

Transparent and replicable science - an ongoing revolution

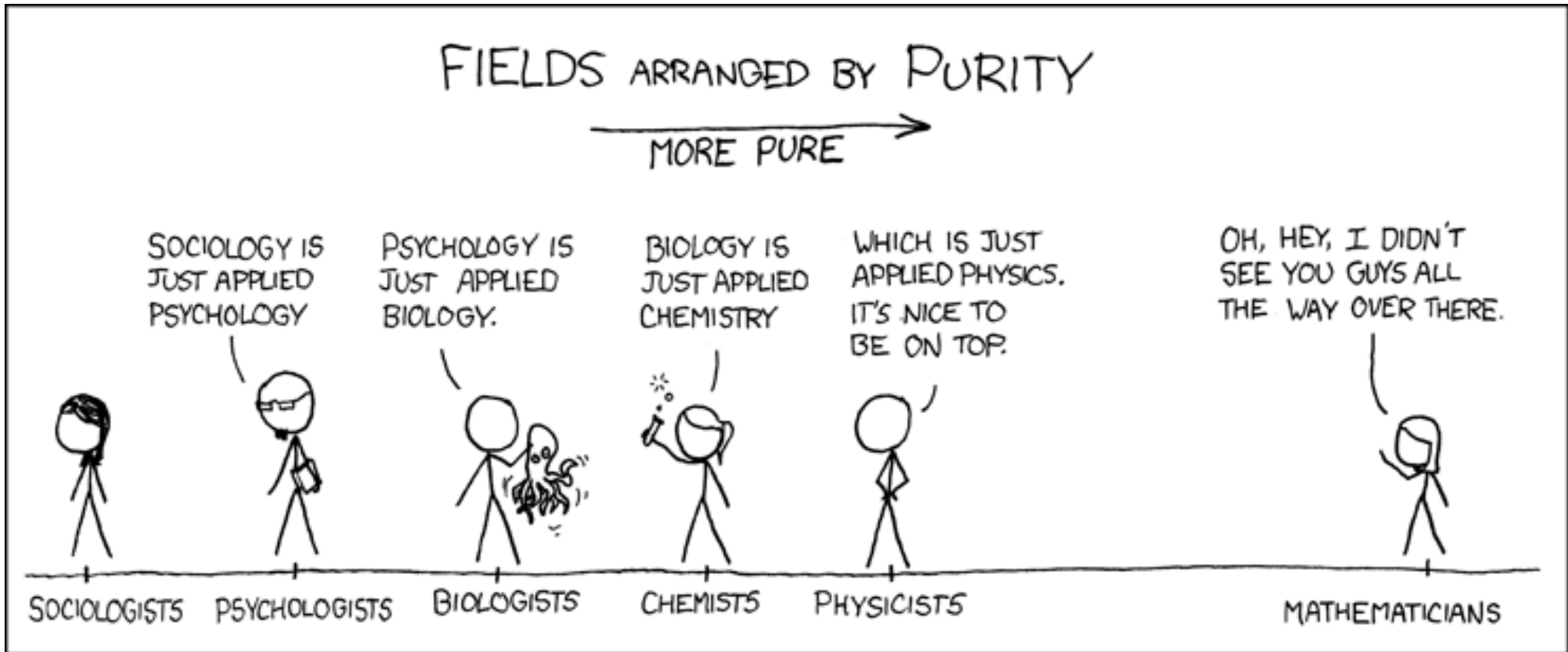
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Today's seminar

- 1. Bad science & the replicability revolution (20 min)**
- 2. Good science & the open science revolution (15 min)**
- 3. IGDORE – a private institute for good science (5 min)**

Bad science & the replicability revolution



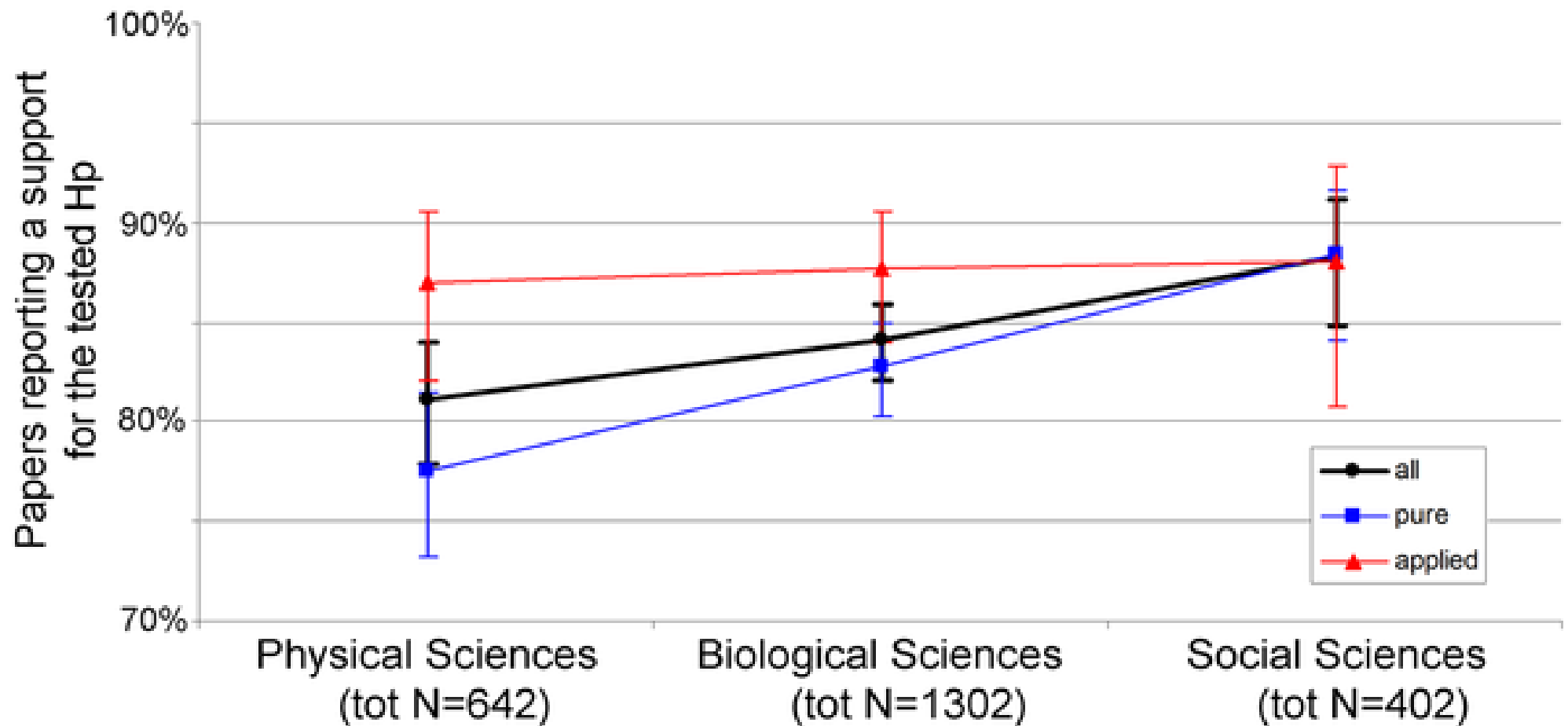
Comic: xkcd.com

Fanelli, D. (2010):

**“Positive” Results Increase Down the Hierarchy
of the Sciences**

PLoS ONE 5(4): e10068.

Figure 3. Positive Results by Disciplinary Domain.



Fanelli D (2010) "Positive" Results Increase Down the Hierarchy of the Sciences. PLOS ONE 5(4): e10068.

<https://doi.org/10.1371/journal.pone.0010068>

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0010068>

Disclosed bad science

KIDS POUR 44% MORE
CEREAL INTO BIG BOWLS



Questionable
Research Practices
(QRPs) – self-
disclosed

Health psychology

Cornell University

2016

Disclosed bad science

Direct replications

Social psychology

Berkeley University &

Harvard University

2015



*Photo: Wikimedia
Commons*

Disclosed bad science

QRPs – suspected by employer

Social psychology

University of Amsterdam

2014-2017

<u>P-VALUE</u>	<u>INTERPRETATION</u>
0.001	HIGHLY SIGNIFICANT
0.01	
0.02	
0.03	
0.04	SIGNIFICANT
0.049	
0.050	OH CRAP. REDO CALCULATIONS.
0.051	ON THE EDGE OF SIGNIFICANCE
0.06	
0.07	HIGHLY SUGGESTIVE, SIGNIFICANT AT THE $P < 0.10$ LEVEL
0.08	
0.09	
0.099	HEY, LOOK AT THIS INTERESTING SUBGROUP ANALYSIS
≥ 0.1	

Comic: xkcd.com

Other examples

Basic & preclinical biomedical research (2009 – ongoing; Begley & Ioannidis, 2015)

Antipsychotic drugs (2017; Lancee et al, 2017, Nature)

Clinical trials in general (2011 – ongoing; e.g. Dawn et al, 2011, Cochrane)

Brain imaging (2012 – ongoing; e.g. Carp, 2012)

Social priming (2013 – ongoing; e.g. Klein et al, 2014)

Good science & the open science revolution

Open (good) practices

1. Preregistration
2. Distinguish between exploration & confirmation
3. Transparent reporting
4. Open data (& open code)
5. Open material
6. Open reports
7. Thorough planning of sample size
8. Direct replications
9. Honest author credits
10. Honest citations
11. Open peer review

Öppna (goda) praktiker

1. Preregistrering

1. Preregistreringsdokument:
Willén & Granhag (OGM-studien)

2. Skilja mellan explorativa & konfirmatoriska frågor

KONFIRMATORISK

1. Tydlig hypotes
2. Beslut om procedur för analys
3. Datainsamling
4. Analysen för att besvara hypotesen

EXPLORATIV

1. Vag hypotes / frågeställning
2. Datainsamling
3. Utforskande analyser och successivt utvecklande av frågeställningarna

Öppna (goda) praktiker

3. Transparent rapportering

21 ord (Simmons, Nelson, Simonsohn, 2012):

“We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study.”

Öppna (goda) praktiker

Transparens i efterhand:

1. Dana Carney's uttalande
2. Min doktorsavhandling
3. Min studie från 2010

Öppna (goda) praktiker

4. Öppna data (& kod)

5. Öppet material

6. Öppen rapportpublicering

Öppna (goda) praktiker

7. Gedigen planering av stickprovsstorlek

<http://www.gpower.hhu.de/>

Öppna (goda) praktiker

8. Direkta replikationer

Figur på nästa sida från LeBel et al (2017):

<https://osf.io/preprints/psyarxiv/uwmr8>

Öppna (goda) praktiker

9. Ärlig författarkreditering

10. Ärligt refererande

11. Öppen peer review

12. Öppen etikprövning

**IGDORE – a private institute
for good science**

IGDORE

Healthy, Global & Transparent Science



- Healthy science
 - Good work environment
 - Work-life balance
- Global science
 - Worldwide recruiting
 - Worldwide data collections
- Transparent science
 - Good science (open scientific practices)

Scientific openness support

IGDORE Indonesia

Coworking space for scientists & students



Photos: Petra Sinatria, IGDORE

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