

Research Transparency and Reproducibility

Part 4:
Implementing a RTR strategy

Arnaud Vaganay
New Delhi, 1 May 2017



META-LAB



Berkeley Initiative for
Transparency in the Social Sciences

Introduction

what role for grant-makers?

Create an environment that is
conducive to RTR

1. Share your values
2. Set ground rules
3. Motivate
4. Nudge
5. Monitor

1. Share your values

2. Set ground rules

3. Motivate

4. Nudge

5. Monitor

Share your values

Regardless of the difficulty of doing RTR...

... Being committed to RTR is like being pregnant:

Either you are or you're not.

You might as well let your stakeholders know where you stand.

Share your values

Science

Home

News

Journals

Topics

Careers

Science

Science Advances

Science Immunology

Science Robotics

Science Signaling

Science Translational Medicine

SHARE

POLICY FORUM | SCIENTIFIC STANDARDS



0



0

Promoting an open research culture

B. A. Nosek^{*}, G. Alter, G. C. Banks, D. Borsboom, S. D. Bowman, S. J. Breckler, S. Buck, C. D. Chambers, G. Chin, G. Christensen, M. Contestabile, A. Dafoe, E. Eich, J. Freese, R. Glennerster, D. Goroff, D. P. Green, B. Hesse, M. Humphreys, J. Ishiyama, D. Karlan, A. Kraut, A. Lupia, P. Mabry, T. Madon, N. Malhotra, E. Mayo-Wilson, M. McNutt, E. Miguel, E. Levy Paluck, U. Simonsohn, C. Soderberg, B. A. Spellman, J. Turitto, G. VandenBos, S. Vazire, E. J. Wagenmakers, R. Wilson, T. Yarkoni

Affiliations for the authors, all of whom are members of the TOP Guidelines Committee, are given in the supplementary materials.

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+ See all authors and affiliations

Science 26 Jun 2015:
Vol. 348, Issue 6242, pp. 1422-1425
DOI: 10.1126/science.aab2374



Become a TOP Guidelines Signatory

Journal signatories are:

- 1) Expressing their support of the principles of openness, transparency, and reproducibility
- 2) Expressing interest in the guidelines and commit to conducting a review within a year of the standards and levels for potential adoption

Organization signatories are:

- 1) Expressing their support of the principles of openness, transparency, and reproducibility
- 2) If relevant, encouraging associated journals to conduct a review of the standards and levels for potential adoption.

* Required

Your full name *

Your answer

Share your values

About OER

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Rigor and Reproducibility

Scientific rigor and transparency in conducting biomedical research is key to the successful application of knowledge toward improving health outcomes. The information provided on this website is designed to assist the extramural community in addressing rigor and transparency in NIH grant applications and progress reports.

On This Page:

- [Goals](#)
- [Guidance: Rigor and Reproducibility in Grant Applications](#)
- [Resources](#)
- [News](#)
- [References](#)

Goals

The NIH strives to exemplify and promote the highest level of scientific integrity, public accountability, and social responsibility in the conduct of science. Updates to grant applications

1. Share your values

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Set ground rules

Key decisions:

- whether to register?
- How to register?
- where to register?
- when to register?

Decision maker:

- Sponsor?
- Investigators?

Set ground rules

Table 1. Original CONSORT Checklist

Paper Section and Topic	Item Number	Descriptor	Reported on Page Number
Title and abstract	1	How participants were allocated to interventions (e.g., "random allocation", "randomized", or "randomly assigned").	
Introduction Background	2	Scientific background and explanation of rationale.	
Methods			
Participants	3	Eligibility criteria for participants and the settings and locations where the data were collected.	
Interventions	4	Precise details of the interventions intended for each group and how and when they were actually administered.	
Objectives	5	Specific objectives and hypotheses.	
Outcomes	6	Clearly defined primary and secondary outcome measures and, when applicable, any methods used to enhance the quality of measurements (e.g., multiple observations, training of assessors).	
Sample size	7	How sample size was determined and, when applicable, explanation of any interim analyses and stopping rules.	
Randomization			
Sequence generation	8	Method used to generate the random allocation sequence, including details of any restriction (e.g., blocking, stratification).	
Allocation concealment	9	Method used to implement the random allocation sequence (e.g., numbered containers or central telephone), clarifying whether the sequence was concealed until interventions were assigned.	
Implementation	10	Who generated the allocation sequence, who enrolled participants, and who assigned participants to their groups.	
Blinding (masking)	11	Whether or not participants, those administering the interventions, and those assessing the outcomes were blinded to group assignment. If done, how the success of blinding was evaluated.	

Set ground rules

8 MODULAR STANDARDS

Citation Standards Describes citation of data	Data Transparency Describes availability and sharing of data
Analytical Methods Transparency Describes analytical code accessibility	Research Materials Transparency Describes research materials accessibility
Design and Analysis Transparency Sets standards for research design disclosures	Preregistration of Studies Specification of study details before data collection
Preregistration of Analysis Plans Specification of analytical details before data collection	Replication Encourages publication of replication studies

ACROSS 3 TIERS

1 DISCLOSURE:
the final research output must disclose if the work satisfies the standard

2 REQUIREMENT:
the final research output must satisfy the standard

3 VERIFICATION:
third party must verify that the standard is being met

Set ground rules

Turner *et al. Systematic Reviews* 2012, **1**:60
<http://www.systematicreviewsjournal.com/content/1/1/60>



RESEARCH

Open Access

Does use of the CONSORT Statement impact the completeness of reporting of randomised controlled trials published in medical journals? A Cochrane review^a

Lucy Turner¹, Larissa Shamseer¹, Douglas G Altman², Kenneth F Schulz³ and David Moher^{1,4*}

Abstract

Background: The Consolidated Standards of Reporting Trials (CONSORT) Statement is intended to facilitate better reporting of randomised clinical trials (RCTs). A systematic review recently published in the Cochrane Library assesses whether journal endorsement of CONSORT impacts the completeness of reporting of RCTs; those findings are summarised here.

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Normative Dissonance in Science: Results from a National Survey of U.S. Scientists

Melissa S. Anderson, Brian C. Martinson, Raymond De Vries

First Published December 1, 2007



Altmetric 27




Abstract

Norms of behavior in scientific research represent ideals to which most scientists subscribe. Our analysis of the extent of dissonance between these widely espoused ideals and scientists' perceptions of their own and others' behavior is based on survey responses from 3,247 mid- and early-career scientists who had research funding from the U.S. National Institutes of Health. We



Perspective | [OPEN](#)

A manifesto for reproducible science

Marcus R. Munafò , Brian A. Nosek, Dorothy V. M. Bishop, Katherine S. Button, Christopher D. Chambers, Nathalie Percie du Sert, Uri Simonsohn, Eric-Jan Wagenmakers, Jennifer J. Ware & John P. A. Ioannidis

Nature Human Behaviour **1**,
Article number: 0021 (2017)
doi:10.1038/s41562-016-0021

[Download Citation](#)

Social sciences

Published online: 10 January 2017



Being a big name in science brings benefits

A study that links scientists' reputations with their citations triggers online talk.

Chris Woolston

12 November 2014

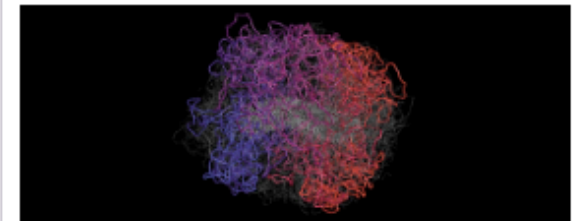
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Scientists develop reputations that often work to their advantage. A study suggests that the presence of a well-known scientist on a list of authors can drive citations of the paper, regardless of the merits of the research — especially soon after its publication. The report rapidly started an online discussion. "How scientists too can be famous for being famous," tweeted [Ed Rybicki](#), a virologist at the University of Cape Town in South Africa. [Naupaka Zimmerman](#), a microbial ecologist at the University of Arizona in Tucson, took to



Based on data from [Altmetric.com](#). Altmetric is supported by Macmillan Science and Education, which owns Nature Publishing Group.

In the loop



DNA's secret weapon against knots and tangles

A simple process seems to explain how massive genomes stay organized. But no one can agree on what powers it.

343k people like this. Be the first of your friends.

The Rogoff-Reinhart data scandal reminds us economists aren't gods

Heidi Moore

The fact that economics spits out cold, hard numbers doesn't mean it produces the cold, hard truth



Kenneth Rogoff and Carmen Reinhart

Motivate

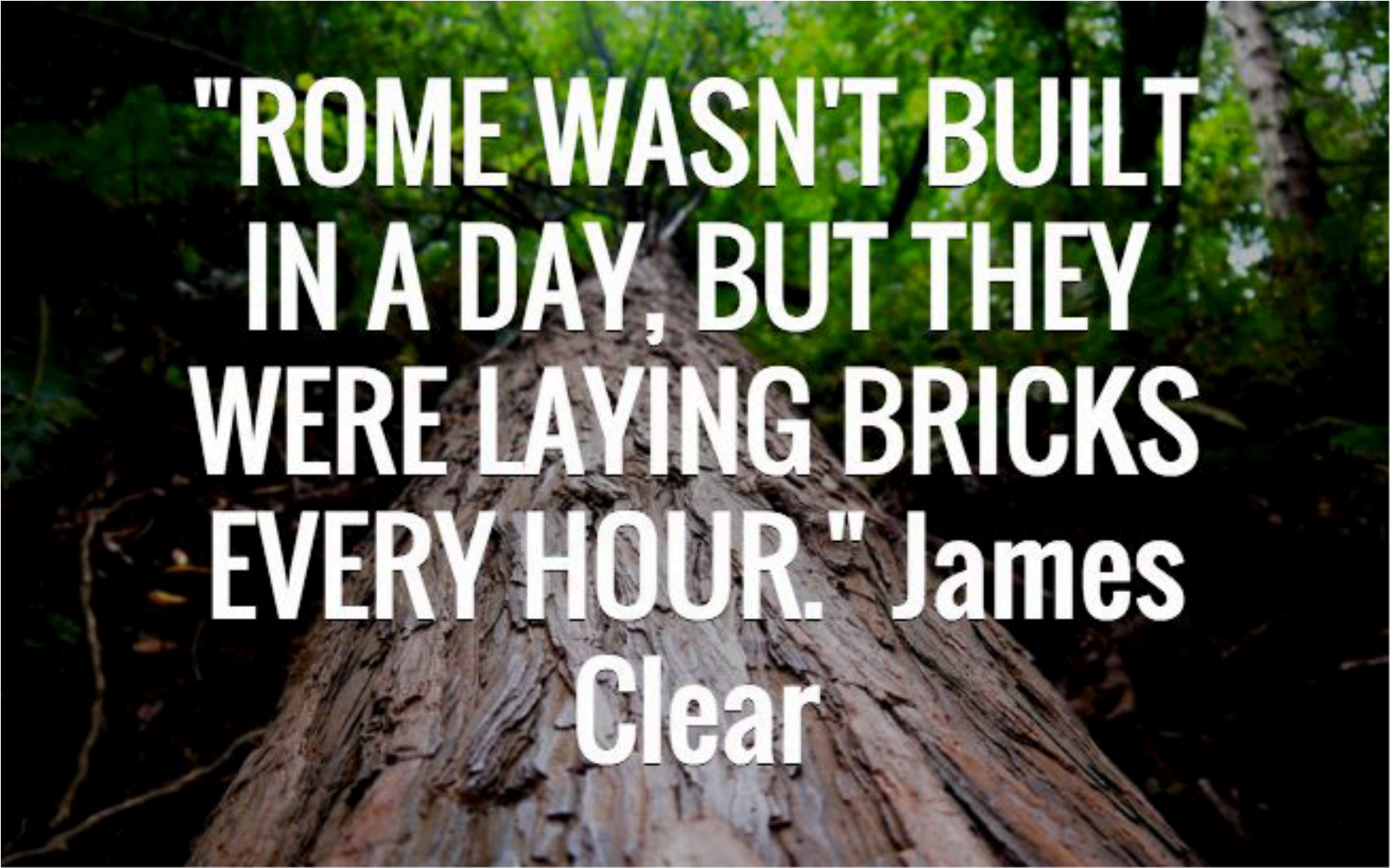


Exploratory
Analysis



Confirmatory
Analysis

Motivate



**"ROME WASN'T BUILT
IN A DAY, BUT THEY
WERE LAYING BRICKS
EVERY HOUR." James
Clear**

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Nudge

#1





Grouping Promotes Equality

The Effect of Recipient Grouping on Allocation of Limited Medical Resources

[Helen Colby](#), [Jeff DeWitt](#), [Gretchen B. Chapman](#)

First Published June 15, 2015



Abstract

Decisions about allocation of scarce resources, such as transplant organs, often entail a trade-off between efficiency (i.e., maximizing the total benefit) and fairness (i.e., dividing resources equally). In three studies, we used a hypothetical scenario for transplant-organ allocation to examine allocation to groups versus individuals. Study 1 demonstrated that allocation to individuals is more efficient than allocation to groups. Study 2 identified a factor that triggers the use of fairness over efficiency: presenting the beneficiaries as one arbitrary group rather than two. Specifically, when beneficiaries were presented as one group, policymakers tended to allocate resources efficiently, maximizing total benefit. However, when beneficiaries were divided into two arbitrary groups (by hospital name), policymakers divided resources more equally across

Vol 26, Issue 7, 2015

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Authors Leading the Way in Open Science

Open Practices Acknowledgments


Since January 2014, authors of accepted manuscripts have been eligible to earn up to three badges in recognition of open scientific practices. These include an Open Data badge, an Open Materials badge, and a Preregistered badge. More information about qualifying for these badges can be found on our [Open Practice Badges page](#).

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ABCDEFGHIJKLMNOPQRSTUVWXYZ

JOSHUA M. ACKERMAN 

RALPH ADOLPHS   

MEGHA AGRAWAL  


FLORA AHN 



 OPEN ACCESS  PEER-REVIEWED

META-RESEARCH ARTICLE

Badges to Acknowledge Open Practices: A Simple, Low-Cost, Effective Method for Increasing Transparency

Mallory C. Kidwell , Ljiljana B. Lazarević, Erica Baranski, Tom E. Hardwicke, Sarah Piechowski, Lina-Sophia Falkenberg, Curtis Kennett, Agnieszka Slowik, Carina Sonnleitner, Chelsey Hess-Holden, Timothy M. Errington, Susann Fiedler, Brian A. Nosek

Published: May 12, 2016 • <https://doi.org/10.1371/journal.pbio.1002456>

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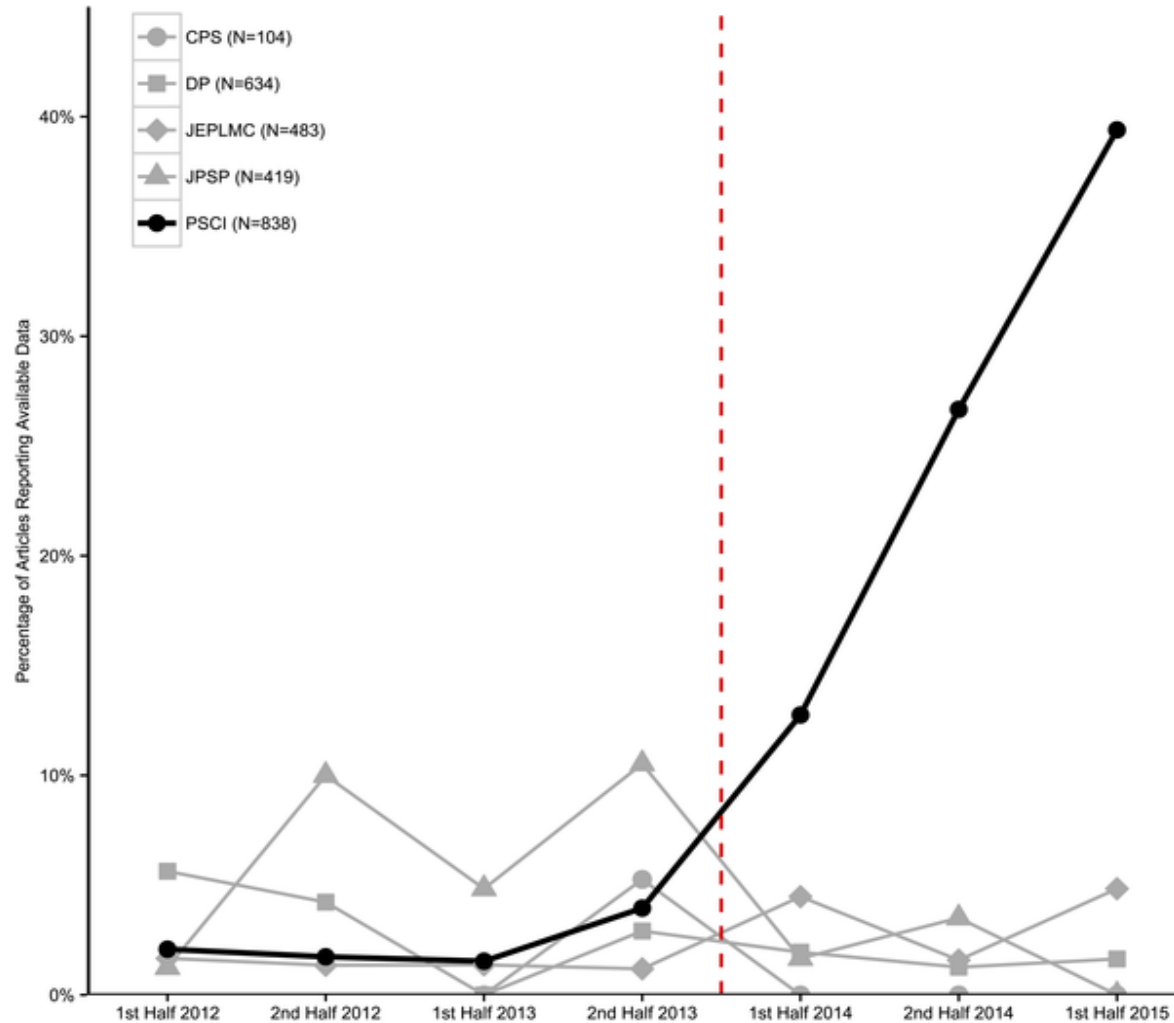
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Abstract

Fig 2. Reportedly available data.



Kidwell MC, Lazarević LB, Baranski E, Hardwicke TE, Piechowski S, et al. (2016) Badges to Acknowledge Open Practices: A Simple, Low-Cost, Effective Method for Increasing Transparency. *PLOS Biology* 14(5): e1002456. <https://doi.org/10.1371/journal.pbio.1002456>
<http://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.1002456>

Nudge

#2

Nudge



<https://cos.io/prereg/>

Nudge

Transparency and independent replication are core values of science. However, scientists must publish, which is more likely with positive and tidy results, even at the expense of transparent, reproducible research. What is good for science and what is good for scientists are not always the same. Preregistration adds credibility to results by documenting in advance what will be tested. If you have a project that is entering the data collection phase, we're giving away \$1,000 to 1,000 researchers who preregister before they publish.

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 OPEN ACCESS  PEER-REVIEWED

RESEARCH ARTICLE

The Effectiveness of Financial Incentives for Health Behaviour Change: Systematic Review and Meta-Analysis

Emma L. Giles , Shannon Robalino, Elaine McColl, Falko F. Sniehotta, Jean Adams

Published: March 11, 2014 • <https://doi.org/10.1371/journal.pone.0090347>

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Introduction

Methods

Results

Discussion

Conclusion

Abstract

Background

Financial incentive interventions have been suggested as one method of promoting healthy behaviour change.



Nudge

#3

Manual of Best Practices in Transparent Social Science

Research

Garret Christensen*

November 14, 2016

Comments and suggestions are strongly encouraged. Please send correspondence to

garret@berkeley.edu, or find the latest version of the manual on [github](#).

<http://www.bitss.org/education/manual-of-best-practices/>

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Reproducible Research

About this course: This course focuses on the concepts and tools behind reporting modern data analyses in a reproducible manner. Reproducible research is the idea that data analyses, and more generally, scientific claims, are published with their data and software code so that others may verify the findings and build upon them. The need for reproducibility is increasing dramatically as data analyses become more

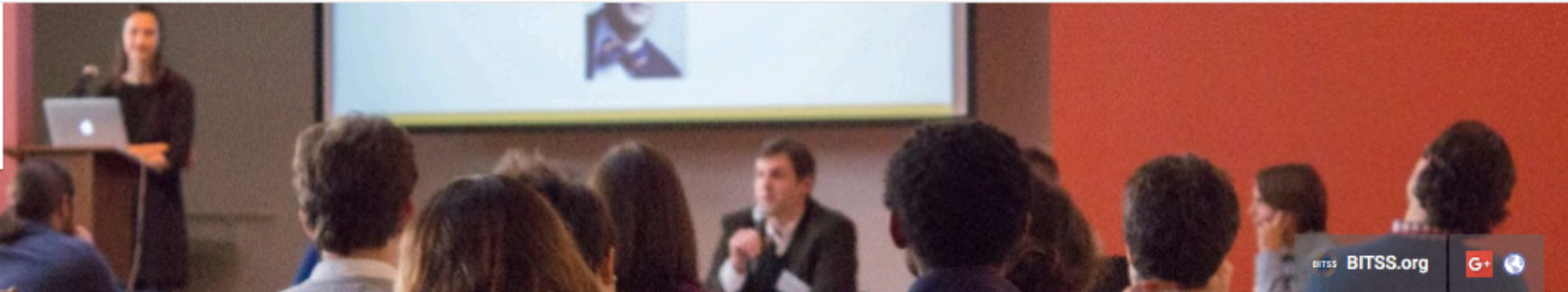
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How to Spread Transparency (and encourage people to use new tools).

- 1) Convince people that transparency tools are useful to them.
- 2) Frame transparency tools as ways to make research better.



Il a dit : « Une série étrange » 11:42

39 Looking Ahead: How to Spread Transparency (FR)
5 views • 2 weeks ago

36 Data Visualization: What should we do to improve our...
1 view • 2 weeks ago

The Evolution of Practice and Methods (according to Thomas Kuhn).

- Why are new approaches eventually adopted?
- 1) They are useful.
 - 2) The next generation is trained on them.
 - 3) Competition between segments of the scholarly community generates a paradigm shift.



Pourquoi les approches 3:47

37 Looking Ahead: The Evolution of Practice and Methods (FR)
6 views • 2 weeks ago

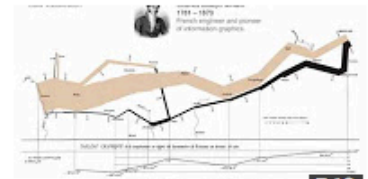
Graphical Excellence and Integrity.

- What makes for graphical excellence?
- 1) Well-designed presentation of interesting data, a combination of substance, statistics, and design.
 - 2) Greatest number of ideas in the shortest time with the least ink in the smallest space, "data richness."
 - 3) Tell the truth about the data, "graphical integrity."



Selon lui, c'est assez naturel, 5:26

35 Data Visualization: Graphical Excellence and Integrity (FR)
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sur le destin de l'armée de Napoléon 7:12

34 Data Visualization: A Brief History of Maps, Time Series, a...
2 views • 2 weeks ago



Berkeley Initiative for Transparency in the Social Sciences

Catalysts

Education

Leamer-Rosenthal Prizes

SSMART Grants

Research

Resources

APPLY

RESEARCH TRANSPARENCY AND REPRODUCIBILITY TRAINING (RT2)

June 7-9, 2017 | Berkeley, CA

This 3-day workshop will provide early career researchers, faculty, and practitioners with an overview of cutting-edge mechanisms for transparent and reproducible social science research.

Deadline to Apply: Friday, March 31, 2017

Topics covered will include:

- ▶ Pre-registration and pre-analysis plans
- ▶ Data preparation and de-identification
- ▶ Innovative open science tools and software

BITSS can sponsor participants' travel and accommodation.

1. Share your values
2. Set ground rules
3. Motivate
4. Nudge
- 5. Monitor**

Nudge

#1

Use checklists manually:

- PAP to assess the grantees' adherence to the original protocol;
- DRESS for filing;
- CONSORT for reporting;
- APA for statistical output.

Monitor

You could also be given access to:

- The workflow diagram;
- All files, including command files.

Nudge

#2

Monitor



statcheck on the web

To check a PDF or HTML file for errors in statistical reporting, upload it below.

More information on this program is available [here](#).

(Currently in beta - please [tell Sean](#) about any errors!)

Upload files (pdf or html):

Browse...

No file selected

STATCHECK

... is an R package and R-based website that detects statistical misreporting...

... reported in APA format...

... by comparing reported p-values with recomputed p-values...

... bearing in mind that p-values can straightforwardly computed from, e.g.:

- A test statistic
- Nb of df

Monitor

Let's give it a try:

<http://statcheck.io/index.php>

With Papers:

Part_4_P1

Part_4_P2

Part_4_P3

Monitor

PROS:

- User friendly
- Does not require access to dataset
- Being piloted by an Elsevier journal.

CONS

- Only works with APA-formatted data
- Assumes that *only* p-values are misreported (not test stat)
- Finds 60% of APA-reported stats
- 80% reliable.
- ?

Nudge

Assessing RTR

RTR is achieved when:

- The PAP is implemented;
- Deviations from the PAP are indicated, justified and reasonable;
- All files are accessible;
- Results can be reproduced.

Monitoring ≠ Controlling

Monitoring:

No consequences for grantees

Controlling :

Consequences (e.g. require amendments, suspend release of funding, etc.).

Conclusion

The success of your RTR strategy depends on:

- The strength of the organisation's commitment to RTR;
- The clarity of its policies;
- The comprehensiveness of the strategy.