

How **Open Science** Can Solve (Parts of) the Replication Crisis

This presentation is inspired by presentations from Daniel Lakens, Jim Grange, Marcus Munafò, Dorothy Bishop, and Brian Nosek

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Ludwig-Maximilians-Universität
München



OSC
LMU Open Science Center



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Hack your way to scientific glory

Tool 1: Outcome switching



Tool 1: Outcome switching

- 2 outcome variables:

false positive rate **5% → 9.5%**

- 5 outcome variables with one-sided testing:

false positive rate **5% → 41%**

For Vohs et al. (2006), “the authors conducted two additional money priming studies that showed no effects, the details of which were shared with us.” and “reported nine dependent measures that were statistically affected by the manipulation in the predicted direction (one in each experiment) but did not report 19 additional measures that were statistically unchanged”.

Tool 2: Many conditions, report only those that worked

<https://twitter.com/JoeHilgard/status/699693258386051072>

Best-practice example:
Transforming a boring dissertation into a groundbreaking publication



Tool 3: Optional stopping

Repeated Significance Tests on Accumulating Data

By P. ARMITAGE, C. K. MCPHERSON and B. C. ROWE

n	2α k	0.10 1.645		0.05 1.960		0.02 2.326		0.01 2.576	
		Q	S	Q	S	Q	S	Q	S
1		0.10000	0.0970	0.05000	0.0545	0.0200			
2		0.16015	0.1650	0.08312	0.0885	0.0345			
3		0.20207	0.1980	0.10726	0.1115	0.0456			
4		0.23399	0.2295	0.12617	0.1260	0.0545			
5		0.25963	0.2590	0.14169	0.1420	0.0620			
160		0.63315		0.40829		0.2083			
180		0.64301		0.41677		0.2135			
200		0.65165		0.42429		0.2182			
250		0.670		0.440		0.228			
500		0.720		0.487		0.250			
750		0.746		0.500		0.276		0.164	
1,000		0.763				0.288		0.172	

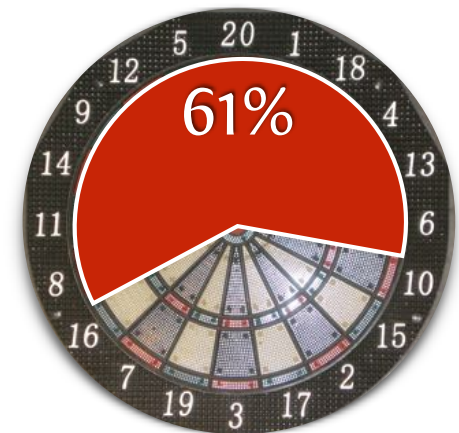
With long enough sampling and optional stopping, it is **guaranteed** to get a significant result!

100%

How bad can it be?

A bad case (but not untypical?) scenario

- Doing some of these *questionable research practices* (QRPs) in combination raises false positive rate from 5% to **61%**!
- QRPs corrupt the logic of the p -value and “renders the reported p -values essentially uninterpretable.”



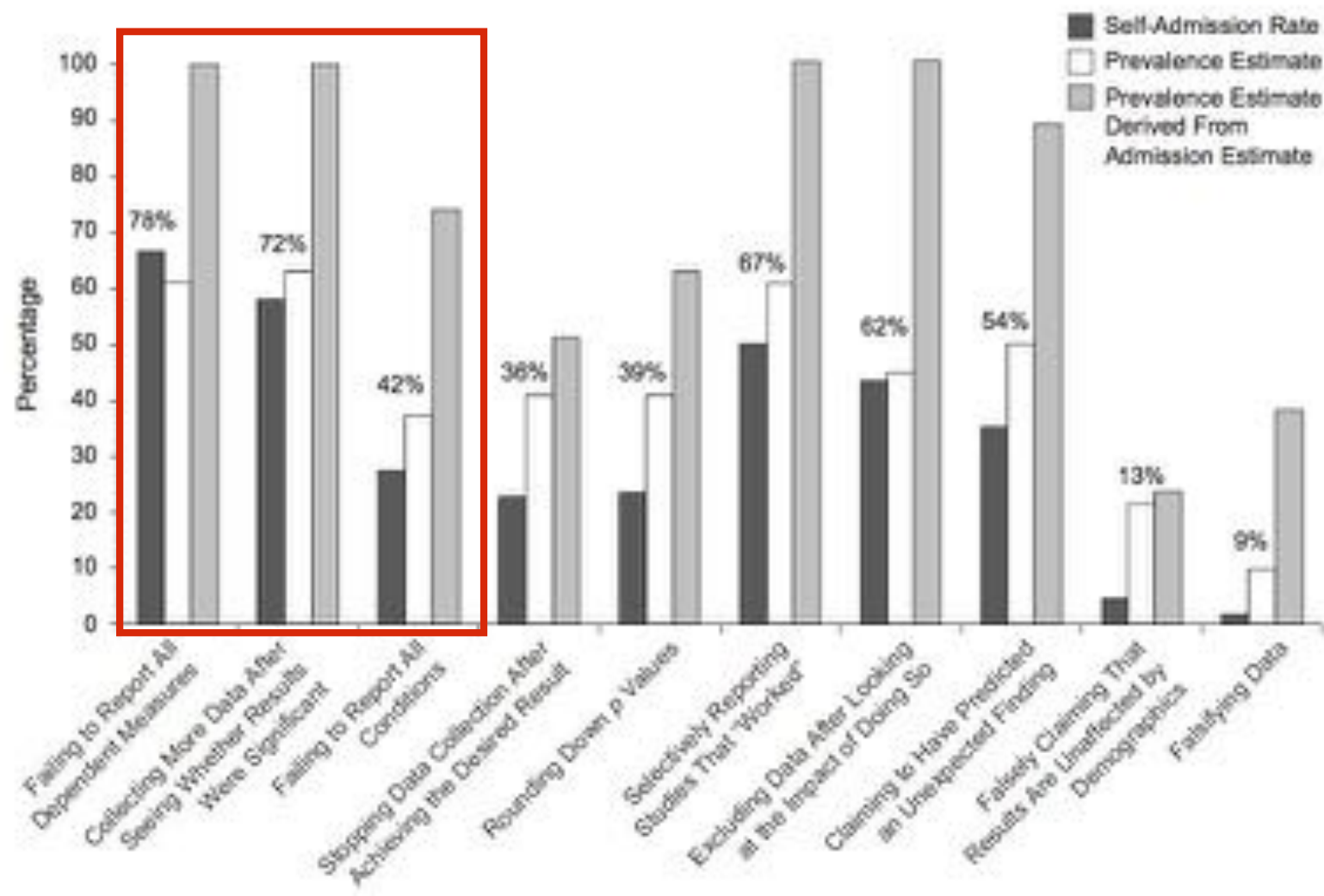
Measuring the Prevalence of Questionable Research Practices With Incentives for Truth Telling

IN PSYCHOLOGY

Psychological Science
21(3) 524-532
© The Author(s) 2012
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sagepub.com/journalsPermissions.nav
DOI: 10.1177/0956797611410913
http://ps.sagepub.com
SAGE

Leslie K. John¹, George Loewenstein², and Drazen Prelec³

¹Marketing Unit, Harvard Business School; ²Department of Social & Decision Sciences, Carnegie Mellon University; and ³Sloan School of Management and Departments of Economics and Brain & Cognitive Sciences, Massachusetts Institute of Technology



Kahneman: Open Letter



Daniel Kahneman, Nobel prize 2002

I believe that you should collectively do something about this mess.

I see a train wreck looming.

Social Psychology: Replication Special Issue

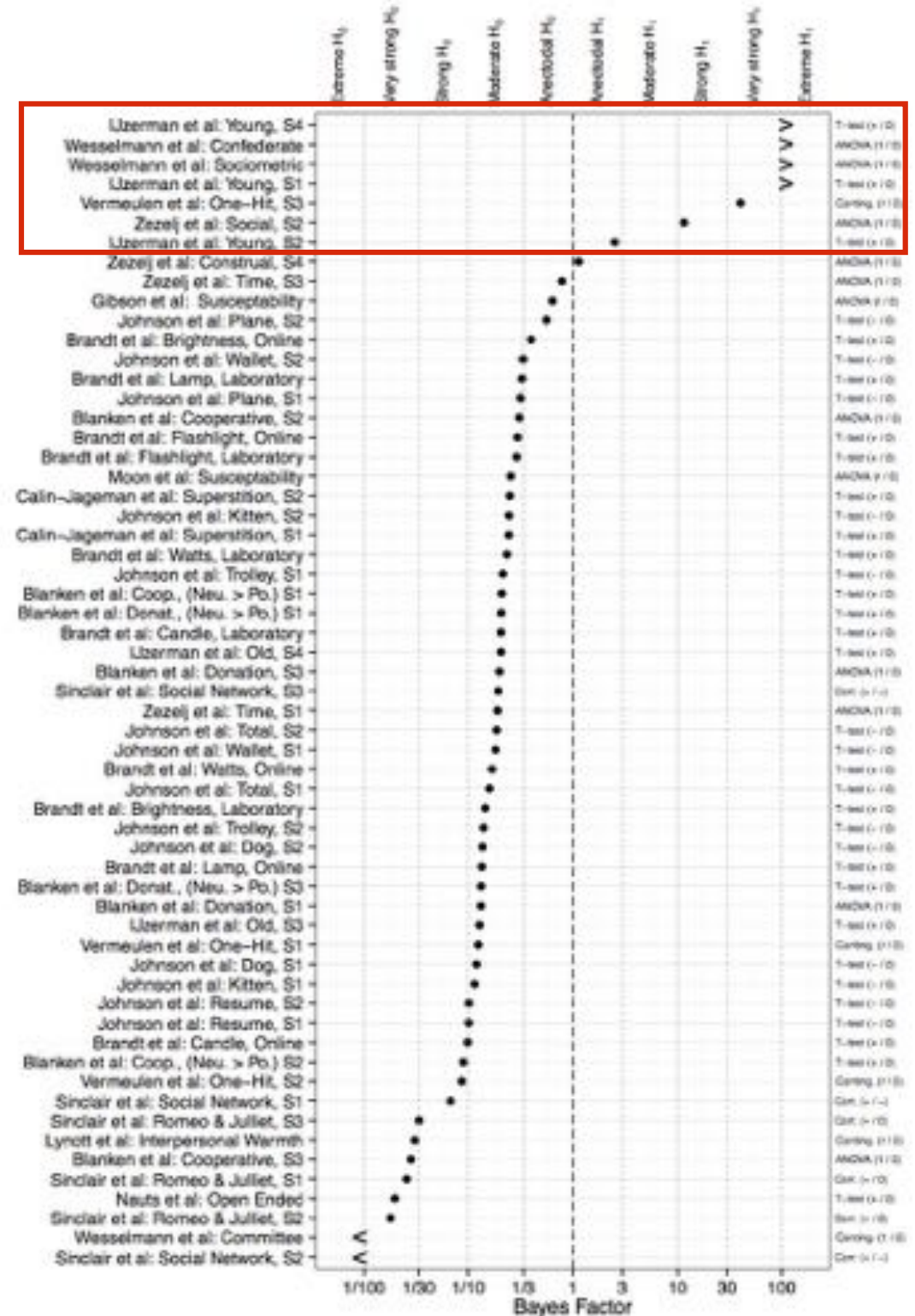
(Nosek & Lakens, 2014)

Bayesian reanalysis

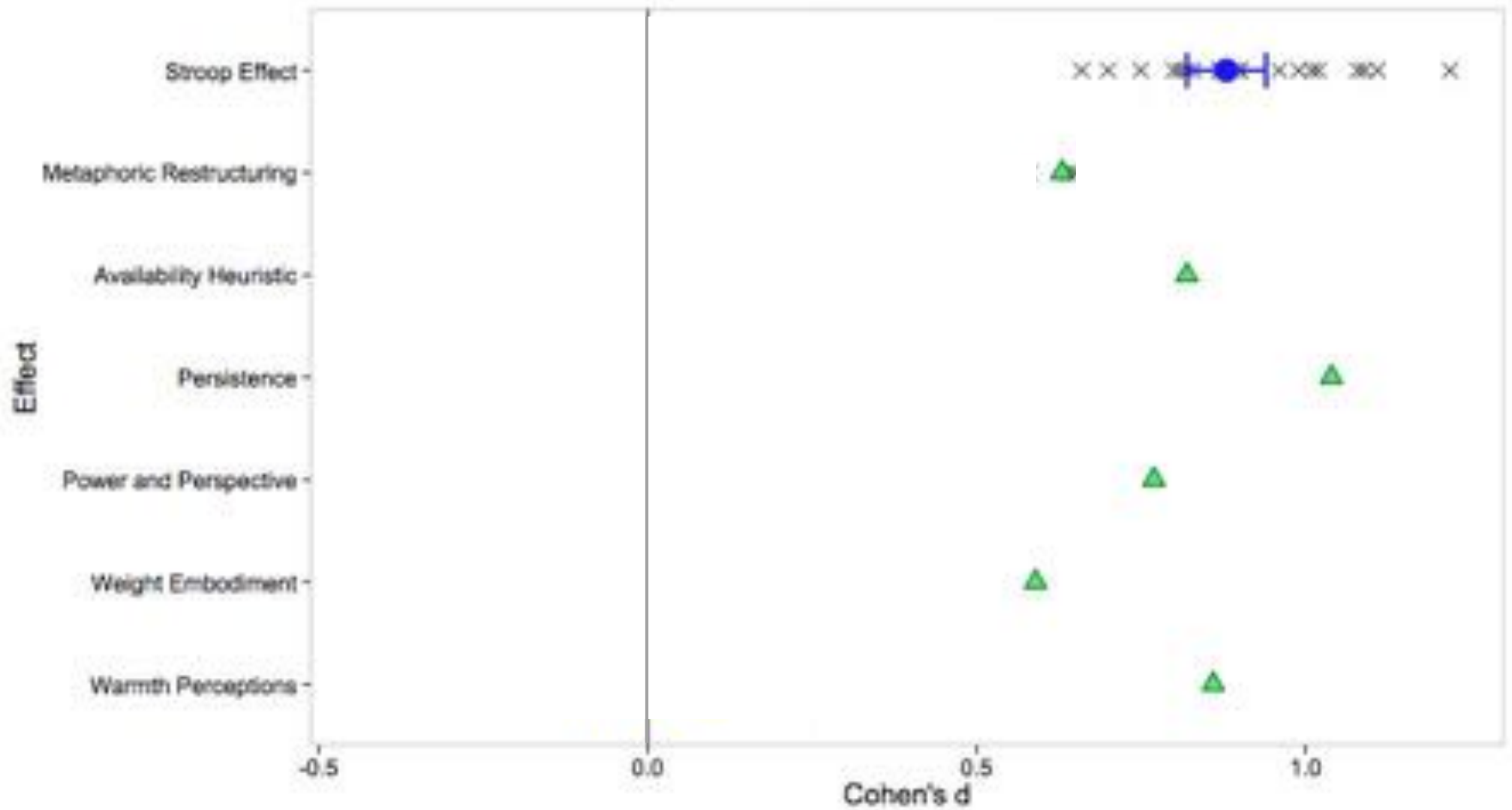
(Marsman, Schönbrodt, Morey, Wagenmakers, in prep.)

7/59 =

12% replicable

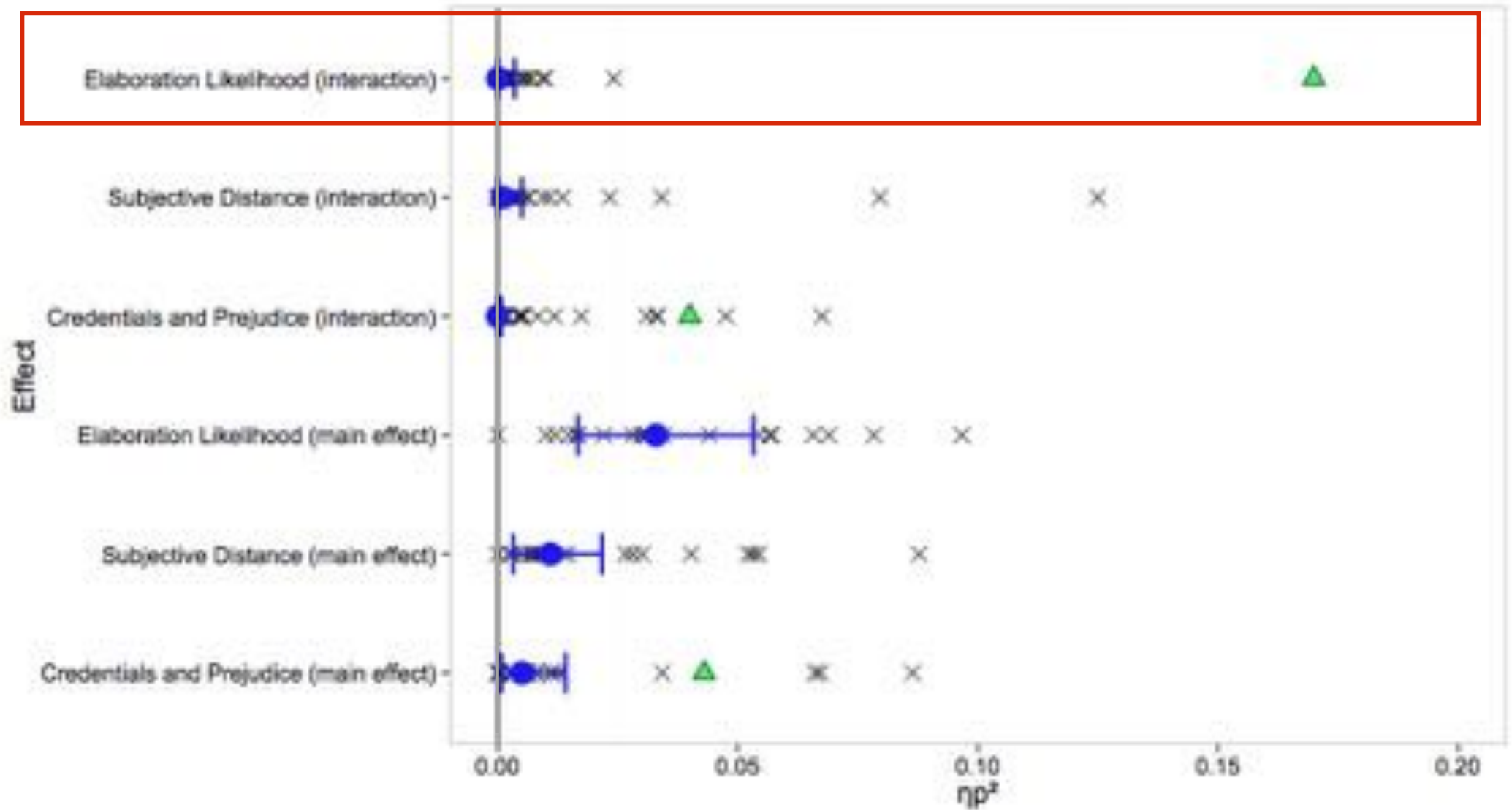


★ ManyLabs 3

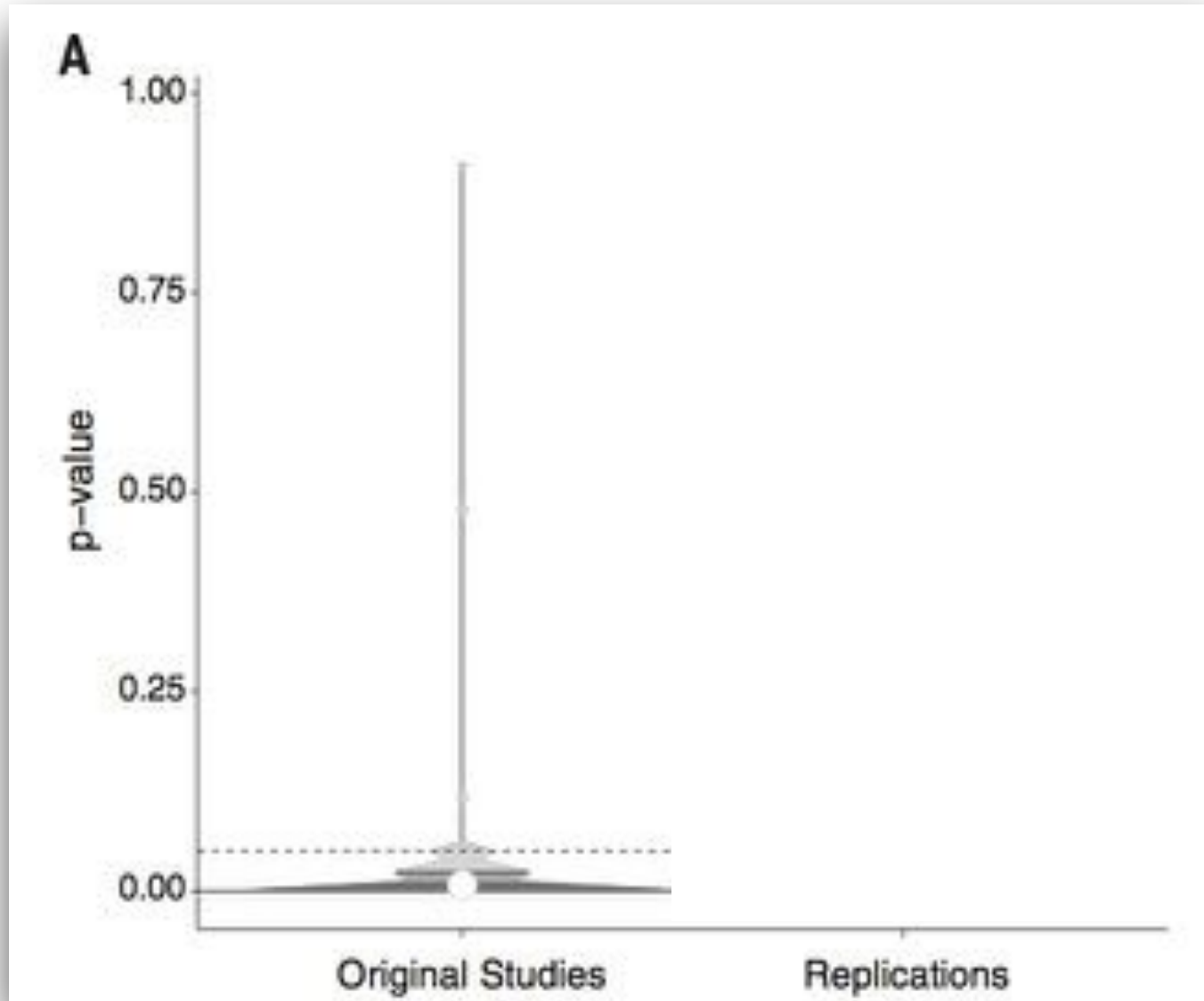


10 effects, 20 labs, $n > 3400$ ||

★ ManyLabs 3



10 effects, 20 labs, $n > 3400$



- 100 replications
- 36% of all replications were significant
 - PS - cog: 53%
 - JEP:LMC: 48%
 - PS - soc: 29%
 - JPSP - soc: 23%
- 83% of all effect sizes are smaller than the original:
 - $M_O: r = .40$
 - $M_R: r = .20$



Eiko Fried hat einen [Link](#) in der Gruppe „PsychMAP“ geteilt.

7 Std. · 🌐

Hopefully interesting for the clinical psych folks out there: one of the most accepted findings in genetic psychiatry — that the interaction of the S allele of the 5-HTTLPR serotonin transporter promoter region and adverse life events lead to depression — was not replicated in N=38803.



Collaborative meta-analysis finds no evidence of a strong interaction between stress and 5-HTTLPR genotype contributing to the development of depression : Sussex

SRO.SUSSEX.AC.UK



Figure 1. Illustration of the technique used to contract the different facial muscles: left, lips condition; right, teeth condition.

Journal of Personality and Social Psychology
1988, Vol. 54, No. 3, 766-777

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0022-3514/88/\$00.75

Inhibiting and Facilitating Conditions of the Human Smile: A Nonobtrusive Test of the Facial Feedback Hypothesis

Fritz Strack
Universität Mannheim
Mannheim, Federal Republic of Germany

Leonard L. Martin
University of Illinois
at Urbana-Champaign

Sabine Stepper
Universität Mannheim
Mannheim, Federal Republic of Germany

Registered Replication Report: Strack, Martin, & Stepper (1988)

E.-J. Wagenmakers*, T. Beek*, L. Dijkhoff*, Q. F. Gronau*,
A. Acosta, R. B. Adams, Jr., D. N. Albohn, E. S. Allard, S. D. Benning,
E.-M. Blouin-Hudon, L. C. Bulnes, T. L. Caldwell, R. J. Calin-Jageman,
C. A. Capaldi, N. S. Carfagno, K. T. Chasten, A. Cleeremans, L. Connell,
J. M. DeCicco, K. Dijkstra, A. H. Fischer, F. Foroni, U. Hess, K. J. Holmes,
J. L. H. Jones, O. Klein, C. Koch, S. Korb, P. Lewinski, J. D. Liao, S. Lund,
J. Lupianez, D. Lynott, C. N. Nance, S. Oosterwijk, A. A. Ozdogru,
A. P. Pacheco-Unguetti, B. Pearson, C. Powis, S. Ridgway, T.-A. Roberts,
R. I. Rumiati, M. Senden, N. B. Shea-Shumsky, K. Sobocko, J. A. Soto,
T. G. Steiner, J. M. Talarico, Z. M. van Allen, M. Vandekerckhove,
B. Wainwright, J. F. Wayand, R. Zeelenberg, E. E. Zetzer, and R. A. Zwaan

*Proposing authors

Protocol vetted by: Ursula Hess

Protocol edited by: Daniel J. Simons

Multilab direct replication of: Study 1 from Strack, F., Martin, L. L., & Stepper, S. (1988). Inhibiting and facilitating conditions of the human smile: A nonobtrusive test of the facial feedback hypothesis. *Journal of Personality and Social Psychology*, 54, 768-777.

Data and registered protocols: <https://osf.io/pkd65/>

Citation: Wagenmakers, E.-J., Beek, T., Dijkhoff, L., Gronau, Q. F., Acosta, A., Adams, R. B., Jr., . . . Zwaan, R. A. (2016). Registered Replication Report: Strack, Martin, & Stepper (1988). *Perspectives on Psychological Science*, 11, 917-928.

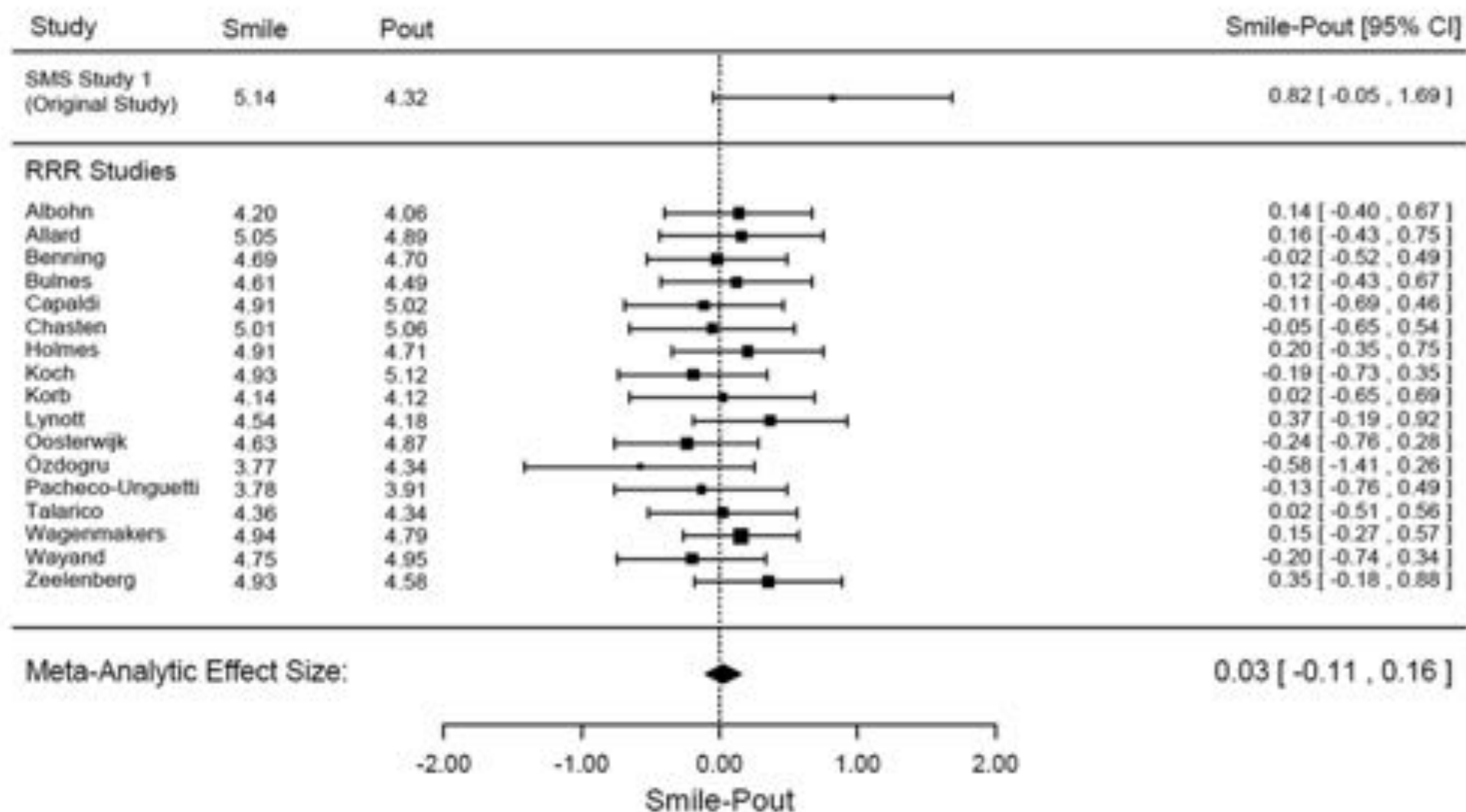
Abstract

According to the *facial feedback hypothesis*, people's affective responses can be influenced by their own facial expression (e.g., smiling, pouting), even when their expression did not result from their emotional experiences. For example, Strack, Martin, and Stepper (1988) instructed participants to rate the funniness of cartoons using a pen that they held in their mouth. In line with the facial feedback hypothesis, when participants held the pen with their teeth (inducing a "smile"), they rated the cartoons as funnier than when they held the pen with their lips (inducing a "pout"). This seminal

Perspectives on Psychological Science
2016, Vol. 11(6) 917-928
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DOI: 10.1177/1745691616674456
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- Direct independent replications from 17 labs
- total N = 1894

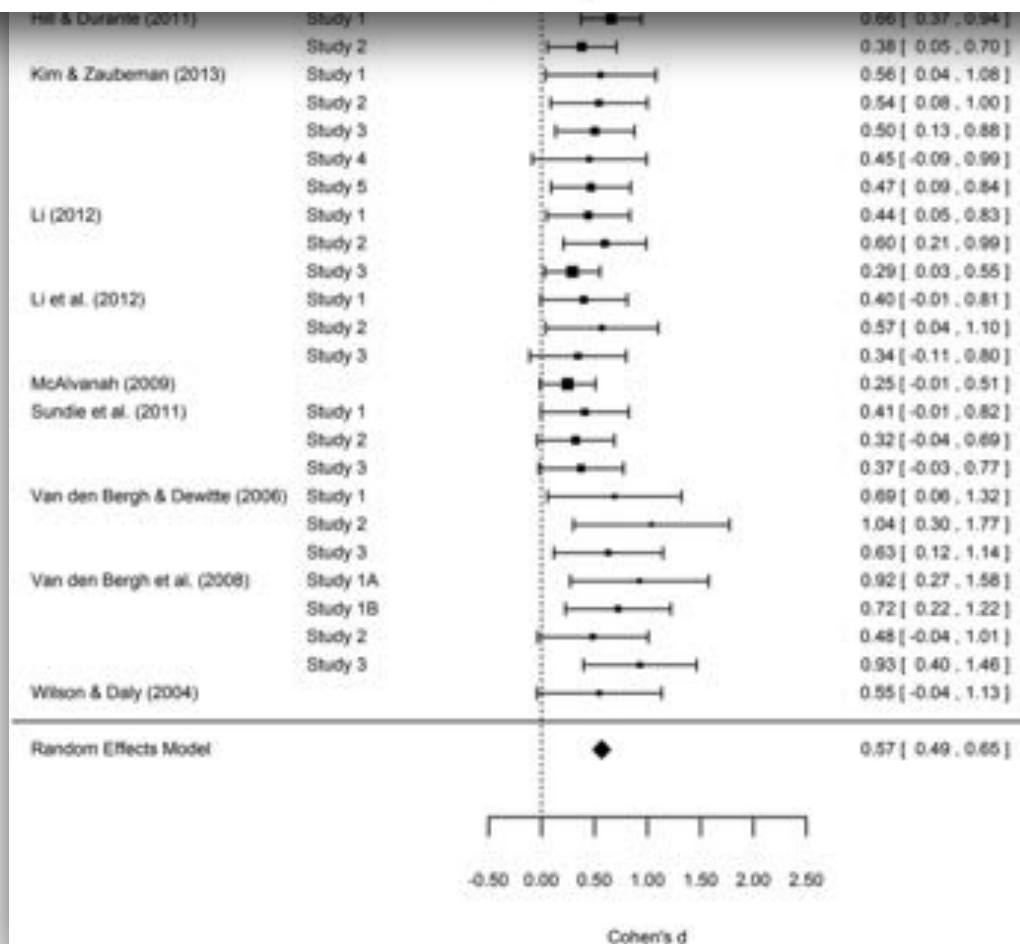


Romance, Risk, and Replication: Can Consumer Choices and Risk-Taking Be Primed by Mating Motives?

David R. Shanks
University College London

Miguel A. Vadillo
King's College London

Benjamin Riedel, Ashley Clymo, Sinita Govind, Nisha Hickin, Amanda J. F. Tamman,
and Lara M. C. Puhlmann
University College London



Random effects
meta-analytic
estimate:
 $d = 0.57 [0.49; 0.65]$

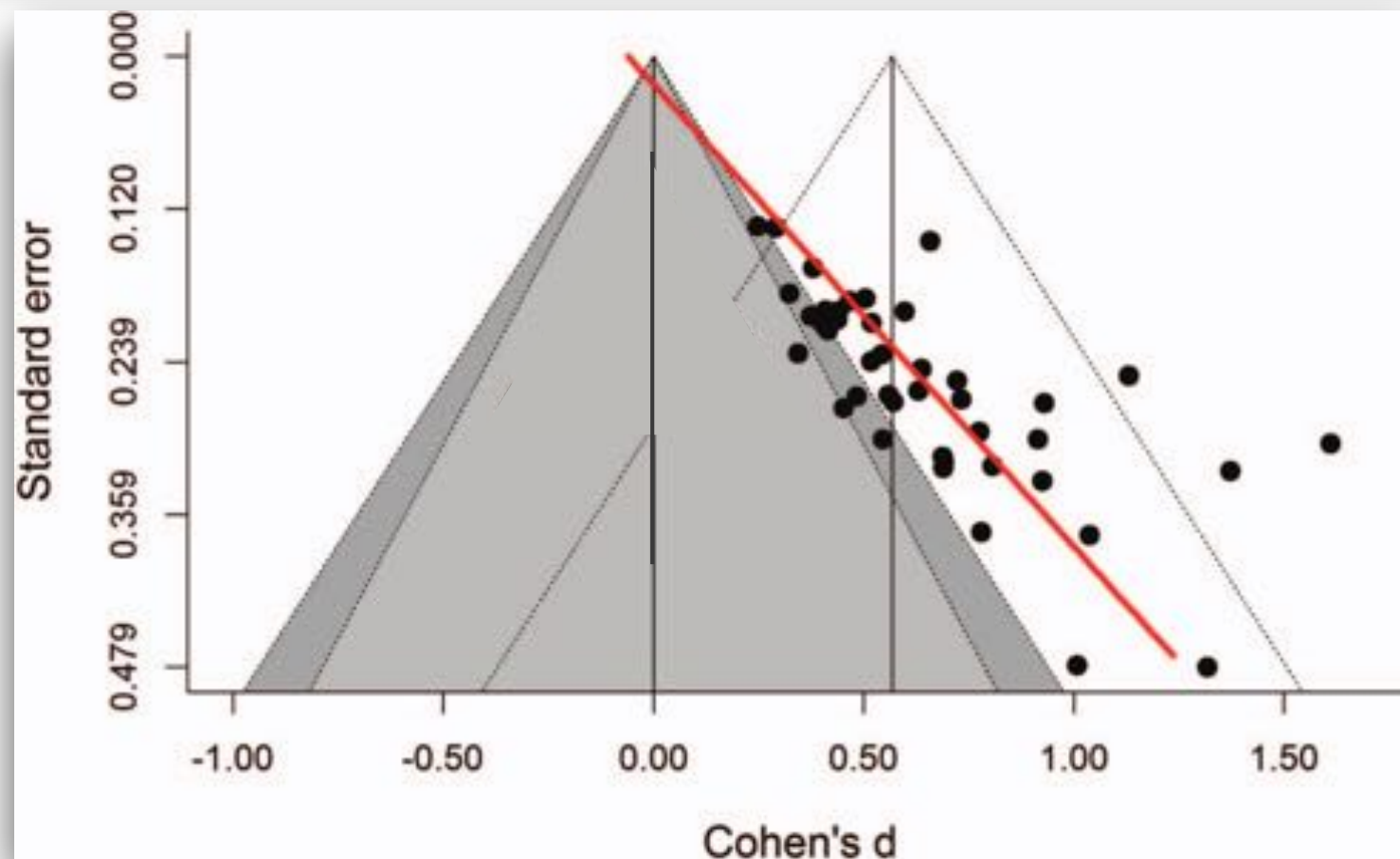
42/43 studies are
significant
(98% success rate)

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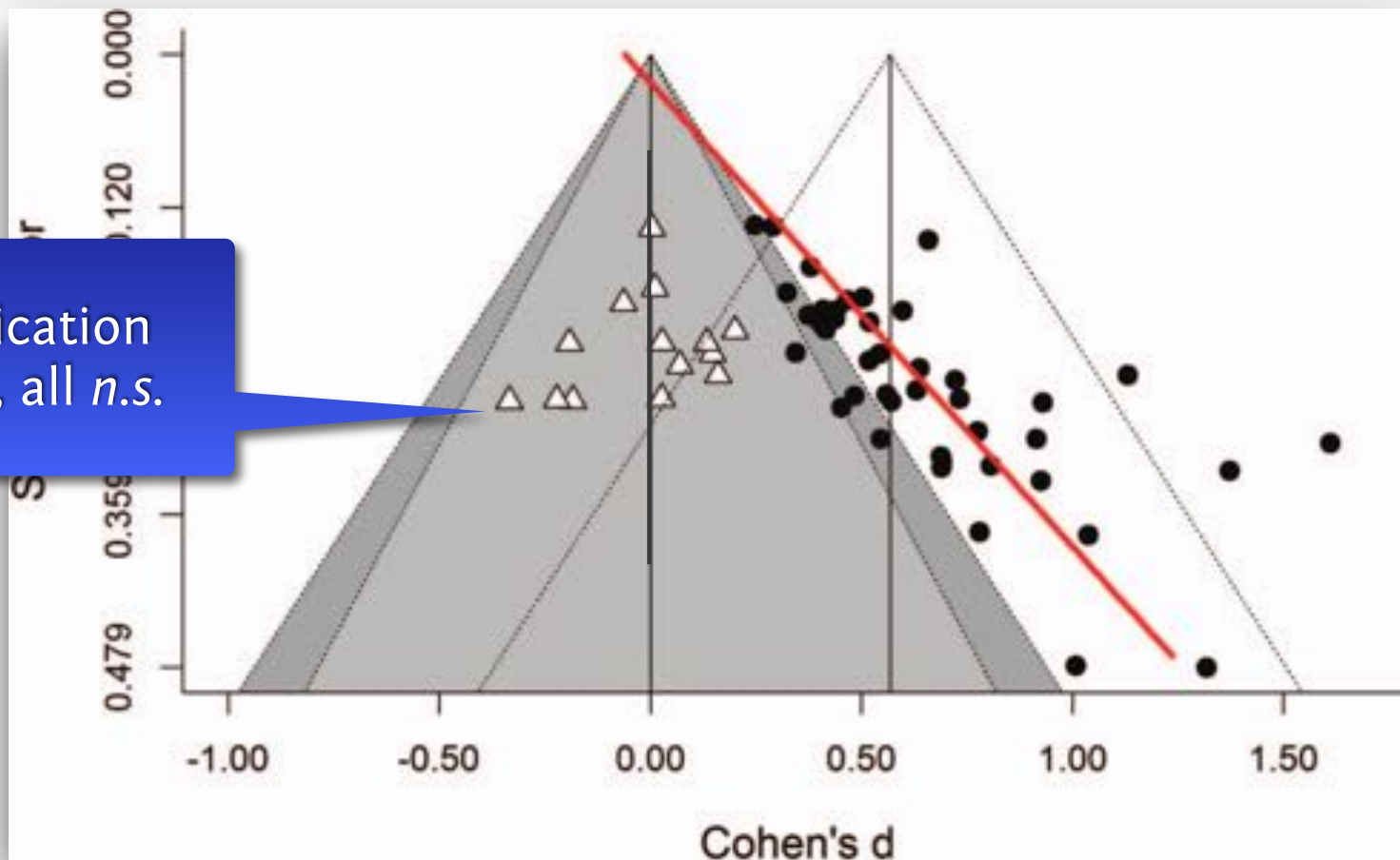
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14 replication
studies, all *n.s.*



Many Labs 2

- Direct replication of 28 classic and contemporary published findings
- 125 samples
- 15,305 total participants from 33 countries and territories
- Results:

Stay tuned at [AMPSS!](#)

Only psychology?

An outlook to other disciplines.

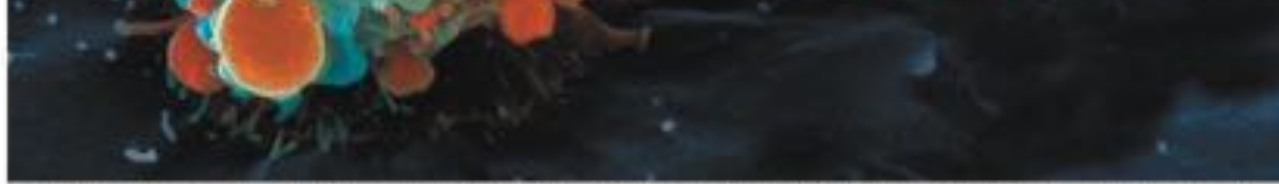
Is Economics Research Replicable? Sixty Published Papers from Thirteen Journals Say “Usually Not”

Andrew C. Chang* and Phillip Li†

September 4, 2015

Abstract

We attempt to replicate 67 papers published in 13 well-regarded economics journals using author-provided replication files that include both data and code. Some journals in our sample require data and code replication files, and other journals do not require such files. Aside from 6 papers that use confidential data, we obtain data and code replication files for 29 of 35 papers (83%) that are required to provide such files as a condition of publication, compared to 11 of 26 papers (42%) that are not required to provide data and code replication files. We successfully replicate the key qualitative result of 22 of 67 papers (33%) without contacting the authors. Excluding the 6 papers that use confidential data and the 2 papers that use software we do not possess, we replicate 29 of 59 papers (49%) with assistance from the authors. Because we are able to replicate less than half of the papers in our sample even with help from the authors, we assert that economics research is usually not replicable. We conclude with recommendations on improving replication of economics research.



Many landmark findings in preclinical oncology research are not reproducible, in part because of inadequate cell lines and animal models.

Raise standards for preclinical cancer research

C. Glenn Begley and Lee M. Ellis propose how methods, publications and incentives must change if patients are to benefit.

Bayer Healthcare: 67 target-validation projects in oncology, women's health, and cardiovascular medicine.

Only 14 (21%) could be reproduced.

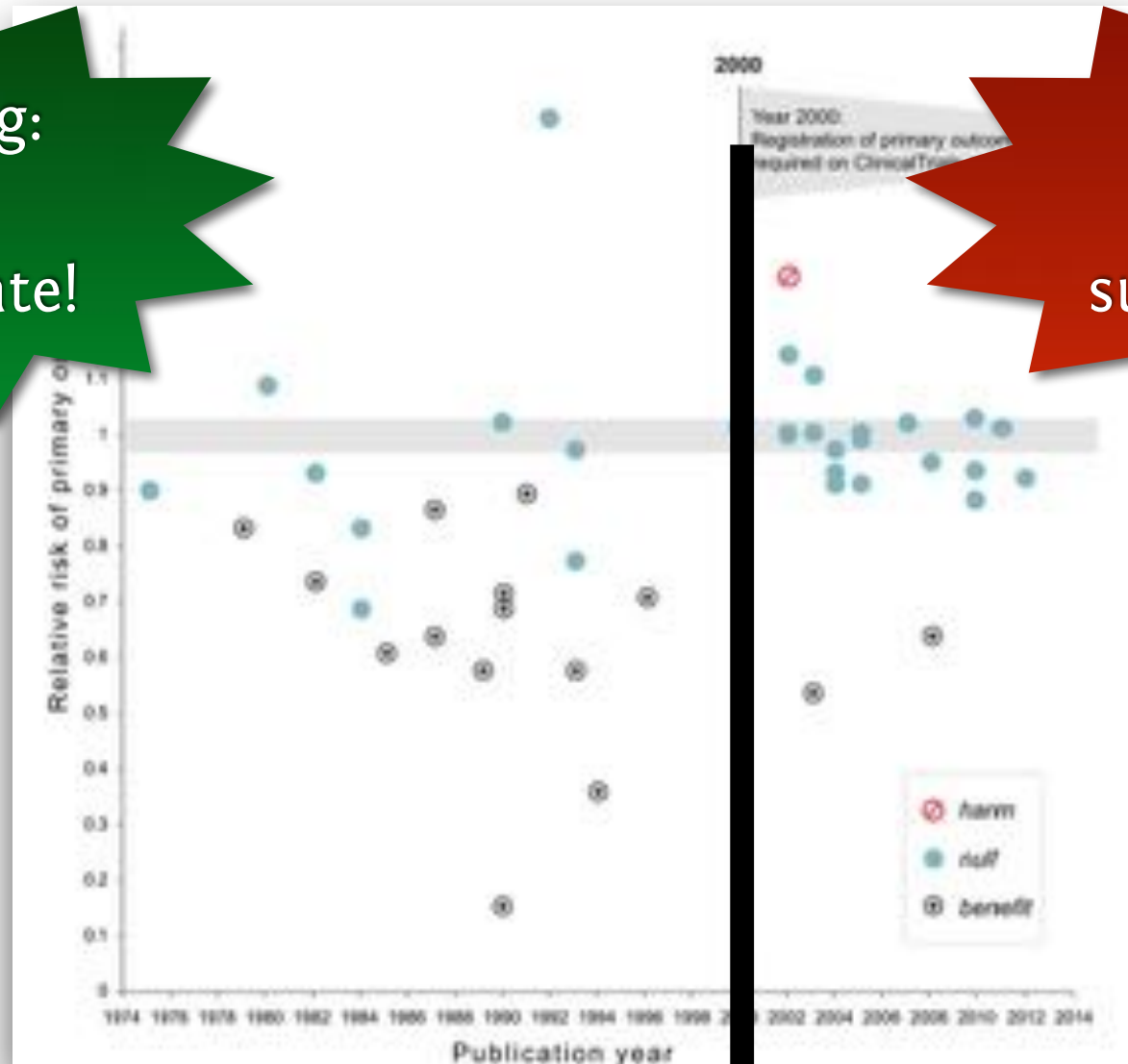
Amgen: **53 'landmark studies', only 6 (11%) could be reproduced.**

“Even knowing the limitations of preclinical research, this was a shocking result.”

Pre-registration causes medicines to stop working!

no prereg:
57%
success rate!

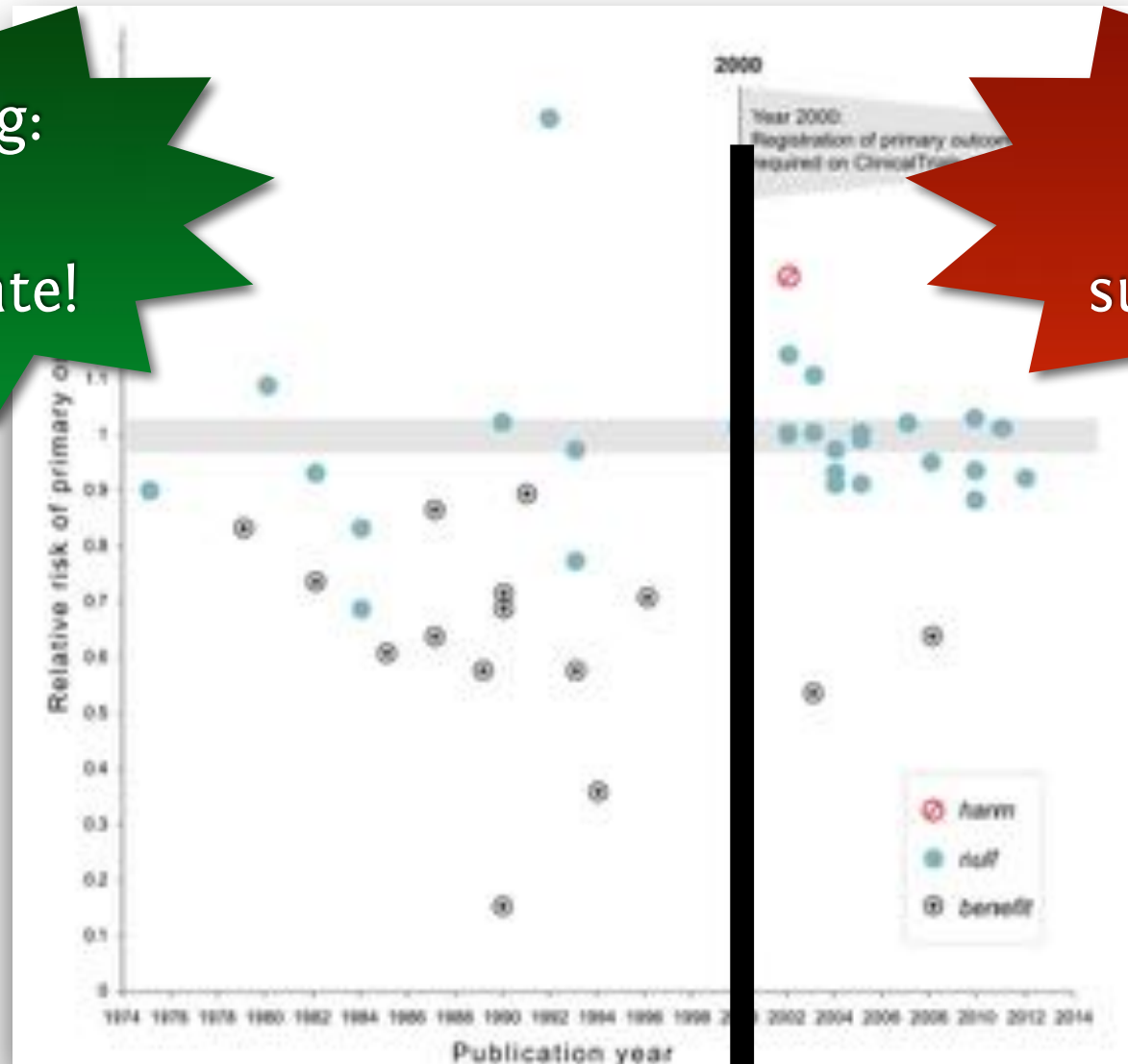
prereg:
8%
success rate...



Pre-registration causes **p-hacking** ~~medicines~~ to stop working!

no prereg:
57%
success rate!

prereg:
8%
success rate...



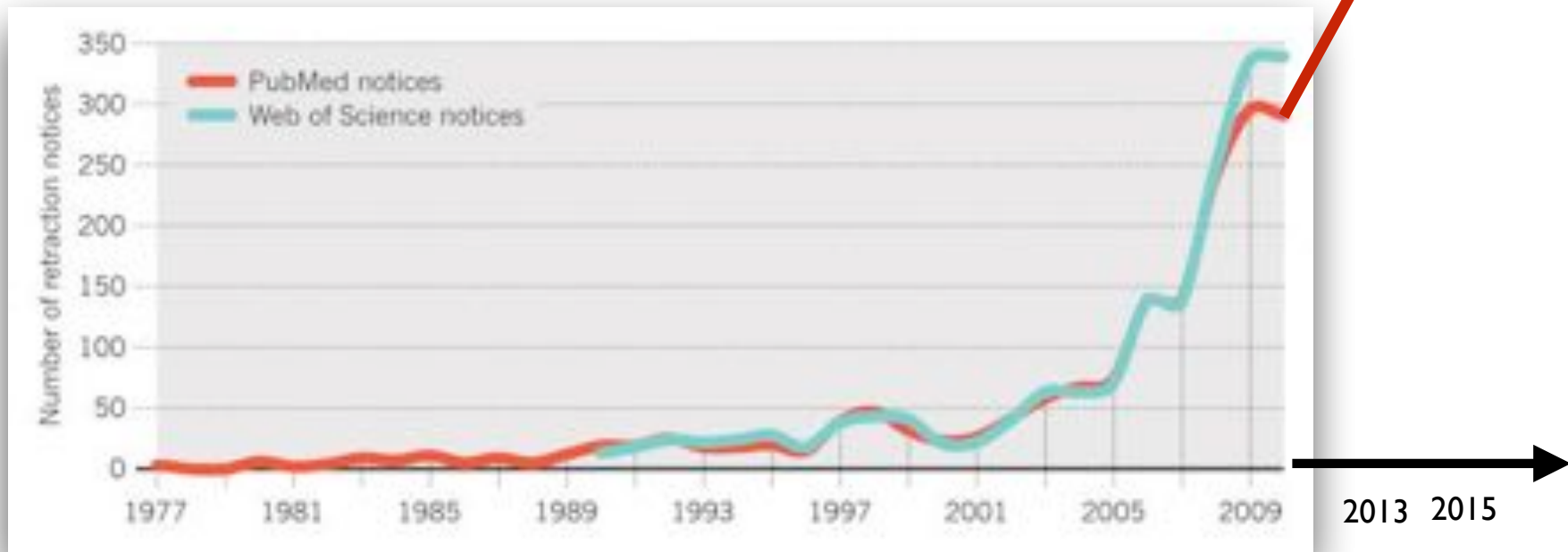
A **dystopian** view of science ...



Coherent stories are made up after seeing the data.
We publish nice fairy-tales; empirical evidence is only
decoration that is tortured until it fits the story.

Retractions: **+1000%** in 10 years

„In the past decade, the number of retraction notices has shot up 10-fold.“



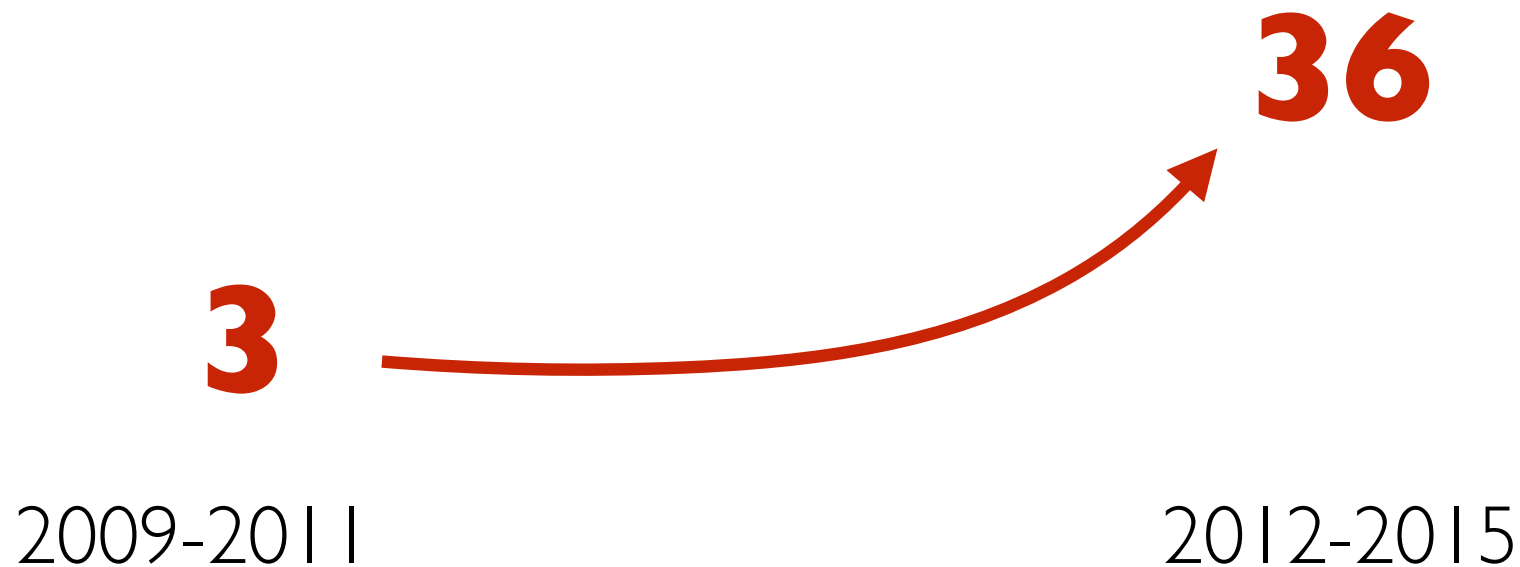
<http://www.nature.com/news/2011/111005/full/478026a/box/2.html>

<http://retractionwatch.com/2016/03/24/retractions-rise-to-nearly-700-in-fiscal-year-2015-and-psst-this-is-our-3000th-post/>

<https://www.washingtonpost.com/news/speaking-of-science/wp/2016/04/01/when-scientists-lie-about-their-research-should-they-go-to-jail/>

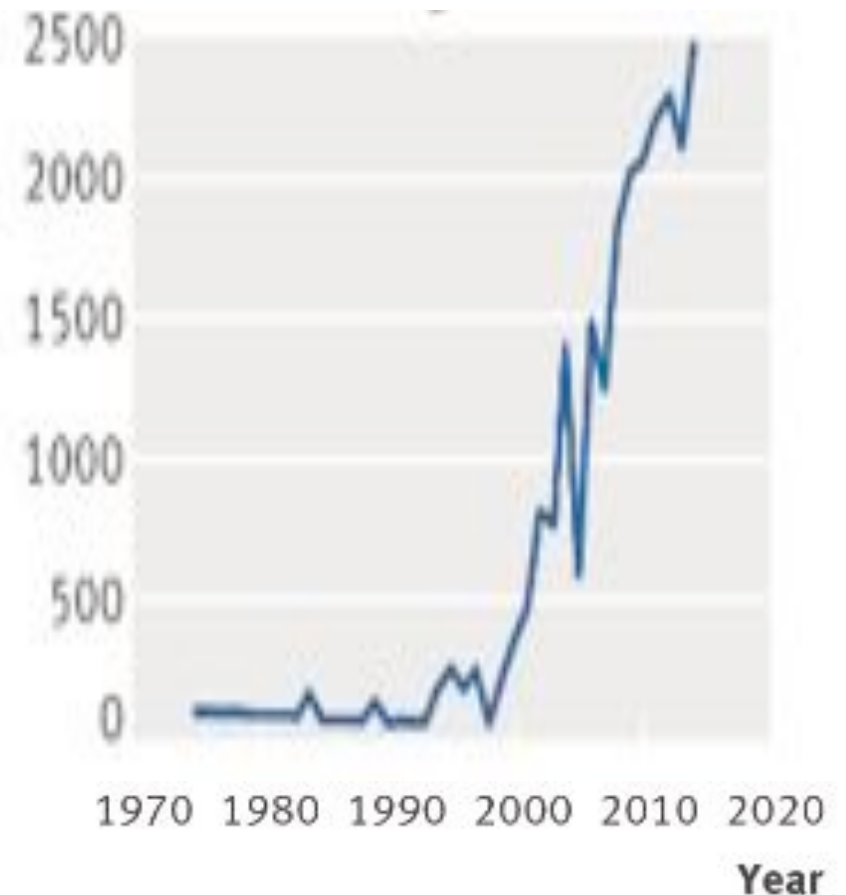
Scientific misconduct: **+ 1200%** in 4 years

U.S. Office of Research Integrity:



„Innovative, unprecedented, transformative!“
+880% from 1974- 2014

Groundbreaking!!!



Thesis:

Our current incentives foster questionable research practices, which decrease the truth value of our shared knowledge.

What is good for the individual careers of researchers leads to a collective fiasco.

Researchers who do it right (i.e., high power, no QRPs, transparency) have a clear competitive disadvantage.

Anti-Thesis:

Society pays for us that we generate valid and robust knowledge.

Our incentives should be chosen in a way that they foster good science.

Researchers who do it right should be supported and promoted.

The old way of doing research

“A tale of two papers” by Michael Inzlicht

Original version

- 7 experiments
- 7/7 significant
- effect sizes in the medium to large range
- many ad-hoc covariates
- “Excessive significance”

“The first [paper] was emblematic of the old way of doing business, with 7 studies that were scrubbed clean to be near-perfect.”

<http://sometimesimwrong.typepad.com/wrong/2015/11/guest-post-a-tale-of-two-papers.html>

2014

- ★ Gründung des Center for Open Science (C^oS) + Open Science Framework
- ★ Simonsohn et al.: p -curve
- ★ ManyLabs I & Special Issue “Replication” C^oS
- ★ Schnall-Debatte
- ★ ManyLabs 3 C^oS
- ★ Reproducibility Project: Psychology (RP:P) C^oS
- ★ DGPs Pressemitteilung und Diskussionsforum

2015

2017



“A tale of two papers”

by Michael Inzlicht

Original version

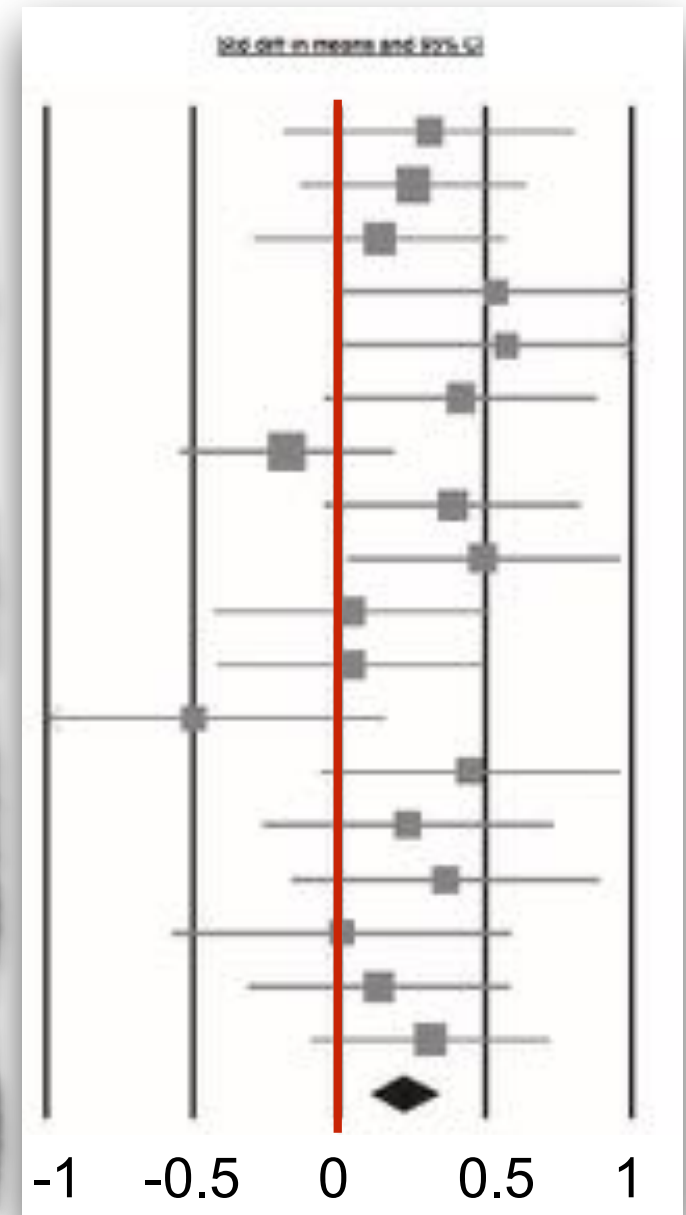
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- 7/7 significant
- effect sizes in the medium to large range
- many ad-hoc covariates
- “Excessive significance”

“The first [paper] was emblematic of the old way of doing business, with 7 studies that were scrubbed clean to be near-perfect.”

Revised version

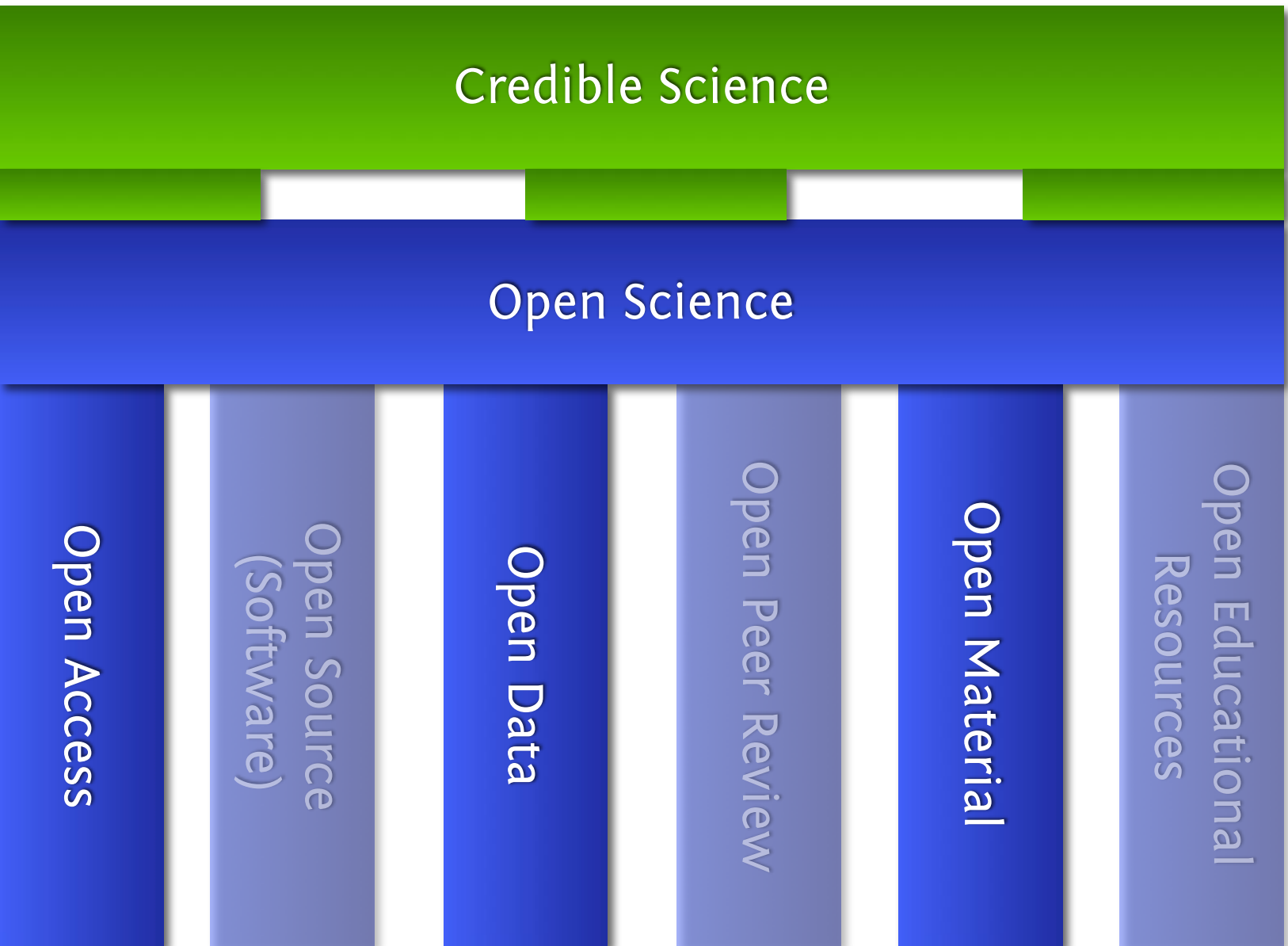
- 18 experiments
- 2/18 significant
- Some studies with reversed direction

“This is what real data look like. The data are not always pretty, they have warts, but they are real.”



The new way of doing research:

A scientific framework
for the 21. century

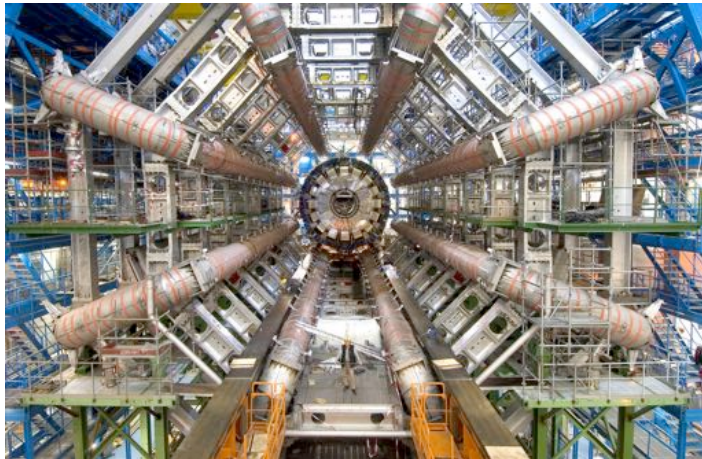


A look at other disciplines

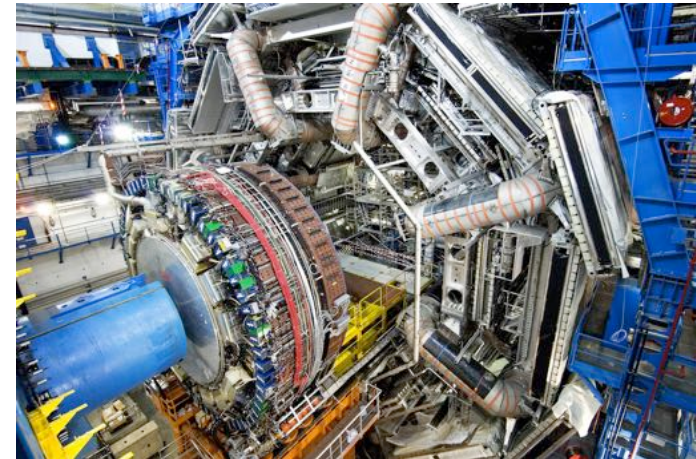
Physics: CERN

Built-in independent replication

ATLAS, 550 Mio €



CMS, 350 Mio €



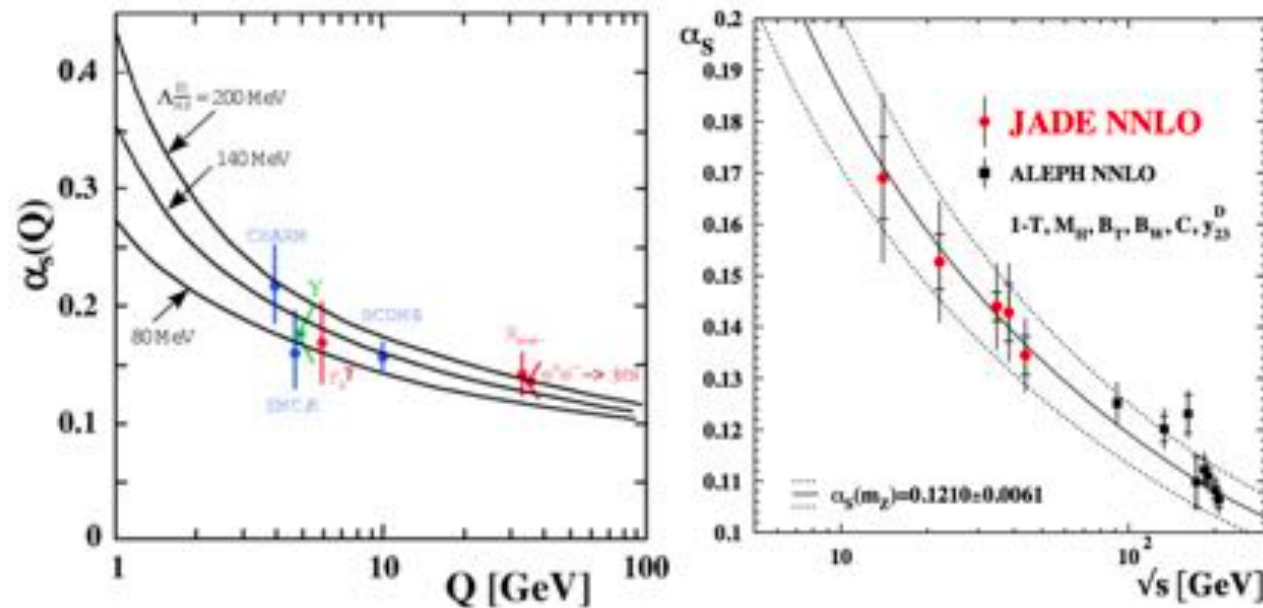
The biggest of these experiments, **ATLAS** and **CMS**, use general-purpose detectors to investigate the largest range of physics possible. Having two independently designed detectors is vital for cross-confirmation of any new discoveries made. **ALICE** and

➔ Independent replication is built into the system. A „discovery“ is only declared as a discovery when it has been independently replicated

Physics: Open Data

Why? Uniqueness of data

- JADE experiment (1979–1986) on PETRA accelerator at DESY
- JADE data still cover unique e^+e^- energy range in 2017
- JADE data being re-analysed even ~ 35 years later!



DPHEP <https://arxiv.org/abs/1205.4667>

@tiborsimko

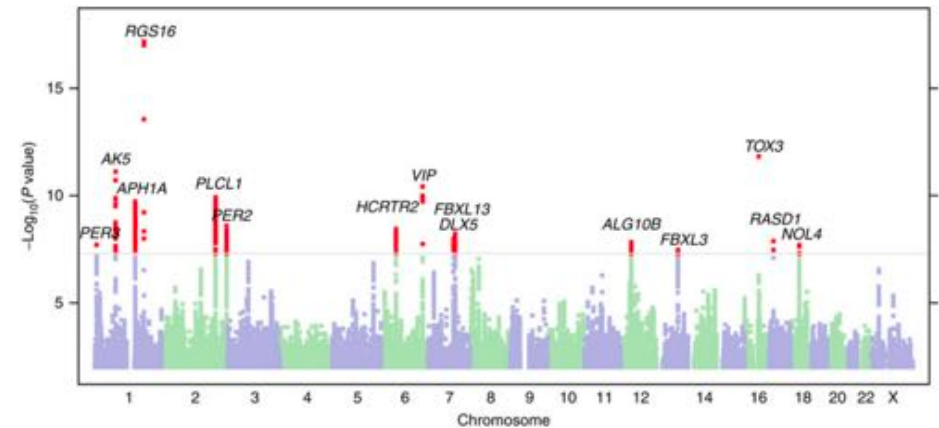
4 / 30

Chemistry

Danheiser is the editor-in-chief of the unconventional journal *Organic Syntheses* that has verified the experiments of all the papers it has published since it launched in 1921. The journal does this by having the research replicated by independent chemists before publishing them – a practice that is almost unheard of in chemistry or any other research field (the exception being a few brief instances in history). All experiments are checked for reproducibility in the lab of one of the journal's board of editors, often by graduate students and postdoctoral researchers working under the supervision of the *Organic Syntheses* editor.

Between 2010 and 2016, the journal rejected 7.5% of submissions due to irreproducibility of yield or selectivity, Danheiser notes. 'Most chemists would consider that to be frightening,' he adds, as papers in conventional journals are therefore less likely to be reproducible.

Genome-wide associations studies



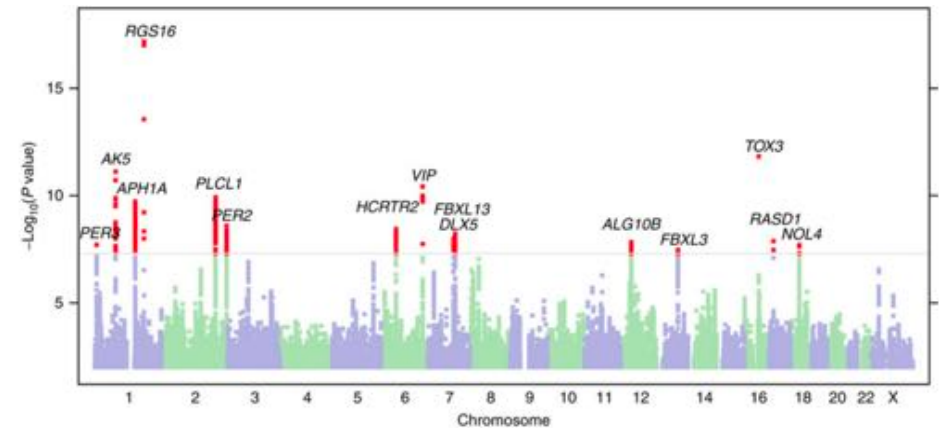
- „prior to 2005, the field was largely a scientific wasteland scattered with the embarrassing and wretched corpses of unreplicated genetic association studies“
(Daniel MacArthur, 2009)



© KC Green

**OUR REPLICATION
RATE IS STATISTICALLY
INDISTINGUISHABLE FROM
100%!**

Genome-wide associations studies



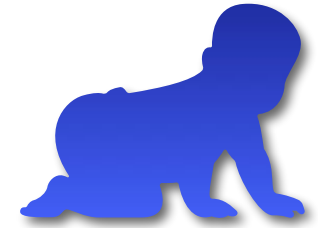
- „prior to 2005, the field was largely a scientific wasteland scattered with the embarrassing and wretched corpses of unreplicated genetic association studies“

(Daniel MacArthur, 2009)

- But after that ...
 - ✓ new statistical standard of evidence: $p < .00000005$
 - ✓ independent replication is standard
 - ✓ all raw data are shared openly (e.g., European Genome-phenome Archive)

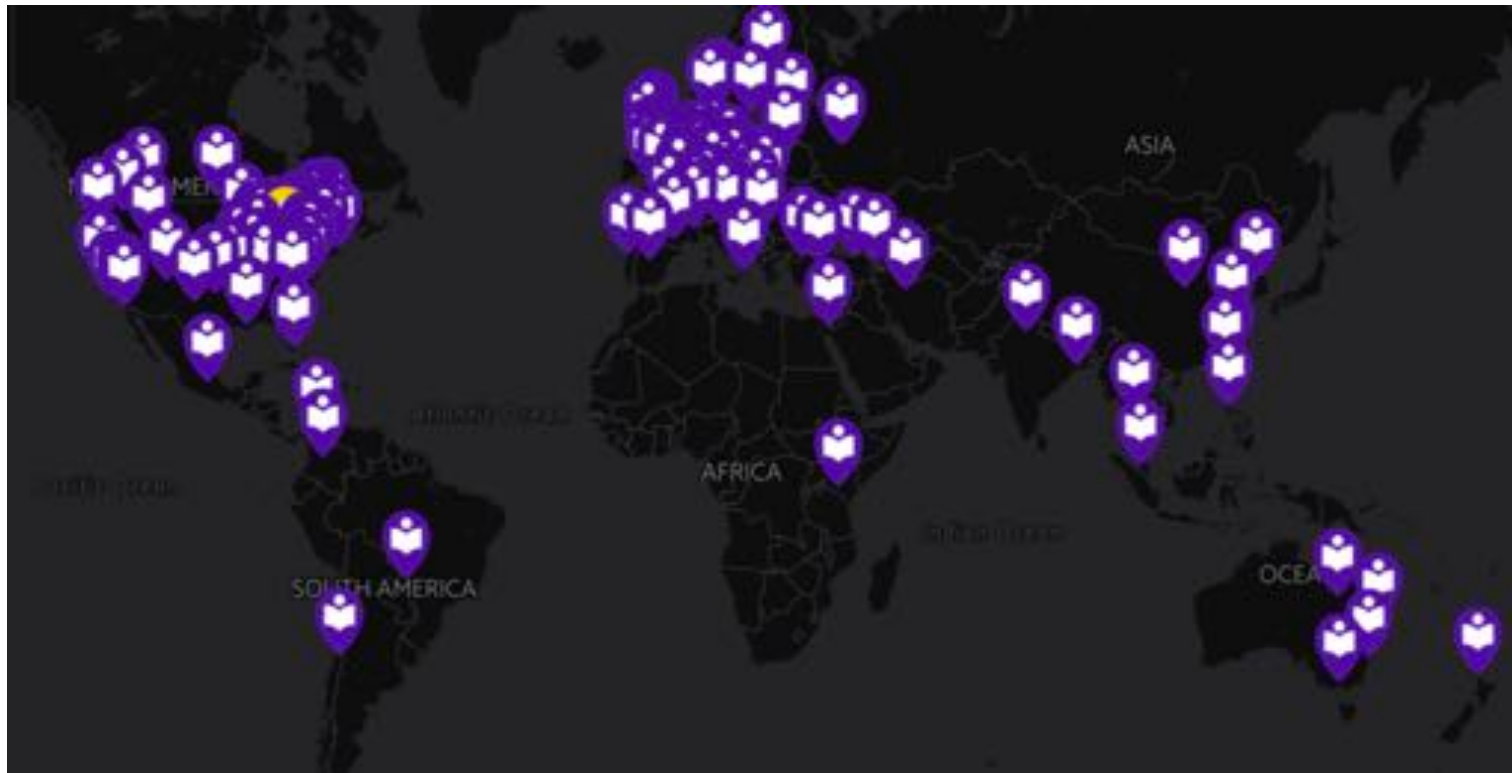
Back to psychology ...

Developmental Psychology: ManyBabies project



- Developmental psychology has notoriously low sample sizes, low power, and huge publication bias: „We simply cannot get large samples with baby studies!“
- But then ...
- ✓ ManyBabies I project (spearheaded by Michael Frank):
Infant Directed Speech Preference
- ✓ Decide as a community: What are the most relevant, most pressing, theoretically most important research questions?
- ✓ Do multi-lab collaborations to achieve this goal
- ✓ First project: A registered replication report (RRR) with guaranteed publication; preregistered + open data
- ✓ The next RRR on Theory of Mind is on its way

A CERN for psychology: The Psychological Science Accelerator



- Spearheaded by Christopher Chartier
- 106 labs from 30 countries
- <https://christopherchartier.com/2017/10/03/the-psychological-science-accelerator-rapid-progress-more-help-needed/>

Open Science Badges



Roberta Michnick Golinkoff, Amy Pace, Paula K. S. Yust, and Katharine Suma
The Contribution of Early Communication Quality to Low-Income Children's Language Success
Psychological Science July 2015 26: 1071-1083, first published on June 5, 2015
doi:10.1177/0956797615581493

[Abstract](#) [Full Text](#) [Full Text \(PDF\)](#)  [Request Permissions](#)

☐ Helen Colby, Jeff DeWitt, and Gretchen B. Chapman
Grouping Promotes Equality: The Effect of Recipient Grouping on Allocation of Limited Medical Resources
Psychological Science July 2015 26: 1084-1089, first published on June 15, 2015
doi:10.1177/0956797615583978



[Abstract](#) [Full Text](#) [Full Text \(PDF\)](#)  [Supplemental Material](#)
[Request Permissions](#)

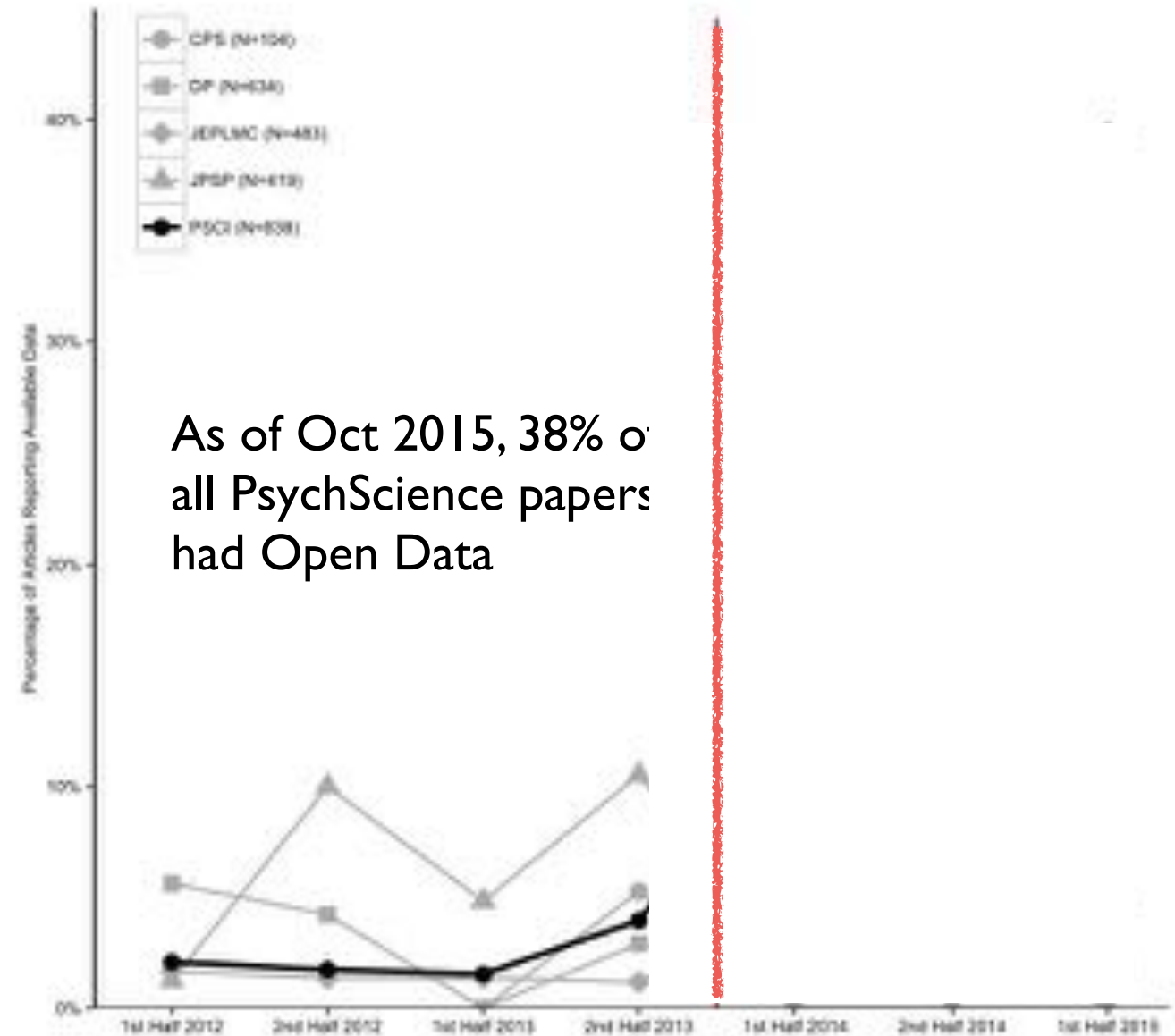
Research Reports

☐ Samantha P. Fan, Zoe Liberman, Boaz Keysar, and Katherine D. Kinzler
The Exposure Advantage: Early Exposure to a Multilingual Environment Promotes Effective Communication
Psychological Science July 2015 26: 1090-1097, first published on May 8, 2015
doi:10.1177/0956797615574699



Open Science Badges

<https://osf.io/tvyxz/wiki/home/>



As of Oct 2015, 38% of all PsychScience papers had Open Data

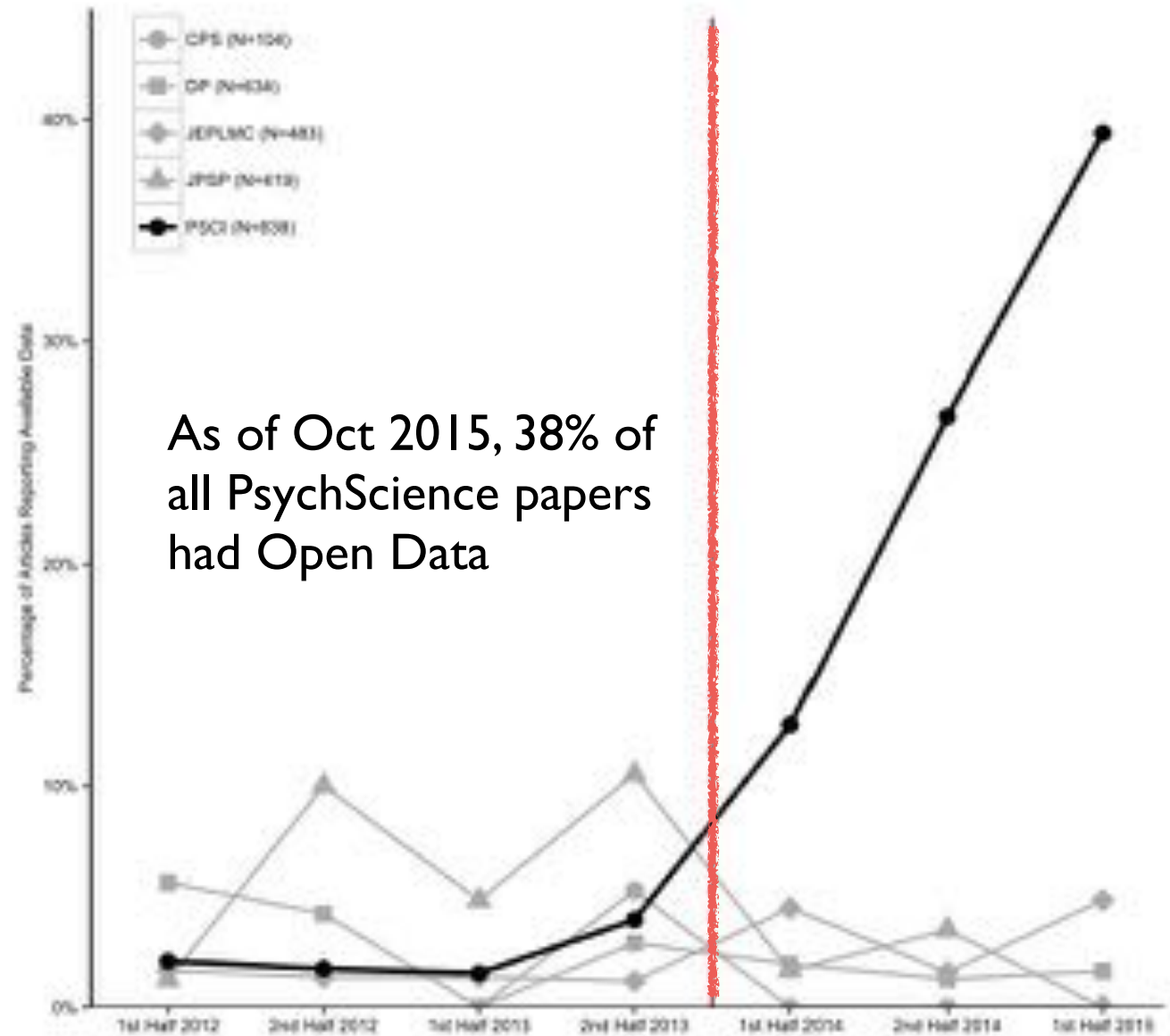
Kidwell, M. C., Lazarević, L. B., Baranski, E., Hardwicke, T. E., Piechowski, S., Falkenberg, L.-S., et al. (2016). Badges to Acknowledge Open Practices: A Simple, Low-Cost, Effective Method for Increasing Transparency. *PLoS Biology*, 14(5), e1002456–15. <http://doi.org/10.1371/journal.pbio.1002456>

Fig 2. Reportedly available data. Percentage of articles reporting open data by half year by journal. Dotted line indicates Psychological Science, and dotted red line indicates when badges were introduced in Psychological Science and none of the comparison journals. Underlying data (<https://osf.io/zt28k/>) and scripts (<https://osf.io/bd3g/>) to reproduce this figure can be found on the Open Science Framework.

[doi:10.1371/journal.pbio.1002456.g002](https://doi.org/10.1371/journal.pbio.1002456.g002)

Open Science Badges

<https://osf.io/tvyxz/wiki/home/>



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Kidwell, M. C., Lazarević, L. B., Baranski, E., Hardwicke, T. E., Piechowski, S., Falkenberg, L.-S., et al. (2016). Badges to Acknowledge Open Practices: A Simple, Low-Cost, Effective Method for Increasing Transparency. *PLoS Biology*, 14(5), e1002456–15. <http://doi.org/10.1371/journal.pbio.1002456>

Fig 2. Reportedly available data. Percentage of articles reporting open data by half year by journal. Dotted line indicates Psychological Science, and dotted red line indicates when badges were introduced in Psychological Science and none of the comparison journals. Underlying data (<https://osf.io/2b2kx/>) and scripts (<https://osf.io/2b2kx/>) to reproduce this figure can be found on the Open Science Framework.

[doi:10.1371/journal.pbio.1002456.g002](https://doi.org/10.1371/journal.pbio.1002456.g002)

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Quarterly publication of scientific psychology featuring original studies, research, critical contributions, interviews and book reviews. [more](#)

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An article in the latest issue of Psychological Thought discusses the question whether doodling has...

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Transparency and Openness Promotion (TOP) Guidelines

Summary of the eight standards and three levels of the TOP guidelines				
Levels 1 to 3 are increasingly stringent for each standard. Level 0 offers a comparison that does not meet the standard.				
	LEVEL 0	LEVEL 1	LEVEL 2	LEVEL 3
Citation standards	Journal encourages citation of data, code, and materials—or says nothing.	Journal describes citation of data in guidelines to authors with clear rules and examples.	Article provides appropriate citation for data and materials used, consistent with journal's author guidelines.	Article is not published until appropriate citation for data and materials is provided that follows journal's author guidelines.
Data transparency	Journal encourages data sharing—or says nothing.	Article states whether data are available and, if so, where to access them.	Data must be posted to a trusted repository. Exceptions must be identified at article submission.	Data must be posted to a trusted repository, and reported analyses will be reproduced independently before publication.
Analytic methods (code) transparency	Journal encourages code sharing—or says nothing.	Article states whether code is available and, if so, where to access them.	Code must be posted to a trusted repository. Exceptions must be identified at article submission.	Code must be posted to a trusted repository, and reported analyses will be reproduced independently before publication.
Research materials transparency	Journal encourages materials sharing—or says nothing.	Article states whether materials are available and, if so, where to access them.	Materials must be posted to a trusted repository. Exceptions must be identified at article submission.	Materials must be posted to a trusted repository, and reported analyses will be reproduced independently before publication.
Design and analysis transparency	Journal encourages design and analysis transparency or says nothing.	Journal articulates design transparency standards.	Journal requires adherence to design transparency standards for review and publication.	Journal requires and enforces adherence to design transparency standards for review and publication.
Preregistration of studies	Journal says nothing.	Journal encourages preregistration of studies and provides link in article to preregistration if it exists.	Journal encourages preregistration of studies and provides link in article and certification of meeting preregistration badge requirements.	Journal requires preregistration of studies and provides link and badge in article to meeting requirements.
Preregistration of analysis plans	Journal says nothing.	Journal encourages preanalysis plans and provides link in article to registered analysis plan if it exists.	Journal encourages preanalysis plans and provides link in article and certification of meeting registered analysis plan badge requirements.	Journal requires preregistration of studies with analysis plans and provides link and badge in article to meeting requirements.
Replication	Journal discourages submission of replication studies—or says nothing.	Journal encourages submission of replication studies.	Journal encourages submission of replication studies and conducts blind review of results.	Journal uses Registered Reports as a submission option for replication studies with peer review before observing the study outcomes.

Summary of the eight standards and three levels of the TOP guidelines

Levels 1 to 3 are increasingly stringent for each standard. Level 0 offers a comparison that does not meet the standard.

	LEVEL 0	LEVEL 1	LEVEL 2	LEVEL 3
Citation standards	Journal encourages citation of data, code, and materials—or says nothing.	Journal describes citation of data in guidelines to authors with clear rules and examples.	Article provides appropriate	Article is not published until
Data transparency	Journal encourages data sharing—or says nothing.	Article states whether data are available and, if so, where to access them.	Data must be posted to a trusted repository. Exceptions must be identified at article submission.	Data must be posted to a trusted repository, and reported analyses will be reproduced independently before publication.
Methods transparency	Journal encourages methods transparency—or says nothing.	Article states whether data are available and, if so, where to access them.	Code must be posted to a trusted repository.	Code must be posted to a trusted repository, and reported analyses will be reproduced independently before publication.

Data sharing transparency

Level 0

Level 1

Level 2

Level 3

Journal encourages data sharing—or says nothing.

Article states whether data are available and, if so, where to access them.

Data must be posted to a trusted repository. Exceptions must be identified at article submission.

Data must be posted to a trusted repository, and reported analyses will be reproduced independently before publication.

Preregistration of studies	Journal says nothing.	Journal encourages preregistration of studies and provides link in article to preregistration if it exists.	Journal encourages preregistration of studies and provides link in article and certification of meeting preregistration badge requirements.	Journal requires preregistration of studies and provides link and badge in article to meeting requirements.
Preregistration of analysis plans	Journal says nothing.	Journal encourages preanalysis plans and provides link in article to registered analysis plan if it exists.	Journal encourages preanalysis plans and provides link in article and certification of meeting preregistration badge requirements.	Journal requires preregistration of studies with analysis plans and provides link and badge in article to meeting requirements.
Replication	Journal discourages submission of replication studies—or says nothing.	Journal encourages submission of replication studies.	Journal encourages submission of replication studies.	Journal requires submission of replication studies.

ajps

American Journal of Political Science

25.6.2015

the eight standards and three levels of the TOP guidelines



Brian Nosek
@BrianNosek

New paper, new ir
Guidelines. In Scie
100+ journal signa
Übersetzung anzeigen

14.7.2015



Chris Chambers
@chrisda77

TOP guidelines for research transp
d by 171 journals &
@Frontiersin & @P
science.org/top/

28.8.2015



CenterForOpenScience
@OSFramework



Folge Ich

510 journals + 49 orgs are signatories to the
Transparency and Openness Promotion
(TOP) Guidelines. Read more: cos.io/top

Cognition and
Emotion

European Journal of
Personality

Experimental
Psychology

Journal of Research in
Personality

Perspectives on
Psychological Science

Psychological Science

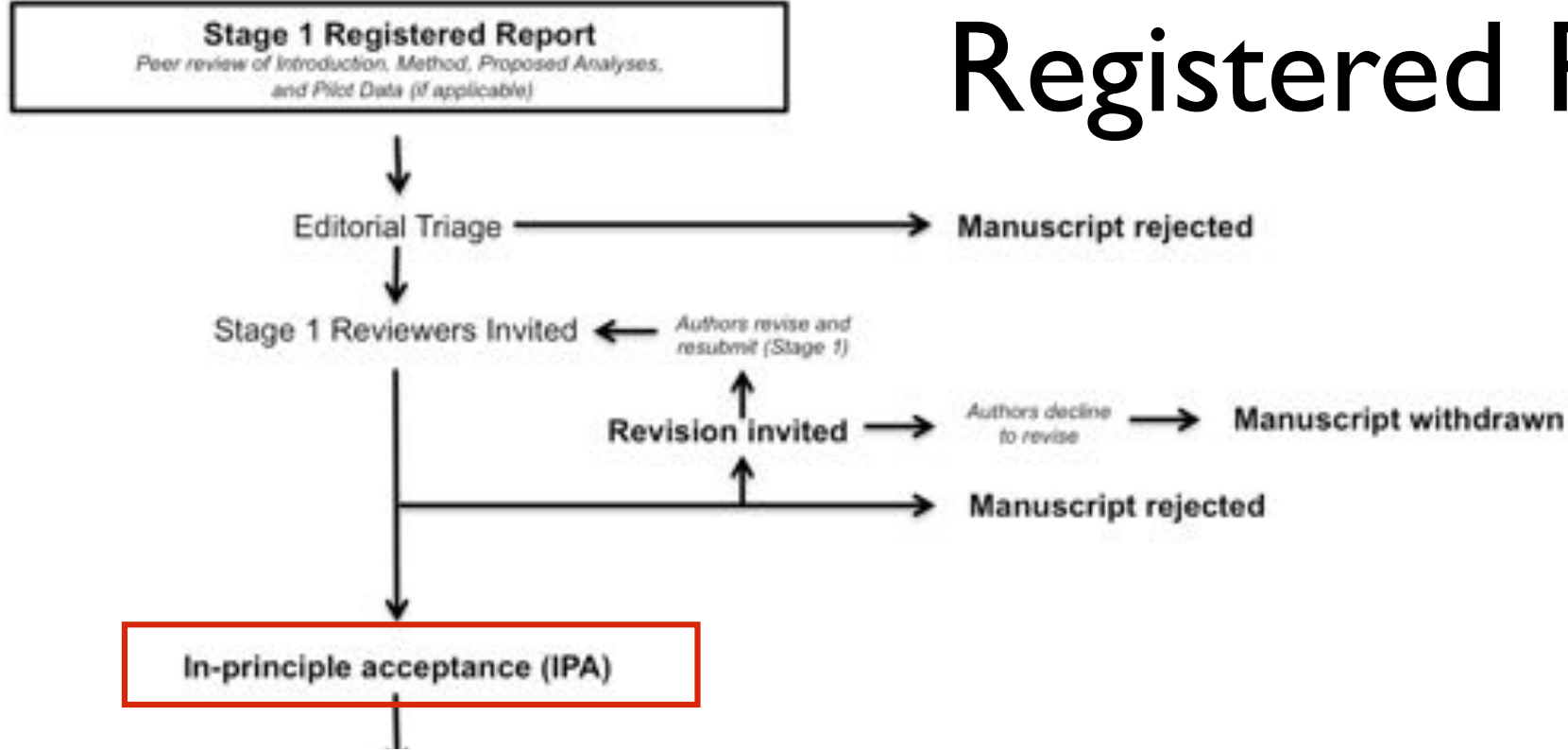
Personal Relationships

> 5000

journals and organizations signed the guidelines
(by December 2017)

Registered Reports

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



Registered Reports

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

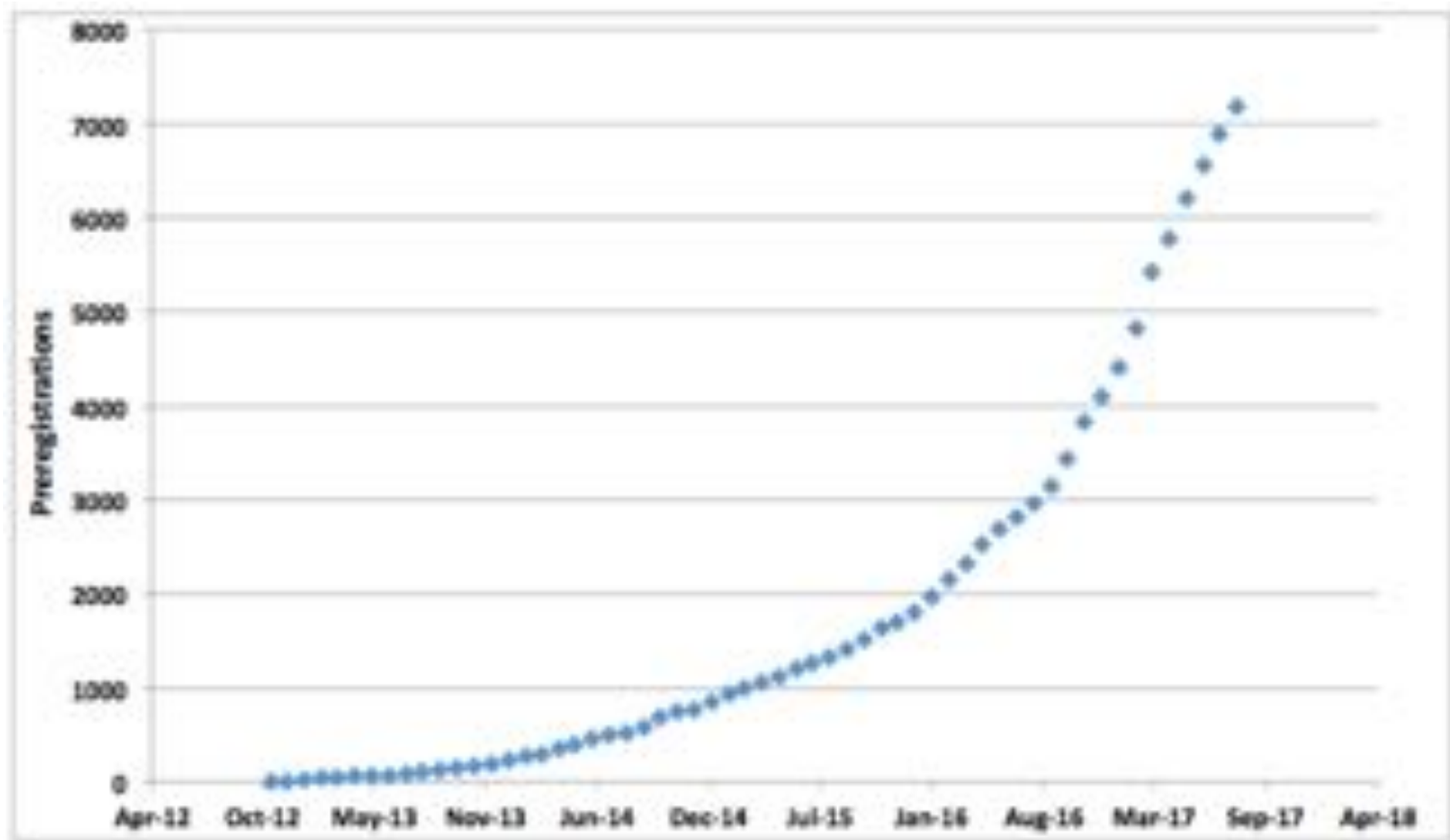


AIMS Neuroscience
Attention, Perception, and Psychophysics
Cognition and Emotion
Comprehensive Results in Social Psychology
Cortex
Drug and Alcohol Dependence
Experimental Psychology

82 journals

offer Registered Reports
(by December 2017)

Perspectives on Psychological Science
Royal Society Open Science
Social Psychology
Working, Aging and Retirement



“dass die Daten unmittelbar nach Abschluss der Forschungen oder nach wenigen Monaten **der Öffentlichkeit frei zur Verfügung gestellt werden.**“

Das Engagement [...] von Wissenschaftlern und Wissenschaftlerinnen um die Verfügbarmachung von Forschungsdaten sollten bei der **Würdigung von wissenschaftlichen [...] Leistungen** zukünftig stärker berücksichtigt werden.

Der Umgang mit Forschungsdaten im Fach Psychologie: Konkretisierung der DFG-Leitlinien

Im Auftrag des DGPs Vorstands (17.09.2016)

Felix Schönbrodt, Mario Gollwitzer und Andrea Abele-Brehm

Die vorliegenden Empfehlungen sollen – als einer von mehreren Bausteinen – zur Qualitätssicherung der psychologischen Forschung beitragen. Sie sind getragen von der Idee einer offenen und transparenten Wissenschaft,

en zur disziplinspezifischen Nutzung und Bereitstellung von Forschungsdaten zu entwickeln'. Die Deutsche Gesellschaft für Psychologie (DGPs) schließt sich den Zielen der DFG und der Allianz der Wissenschaftsorganisationen an

Open Science as a strategic benefit

McKiernan, E. C., Bourne, P. E., Brown, C.T., Buck, S., Kenall, A., Lin, J., et al. (2016). How open science helps researchers succeed. eLife, 5, e16800. <http://doi.org/10.7554/eLife.16800>

Journals with mandatory open data (or justification why not)

- Advances in Methods and Practices in Psychological Science
(<http://www.psychologicalscience.org/publications/ampps/ampps-submission-guidelines#DISC>)
- Collabra: Psychology
(<https://www.collabra.org/about/research-integrity/>)
- Experimental Psychology
(<http://econtent.hogrefe.com/doi/10.1027/1618-3169/a000355>)
- Journal of Research in Personality
(<http://www.sciencedirect.com/science/article/pii/S0092656617300211>)
- Judgment and Decision Making
(<http://journal.sjdm.org/>)
- Journal of Cognition
(<https://www.journalofcognition.org/about/editorialpolicies/>)
- PLOS ONE
(<http://blogs.plos.org/everyone/2017/05/08/making-progress-toward-open-data/>)
- Royal Society Open Science
(http://rsos.royalsocietypublishing.org/author-information#Open_data)
- Science
(<http://www.sciencemag.org/authors/science-editorial-policies>)



An der Fakultät für Psychologie und Pädagogik der Ludwig-Maximilians-Universität München ist zum Wintersemester 2016/2017 eine

Professur (W3) für Sozialpsychologie (Lehrstuhl)

...

Das Department Psychologie legt Wert auf transparente und replizierbare Forschung und unterstützt diese Ziele durch Open Data, Open Material und Präregistrierungen. Bewerber/innen werden daher gebeten, in ihrem Anschreiben darzulegen, auf welche Art und Weise sie diese Ziele bereits verfolgt haben und in Zukunft verfolgen möchten.



Am Fachbereich 07 - Psychologie und Sportwissenschaft, Institut für Psychologie - der Westfälischen Wilhelms-Universität Münster ist zum nächstmöglichen Zeitpunkt eine

Professur (W 2 BBesO) für Pädagogische Psychologie

zu besetzen.

...

Das Fach Psychologie in Münster legt Wert auf transparente und replizierbare Forschung und unterstützt Open Science Praktiken. Bewerber/-innen werden gebeten, in ihren Bewerbungsunterlagen darzulegen, auf welche Art und Weise sie diese Praktiken bereits verfolgt haben und/oder in Zukunft verfolgen möchten.

+ 3 additional professorship job descriptions

The **Department of Psychology at the Faculty of Human Sciences of the University of Cologne (UoC)** seeks to appoint a

Full Professor (W3) of Social Psychology

to be filled as soon as possible.

...

The Department of Psychology aims for transparent and reproducible research (including Open Data, Open Materials, and Preregistrations). Applicants are asked to illustrate how they have pursued these goals in the past and/or how they plan to do so in the future.

- Citation advantage: $\sim 2.5\times$ in psychology
- Top journals require openness
- Funders require openness
 - DFG
 - EU
 - Open Research Funders Group (<http://www.orfg.org/>)
- Essential or desired criteria for professorship and post-doc positions

(see also https://docs.google.com/document/d/1ty43Syw0Flkh8ncjW8MZArlkvYe8hLwwhLllwbtSk_Y/edit?usp=drive_web).

Journals should really

It's the task of granting agencies to

University boards have to

Journals, it's really

It's the task of funding agencies to

University, we have to



I want you for
Open Science!

A journey of a thousand miles
begins with a single step



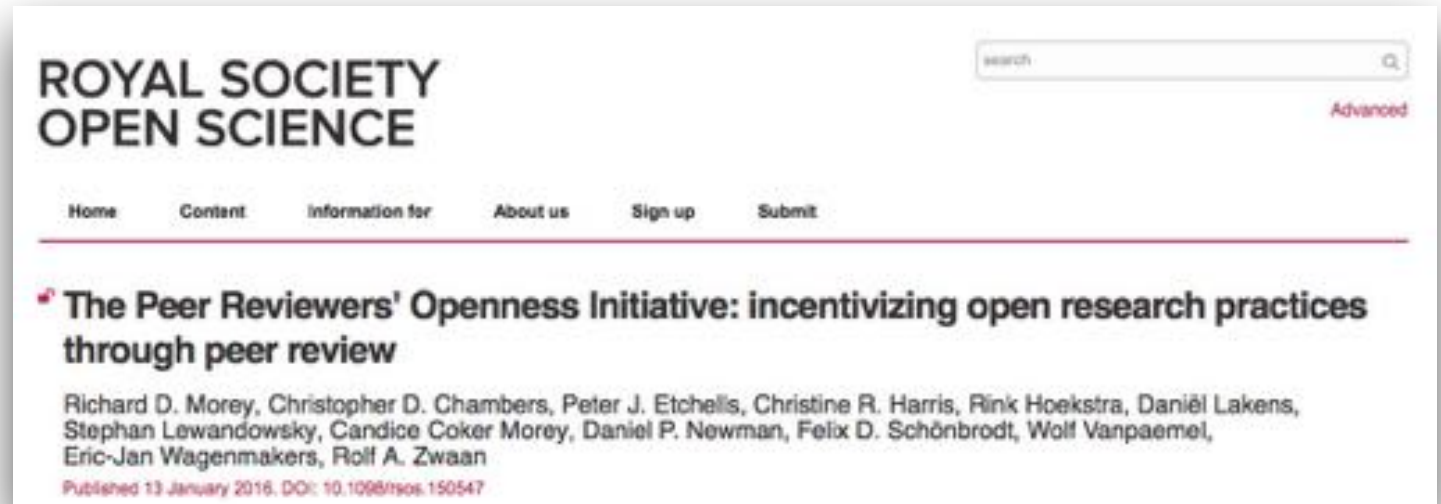
Lao-tse

Spend your valuable reviewer's time on research that is worthy to be reviewed



PEER
REVIEWERS'
OPENNESS
INITIATIVE

<https://opennessinitiative.org/>



We suggest that beginning January 1, 2017, **reviewers make open practices a pre-condition for more comprehensive review.**

This is already in reviewers' power; to drive the change, all that is needed is for reviewers to collectively agree that the time for change has come.

Consider to sign our voluntary commitment to research transparency



<http://www.researchtransparency.org/>

<http://www.nicebread.de/a-voluntary-commitment-to-research-transparency/>

Consider to sign our voluntary commitment to research transparency

<http://www.researchtransparency.org/>

As first authors we do always...

- Open Data
- Reproducible analysis scripts
- 21-word-solution (Simmons et al., 2012)

As co-authors ...

- We try to convince the first authors to do it the same way

Supervision of dissertations:

- We expect Open Data, Open Material, reproducible scripts (internal)
- If publication: see “first authors”
- If series of experiments:
at least 1 pre-registered study
- Grading independent of p -value and “publishability”

As reviewers:

- We ask for Open Data and use the “standard reviewer disclosure request” (<https://osf.io/hadz3/>)

In committees, as editors, ...

- We promote the values of open science and transparency

Consider to sign our voluntary commitment to research transparency

<http://www.researchtransparency.org/>

- 138 signatories from >50 international universities (by December 2017)

Julia M. Rohrer from Universität Leipzig

signed on 2016-09-10

Radu Giurgiu from University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania

signed on 2016-08-11

Cornelia Wrzus from Johannes Gutenberg University Mainz, Germany

signed on 2016-07-28

Maarten van Zalk from Oxford University

signed on 2016-07-13

Nidhal Selmi from Arizona State University

signed on 2016-07-10

Marcus Mund from Friedrich-Schiller-Universität Jena

signed on 2016-06-29

Ruben Arslan from Georg August Universität Göttingen

signed on 2016-06-17

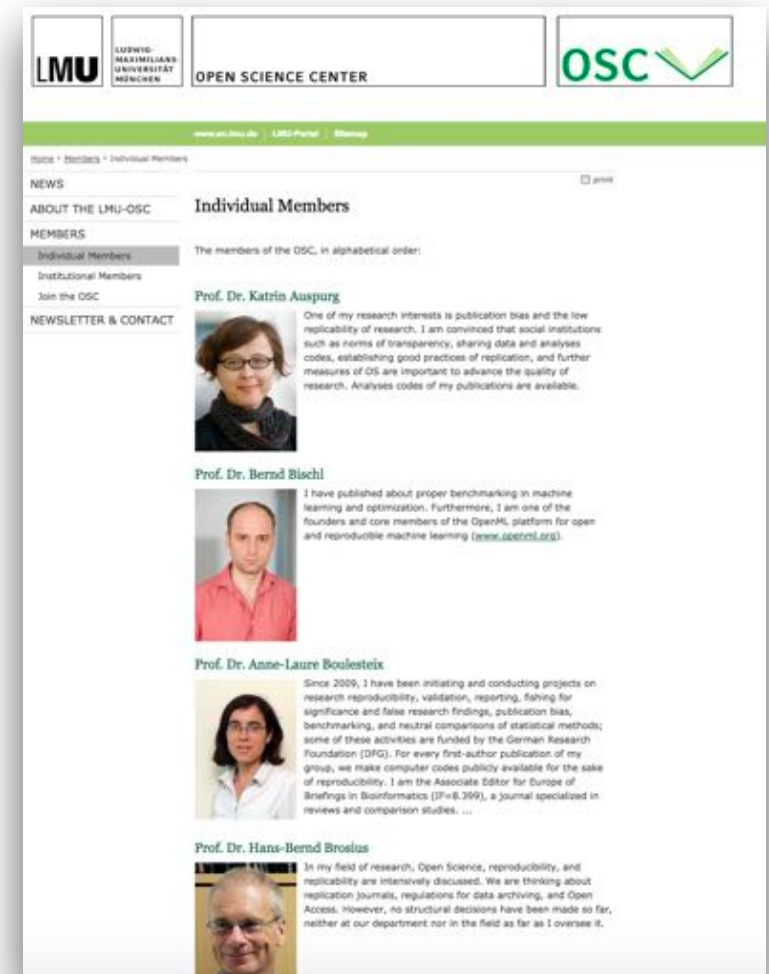
Oliver Lindemann from University of Potsdam

Establish your department's “open science committee”

Tasks of the Open-Science-Committee at LMU:

- Monitor the international developments in the area of open science and communicate them to the department.
 - Organize workshops that teach skills for open science
 - Develop concrete suggestions concerning tenure-track criteria, hiring criteria, PhD supervision and grading, teaching, curricula, etc.
 - Channel the discussion concerning standards of research quality and transparency in the department. Explore in what way a department-wide consensus can be established concerning certain points of open science.
-
- 40 members, *all* chairs represented
 - Discuss suggestions, accept field-specific problems, find solutions
→ no “replication police”!

- 17 members of 10 disciplines:
Psychology, sociology, computer science, statistics, geography, medicine, veterinary medicine, economics, ...
- 3 entire faculties as members:
Faculty of Medicine, Faculty of Veterinary Medicine, Faculty of Psychology and Educational Science
- Mission Statement:
 - Education (from PhD student to professor)
 - Meta-science research
 - Change the incentive structure
- <http://www.osc.lmu.de>



Establish your department's “open science committee”

- Explore whether an open science committee can be established as an official committee in your department.
- See LMU example: <https://osf.io/mgwk8/>
- 8 Open-Science-Initiatives in Germany/Austria:
LMU München, Koblenz-Landau, Hagen, Münster,
Göttingen, Wien, Berlin, Leipzig
- NOSI: Netzwerk der Open-Science-Initiativen. **Join us!**
(<https://osf.io/tbkzh/>, <https://groups.google.com/d/forum/nosi-de>)

10 easy steps to increase your openness

1. **Create an account on OSF** (<http://osf.io/>)
2. **Upload the material for an existing study** (questionnaires, maybe reproducible analysis scripts) to an OSF project.
3. **Add an open license to all of your figures** (so that you can reuse them in later publications, blog posts, or presentations: „Figure available under a CC-BY4.0 license at osf.io/XXXX.“)
4. For the next project: **Change the consent forms** in a way that **open data** would be possible for that project (see <https://osf.io/mgwk8/wiki/Consent%20form%20templates%20for%20open%20data/>).
5. **Sign the PRO initiative** and expect openness (or a justification why not) if you review another paper (<https://opennessinitiative.org/>)
6. For the next data analysis: Practice to create **scripts for reproducible data analysis** (e.g., SPSS syntax, R scripts). All analytic steps that lead from raw data to the final results should be reproducible.
7. **Let a master student preregister his/her thesis**. Can be either a „local preregistration“, or a proper preregistration at OSF or at <https://aspredicted.org/>. See this workshop material for how to do a preregistration: <https://osf.io/yd487/>, <https://osf.io/mx7yp/>
8. **Do you own first preregistration**; enter the Prereg challenge and get 1000\$: <https://cos.io/prereg/>
9. **Publish your first open data set**: Ensure anonymity, provide a codebook. See here for details: <http://econtent.hogrefe.com/doi/pdf/10.1026/0033-3042/a000341>
10. Team up with colleagues and **establish a local open science initiative**

The future of science ...

- is **open**: open access, open data, open material
- is **collaborative**: Less “superstars”, more (ad hoc) large scale research teams for more power (see ManyLabs & RP:P; ‘Team up!’, Back & Vazire, 2015)
- uses new technology, such as the **Open Science Framework**
- provides incentives for the **quality of the process**, not for the outcome (and definitely not for sheer quantity)