

# Transparent and replicable science - an ongoing revolution

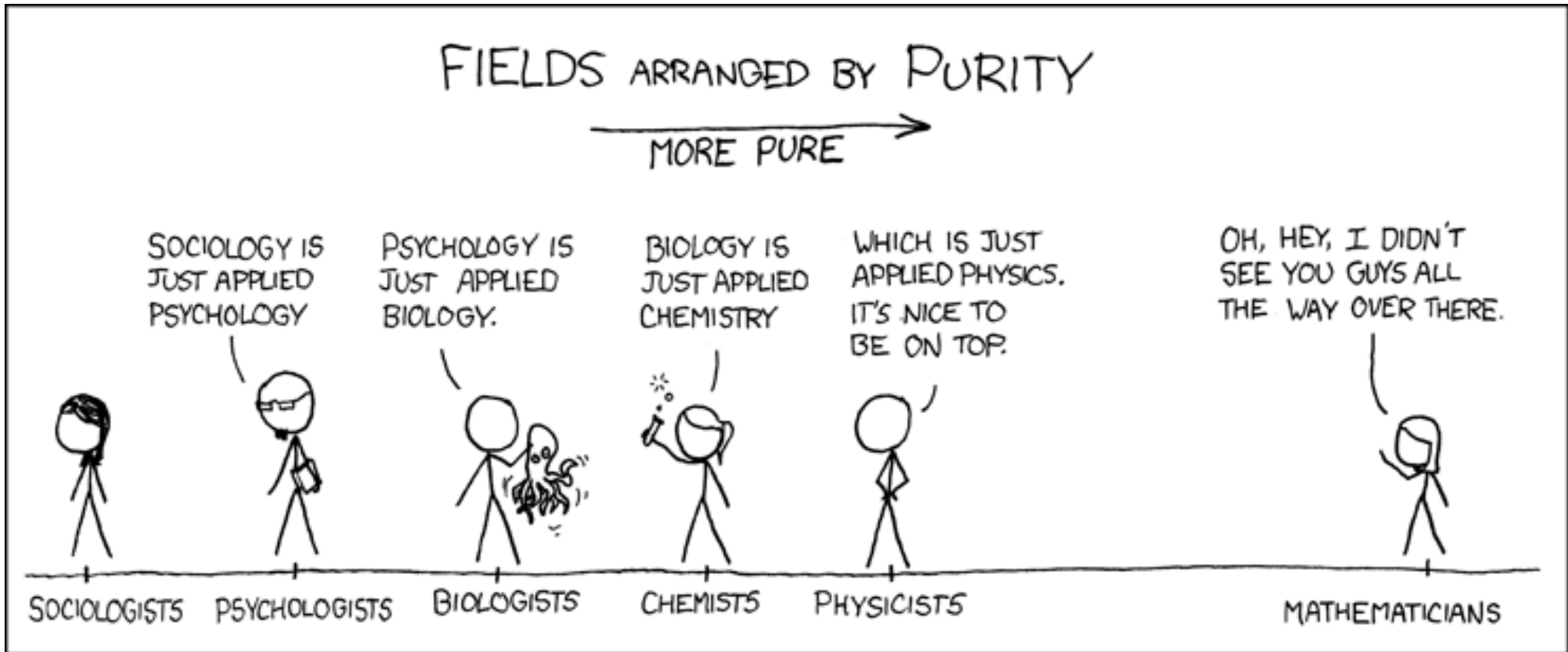
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# Today's seminar

- 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**



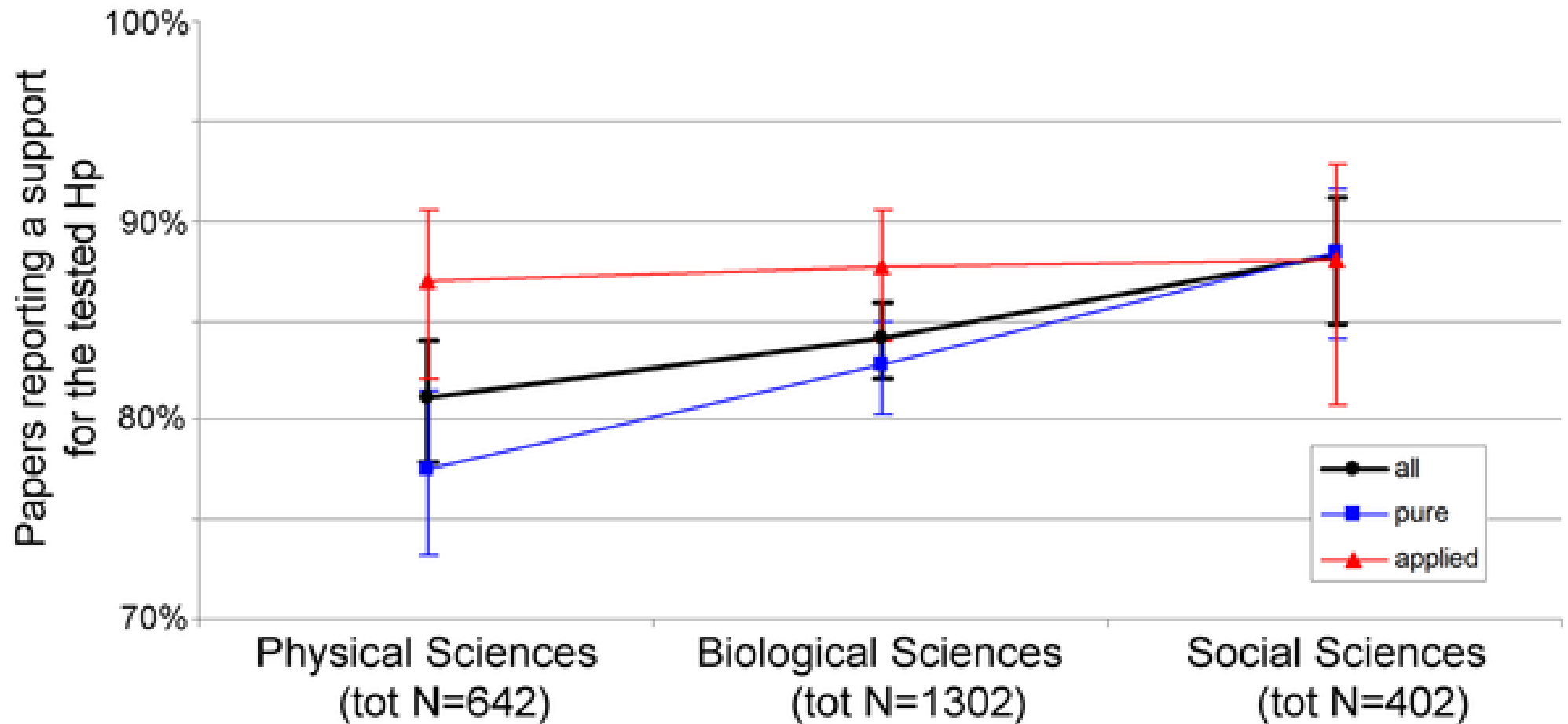
Comic: xkcd.com

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

## 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
$\geq 0.1$	

Comic: xkcd.com



# Other examples

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

**Antipsychotic drugs** (2017; Lancet 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

# Preregistration

Willen & Granhag (2015) Preregistration document

# Transparent reporting

Willen (2016) Doctoral thesis

**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

General assistance and guidance

Preregistration

Open data

Open material

Open reports



# IGDORE Indonesia

## Coworking space for scientists & students



Photos: Petra Sinatria, IGDORE

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