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## "Fake Results": The Reproducibility Crisis in Research and Open Science Solutions

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# **“Fake Results”**

The Reproducibility Crisis in Research  
and Open Science Solutions

“It can be proven that most claimed research findings are false.”

– John P. A. Ioannidis, 2005

Those are the words of John Ioannidis (yo-NEE-dees) in a highly-cited article from 2005.

Now based at Stanford University, Ioannidis is a meta-scientist who conducts “research on research” with the goal of making improvements.

Sources:

Ioannidis, John P. A. “Why Most Published Research Findings Are False.” *PLoS Medicine* 2, no. 8 (August 2005): e124. doi: 10.1371/journal.pmed/0020124.

*Wikipedia*, s.v. “Meta-research.” Accessed March 14, 2017.  
<https://en.wikipedia.org/wiki/Meta-research>.

## “Reproducibility crisis” (aka “replication crisis”)

“A methodological crisis in science in which scientists have found that the results of many scientific experiments are difficult or impossible to replicate on subsequent investigation, either by independent researchers or by the original researchers themselves.”

– Wikipedia

A recent survey by *Nature* found that more than 70% of researchers have tried and failed to reproduce another scientist’s experiments and more than half have failed to reproduce their own experiments.

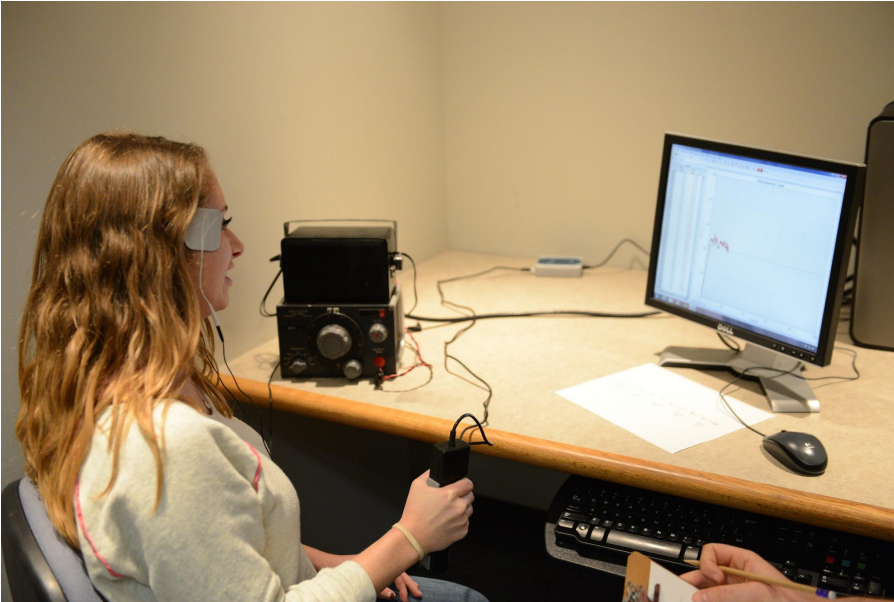
90% of respondents agreed there is a reproducibility crisis.

Source:

Baker, Monya. “Is There a Reproducibility Crisis?” *Nature* 533 (May 26, 2016): 452-454. doi: 10.1038/533452a.

*Wikipedia*, s.v. “Replication Crisis.” Accessed March 14, 2017.  
[https://en.wikipedia.org/wiki/Replication\\_crisis](https://en.wikipedia.org/wiki/Replication_crisis).

# Psychology



91.5% of all published studies in psychology found positive results.

“[EEG Experiment](#)”  
from Dr. Hirt’s  
Psychology Lab,  
Indiana University

Psychology is one of the disciplines where the crisis has received the most attention.

It is also a field where 91.5% of all published studies found positive results, that is, they supported the outcome predicted by researchers.

In 2015, the results of the Reproducibility Project: Psychology were published.

This was a four-year study lead by Brian Nosek, a professor of psychology at the University of Virginia and the co-founder & executive director of the Center for Open Science.

In the study, 270 authors replicated 100 social and cognitive psychology studies that had been published in three top psychology journals in 2008.

While 97% of the original studies produced significant results, only 36% of the replications did. Also, the effect sizes in the replication studies were only about half that of the original studies.

Sources:

Fanelli, Daniele. “‘Positive’ Results Increase Down the Hierarchy of the Sciences.” *PLoS One* 5, no. 4 (2010): e10068. doi: 10.1371/journal.pone.0010068.

Open Science Collaboration. "Estimating the Reproducibility of Psychological Science." *Science* 349, no. 6251 (August 27, 2015): aac4716. doi: 10.1126/science.aac4716.

# Economics



“...We assert that economics research is usually not replicable.”

– Andrew C. Chang and Phillip Li, 2015

[“Homeless man in Vancouver”](#) by Jay Black is licensed under [CC BY-SA 2.0](#).

Economics is another discipline with a reputation for non-reproducibility.

A 2015 paper by two researchers from the Federal Reserve and the Department of the Treasury tried to replicate results from 67 papers published in 13 prestigious journals. Even after contacting the authors of the original studies when necessary, they were only able to replicate 49% of the results. They concluded, “Because we were 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.”

Perhaps the best known replication case in economics is this one:

In 2010, Harvard economists Carmen Reinhart and Kenneth Rogoff published a paper in the *American Economic Review* that demonstrated that the rate of economic growth in advanced economies declines precipitously once the level of government debt exceeds 90 percent of the country’s GDP. Their paper was embraced by politicians around the world as justification to cut back on stimulus measures after the 2008 crash and to instead implement austerity.

But in 2013 Thomas Herndon, a grad student at UMass Amherst, had a course assignment to replicate a well-known economics study. He chose Reinhart & Rogoff. To make a long story short, after pestering Reinhart & Rogoff for their data, Herndon discovered that spreadsheet coding errors, selective data omissions, and unconventional statistical techniques by the Harvard researchers had lead to a false result. In fact, the average GDP growth for advanced economies with public-debt to

GDP ratios over 90 percent is not dramatically different than when debt ratios are lower.

Sources:

Chang, Andrew C., and Phillip Li. "Is Economics Research Replicable? Sixty Published Papers from Thirteen Journals Say 'Usually Not.'" *Finance and Economics Discussion Series 2015-083*. Washington: Board of Governors of the Federal Reserve System, 2015. doi: 10.17016/FEDS.2015.083.

Herndon, Thomas, Michael Ash, and Robert Pollin. "Does High Public Debt Consistently Stifle Economic Growth? A Critique of Reinhart and Rogoff." *Cambridge Journal of Economics* 38, no. 2 (2014): 257-279. doi: 10.1093/cje/bet075.

Reinhart, Carmen M. and Kenneth S. Rogoff. "Growth in a Time of Debt." *American Economic Review* 100, no. 2 (May 2010): 573-78. doi: 10.1257/aer.100.2.573.



## Animal studies



“I think it may have confounded, to whatever degree, some very large subset of existing research.”

– Jeffrey Mogil,  
2014

“[Lobund Wistar-Rat](#)”  
by Janet Stephens is  
in the public domain.

Jeffrey Mogil is a neuroscientist who studies pain at McGill University in Montreal.

When the mice in his experiment weren't experiencing pain as expected, he realized that the mice that weren't feeling the pain had been handled by male students.

Subsequent experiments determined that, as the headline in *Nature* put it, “male researchers stress out rodents.”

It turns out that being in the presence of men, but not women, caused intense stress in the animals, which dampened their pain response.

And since almost every animal behavior studied in the lab is affected by stress, this finding could have broad implications.

As Mogil put it, “I think it may have confounded, to whatever degree, some very large subset of existing research.”

Sources:

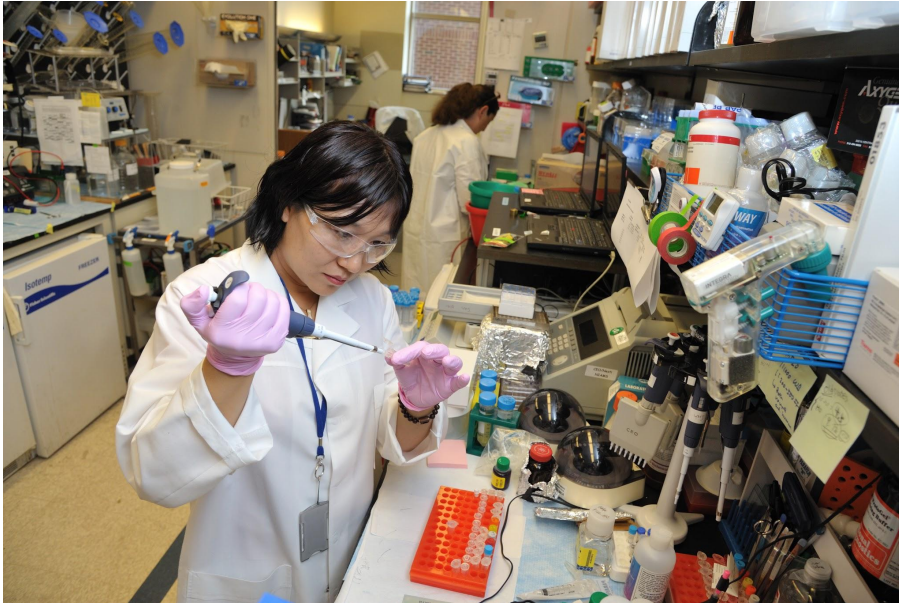
Duhaime-Ross, Arielle. “Lab Mice Fear Men But Not Women, and That’s a Big Problem for Science.” *The Verge*. Last modified April 28, 2014.  
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# Biomedical research



[“The NIAMS Cartilage Biology and Orthopaedics Branch”](#) by [NIH Image Gallery](#) is licensed under [CC BY-NC 2.0](#).

Reproducibility has also been a big problem in biomedical research, or so-called “preclinical research.”

Preclinical research describes the type of exploratory, hypothesis-generating research that goes on at universities (as opposed to clinical research and testing in humans that may be conducted by drug companies, for example).

In 2011, a team from Bayer reported that in only 20-25% of 67 seminal studies they tried to reproduce did they come to results “completely in line” with those of the original publications.

In 2012, Glenn Begley, the former head of cancer research at Amgen, reported that over a 10 year stretch, Amgen’s scientists had tried to replicate the findings of 53 landmark studies in cancer biology. They obtained positive results in only 6, a rate of just over 11%.

Ioannidis studied 49 of the most highly-regarded research findings in medicine published between 1990-2003, each cited more than 1,000 times. These were articles that helped lead to the widespread popularity of treatments such as the use of hormone-replacement therapy for menopausal women, vitamin E to reduce the risk of heart disease, coronary stents to ward off heart attacks, and daily low-dose aspirin to control blood pressure and prevent heart attacks and strokes. Of the 49 claims, 34 had been re-tested, and 14, or 41% had been convincingly shown to be wrong or significantly exaggerated.

One analysis of past studies indicates that the total prevalence of irreproducible preclinical research exceeds 50%, resulting in approximately \$28 billion a year spent on research that is not reproducible, in the United States alone.

Sources:

Begley, C. Glenn, and Lee M. Ellis. "Drug Development: Raise Standards for Preclinical Cancer Research." *Nature* 483 (29 March 2012). 531-533. doi: 10.1038/483531a.

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## Why? “File-drawer problem”



Researchers do not bother to write up experiments with negative / null results or the results of replication studies.

Instead of submitting them to journals, they file them away.

“Filing” by [Jeff Youngstrom](#) is licensed under [CC BY-NC 2.0](#).

File-drawer problem: Researchers do not bother to write up experiments with negative / null results or the results of replication studies.

Instead of submitting them to journals, they file them away.

They believe journals are not interested in publishing negative results or replications.

Replication studies are viewed as lacking prestige, originality, or excitement. They can be seen as a challenge to authority in their field.

Researchers fear that replications and negative results will not get them published, promoted, or even hired.

Example:

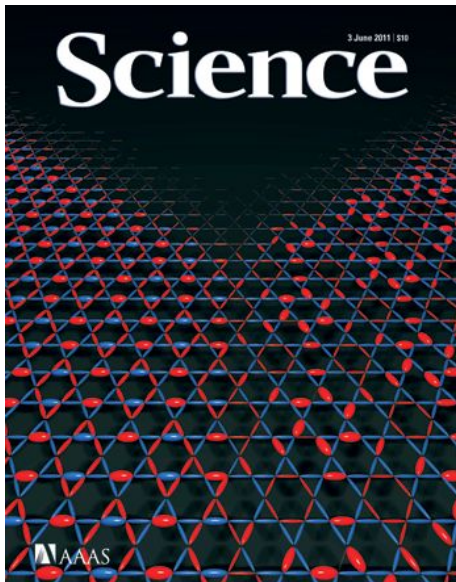
A 2008 study of antidepressant trials registered with the FDA found that almost all trials showing positive effects of the drugs were published, while trials with negative results, with few exceptions, remained either unpublished or were published with the results presented so that they would appear positive.

Sources:

Turner, Erick H., Annette M. Matthews, Eftihia Linardatos, Robert A. Tell, and Robert

Rosenthal. "Selective Publication of Antidepressant Trials and Its Influence on Apparent Efficacy." *New England Journal of Medicine* 358 (2008): 252-260. doi: 10.1056/NEJMsa065779.

## Why? *Publication bias*



“...the small proportion of results chosen for publication are unrepresentative of scientists’ repeated samplings of the real world.”

– Neal S. Young, John P. A. Ioannidis, and Omar Al-Ubaydli, 2008

[Cover of Science v. 332, no. 6034](#) by the American Association for the Advancement of Science. Image by Stephen R. White.

Not only are researchers biased against writing up and submitting negative results, but **journals are biased toward publishing positive results.**

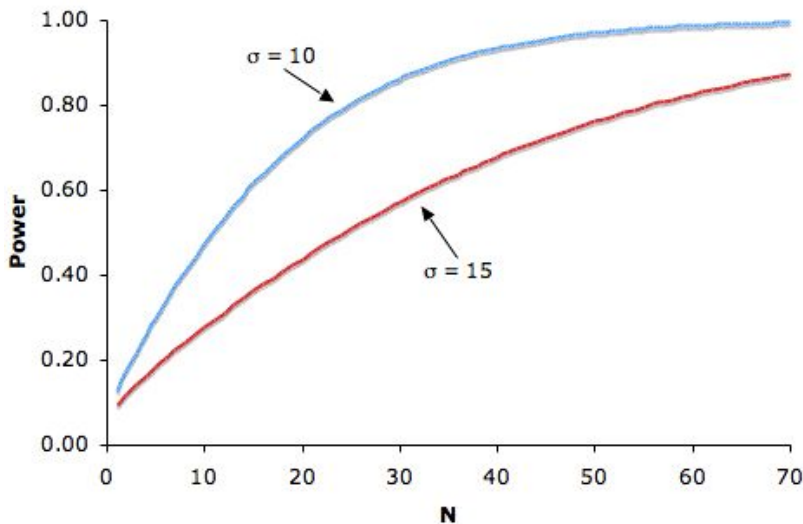
**A 2012 study by Danielle Fanelli of the University of Edinburgh analyzed over 4,600 papers published in all disciplines between 1990 and 2007. She found that the proportion of positive results increased from 70% in 1990-1991 to 86% in 2007.**

Sources:

Fanelli, Daniele. “Negative Results are Disappearing From Most Disciplines and Countries.” *Scientometrics* 90, no. 3 (March 2012): 891-904. doi: 10.1007/s11192-011-0494-7.

Young, Neal S., John P. A. Ioannidis, and Omar Al-Ubaydli. “Why Current Publication Practices May Distort Science.” *PLoS Medicine* 5, no. 10 (2008): e201. doi: 10.1371/journal.pmed.0050201.

# Why? *Bad experimental design & analysis*



“If you torture the data long enough, it will confess.”

– Ronald Coase, recipient of the 1991 Nobel Prize in Economics

[“The Relationship Between Sample Size and Power”](#) by [Online Statistics Education: A Multimedia Course of Study](#) is in the public domain.

This slide could be the entire presentation in itself.

To keep it simple, problems with experimental design and data analysis include:

- Using sample sizes that are too small -- while results might be positive, their statistical power is low
- Failing to state one’s hypothesis in advance of the study, also known as HARK-ing (hypothesizing after the results are known)
- “P-hacking”
  - Viewing experimental data as they are coming in and stopping the experiment once a positive result is obtained
  - Performing hundreds of tests on dozens of variables and only reporting those that produced positive results
- Researchers not using controls or not blinding themselves to study group vs. control group
- Not attempting to replicate results before publication
- Not documenting experimental methods adequately
- Not making available data and code underlying the experiment
- In biological sciences, not validating reagents, antibodies, cell lines, and other lab materials



Source:

*Wikiquote*, s.v. "Ronald Coase." Accessed March 15, 2017.  
[https://en.wikiquote.org/wiki/Ronald\\_Coase](https://en.wikiquote.org/wiki/Ronald_Coase).

## Why? *Incentive structure*



“Today I wouldn’t get an academic job. It’s as simple as that. I don’t think I would be regarded as productive enough.”

– Peter Higgs, 2013 (winner of the 2013 Nobel Prize in Physics)

“[Prof. Meyerson in his funky Stanford gown](#)” by [Anna Majkowska](#) is licensed under [CC BY 2.0](#).

Perhaps the biggest reason for the reproducibility crisis is the incentive structure for academic researchers.

Researchers know that they need to publish regularly in the most prestigious journals possible in order to get tenure and receive grants.

- Due to the intense competition for academic research positions, there have been persistent increases in the average number of publications at the time of hiring.

Because high-prestige journals like to publish exciting, surprising, or “sexy,” results, there is incentive to test hypotheses that are **unlikely**.

- In the years between 1974 and 2014, the frequency of the words “innovative,” “groundbreaking,” and “novel” in PubMed abstracts increased by 2500% or more.

To make sure a hypothesis has firm theoretical grounding and an experimental design is well powered slows down the rate of production, so sound science is discouraged.

Shai Silberberg of the NIH notes that, “As long as universities think that the way for investigators to get money is to publish in *Nature* and *Science*, then that’s what they’re going to look for in investigators. They want that money.”

Sources:

Aitkenhead, Decca. "Peter Higgs: I Wouldn't Be Productive Enough for Today's Academic System." *The Guardian* (London), December 6, 2013.  
<https://www.theguardian.com/science/2013/dec/06/peter-higgs-boson-academic-system>.

Smaldino, Paul E. and Richard McElreath. "The Natural Selection of Bad Science." *Royal Society Open Science* 3 (2016): 160384. doi: 10.1098/rsos.160384.

Voosen, Paul. "Amid a Sea of False Findings, the NIH Tries Reform." *The Chronicle of Higher Education*. Last modified: March 16, 2015.  
<http://www.chronicle.com/article/Amid-a-Sea-of-False-Findings/228479/>.

## What about peer review?



“We need to get away from the notion, proven wrong on a daily basis, that peer review of any kind at any journal means that a work of science is correct.”

– Michael Eisen, 2014

“[Peer Review Monster](#)” by [Gideon Burton](#) is licensed under [CC BY-SA 2.0](#).

The problems with peer review would also require a separate presentation. Just some highlights:

The Cochrane Collaboration reviewed the evidence on peer review of manuscripts and grant proposals. They concluded, “At present, little empirical evidence is available to support the use of editorial peer review as a mechanism to ensure quality of biomedical research.”

The British Medical Journal took a study that was about to be published and inserted 8 errors in it, then sent it out to 300 reviewers. The median number of errors spotted was two, and 20% of the reviewers did not spot any.

And, one of the best well-known failures of peer review was the article by Andrew Wakefield, published in *The Lancet* in 1998, finding that the MMR vaccine caused autism. That article was reviewed by 6 reviewers, none of whom found any of the problems with it that were later identified.

**In short, peer review fails to detect false research findings primarily because:**

- Reviewers don't re-run the experiments or examine the data, and they can have no knowledge as to what data investigators have chosen to exclude.
- And again, incentives: Reviewing is not highly valued for career advancement — thus diligence in reviewing and time spent are not rewarded.

[Alternatives: Publish everything and then let the world decide what is important; post-publication peer review; increased transparency; credit for reviewers.]

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Campbell, Hank. "The Corruption of Peer Review is Harming Scientific Credibility." *Wall Street Journal* (New York, NY), July 14, 2014.

Houses of Parliament, Parliamentary Office of Science & Technology. "Integrity in Research." *POSTnote* 544 (January 2017).  
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## Proposed solutions: *Registered reports*



Image source: Center for Open Science, <https://cos.io/rr/>.

Registered reports are an initiative of the Center for Open Science. Over 49 journals now offer them. Researchers can also use the Center for Open Science's Open Science Framework to register their research.

Here's how it works:

Journals agree to review a study's design and analysis plan **before** the experiment is conducted.

The study design is itself peer reviewed and must be methodologically sound and address an important scientific question.

Approved studies will be published as long as the study protocols were followed, regardless of the findings.

Therefore, publication is based not on results but on an experiment's methods and rigor.

This eliminates publication bias toward positive results as well as questionable research practices.

Similar initiatives are:

- ClinicalTrials.gov, started in 2000 and run by the National Library of Medicine.

- It is a registry of over 230,000 clinical trials from 195 countries in the world. It addresses the problem of pharmaceutical companies not sharing negative results of their drug trials.
- AllTrials, started in 2013, is a campaign advocating that all clinical trials, including past trials, be listed in a clinical trials registry, and that their results be shared openly.

Sources:

“AllTrials.” Accessed March 10, 2017. <http://www.alltrials.net/>.

Center for Open Science, “Open Science Framework.” Accessed March 16, 2017. <https://osf.io/>.

Center for Open Science, “Registered Reports.” Accessed March 15, 2017. <https://cos.io/rr/>.

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*Wikipedia*, s.v. “ClinicalTrials.gov.” Accessed March 15, 2017. <https://en.wikipedia.org/wiki/ClinicalTrials.gov>.

## Proposed solutions: *Funding & publishing replications, publishing negative results*

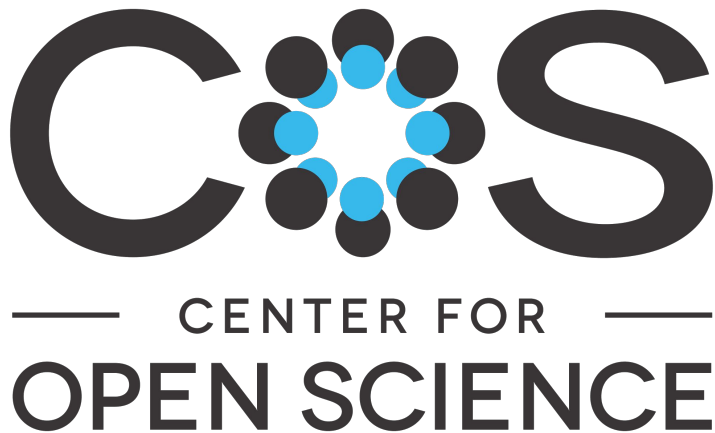


Image source: Center for Open Science,  
[https://cdn.cos.io/static/images/cos\\_stack.png](https://cdn.cos.io/static/images/cos_stack.png)

### **Funding and publishing replication studies:**

Funding agencies should fund replication studies, and journals should publish them.

One current example is the Reproducibility Project: Cancer Biology.

- Launched in 2013 with a \$2 million grant from the Laura and John Arnold Foundation, it is a collaboration between the Center for Open Science and the Science Exchange.
- Researchers are independently replicating a subset of experimental results from a number of high-profile papers in the field of cancer biology published between 2010-2012.
- So far, five replications, with mixed results, have been published in the journal *eLife*.

Some journals have created sections devoted to replications, for example *Perspectives on Psychological Science*.

### **Publishing negative / null results:**

Referees and journal editors should value negative / null results and publish them.

Before publishing positive results, journals should require demanding reproducibility criteria, such as an independent replication.



A number of new journals or collections within journals have been established to specialize in publishing negative results, e.g.:

- Elsevier's *New Negatives in Plant Science*
- PLoS One's Positively Negative collection
- Biomed Central's *Journal of Negative Results in Biomedicine*

At the very least, we need rapid, digital publication of all articles that contain no flaws, irrespective of perceived importance.

- PLoS One is one journal that asks peer reviewers only if a paper is methodologically sound.

Replication studies and negative / null results can also be shared on preprint servers such as ArXiv, bioRxiv, SocArXiv, engrXiv, and SSRN.

The goal should be for the results of all research to be discoverable, even if not formally published.

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Aschwanden, Christie. "Failure is Moving Science Forward." *FiveThirtyEight*. Last modified March 24, 2016.

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Proposed solutions: *Open data, open access*



Image source: Registry of Research Data Repositories, <http://www.re3data.org/>.

**Data and software code underlying an article should be openly shared.**

There are a growing number of public data repositories available, and the Center for Open Science's Open Science Framework also provides tools for sharing.

**In fact, open data should be mandatory as a condition of publication.**

Fortunately, many funders and journals now make sharing data a requirement. (Though a 2011 study found that of 351 papers published in 2009 in journals with a data availability policy, only 41% fully complied.)

This is also good for the preservation of the scholarly record.

- One group of researchers, lead by Timothy Vines, reached out to the investigators behind over 500 research papers published between 1991 and 2001. They found that just 23% of the data still existed, and that the odds of a data set still existing fell by 17% per year.

Of course, open access to the articles themselves is also good for reproducibility. Open access can be provided by publishing in an open access journal or by posting article manuscripts to preprint servers or repositories.

Sources:

Alsheikh-Ali, Alawi A., Waqas Qureshi, Mouaz H. Al-Mallah, John P. A. Ioannidis. "Public Availability of Published Research Data in High-Impact Journals." *PLoS One* 6, no. 9 (2011): e24357. doi: 10.1371/journal.pone.0024357.

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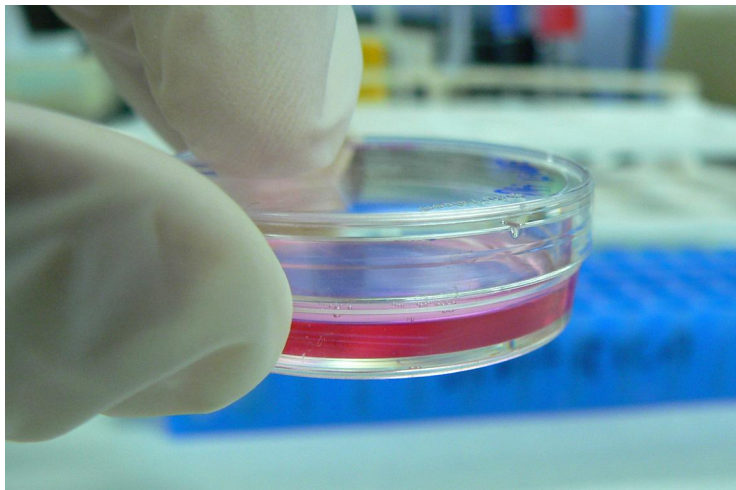
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## Proposed solutions: *Better study designs & statistical methods*



“Cell Culture” by [Umberto Salvagnin](#) is licensed under [CC BY 2.0](#).

### Some highlights:

- Distinguish exploratory studies from hypothesis-testing studies. Hypotheses can only be tested after they have been formulated.
- Design confirmatory **studies with larger sample sizes** for higher statistical power; **one way is to collaborate with groups at other institutions to run the study.**
- Utilize good scientific methods (e.g. blinding, controls, repeats).
- Create a plan for data analysis before observing the data.
- **Describe methods in more detail to increase others' ability to reproduce the results.** Several journals now offer checklists of information that should be included.
- Validate materials used in the lab, e.g. cell lines, antibodies, specialty chemicals.
- Improve training in experimental design and statistical techniques for grad students, post-docs, and even researchers, because best practices are constantly evolving.

### Sources:

Begley, C. Glenn and John P. A. Ioannidis. “Reproducibility in Science: Improving the Standard for Basic and Preclinical Research.” *Circulation Research* 116, no. 1

(January 2015): 116-126. doi: 10.1161/CIRCRESAHA.114.303819.

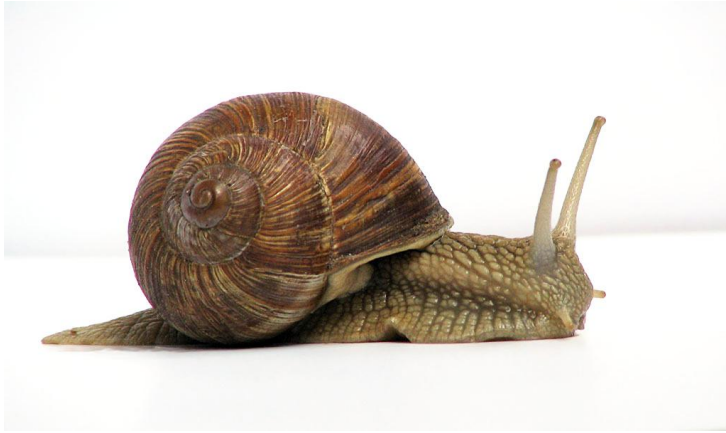
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## Proposed solutions: *Slow science*



“Scrupulous research on difficult problems may require years of intense work before yielding coherent, publishable results.”

– Paul E. Smaldino and Richard McElreath, 2016

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Research culture and career incentives need to be changed:

Researchers should be assessed for career advancement and funding decisions on the quality of their work, not on the quantity of publications they've written or journal impact factor or brand.

Those who conduct rigorous, transparent and reproducible research should be rewarded more than those who do not, and researchers need to be held accountable for acknowledging mistakes.

Systems should be developed that finance individual investigators over the longer term rather than specific projects.

[Would require less austerity in higher education, more funding, more positions, to tone down hyper-competitive culture.]

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See also:

Berg, Maggie and Barbara Seeber. *The Slow Professor: Challenging the Culture of Speed in the Academy*. Toronto: University of Toronto Press, 2016.

## How does this connect with “fake news”?



“[Invasion of Fake News](#)” by [Free Press/ Free Press Action Fund](#) is licensed under [CC BY-NC-SA 2.0](#).

- Consumption of “fake” and low quality information is not limited to the uneducated or ignorant.
- “Fake results” of research undermine public trust in expertise and established knowledge.

The highly educated also deal in false information, though in most cases this is not deliberate, rather the result of structural problems.

We have all heard of expert advice based on scientific studies that has turned out not to be true: advice on diet, safety of drugs, effectiveness of medical interventions, etc.

See:

Nichols, Tom. *The Death of Expertise: The Campaign Against Established Knowledge and Why It Matters*. New York: Oxford University Press, 2017.



## Closing thoughts

“As readers of scientific work, all we can do is be more skeptical of everything that is published.”

– Christobal Young, Assistant Professor of Sociology, Stanford University, 2015

“I want to adopt a stance of humility and assume that there are errors and that’s why I need to be cautious in my conclusions.”

– Brian Nosek, Professor of Psychology, University of Virginia and co-founder and director of the Center for Open Science, 2016

**Be critical:** We can view research claims with a critical eye, educate ourselves on basic ways of evaluating research quality.

**Be humble:** Don’t arrogantly assume that we have figured everything out and have all the answers, because we usually don’t.

**Be willing to revise** our own personal opinions: We should be able to disconnect our positions from our identities, not stake our sense of self on a particular position we hold or practice that we’ve embraced.

Push for **openness** and transparency in the production and dissemination of knowledge.

Sources:

Aschwanden, Christie. “Failure is Moving Science Forward.” *FiveThirtyEight*. Last modified March 24, 2016.  
<https://fivethirtyeight.com/features/failure-is-moving-science-forward/>.

Flaherty, Colleen. “Landmark Study Suggests Most Psychology Studies Don’t Yield Reproducible Results.” *Inside Higher Ed*. Last modified August 28, 2015.  
<https://www.insidehighered.com/news/2015/08/28/landmark-study-suggests-most-psychology-studies-dont-yield-reproducible-results>.

## Closing thoughts

“The facts that science denialists target are almost always very different from the types of facts we are modeling. We are modeling small-scale facts of modest import. The reality of anthropogenic climate change, the lack of connection between vaccination and autism, or the causative role of smoking in cancer are very different. Facts of this sort have enormous practical importance; they are supported by massive volumes of research.”

– Silas Boye Nissen, Tali Magidson, Kevin Gross, and Carl T. Bergstrom, 2016

Finally, the reproducibility crisis, though real and pervasive, is not to be confused with scientific denialism.

Replication problems are not an issue in areas such as human-induced climate change and natural selection that have been verified by thousands of scientists over many years.

So, this presentation is not a repudiation of the scientific method, but rather a call to better live up to it.

Sources:

Nissen, Silas Boye, Tali Magidson, Kevin Gross, and Carl T. Bergstrom. “Publication Bias and the Canonization of False Facts.” *eLife* 5 (2016): e21451. doi: 10.7554/eLife.21451.

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Panel presentation at “Finding Reliable Information in a  
“Post-Fact’ World,” March 23, 2017, University of Rhode Island.



Presentation given on Thursday, March 23, 2017 at “Finding Reliable Information in a  
‘Post-Fact’ World,” a panel discussion presented by the Coalition to Encourage Civic  
Engagement.

Co-sponsors: URI College of Arts and Sciences, University Libraries, Harrington  
School of Communication and Media, Gender and Women’s Studies Program,  
Department of English, Department of Sociology and Anthropology.

Location: Chafee Hall 273, University of Rhode Island, Kingston, RI

Time: 4:00 - 6:00 pm

Panelists:

- Karen F. Stein, Professor, Department of English and Gender and Women’s Studies  
Program
- Amanda Izenstark, Associate Professor, University Libraries
- Brian Krueger, Chair, Department of Political Science
- John Pantalone, Chair, Department of Journalism
- Andrée Rathemacher, Professor, University Libraries
- Christine Zozula, Assistant Professor, Department of Sociology and Anthropology