



# New Developments in Research Transparency and Reproducibility

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Open Access Event 2018: Novel Approaches in  
Open Science

22 October 2018

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# Talk Outline

1. Research transparency and reproducibility in Open Science: a brief taxonomy
2. Why research transparency and reproducibility?
3. Some new developments in approaches to research transparency and reproducibility
  - Reproducible research: dynamic documents, open workflow
  - Study preregistration and preanalysis plans (PAPs)
  - Open data

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# Research transparency and reproducibility in Open Science

- ***Open Methodology/Workflow***
- Open Source
- ***Open Data***
- Open Access
- Open Peer Review
- Open Educational Resources
- ...

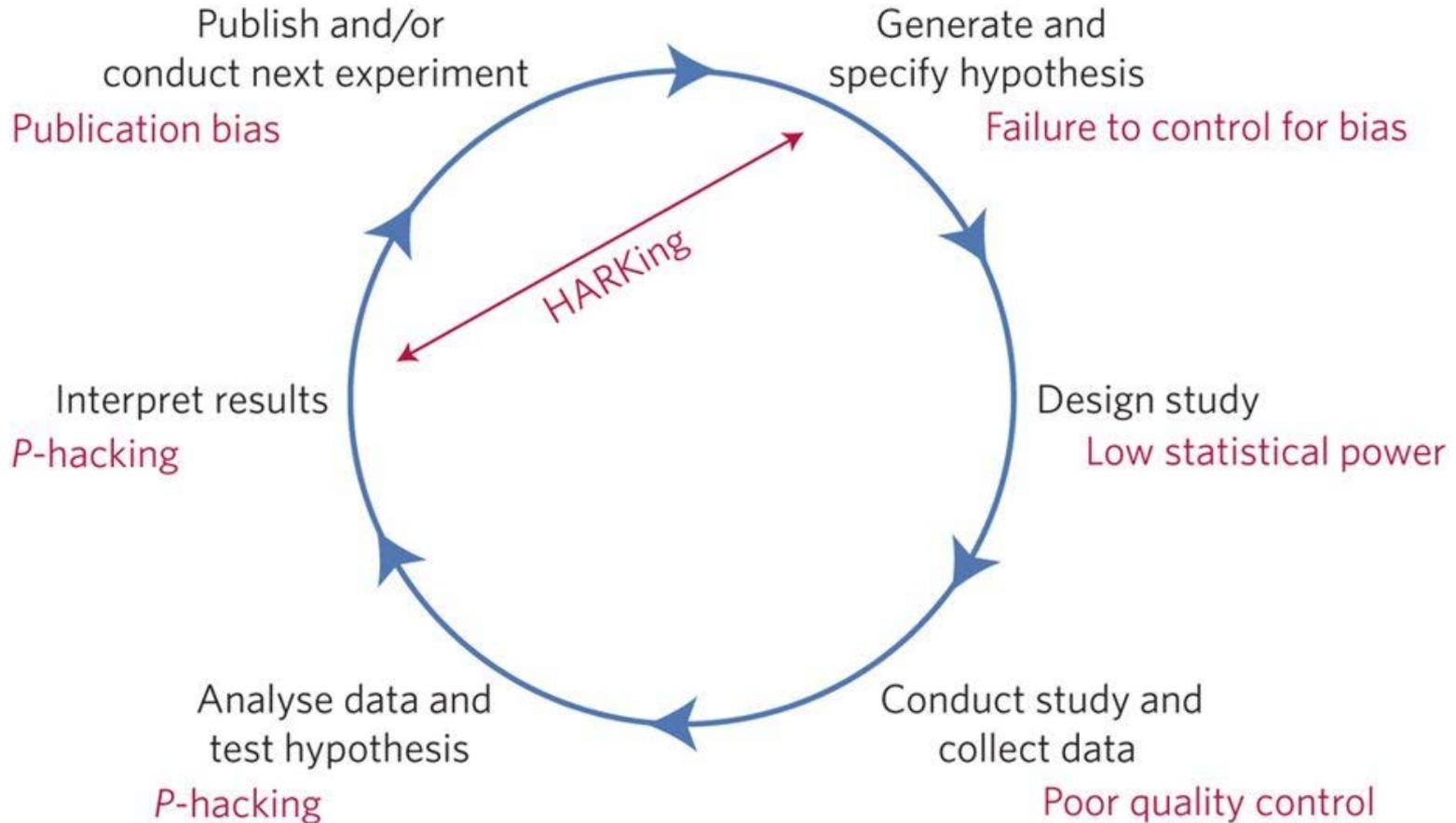
# Why research transparency and reproducibility?

## Problems for integrity, credibility, and utility of research



# Why research transparency and reproducibility?

## ■ Problems for robustness & possibility for self-correction



Source: Munafò et al. (2017). A manifesto for reproducible science. *Nature Human Behaviour*, 1(1), Article 0021.

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# Why research transparency and reproducibility?

## Dynamic documents & open workflow

- Practical consequence for the process of document preparation of cumulative and intersubjectively accessible science
- Dynamic documents are: reproducible, reusable, maintainable, and transparent
- Need to
  - reuse ideas from one project for another
  - reuse and polish lessons for teaching
  - be able to trace methods for reaching particular numerical results
  - update analyses in light of new data
  - produce structurally similar reports
- Dynamic documents are a massive boon to **instructiveness**, **credibility**, and **efficiency** of research: one folder of files that has it all!

# How to do research transparency and reproducibility? Dynamic documents & open workflow

## With R(Studio):

Gandrud, C. (2015). *Reproducible research with R and RStudio* (2nd ed.). Boca Raton, FL: CRC Press.

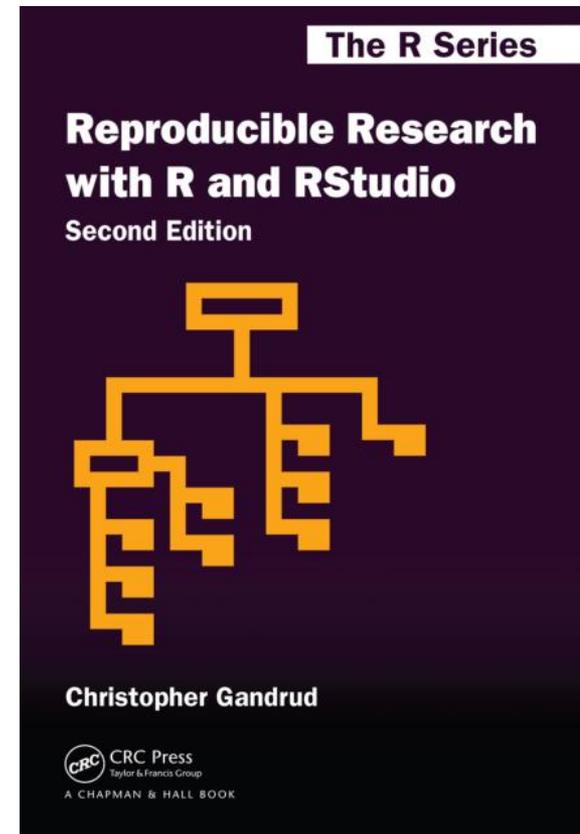
Healy, K. (2018). *The plain person's guide to plain text social science*. Tutorial, Durham, NC.

## With Stata:

Rising, B. (2018, June). *Efficient dynamic documents using Stata*. Presented at the annual meeting of the German Stata User Group, Constance, Germany.

## With Jupyter notebooks:

Connelly, R., & Gayle, V. (in press). An investigation of social class inequalities in general cognitive ability in two British birth cohorts. *British Journal of Sociology*.



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# Dynamic documents & open workflow: R

- Tools for fully reproducible workflow in R à la Gandrud (2015):
  - [R](#) / [Rstudio](#)
  - [R Markdown](#)
  - [knitr](#) / [pandoc](#)
  - [Dropbox](#) or [Git](#) / [GitHub](#) (backup, collaboration, version control)
  - Systematic file management
  - Reproducible data gathering (via makefiles)

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# Dynamic documents & open workflow: Stata

- Tools for fully reproducible workflow in Stata à la Rising (2018):
  - `markstat` command (user-generated)
  - `dyndoc` command (official Stata)
  - `putdocx` command (official Stata)
  - `putwrap` command, wrapper for simpler `putdocx`
  - [Dropbox](#) or [Git](#) / [GitHub](#) (backup, collaboration, version control)
  - Systematic file management

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# Dynamic documents & open workflow

## ■ Zotero Groups

- Public groups in open-source ref manager to collaborate, share bibliographies, files, etc.

- Also available for non-open reference managers (Endnote, Mendeley, etc.)

- End-to-end support: [Open Science Framework](#)

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# Dynamic documents & open workflow

Multiple field-specific social science & psychological preprint servers

## [SocArXiv](#)

established July 2016, run by social scientists, members of the academic library community, COS/OSF coop

Under development, simple upload through email deposit

Also for other fields: [PsyArXiv](#), etc.

Another option: Local institutional ([MADOC](#)) & private repositories (personal website)

Another non-option: Social Science Research Network (SSRN, owned by Elsevier since 2016 – going downhill since), Academia.edu, ResearchGate

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# Open Science Framework: An integrated research-lifecycle solution

- Integrates with third-party tools (Dropbox, GitHub, Figshare, Dataverse, etc.)
- Public projects
  - [Example](#) from my own work
- [OSF for Meetings](#)
  - central location for conference submissions
  - slide and poster sharing before/after a conference
- Open preprint repository *network*

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# Transparency from the start: Study preregistration and preanalysis plans (PAPs)

- Movement of social science journals to accepting preregistered reports (JEPS, JJSC, ...)
- Emphasizes importance of research question and quality of methodology
  - [Example](#)
- Check out [Election Research Preacceptance Competition](#) (Skip Lupia and Brendan Nyhan):
  - Option to preregister study design, before 2016 ANES data release in April 2017
- Check out COS [Preregistration Challenge](#):
  - [Introduction video](#)

## Alternatives to OSF:

- [EGAP Registry](#) (Evidence in Governance and Politics) of APSA Experimental Research Section
  - Temporary, will be integrated into OSF
- [RIDIE](#) (Registry for International Development Impact Evaluations) by International Initiative for Impact Evaluation
  - Only for studies assessing impact of development programs

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# Open Data

- [Dataverses](#) (esp. [Harvard Dataverse](#))
  - repositories for data, code, documentation
  
- Many alternatives exist – examples:
  - Social sciences in Germany:
    - [GESIS Data Archive](#)
      - supervised GESIS data repository service
    - [datorium](#)
      - unsupervised GESIS data repository service
  
  - Again: University (library) server space
    - [MADATA](#) (U of Mannheim)
      - repository for all University of Mannheim researchers to make research data accessible online

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# Open Data: Peer Reviewers' Openness Initiative

- Actively enforcing open data practices by using leverage to change incentive structures



- If you peer-review for academic journals, you can **join more than 500 academic peers** and sign the pledge to “not offer comprehensive review for, nor recommend the publication of, any manuscript that does not meet ... minimum [open data] requirements”

- See: <https://opennessinitiative.org/>

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## In conclusion...

- Open Science is becoming a new practical principle (supported by OSF and other infrastructure)
- Open Science is becoming a personal challenge (or regulative ideal) for researchers
- Open Science is also (slowly) becoming an institutionalized career requirement (publications, grants, hiring)
- Especially for young scholars, need to keep abreast of developments and participate in ongoing transformation of scholarly communication

More soon...



MZES Open Social Science Conference 2019 (OSSC19): Practicing New Standards in Transparency and Reproducibility.

*Mannheim, 25-27 January 2019 – **register now!***

Includes workshop on cutting-edge open science practices on last day, offered with the Berkeley Initiative for Transparency in the Social Sciences!



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# Thank you!

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# References

- Brüderl, J. (2013, November). *Sind die Sozialwissenschaften wissenschaftlich? Ergebnisse eines Replikationsexperiments*. Presented at the Tagung „Rational Choice Soziologie: : Theorie und empirische Anwendungen“, Venice, Italy. Retrieved from [http://www.ls4.soziologie.uni-muenchen.de/studium\\_lehre/lehveranstaltungen/wise1314/venice13/v\\_dienstag/bruederl.pdf](http://www.ls4.soziologie.uni-muenchen.de/studium_lehre/lehveranstaltungen/wise1314/venice13/v_dienstag/bruederl.pdf)
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- Munafò, M. R., Nosek, B. A., Bishop, D. V. M., Button, K. S., Chambers, C. D., Sert, N. P. du, ... Ioannidis, J. P. A. (2017). A manifesto for reproducible science. *Nature Human Behaviour*, 1(1), Article 0021. <https://doi.org/10.1038/s41562-016-0021>
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