

¿Para qué y por qué estudiar o interesarse por la epistemología?

Ciencia y tecnología reflexivas

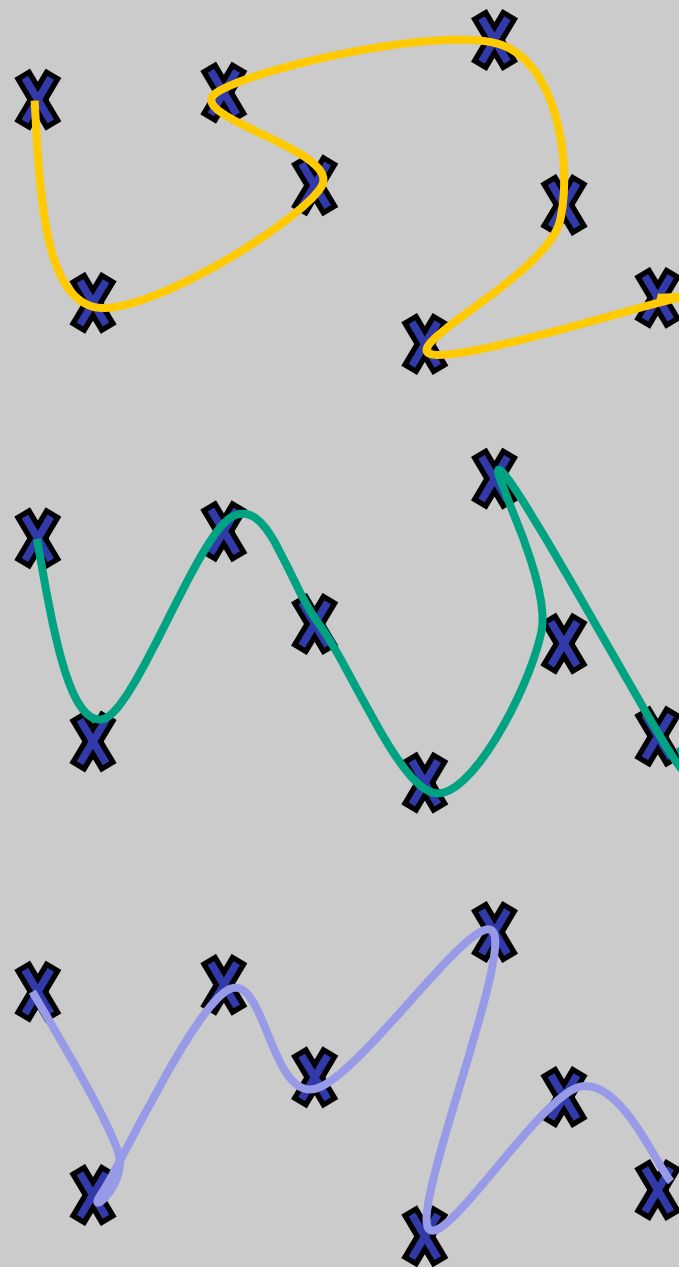
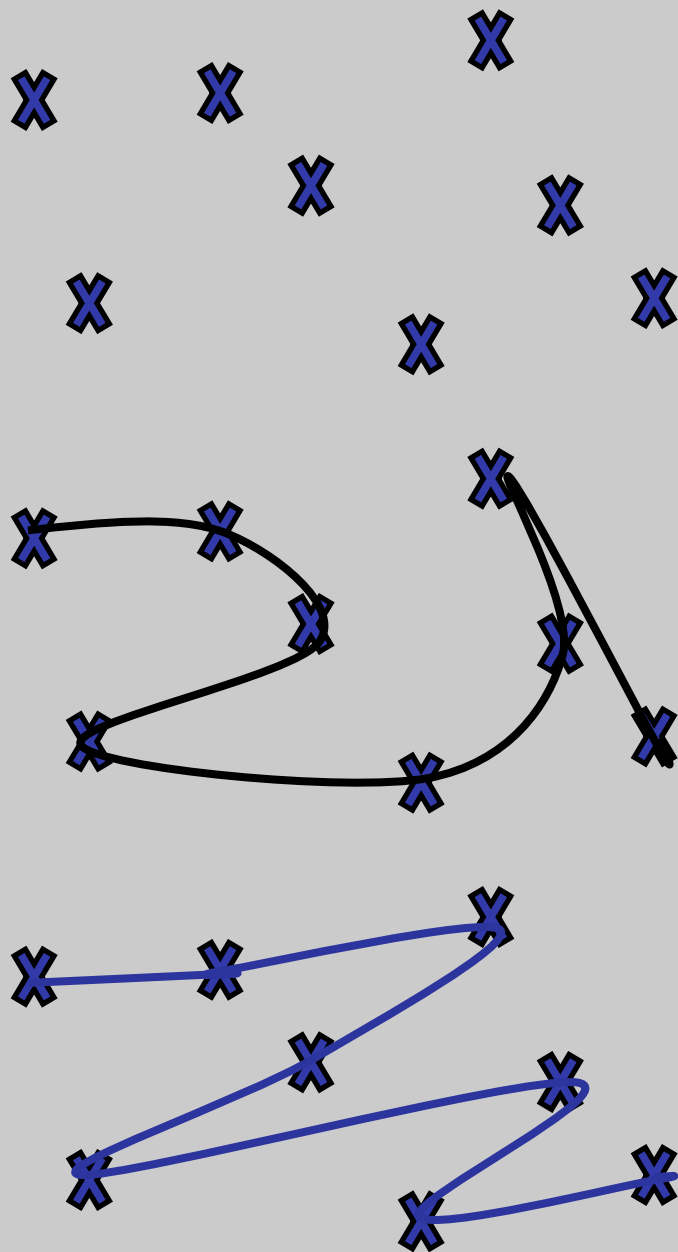
Enseñanza reflexiva

Profesión reflexiva, responsable

“I can say with certainty that the ablest students whom I met as a teacher were deeply interested in the theory of knowledge”

Albert Einstein (1916)

Subdeterminación de la teoría por los datos



Subdeterminación de la teoría por los datos

Falacia de Afirmación del Consecuente

Si p , entonces q

q

p

Si H , entonces *dato*

dato

H

Cada vez que confirmamos una idea o hipótesis de trabajo (i.e. que tenemos algún asterisco que mostrar mediante cualquier tipo de dispositivo experimental) lo hacemos empleando un razonamiento incorrecto.

Subdeterminación de la teoría por los datos

Los datos disponibles, incluyendo los resultados de experimentos relevantes, nunca pueden determinar que una hipótesis sea correcta. Esos datos tampoco pueden determinar completamente que una hipótesis competidora sea incorrecta. De hecho, varias hipótesis competidoras pueden ser compatibles con los datos disponibles.

No hypothesis can be proved by experiment.

When conclusions from a certain hypothesis are in agreement with observation, we can only conclude that the hypothesis may be right, but it does not follow that the hypothesis must be right. It could be that the same observational results could also be derived from a different hypothesis. Then our observations cannot decide between two different principles.

Since we can never imagine all possible hypotheses, we cannot say that a certain hypothesis is the right one.

Modificado a partir de Frank (1957)

Subdeterminación de la teoría por los datos

¿es solo un *artefacto* filosófico o sus consecuencias se ven usualmente en la actividad científica?

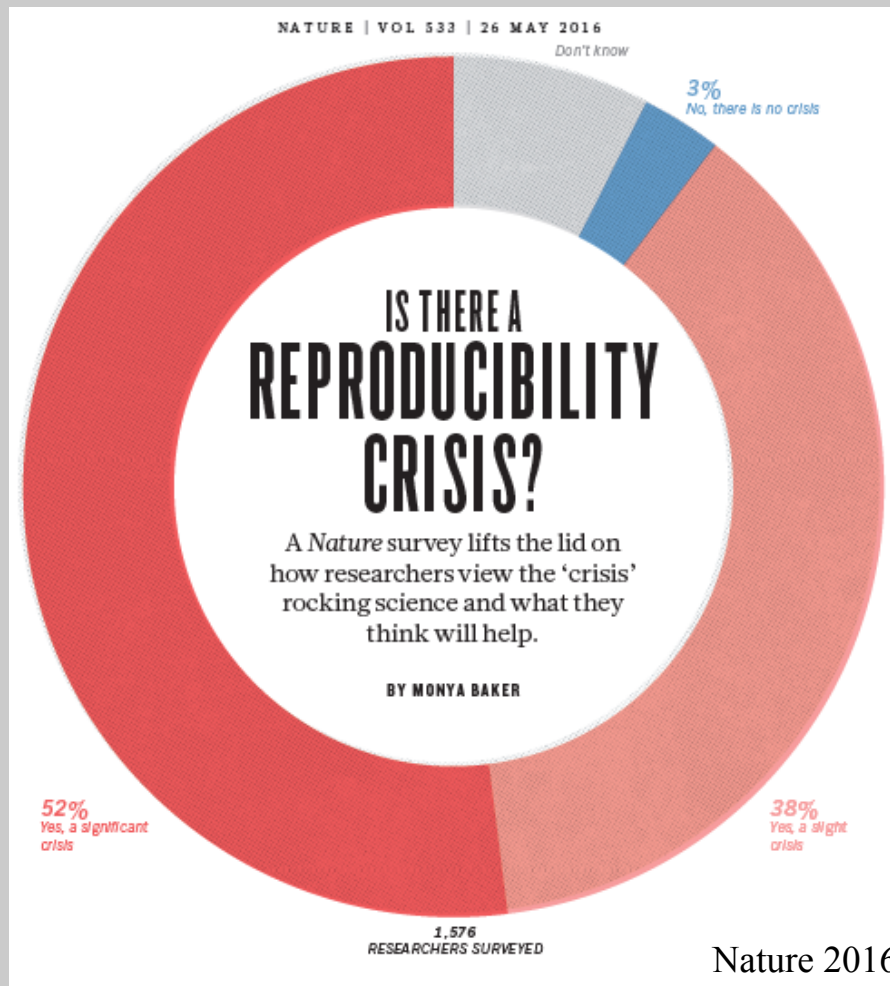


Essay

Why Most Published Research Findings Are False

John P. A. Ioannidis

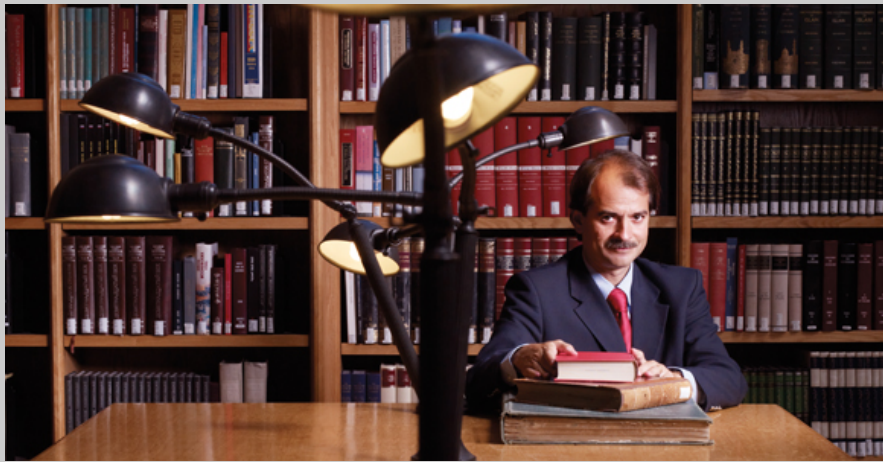
Citation: Ioannidis JPA (2005) Why most published research findings are false. PLoS Med 2(8): e124.



Lack of reproducibility [e.g. of patterns] entails, among other problems,

low predictive capability

Nature 2016



John PA Ioannidis

Scopus (2016)

> 800 publicaciones

> 40000 citas

$h > 100$

Google Scholar (2018)

> 1500 publicaciones

> 150000 citas

$h > 160$

Contradicted and Initially Stronger Effects in Highly Cited Clinical Research

John PA Ioannidis. JAMA 2005 [379 citas en Scopus]

Results Of 49 highly cited original clinical research studies, 45 claimed that the intervention was effective. **Of these, 7 (16%) were contradicted by subsequent studies, 7 (16%) had found effects that were stronger than those of subsequent studies,** 20 (44%) were replicated, and 11 (24%) remained largely unchallenged. Five of 6 (83%) highly cited non-randomized studies had been contradicted or had found stronger effects *vs* 9 of 39 (23%) randomized controlled trials ($P=.008$) ...

Conclusions **Contradiction and initially stronger effects are not unusual in highly cited research of clinical interventions and their outcomes.** The extent to which high citations may provoke contradictions and *vice versa* needs more study. Controversies are most common with highly cited nonrandomized studies, but even the most highly cited randomized trials may be challenged and refuted over time, especially small ones.

Why most published research findings are false?

John PA Ioannidis. Plos Medicine 2 (8): 696-701. 2005

Published research findings are sometimes refuted by subsequent evidence, with ensuing confusion and disappointment... There is increasing concern that false findings may be the majority –or even the vast majority– of published research claims...

The probability that a research finding is indeed true depends on the **number of other studies asking the same question, the ratio of ‘true relationships’ to ‘no relationships’ among those studies, the statistical power and the level of statistical significance** of the specific analysis...

Prevailing mentality in some fields has been to focus on isolated discoveries by single teams, interpreting research experiments in isolation ... If the sample and effect size are small, the field is likely to be plagued by false positive claims.

El árbitro González lleva un récord de 8 victorias y 2 derrotas cuando dirige de local al equipo Blanco (pero no se corrige por el récord de todos los árbitros que ha dirigido al equipo Blanco de local)



Reality check on reproducibility

A survey of Nature readers revealed a high level of concern about the problem of irreproducible results. Researchers, funders and journals need to work together to make research more reliable.

Is there a reproducibility crisis in science? Yes, according to the readers of *Nature*. As we report on page 452, two-thirds of researchers who responded to a survey by this journal said that current levels of reproducibility are a major problem.

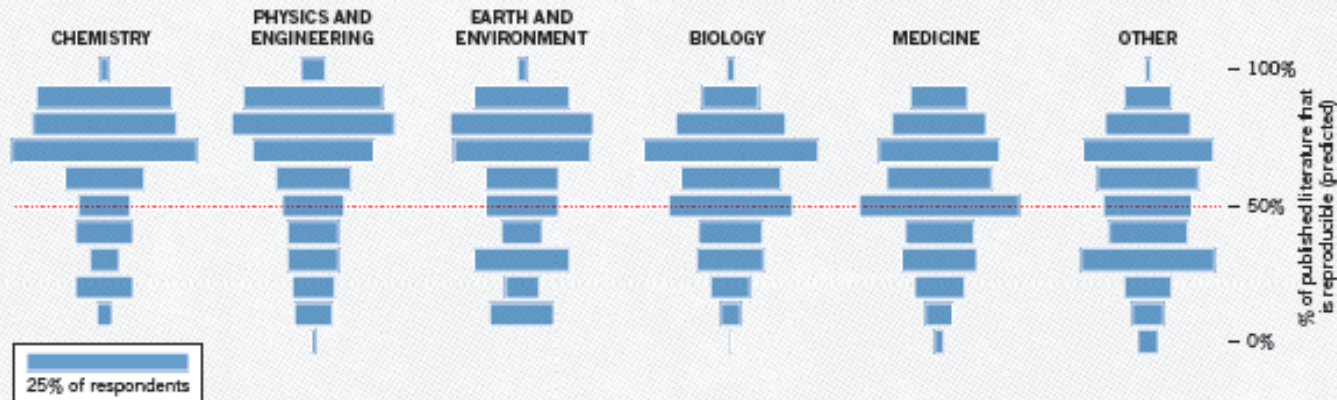
person ready to question whether a data point or a sample should really be excluded from analysis can help to cut down on cherry-picking, conscious or not. A couple of senior scientists have set up workflows that avoid having a single researcher in charge of preparing

A 'CRISIS' IN NUMBERS

Nature surveyed 1,576 scientists online to get their thoughts on reproducibility in their field and in science in general. See go.nature.com/2vjrd4y for more charts and access to the full data.

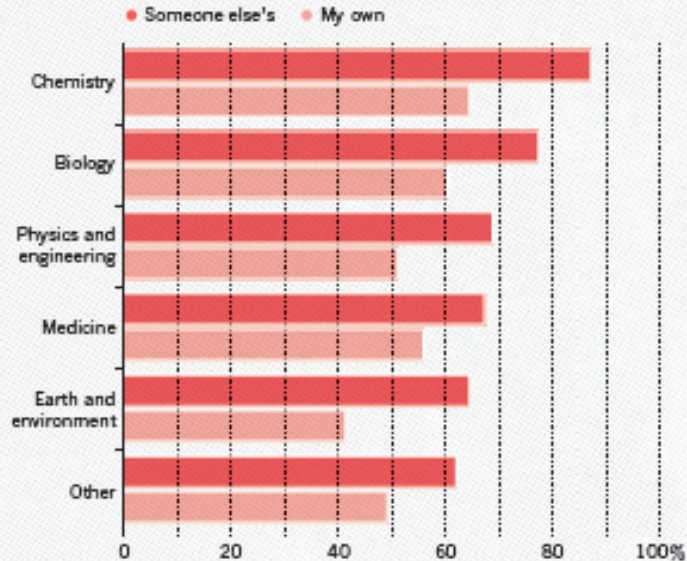
HOW MUCH PUBLISHED WORK IN YOUR FIELD IS REPRODUCIBLE?

Physicists and chemists were most confident in the literature.



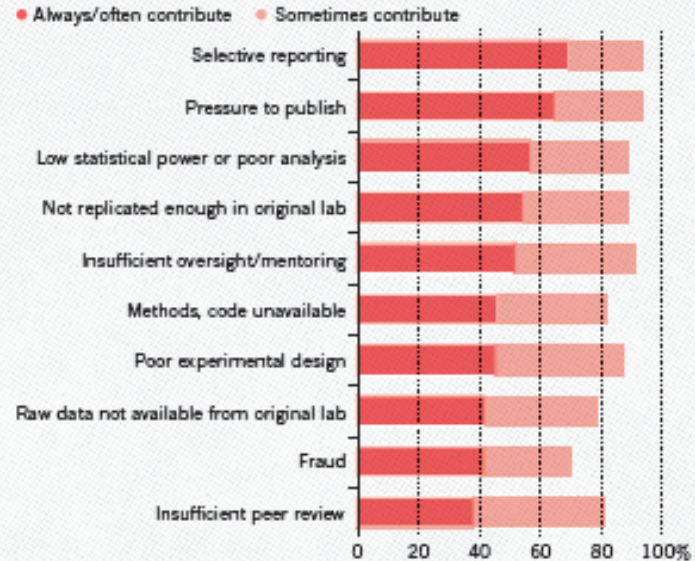
HAVE YOU FAILED TO REPRODUCE AN EXPERIMENT?

Most scientists have experienced failure to reproduce results.



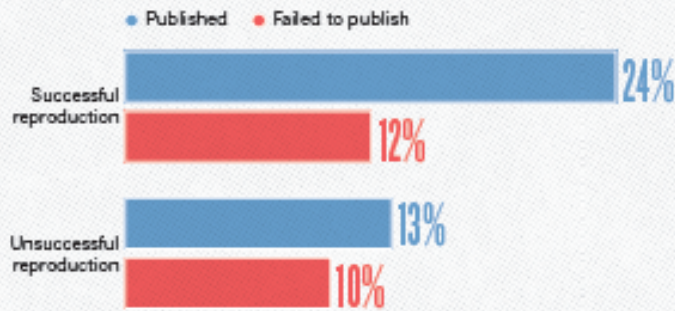
WHAT FACTORS CONTRIBUTE TO IRREPRODUCIBLE RESEARCH?

Many top-rated factors relate to intense competition and time pressure.



HAVE YOU EVER TRIED TO PUBLISH A REPRODUCTION ATTEMPT?

Although only a small proportion of respondents tried to publish replication attempts, many had their papers accepted.

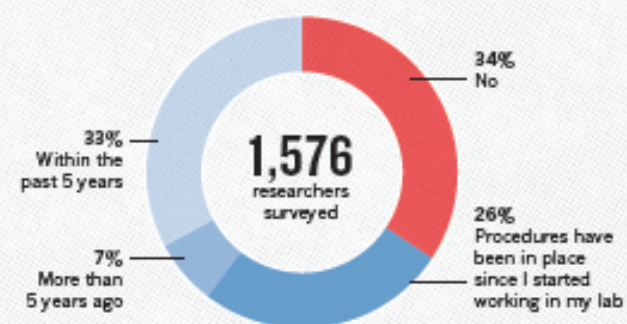


Number of respondents from each discipline:

Biology 703, Chemistry 106, Earth and environmental 95, Medicine 203, Physics and engineering 236, Other 233

HAVE YOU ESTABLISHED PROCEDURES FOR REPRODUCIBILITY?

Among the most popular strategies was having different lab members redo experiments.



Vamos, Mendieta... Ningún
pronóstico meteorológico
tendencioso detendría
jamás a...

BAROWN

¿Qué pucha

Que lo
pario'

Lo que me molesta de la Evlogia no es
su pesimismo, Mendieta...
Es que siempre tiene razón...

