

Towards a more transparent and reliable science

Daniël Lakens



Lastly, I would address one general admonition to all — that they consider what are the true ends of knowledge, and that they seek it not either for pleasure of the mind, or for contention, or for superiority to others, or for profit, or fame, or power, or any of these inferior things, but for the benefit and use of life, and that they perfect and govern it in charity.

Bacon, 1620

Charles Babbage, 1830, Reflections on the Decline of Science in England: And on Some of Its Causes'

Of Cooking. This is an art of various forms, the object of which is to give to ordinary observations the appearance and character of those of the highest degree of accuracy.

One of its numerous processes is to make multitudes of observations, and out of these to select those only which agree, or very nearly agree. If a hundred observations are made, the cook must be very unlucky if he cannot pick out fifteen or twenty which will do for serving up.



A man with glasses and a dark suit is speaking at a podium. Behind him is a large projection screen displaying a presentation slide with the following text:

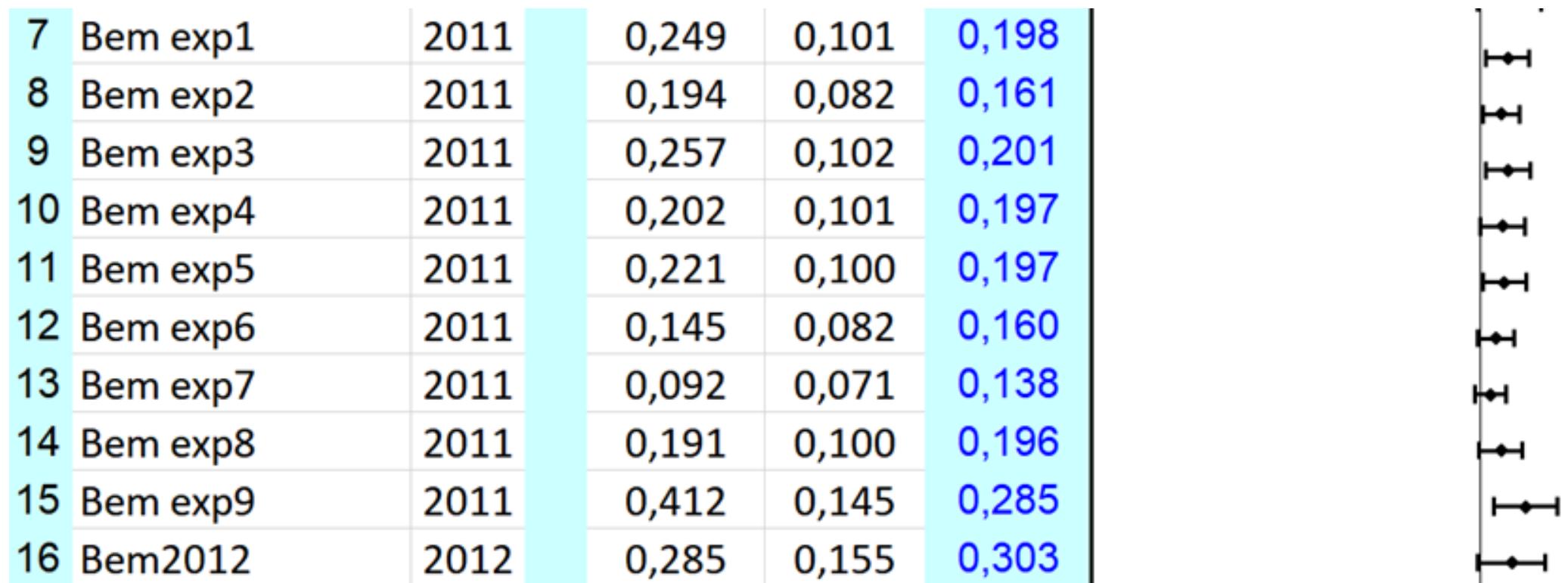
**Feeling the Future:
Experimental Evidence for
Anomalous Retroactive Influences
on Cognition and Affect**

Results and Discussion

Across all 100 sessions, participants correctly identified the future position of the erotic pictures significantly more frequently than the 50% hit rate expected by chance: 53.1%, $t(99) = 2.51$, $p = .01$, $d = 0.25$.³ In contrast, their hit rate on the nonerotic pictures did not differ significantly from chance: 49.8%, $t(99) = -0.15$, $p = .56$. This was true across all types of nonerotic pictures: neutral pictures, 49.6%; negative pictures, 51.3%; positive pictures, 49.4%; and romantic but nonerotic pictures, 50.2%.

Bem, 2011

Pre-Cognition Meta-Analysis



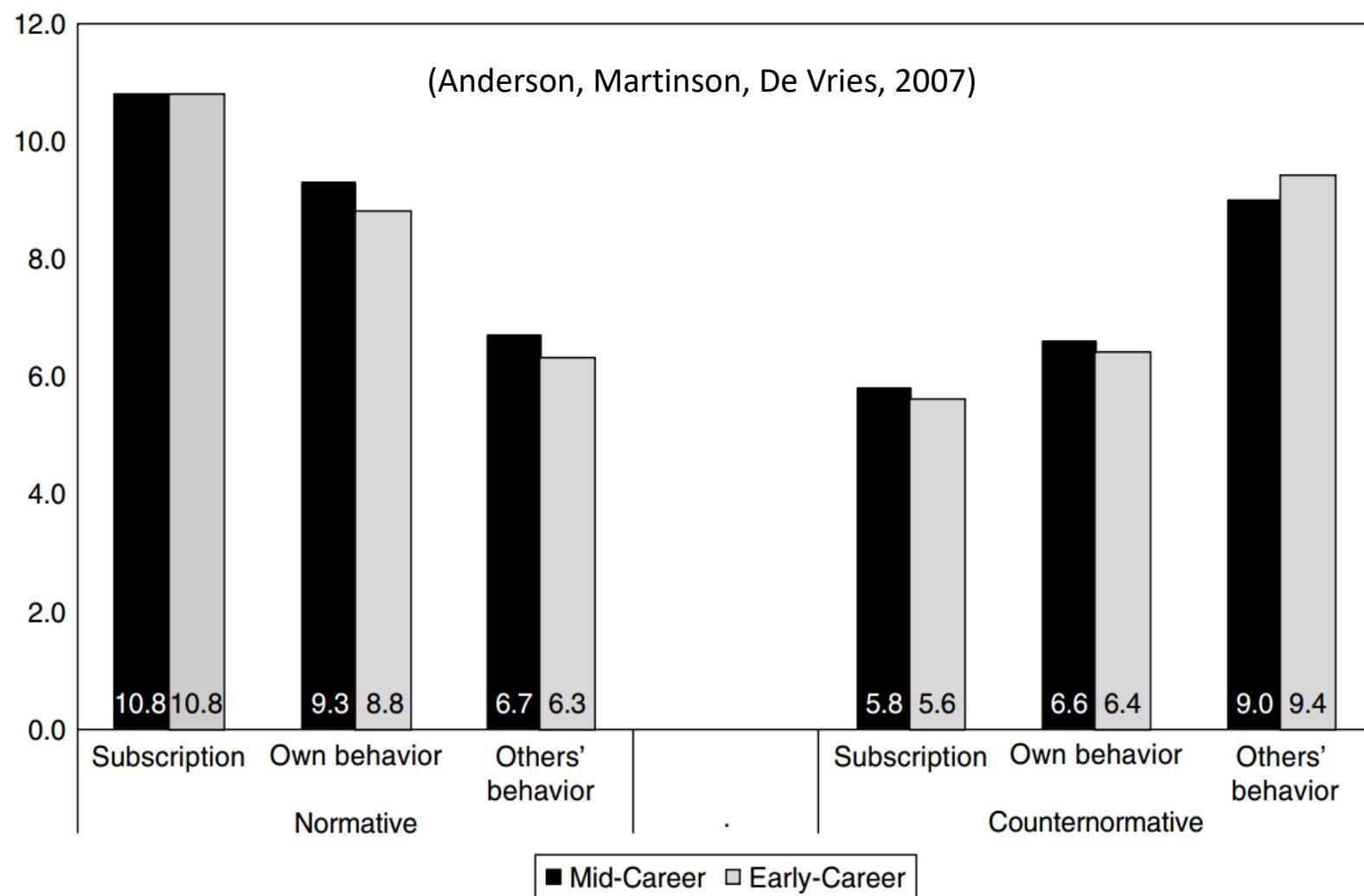
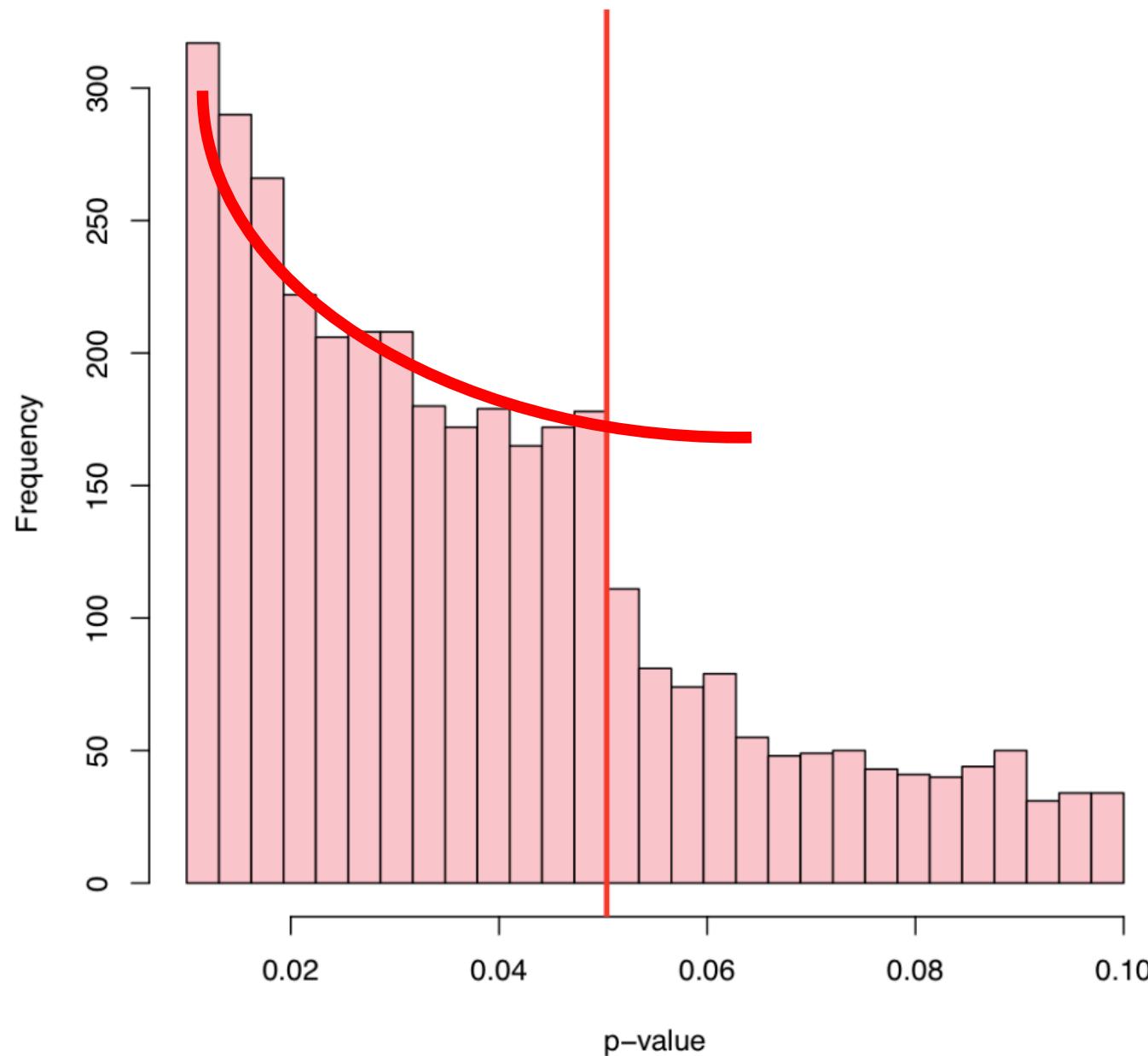


FIG. 2. Means of Normative and Counternormative Subscription and Behavior.

40% has at least once selectively reported analyses that ‘worked’. (Fiedler & Schwarz, 2015).

More than 50% of Americans thinks researchers who selectively report what ‘works’ should be fired. (Pickett & Roche, 2017)



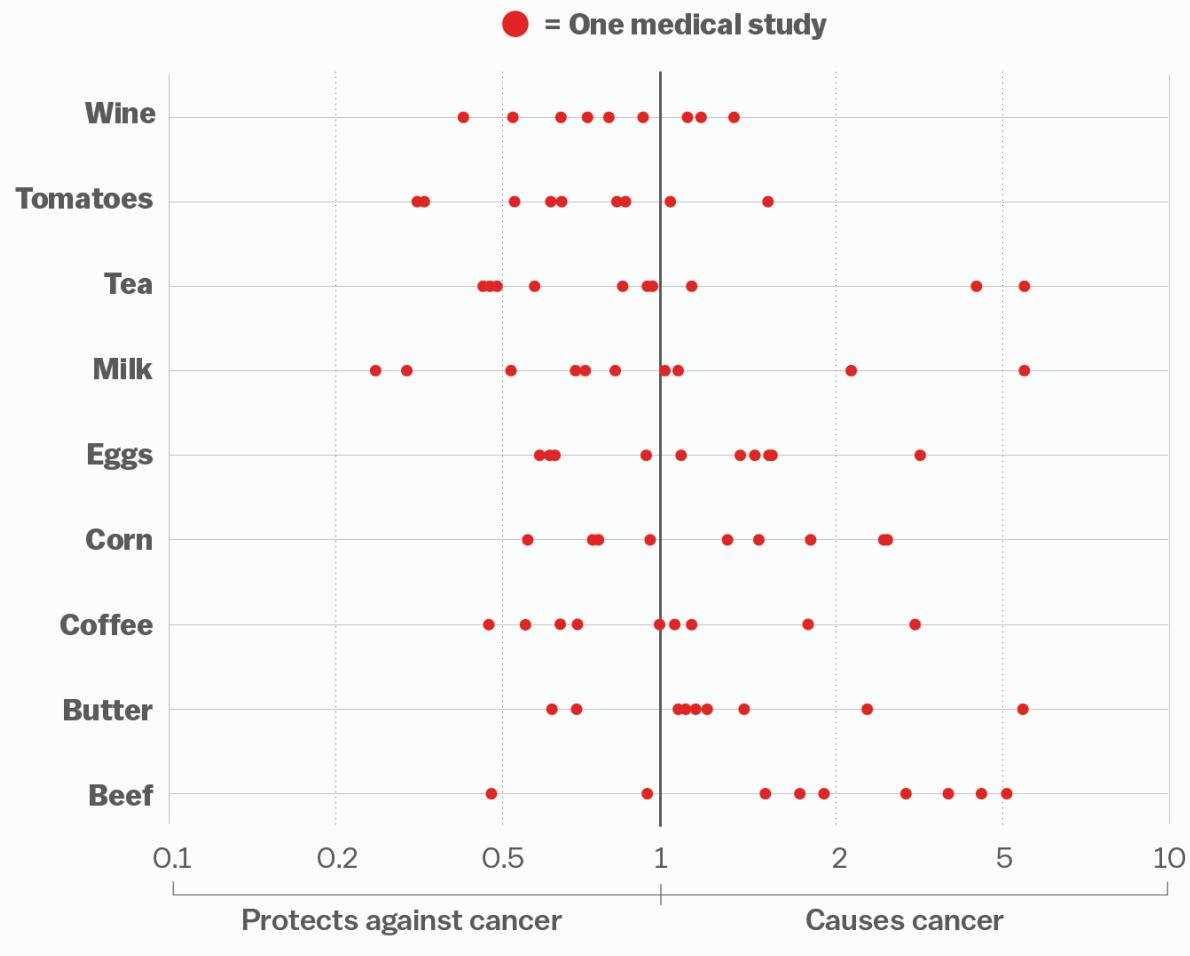
Masicampo and Lalande, 2012
Graph by
<https://normaldeviate.wordpress.com/>

And this is where we put
the non-
significant
results.



Created by [Sophy3062199](#)

Everything we eat both causes and prevents cancer



SOURCE: Schoenfeld and Ioannidis, *American Journal of Clinical Nutrition*

Vox

Person 2

Person 1

	Defect	Collaborate
Defect	+ -	-
Collaborate	-	++

How do we solve social dilemmas?

1) Rules



[KMJ](#), alpha masking by [Edokter](#) - de.wikipedia

Data management protocol

 [Open Science](#)

 [Q&A Open Access at NWO](#)

 [Researchers about Open Access](#)

 **Data management**

[Data management section](#)

[Q&A](#)

 [Contacts](#)

Responsible data management is part of good research. NWO wants research data that emerges from publicly funded research to become findable, accessible, interoperable and reusable (FAIR) for the use by other researchers. Data management is thus part of Open Science. Due consideration is given to aspects such as privacy, public security, ethical limitations, property rights and commercial interests.

The basic principle is therefore open access to data and that access to data is only limited when necessary. To make data that emerges from NWO-funded research as accessible and reusable as possible, NWO has decided to implement the data management policy in all NWO funding instruments with effect from 1 October 2016.

In concrete terms this means that all calls for proposals published from 1 October 2016 onwards will include the data management protocol.

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Form

 [Data management plan form](#)

Related items

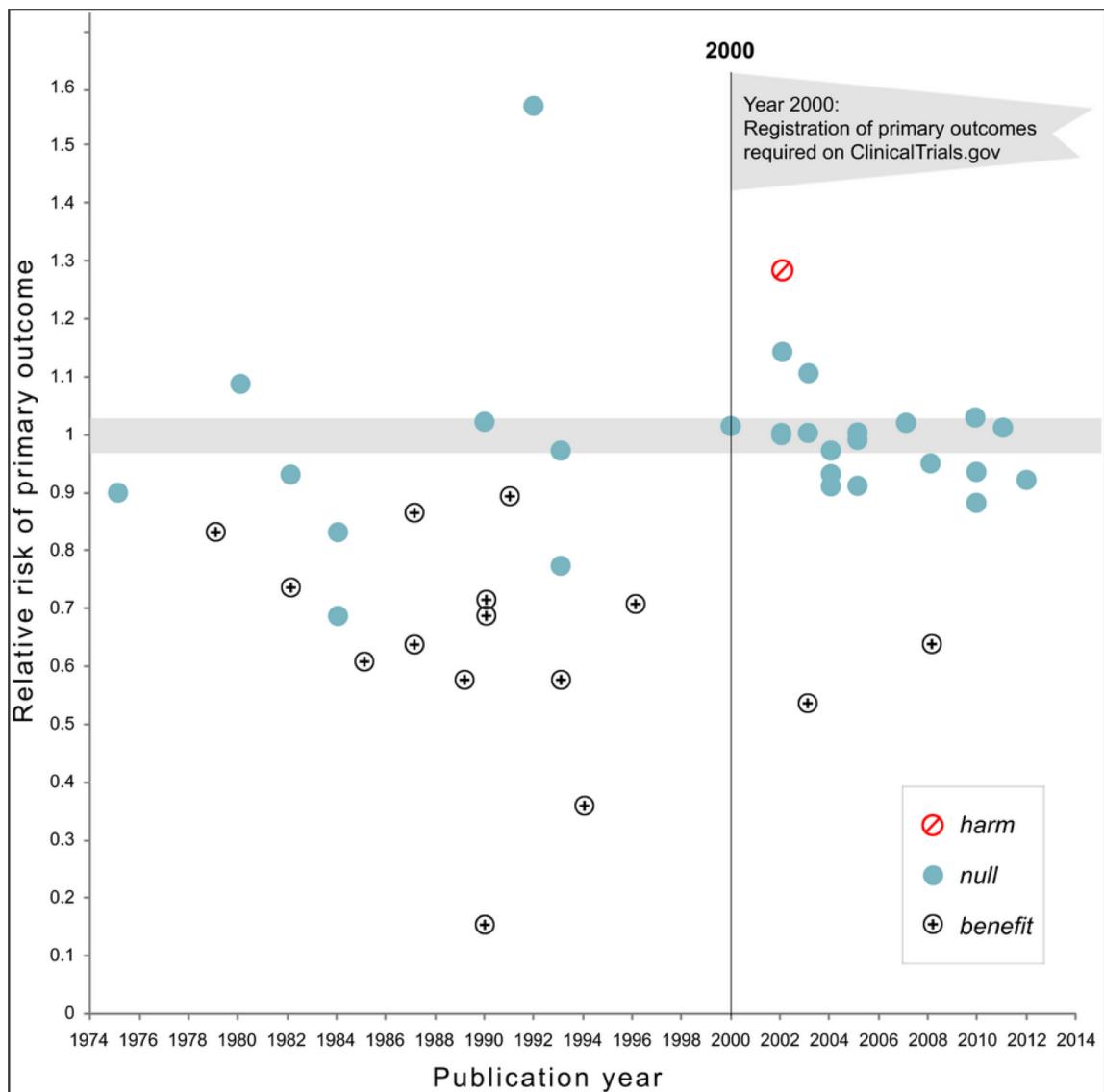
 [Data sharing video \(Youtube\)](#)

 [Article: Datamanagement | Hypothese 2014-3 \(pdf\)](#)

PREREGISTER

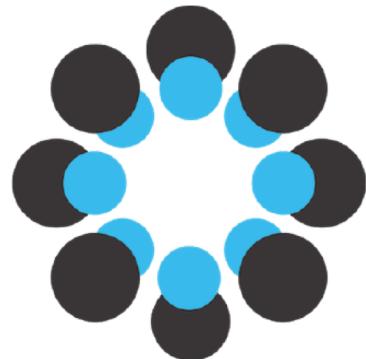


<https://youtu.be/SWkqdNppL-s>



Before 2000 17/30 studies showed a significant (+) effect. After pre-registration, only 2/25 showed a significant effect.

Kaplan & Irvin, 2015



Open Science Framework

62,100

Active Users



186,000

Monthly Visits



5,000

TOP Members



86,000

OSF Projects



720,000

Monthly Pageviews



9,700

Registrations



2.3MM

Indexed Preprints



40.9MM

SHARE Events



5.2MM

Downloads





100+ journals now offer Registered Reports (in 4 years). Now still voluntary for researchers...



You can also create your
own rules!



How do we solve social dilemmas?

2) Punishment



General Article



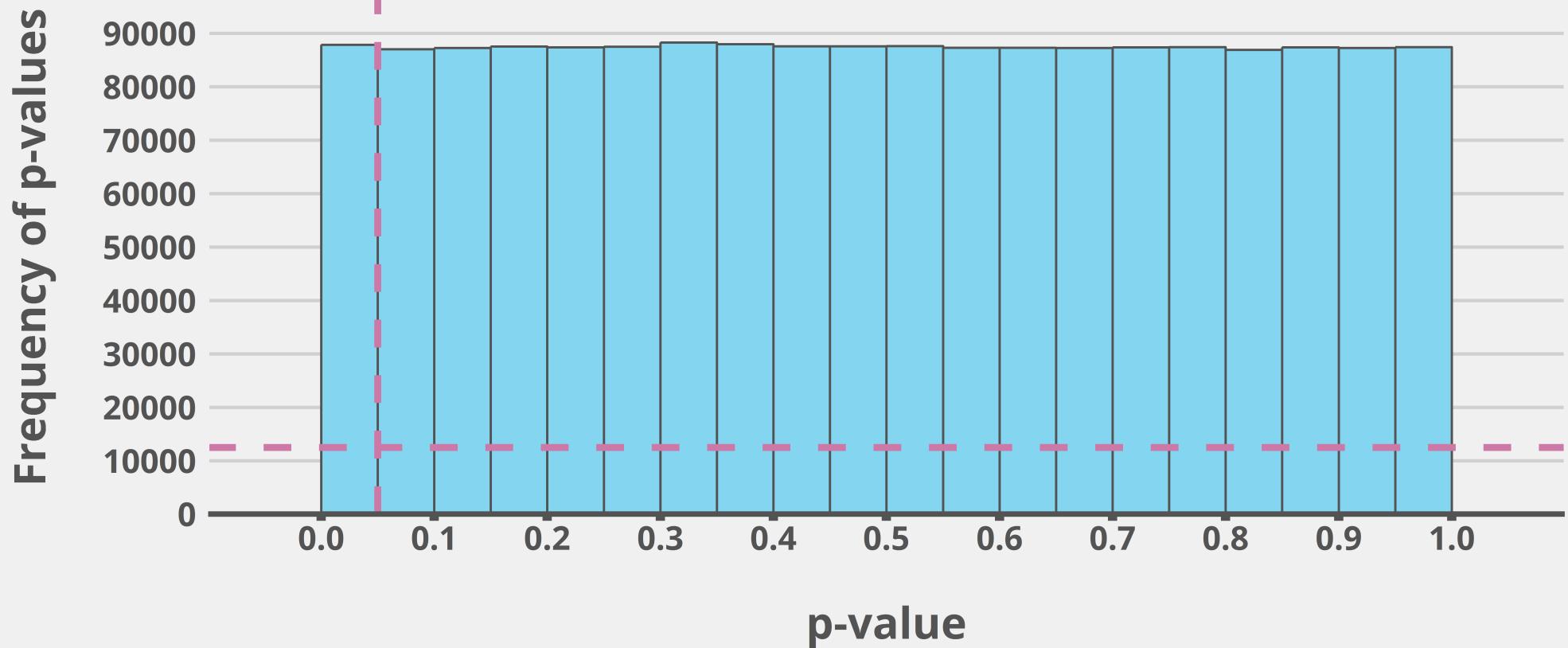
Just Post It: The Lesson From Two Cases of Fabricated Data Detected by Statistics Alone

Uri Simonsohn

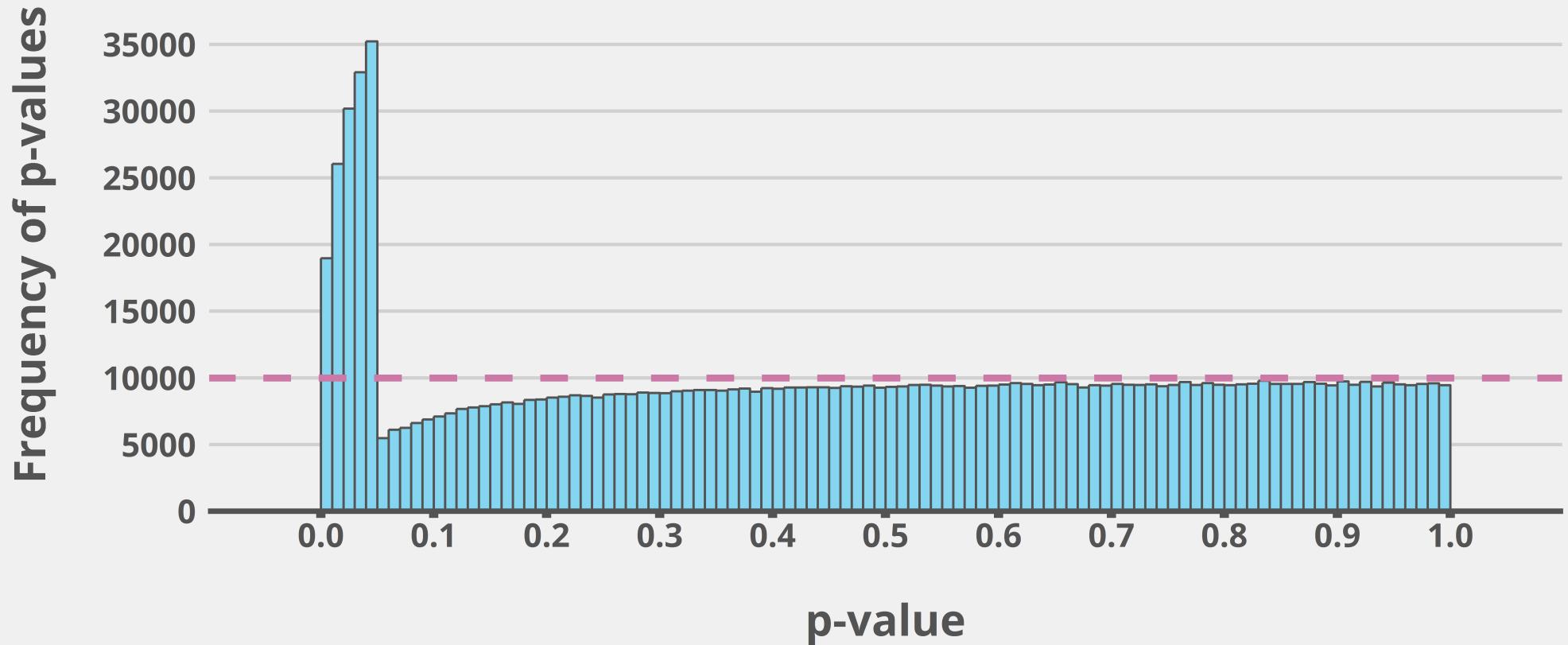
The Wharton School, University of Pennsylvania

Psychological Science
24(10) 1875–1888
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DOI: 10.1177/0956797613480366
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SAGE

Unadjusted p-value distribution



Optional stopping with 5 looks



Science

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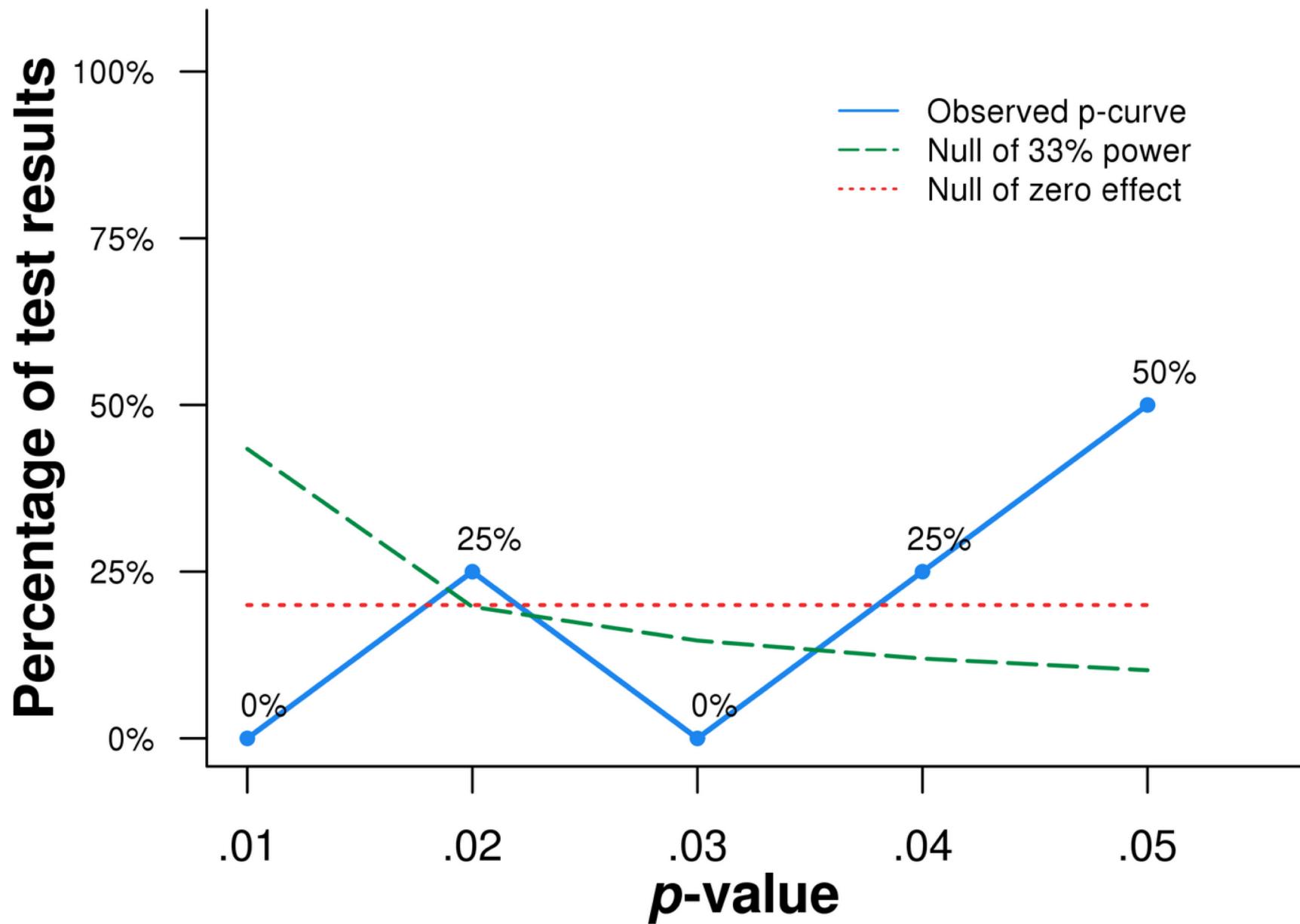
Reading Literary Fiction Improves Theory of Mind

**David Comer Kidd^{*}, Emanuele Castano^{*}**[+ Author Affiliations](#)^{*}Corresponding author. E-mail: kidd305@newschool.edu (D.C.K.); castanoe@newschool.edu (E.C.)

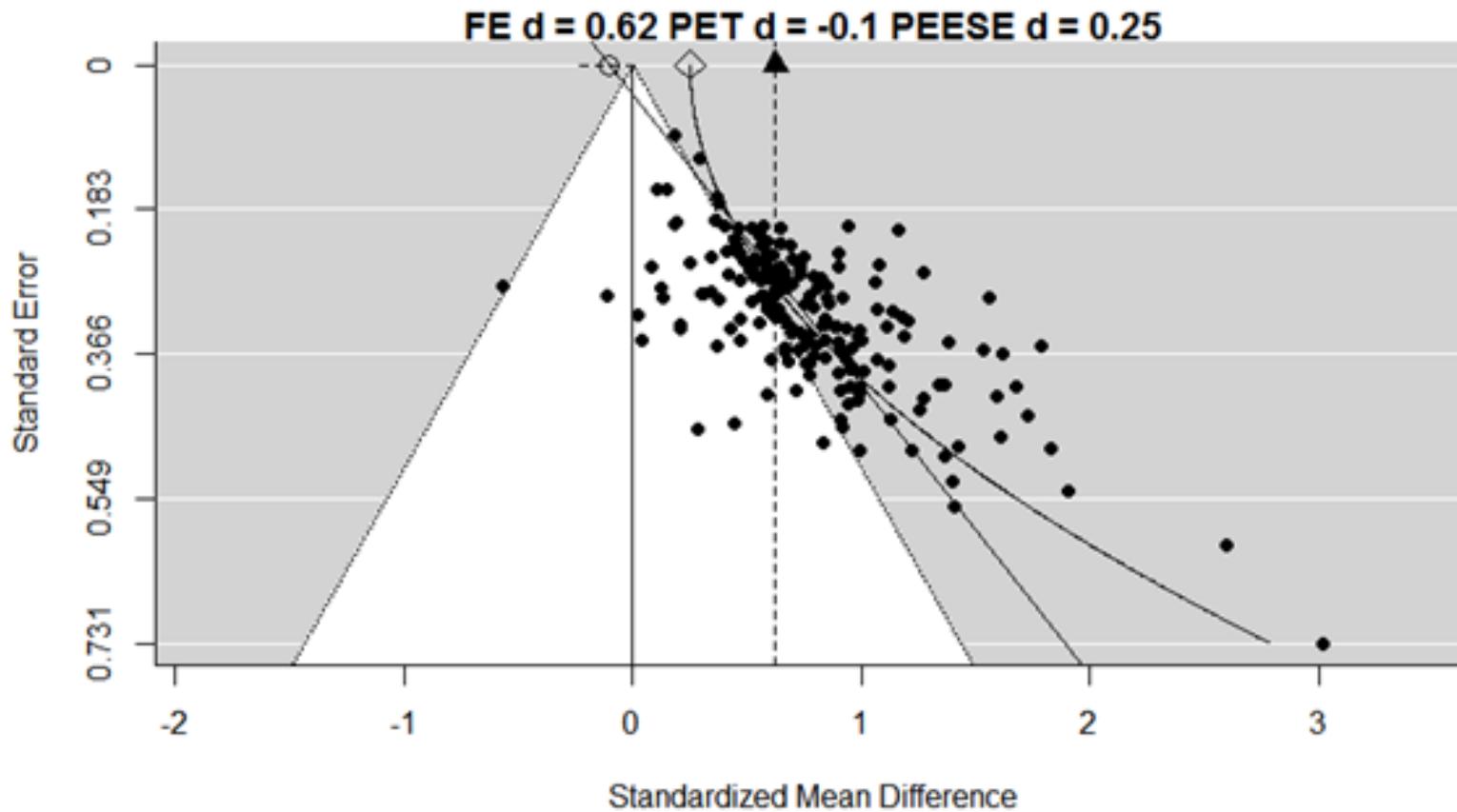
Science 18 Oct 2013:
Vol. 342, Issue 6156, pp. 377-380

Table 1. RMET and DANVA2-AF analyses.

Experiment	Independent variable	Test	P	ω_p^2
Exp. 1 RMET	Condition	$F_{1,82} = 6.40$	0.011	0.05
	Author Recognition Test	$\beta = 0.36$	0.0003	0.13
	Author Recognition Test x Condition	$F_{1,82} = 1.06$	0.30	0.00
Exp. 2 DANVA2-AF	Condition	$F_{2,108} = 2.57$	0.08	0.02
	Author Recognition Test	$\beta = -0.16$	0.08	0.01
	Author Recognition Test x Condition	$F_{2,108} = 1.17$	0.31	0.00
Exp. 3 RMET	Condition	$F_{1,65} = 4.07$	0.04	0.04
	Author Recognition Test	$\beta = -0.01$	0.90	-0.01
	Author Recognition Test x Condition	$F_{1,65} = 0.01$	0.90	-0.01
Exp. 4 RMET	Condition	$F_{1,68} = 4.39$	0.04	0.04
	Author Recognition Test	$\beta = 0.39$	<0.001	0.15
	Author Recognition Test x Condition	$F_{1,68} = 1.50$	0.22	0.00
Exp. 5 RMET	Condition	$F_{2,352} = 3.10$	0.04	0.01
	Author Recognition Test	$\beta = 0.28$	<0.001	0.07
	Author Recognition Test x Condition	$F_{2,352} = 1.37$	0.25	0.00



Carter & McCullough, 2014: Ego-depletion



How do we solve social
dilemmas?

3) Collaborate



**SOCIETY FOR THE
IMPROVEMENT OF
PSYCHOLOGICAL SCIENCE**

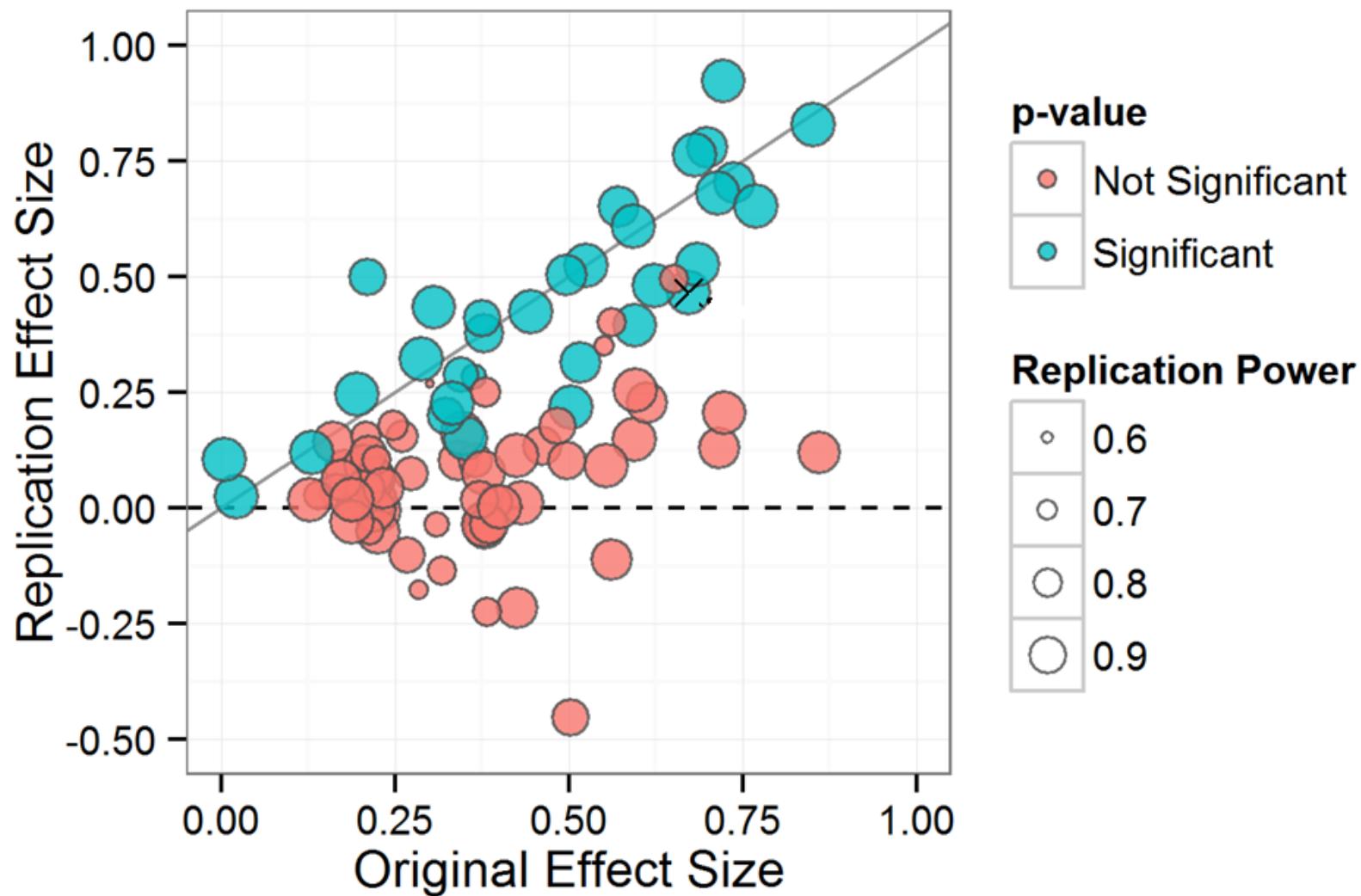
RESEARCH ARTICLE SUMMARY

PSYCHOLOGY

Estimating the reproducibility of psychological science

Open Science Collaboration*

Ongeveer 60 mensen in 2011 –
uiteindelijk 260 auteurs in 2015



**Large-scale collaboration is becoming more
and more normal (but there still are
challenges)**



Psychological Science Accelerator

a distributed laboratory network

Additional initiatives:

1) Teaching people how
to improve (*like during
brainhack!*)



Advances in Methods and Practices in Psychological Science

An official journal of the [Association for Psychological Science](#)

Editor

[Daniel J. Simons](#)

University of Illinois at Urbana-Champaign, Department of Psychology

Home > Data Science > Probability and Statistics

Overview

Syllabus

FAQs

Creators

Ratings and
Reviews

Enroll

Starts Mar 05

Improving your statistical inferences

About this course: This course aims to help you to draw better statistical inferences from empirical research. First, we will discuss how to correctly interpret p-values, effect sizes, confidence intervals, Bayes Factors, and likelihood ratios, and how these statistics answer different questions you might be interested in. Then,

▼ More

Who is this class for: This course is aimed at anyone who wants to improve their statistical inferences, either because you are preparing to do empirical research for the first time, or because you were never taught these important statistical concepts in a clear and accessible manner in the past. I didn't know most of the

Additional initiatives:

2) Organize what we know.

Verbal overshadowing (RRR1 & RRR2 [PDF](#)) -- Replications (23) [Tweet](#) [Link](#)

Schooler & Engstler-Schooler (1990) [For RRR1 studies, see [replication table above](#) (type "RRR1")]

Verbal overshadowing of visual memories: Some things are better left unsaid

Original Studies & Replications

Operationalization #1: Verbal description (bank robber) reduces successful identification of perpetrator (lineup task)

Schooler & Engstler-Schooler (1990) Study 1

Poirier et al. (2014)

Delvenne et al. (2014)

Birt & Aucoin (2014)

Susa et al. (2014)

Carlson et al. (2014)

Musselman & Colarusso (2014)

Echterhoff & Kopietz (2014)

Mammarella et al. (2014)

Dellapola & Bornstein (2014)

Mitchell & Petro (2014)

Ulatowska & Cislak (2014)

Wade et al. (2014)

Birch (2014)

McCoy & Rancourt (2014)

Greenberg et al. (2014)

Alogna et al. (2014)

Michael et al. (2014, mTurk)

Koch et al. (2014)

Thompson (2014)

Rubinova et al. (2014)

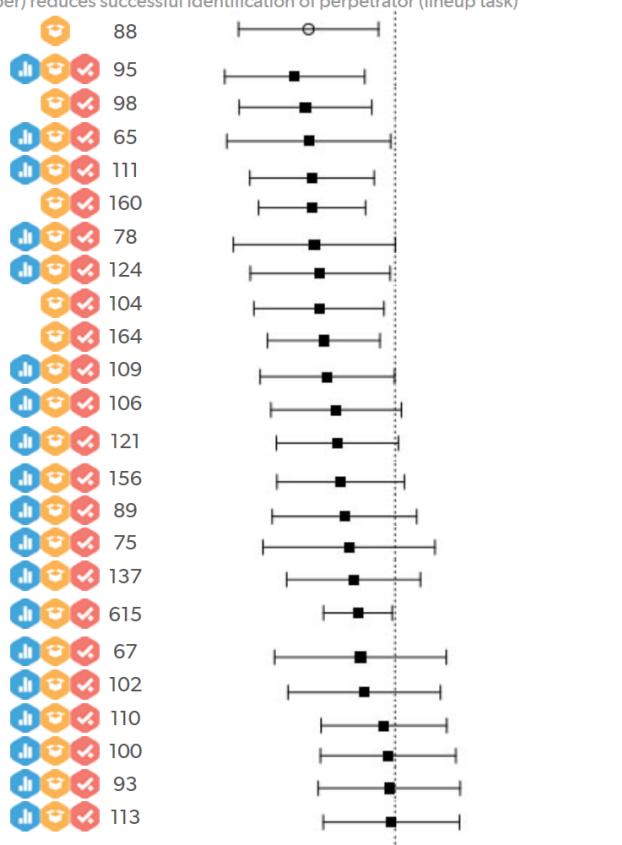
Brandimonte (2014)

Eggleston et al. (2014)

Kehn et al. (2014)

N

Effect size [95% CI]



Current meta-analytic estimate of operationalization #1 replications

-0.60 -0.20 0.20 0.40 0.60



Top-20 List of Studies Users Would Like to see Replicated

Browse by Target Article

To view list of the replication attempts relating to a target article, click on the underlined numerals (e.g., 1) in whatever column (e.g., Failure, Success) you are interested in. To see the full citation for each target article, hover over the target article author names.

If you wish to submit details of your own replication attempt, you need to [log in](#).

Author(s) of Target Article	Date	Brief Description of Result	Success	Failure
Ackerman, J. M., Maner, J. K., & Carpenter, S. M.	2016	Going All In: Unfavorable Sex Ratios Attenuate Choice Diversification		1
Bailey, J. M., Gaulin, S., Agyei, Y., & Gladue, B. A.	1994	Bailey, Gaulin, Agyei, & Gladue (1994)	1	
Balceris, E., & Dunning, D.	2010	Wishful Seeing: More Desired Objects Are Seen as Closer		1
Bargh, J. A., & Shalev, I.	2012	Bargh and Shalev (2012)	1	3
Bargh, J. A., Chen, M., & Burrows, L.	1996	Elderly-Related Words Prime Slow Walking		1
Bem, D.	2011	Bem, D. (2011)Feeling the Future: Experimental Evidence for Anomalous Retroactive Influences on Cognition and AffectJournal of Personality and Social Psychology, Vol. 100, No. 3, 407â€“425	1	1
Bernard, P., Gervais, S.J., Allen, J., & Klein, O.	2013	Bernard, P., Gervais, S.J., Allen, J., & Klein, O., (2013). Response to Tarr.	1	

Additional initiatives:
3) Fund replication
research.

NWO makes 3 million available for Replication Studies pilot

[List of news](#)

19 July 2016

NWO is making 3 million euros available for a Replication Studies pilot programme. In this programme, scientists will be able to repeat research that has been carried out by others. The pilot focuses on replicating studies that have a large impact on science, government policy or the public debate. This is the first special funding programme in the world for the repetition of such 'cornerstone research'. With this initiative NWO wants to facilitate innovation in science and encourage researchers to carry out replication research.

Additional initiatives:
4) Reproducibility.

There is enough left to improve. There is also a lot that has been done and to be proud of!

Thanks

@Lakens