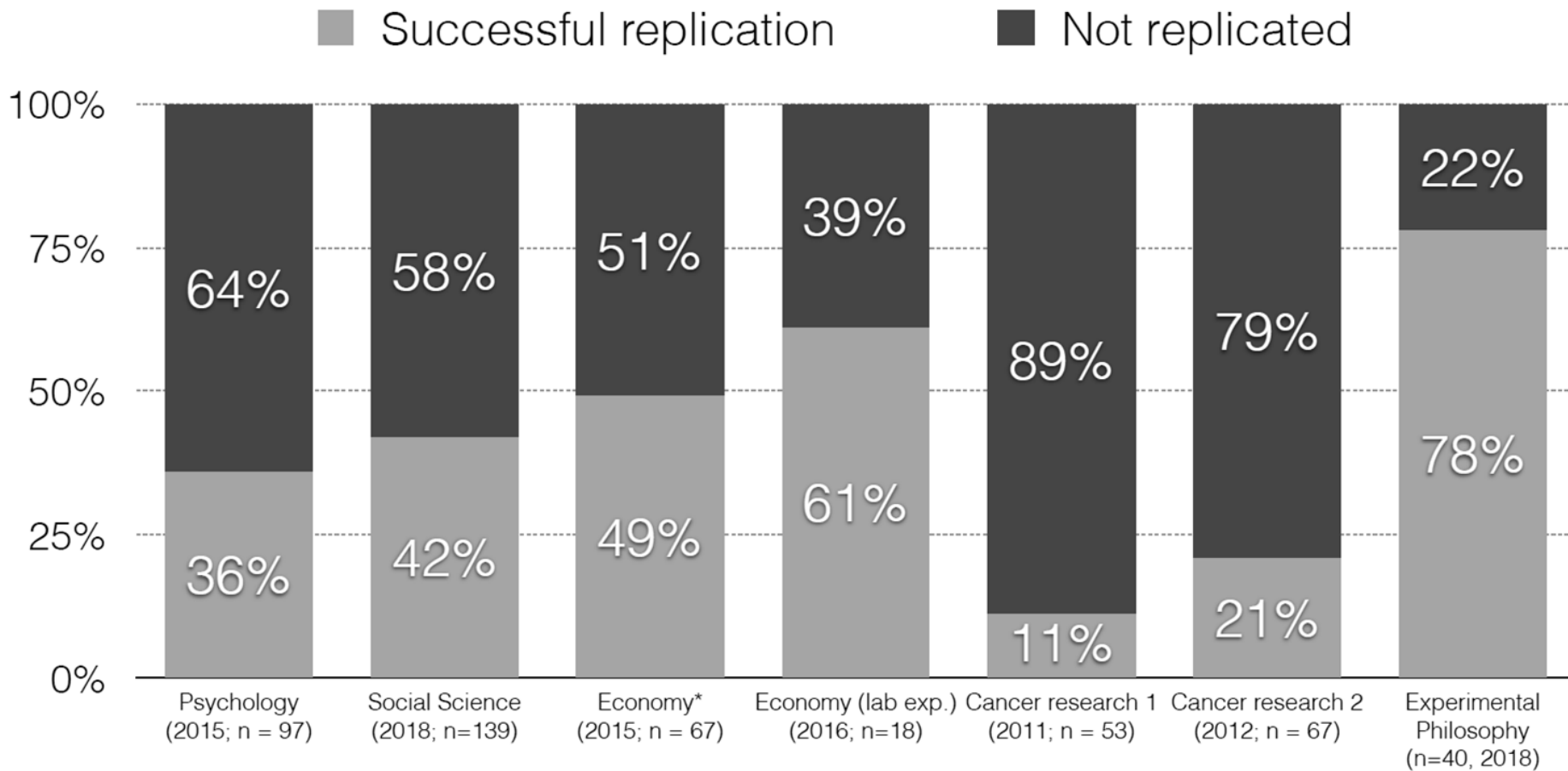
Open Science Collaboration (2015); Social Science: Combined sample of systematically sampled projects (RPP, SSRP, EERP); Chang & Li (2015); Camerer et al (2016); Begley, C. G., & Ellis, L. M. (2012). Prinz, F., Schlange, T., & Asadullah, K. (2011); Cova et al. (2018)

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Schoenbrodt (2021)
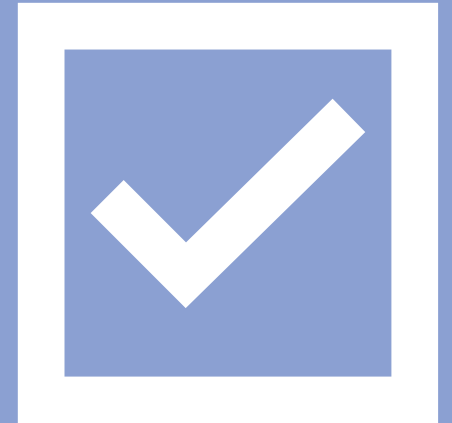
Preregistration

What is preregistration?

The specification of a research design, hypotheses, and/or analysis plan prior to observing the outcomes of a study.

Typically takes a form of a time-stamped, frozen document made available on an online platform.

Nosek & Lindsay (2018)

What do I need to preregister?

Research questions
and hypotheses

Study design and data
collection methods
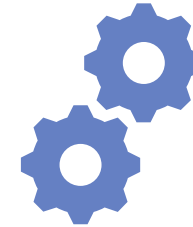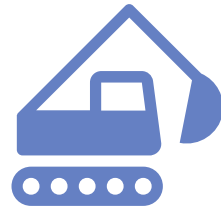
Data preprocessing
and analysis plan

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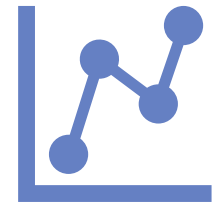
A (very) simple example
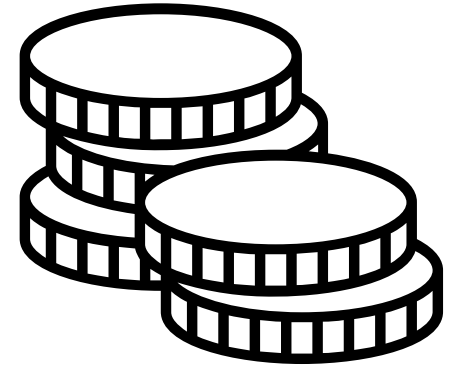
Hypothesis: When throwing a coin multiple times, we will observe equal number of heads and tails (50-50).

Methods: We will throw a coin 100 times and register the outcome (head or tail) each time after it falls on the floor. Data collection will stop after N = 100.

Data preprocessing: Head outcomes will be labeled as "1" and tails outcomes will be labeled as "0" in the spreadsheet.

Data analysis: We will perform a t-test on the data against chance level (0.5).

Preregistration vs Registered Report

https://www.cos.io/initiatives/registered-reports

Preregistration vs Registered Report

DEVELOP IDEA → DESIGN STUDY → COLLECT & ANALYZE DATA → WRITE REPORT → PUBLISH REPORT

**Preregister and time-stamp
on an online platform
(no peer review)**

https://www.cos.io/initiatives/registered-reports

Preregistration vs Registered Report

Preregistration vs Registered Report
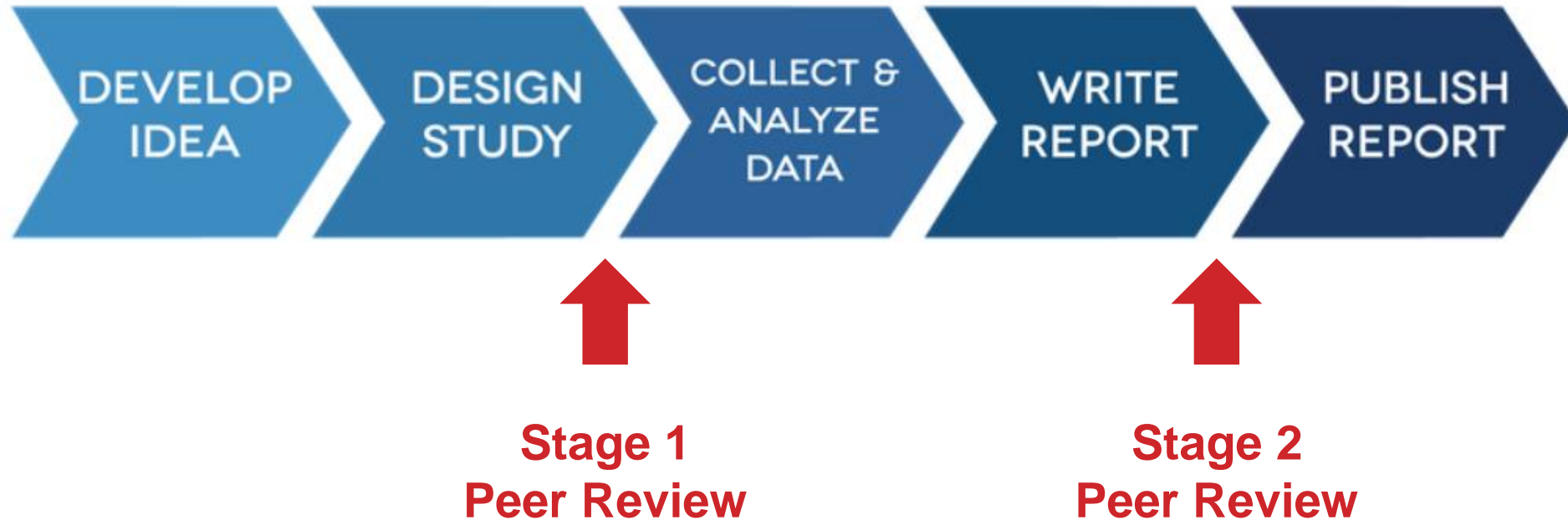
Currently, **295** scientific journals use the Registered Reports publishing format either as a **regular submission option** or as part of a single **special issue**.

https://www.cos.io/initiatives/registered-reports

It works!

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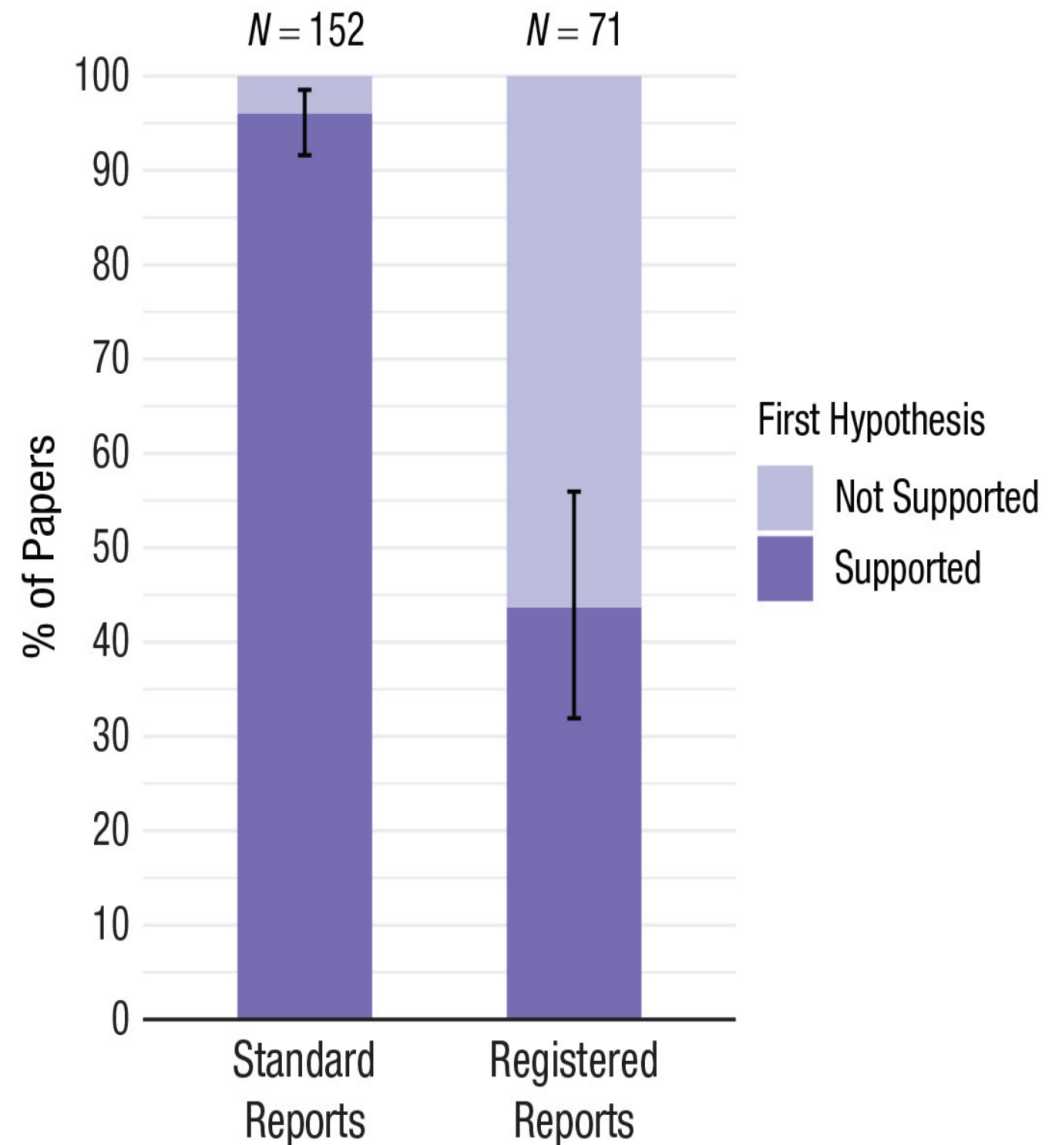
But what's in it for me?

Seven Selfish Reasons for Preregistration:
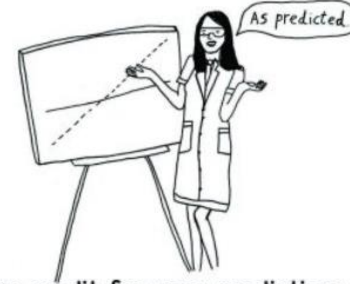
1. Take credit for your predictions.

2. Experience the excitement.

3. Prevent the data from taking you hostage.

4. Profit from online resources.

5. Increase your reputation and self-image.
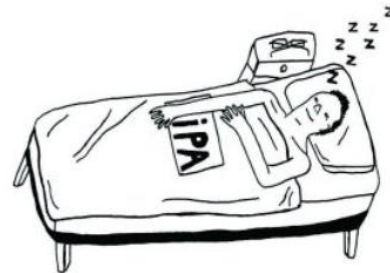
6. Await your results without fear with in-principle acceptance.
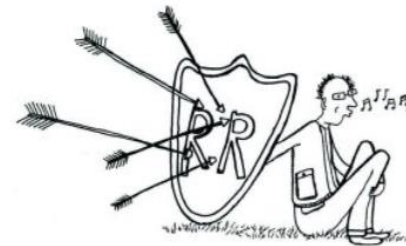
7. Protect yourself against post-hoc critique.

Registered Reports

Illustrations by Stella de Kort, www.stelladekort.nl

Other selfish reasons

- You will be encouraged to **think more deeply** about research design and planned analyses before collecting data (and plan better research!)
- You will increase the odds of getting your research **published** (despite the negative or "boring" findings)
- You will be more competitive on the **academic job market** (more and more listings mention scientific transparency and open science practices)
- You will be a more competitive **grant applicant**

What can go wrong?

The challenges of preregistration

- Writing preregistration may improve study design and analyses, but there is **no quality stamp.**

- **More time** required at the planning phase (but less time required at the analysis and writing stage!)

- Higher **visibility of errors** (e.g., if wrong types of analyses are preregistered)

- **Less flexibility** (however, changes to preregistration are possible)

How to preregister research?
A primer

Step 1: Choose the platform and the template

Focus	Type of research	Platform	Template
Discipline-specific	Clinical research	clinicaltrials.gov	Generic
	Animal research	animalstudyregistry.org	Generic
	Economics/Social sciences	socialscienceregistry.org	Generic
Discipline-general	Basic research	aspredicted.org	Generic
		osf.io/registries	Structured, Unstructured, Qualitative research, Replications, etc.

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ClinicalTrials.gov

Find Studies ▾   About Studies ▾   Submit Studies ▾   Resources ▾   About Site ▾   PRS Login

SUBMIT STUDIES

Submit Studies to
ClinicalTrials.gov PRS

**Why Should I Register and
Submit Results?**

FDAAA 801 and the Final
Rule

How to Apply for a PRS
Account

How to Register Your Study

How to Edit Your Study
Record

How to Submit Your Results

Do you or someone you know want to participate in a clinical study? See information for patients and families.

Why Should I Register and Submit Results?

Contents

- What Is the Purpose of Trial Registration and Results Submission?
- Why Do I Need to Register My Trial and Submit Results to ClinicalTrials.gov?

What Is the Purpose of Trial Registration and Results Submission?

Registering clinical trials when they begin, providing timely updates, submitting summary results, and making this information publicly available fulfills a number of purposes and benefits a variety of people.

https://clinicaltrials.gov

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Animal Study Registry

Animal Study Registry is an online registry for scientific studies involving animals conducted around the world. It is operated by the German Centre for the Protection of Laboratory Animals (Bf3R) at the German Federal Institute for Risk Assessment (BfR). The registry was launched as a reaction to the reproducibility crisis and provides scientists a platform to register an exact study plan prior to the start of experiments in order to prevent selective reporting. This allows reviewers or other scientists to compare the initially registered contents with the final publication. Thereby, Animal Study Registry encourages transparency, reproducibility, and animal welfare.

Register your study in Animal Study Registry

Take all the time you need to prepare the registration of your study in Animal Study Registry. As long as your study is in preparation, you can save all changes and come back to it anytime you want. Once your study is submitted, you can still decide to change or retract it within two weeks from the submission date. After this period, the registration becomes binding and your study receives a DOI (Digital Object Identifier) number which marks your study as your intellectual property. From this date on you can only add comments to your study. Our platform allows registration of a study without making it immediately publicly accessible. You can restrict the visibility of your study for a period of up to five years. During this embargo period, your study will appear in Animal Study Registry only with its title, your institution and optionally your name, accompanied by a short summary. At the end of the embargo period, your study will automatically become fully publicly accessible. Please have a look at our sample study 10.17590/asr.0000091.

https://www.animalstudyregistry.org

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AEA RCT Registry

The American Economic Association's registry for randomized controlled trials

About   Registration Guidelines   Data   FAQ

Advanced Search

SEARCH

REGISTRATION GUIDELINES

REGISTER A TRIAL >

Please review these instructions before beginning a trial registration.

Accounts

You will need a valid account to register a trial. To create an account go to the Sign Up page.

Trial Registration

Once you have a valid account, you can register a trial at the Trial Registration page. The person registering the trial is considered to be the primary principal investigator (PI). For studies with additional PIs, there are additional fields to enter their names, emails and affiliations. Email addresses are hidden from public view.

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		osf.io/registries	Structured, Unstructured, Qualitative research, Replications, etc.

HOME

Create a new pre-registration

CREATE

☐ **Just trying it out; make this pre-registration self-destroy in 24 hours.** 💣

See your pre-registrations

(e.g., to share with reviewers or make public)

email address you have used in AsPredicted

Sign in

I cannot access my AsPredicted email account anymore

WHAT IS ASPREDICTED?

AsPredicted is a platform that makes it easy for researchers to pre-register their studies, and easy for others to read and evaluate those pre-registrations. To pre-register a study on AsPredicted, a researcher answers nine simple questions about their research design and analyses. The platform then generates a time-stamped, single page .pdf document that includes a unique URL for verification.

HOW DOES IT WORK?

- One author creates the pre-registration.
- Participating authors are emailed, requesting approval.
- If all approve, it is saved but remains private until an author makes it public; or remains private forever.(Why?)
- Authors may share an anonymous version of the pre-registration with reviewers.
- If made public, the final .pdf (sample) is automatically stored in the web-archive.

https://aspredicted.org/

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OSF**REGISTRIES**

The **open** registries network

Add New Registration

You are submitting to OSF Registries. *Click here* to learn more about other hosted registries.

STEP 1

Do you have content for registration in an existing OSF project?

YES	NO

STEP 2

Which type of registration would you like to create? *

OSF Preregistration ▲
OSF Preregistration
Open-Ended Registration
OSF-Standard Pre-Data Collection Registration
Pre-Registration in Social Psychology (van 't Veer & Giner-Sorolla, 2016): Pre-Registration
Preregistration Template from AsPredicted.org
Qualitative Preregistration

https://osf.io/registries

Step 2: Write up!

- Think through your hypotheses, methods, and planned statistical analyses very carefully

- Be precise about your exclusion criteria, stopping rule, handling missing data and outliers

- Try out your methods and planned analyses in a pilot study or on mock data

- Think about possible unexpected scenarios

Step 2: Write up!
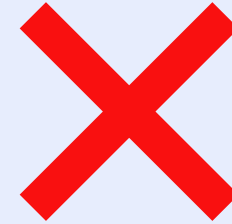
We are interested in testing group differences.
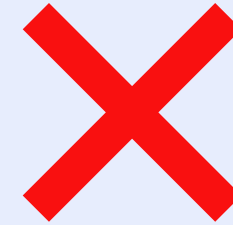
We hypothesize that groups A and B will differ in condition X based on...
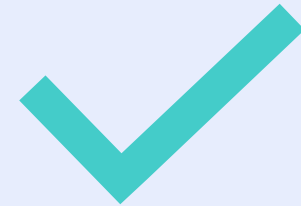
Step 2: Write up!

We will exclude inattentive participants. ❌

We will exclude participants who did not pass 2 out of 3 control questions. ✔️

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Step 2: Write up!

We will remove outliers.
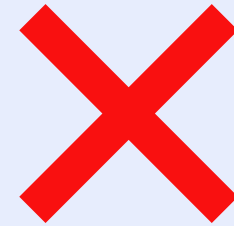
We will remove influential observations identified through Cook's Distance analysis.

Step 3: Register and time-stamp!

You can decide whether you want your preregistration to be open to public or closed until the results are published.
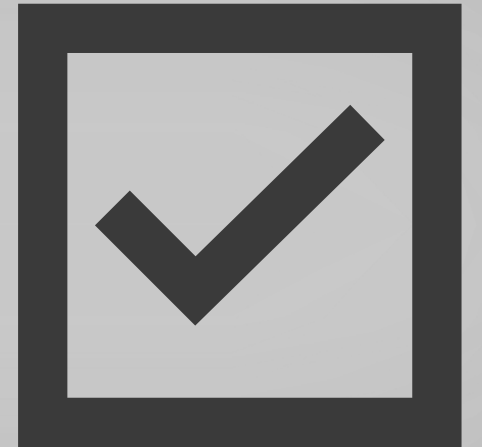
Step 4: Changes to preregistration

- Even the best plans might need changes once implemented

- When reporting deviations from the original, preregistered plan, be **explicit** about what has changed

- If needed, you can upload changes to your time-stamped preregistration or preregister a new plan (but refer to the original preregistration and explain why you made the changes)

How to get the most out of preregistration?

Preregistering quantitative vs qualitative studies

Quantitative research: have the right confirmatory analyses been carried out based on original hypotheses?

Qualitative research: have the right data collection and analysis methods been used? Is the interpretation convincing, based on original theoretical framework and planned methodology?

Preregistration will look different depending on scientific discipline or the type of research study.

Choose **the right template** for your preregistration.

Take a look at **preregistration examples** for similar studies before you write up yours.

Consult your **colleagues** if they have experience with preregistration in your field.

Preregistering qualitative research

Tamarinde L. Haven ✉ iD & Dr. Leonie Van Grootel iD

Preregistration of exploratory research: Learning from the golden age of discovery

Ulrich Dirnagl ✉

Preregistration of Analyses of Preexisting Data

Authors: Gaëtan Mertens ✉, Angelos-Miltiadis Krypotos

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Preregistration is a plan, not a prison.

Remember that you can make changes to the preregistration or report non-preregistered findings, as long as you are explicit about what was planned and what was not planned.

https://www.cos.io/blog/preregistration-plan-not-prison

Thank you!

Questions?

Email us at: research-data@uio.no

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Menu ← Courses and events ← Courses ← Freestanding courses

Research data

Good research data management plays an essential role in Open Science, which is increasingly important for scholars around the globe. The University Library provides courses on key concepts as a part of the Skills Development for Research Data project.

We can provide training on the following topics:

- Introduction to research data management (RDM)

- Current data management policies (UiO, Research Council of Norway, EU)

- Data management planning

- Data organization

- Metadata and documentation

- Data classification and storage

- Sharing and archiving research data

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