

# 8 Easy Steps to Open Science

An Annotated Reading List (To Give to your busy Supervisor/Office Mate)

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# Structure

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1. **Why** this reading list?
2. **How**: The process
3. **What**: The content



# Outside of the Open Science Bubble

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“We do not do exploratory work! We only do good, confirmatory work. The data might still not come out quite as we want them to, so we might have to slice them up in certain ways to...”

“You’d believe this result more if it was preregistered?? That means you’re mistrusting that researcher and assuming they’re purposefully doing bad work!”

“I can see that doing Open Science here would be better for the field, but I don’t see the point in doing this myself, as it would only slow me down and disadvantage me.”

# (Inherent?) Value of Open Science

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→ Transparency of & Access to research

Inherent: Fundamental principle of (good) science?

Instrumental: (Just) a way to get to e.g., credibility and efficiency?

Openness seems to be needed for science to function properly (cf. Bacon, Merton's norms)



# Barriers to engaging with Open Science I

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Houtkoop et al. (2018), re data sharing:

- a) it's not commonly done [Why should I do this?!],
- b) they prefer to give it only on request [STRANGER DANGER],
- c) it just takes more work [This slows me down!], and
- d) they'd have to learn new skills [I don't have the time!]

→ a) and b) need culture change, c) and d) may be solved by education and developing tools and methods



# Barriers to engaging with Open Science II

## Recommendations for Increasing Replicability in Psychology†

Jens B. Asendorpf , Mark Conner, Filip De Fruyt, Jan De Houwer ... [See all authors](#) ▾

First published: 18 April 2013 | <https://doi.org/10.1002/per.1919> | Cited by: 255

† This target paper is the result of an Expert Meeting on 'Reducing non-replicable findings in personality research' in Trieste, Italy, July 14–16, 2012, financed by the European Association of Personality Psychology (EAPP) in the recognition of the current debate on insufficient replicability in psychology and medicine. The participants of this Expert Meeting served as authors of the current article (the organizer of the meeting as the first author) or as its editor.

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### RESEARCH ARTICLE

## Estimating the reproducibility of psychological science

Open Science Collaboration<sup>†,‡</sup>  
+ See all authors and affiliations

Science 28 Aug 2015:  
Vol. 349, Issue 6251, aac4716  
DOI: 10.1126/science.aac4716

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## Data Sharing in Psychology: A Survey on Barriers and Preconditions

Bobby Lee Houtkoop, Chris Chambers, Malcolm Macleod, more...

[Show all authors](#) ▾

First Published February 15, 2018 | Research Article

 Check for updates

<https://doi.org/10.1177/2515245917751886>

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### Abstract

Despite its potential to accelerate academic progress in psychological science, public data sharing remains relatively uncommon. In order to discover the perceived barriers to public data sharing and possible means for lowering them, we conducted a survey, which elicited responses from 600 authors of articles in psychology.

shared only infrequently. Perceived barriers included common practice in their fields, their preference to perception that sharing requires extra work, and the survey suggests that strong encouragement from particularly effective in overcoming these barriers, that demonstrate where and how data can be shared.

### Open Science: A Candid Conversation

Kendal N. Smith , Matthew C. Makel

First Published February 14, 2019 | Research Article

 Check for updates

<https://doi.org/10.1177/1932202X19829750>

[Article information](#) ▾

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### Abstract

In response to concerns about the credibility of many published research findings, open science reforms such as preregistration, data sharing, and alternative forms of publication are being increasingly adopted across scientific communities. Although journals on giftedness and advanced academic research have already implemented several of these practices, they remain unfamiliar to some researchers. In this informal conversation, Kendal Smith and Matthew Makel discuss how they came to know and use open science practices, the values of open science, benefits and objections, and their future aspirations for open science practices in gifted education research. Their conversation aims to help make open science practices more understandable and actionable for both early career and established researchers.

### Keywords

open science, research methods, gifted education, advanced academics, talent development

 View access options ▾

# Barriers to engaging with Open Science III

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Washburn et al. (2018), on how to get psychologists to adopt new practices:

- Ease of use of new practices
- Clear up confusions about new developments

→ More education & discussion needed



# Putting Together A Reading List

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- Hackathon at SIPS 2018!
- Inspired by Etz et al. (2018)
- Initially with the help of a long reading list by Brent Roberts and Dan Simons
- 8 topics
- Internal reviews for “longlists”, “shortlists”, and written sections





# Choosing Topics

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1. Understanding open science
2. Open access
3. Open data, materials, and code
4. Reproducible analyses
5. Preregistration and registered reports
6. Best practices in statistics and methodology
7. Replication research
8. Teaching open science



# Understanding open science

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Main: Munafò et al. (2017) – A manifesto for reproducible science.

Further:

Corker (2018) Open Science is a Behaviour

Fecher & Friesike (2014). Open science: One term, five schools of thought.

Spellman, Gilbert, & Corker (2017). Open Science: What, Why, and How.

# Open Access

— — —

Main: Tennant et al. (2016). The academic, economic and societal impacts of Open Access: an evidence-based review.

Further:

Chan et al. (2002) Budapest Open Access Initiative.

COPE (2018) Principles of Transparency and Best Practice in Scholarly Publishing

Piwowar et al. (2018) The State of OA: A large-scale analysis of the prevalence and impact of Open Access articles.

# Open Data, Materials, and Code

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Main: Klein et al. (2018). A practical guide for transparency in psychological science.

Further:

Gilmore, Kennedy, & Adolph (2018). Practical solutions for sharing data and materials from psychological research.

Levenstein & Lyle (2018). Data: Sharing Is Caring.

# Reproducible **Analyses**

— — —

Main: Wilson et al. (2017). Good enough practices in scientific computing.

Further:

Brown et al. (2014). A duty to describe: Better the devil you know than the devil you don't.

Goh, Hall, & Rosenthal (2016). Mini meta-analysis of your own studies: Some arguments on why and a primer on how.

Poldrack et al. (2017). Scanning the horizon: towards transparent and reproducible neuroimaging research.

Software Carpentry Workshops

# Preregistration **and** Registered Reports

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Main: Wagenmakers et al. (2012) – An agenda for purely confirmatory research.

Further:

van't Veer & Giner-Sorolla (2016). Pre-registration in social psychology—A discussion and suggested template.

Nosek, Ebersole, DeHaven, & Mellor (2018). The preregistration revolution.

Chambers, Feredoes, Muthukumaraswamy, & Etchells (2014). Instead of "playing the game" it is time to change the rules: Registered Reports at AIMS Neuroscience and beyond.

# Best Practices in Statistics and Methodology

— — —

Main: Greenland et al. (2016). Statistical tests, p values, confidence intervals, and power: a guide to misinterpretations.

Further:

De Groot, A. D. (1956/2014). The meaning of “significance” for different types of research.

Etz, Gronau, Dablander, Edelsbrunner, & Baribault (2018). How to become a Bayesian in eight easy steps: An annotated reading list.

Kass et al. (2016). Ten Simple Rules for Effective Statistical Practice.

# Replication Research

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Main: Zwaan, Etz, Lucas, & Donnellan (2018). Making replication mainstream.

Further:

Schmidt (2009). Shall we really do it again? The powerful concept of replication is neglected in the social sciences.

Makel, Plucker, & Hegarty (2012). Replications in psychology research: How often do they really occur?

Brandt et al. (2014). The replication recipe: What makes for a convincing replication?



# Teaching Open Science

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Main: Chopik et al. (2018). How (and whether) to teach undergraduates about the replication crisis in psychological science.

Further:

Janz (2016) – Bringing the Gold Standard into the Classroom: Replication in University Teaching.

Frank & Saxe (2018) – Teaching Replication.

# So What?

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Lots of (potential) barriers to engaging with Open Science.

So, if we agree that Open Science is something to strive towards, then we need to provide straightforward introductions and easy tools.

# Awesome People

— — —



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@Sam\_D\_Parsons

Any  
Questions?

