



Universidad Católica del Norte
InES Ciencia Abierta

Investigación Reproducible

Horizonte clave de la ciencia abierta

Joaquín Bahamondes, Ph.D.

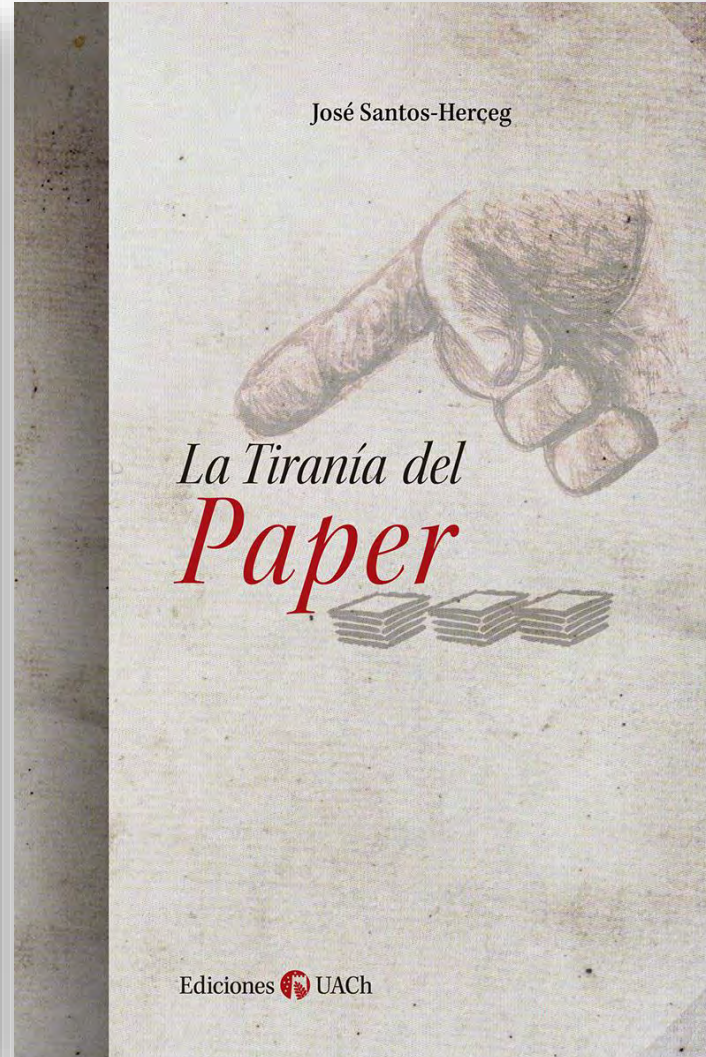
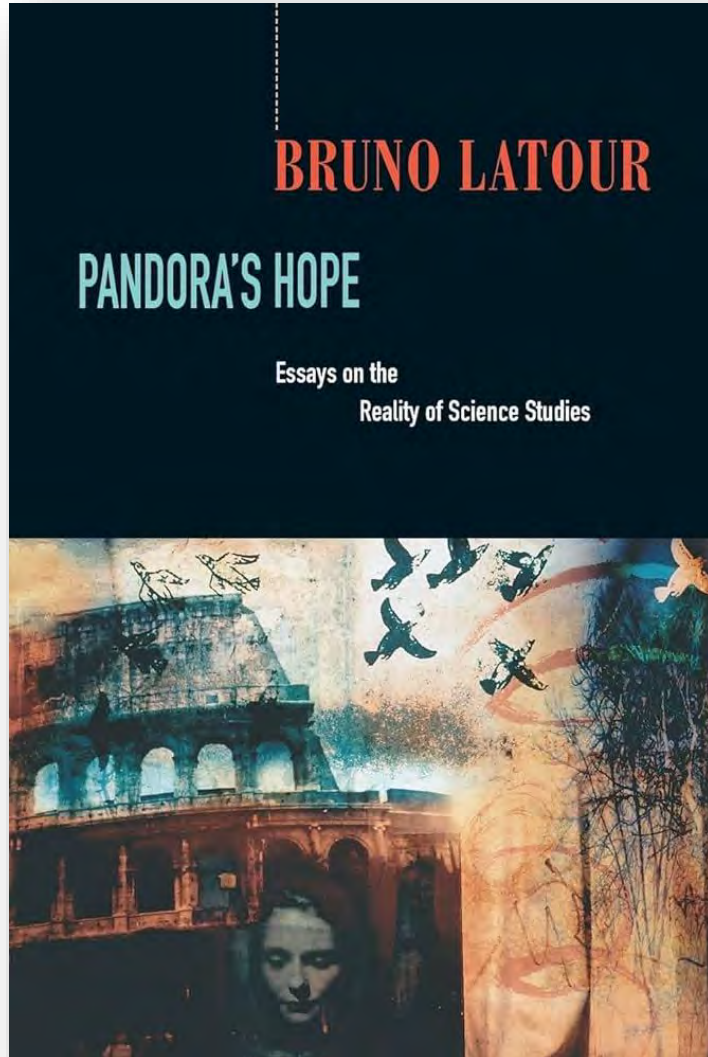


Antofagasta, septiembre 2025

Investigación Reproducible

1. El problema cultural de la ciencia
2. El área gris de las prácticas cuestionables
3. Las consecuencias
4. Apertura y replicabilidad

I. La cultura científica



Scientists need more time to think

E-mails and instant messaging are core to research – but also a distraction. Researchers should study their impact on science, and how they can claw back time to concentrate.

Video calls. Instant messaging. Voice calls. E-mails. Social media. Smartphones. Tablets. Laptops. Desktops. More digital devices equals less time to concentrate and to think. The negative effects of this on researchers are tackled by computer scientist Cal Newport in his latest book, *Slow Productivity*. The book's title challenges the idea, common to many workplaces, that productivity must always increase. A study has shown that science is becoming less disruptive, even though there are now more papers being published and grants awarded than ever before. Newport, who studies technology in the workplace at Georgetown University in Washington DC, says that researchers and other knowledge workers need to slow down and spend more time thinking, to focus on maintaining and improving quality in their work.

Newport does the research community a service by shining a spotlight on an overburdened workforce. Institutions should already be accessing the expertise that exists within their walls in the search for answers, but are not doing so. Newer communications technologies have enormous benefits, including speeding up research, as was necessary during the COVID-19 pandemic. But they are also squeezing out thinking time. Newport's book reminds us that there are researchers who will know how to help.

require all members, thus avoiding individual members sending e-mails to each other. For institutions, Newport recommends a transparent workload management system – a way for managers to see everything that a colleague is expected to do – and then to adjust the workload if there are more tasks than there is available time.

Undoubtedly good advice, this might be easier to implement in industrial settings than in academic ones. In many academic research laboratories, researchers report to a single principal investigator, with little management structure. This is partly because it is hard to justify to academic funders the budget for paying for management and administration roles.

But Felicity Mellor, a science-communication researcher at Imperial College London, is sceptical about giving managers a role in thinking time. In many cases, researchers are already feeling the weight of their institution's monitoring and evaluation systems. Mellor argues that including yet another box in an evaluation form might not go down well. She also thinks that institutions will not accept this. "Can you imagine the response if a scientist filled out a time sheet where it says 'eight hours spent thinking'?" Ultimately, she says, creating a more supportive research culture needs a much more fundamental change. That suggests an even more radical rethink of the current funding model for academic research, as we wrote last month (see *Nature* 630, 793; 2024), along with changes to other aspects of academic science.

“Thinking time is often undervalued; it is rarely, if ever, quantified in employment practices.”

Quality check

Newport's thesis raises a much more fundamental question: what is the impact of lost concentration time on science – not just on the structure and process of science, but also on the content and quality of research?

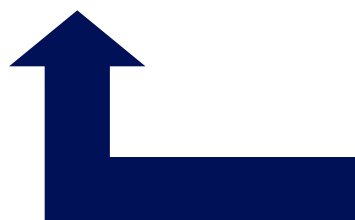
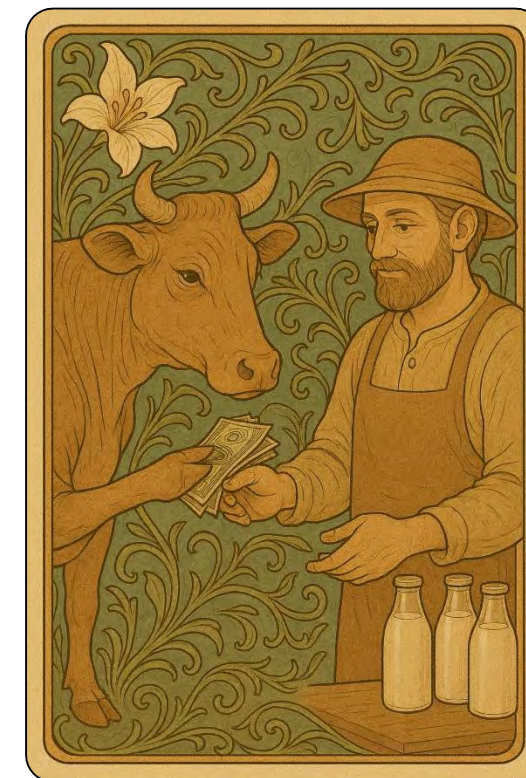
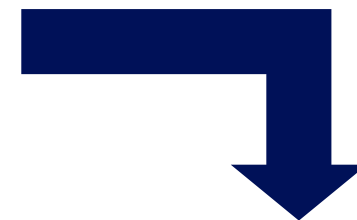
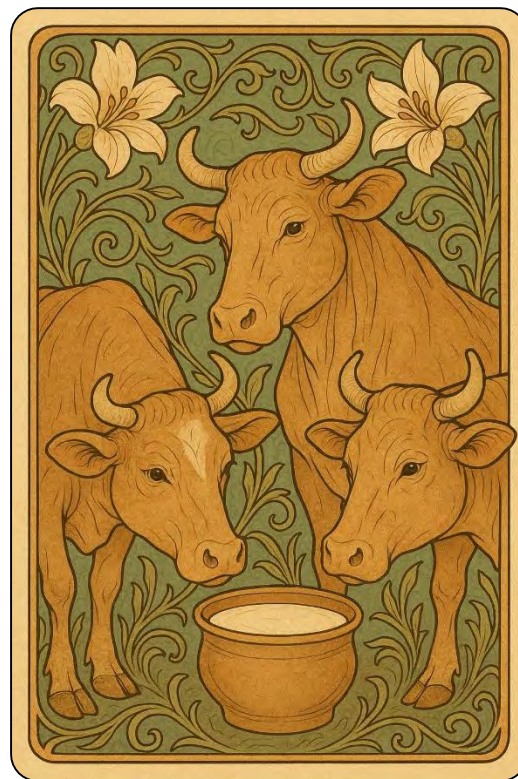
In 2014, Mellor co-led a research project, funded by the UK Arts and Humanities Research Council, called *The Silences of Science*, published as a book two years later. Researchers discussed this question, and others in a series of workshops, but the work did not continue after the grant

«La investigación como artesanía»: reflexiones sobre el ejercicio de investigar en las Ciencias Sociales

DOI: 10.25100/peu.858.cap4

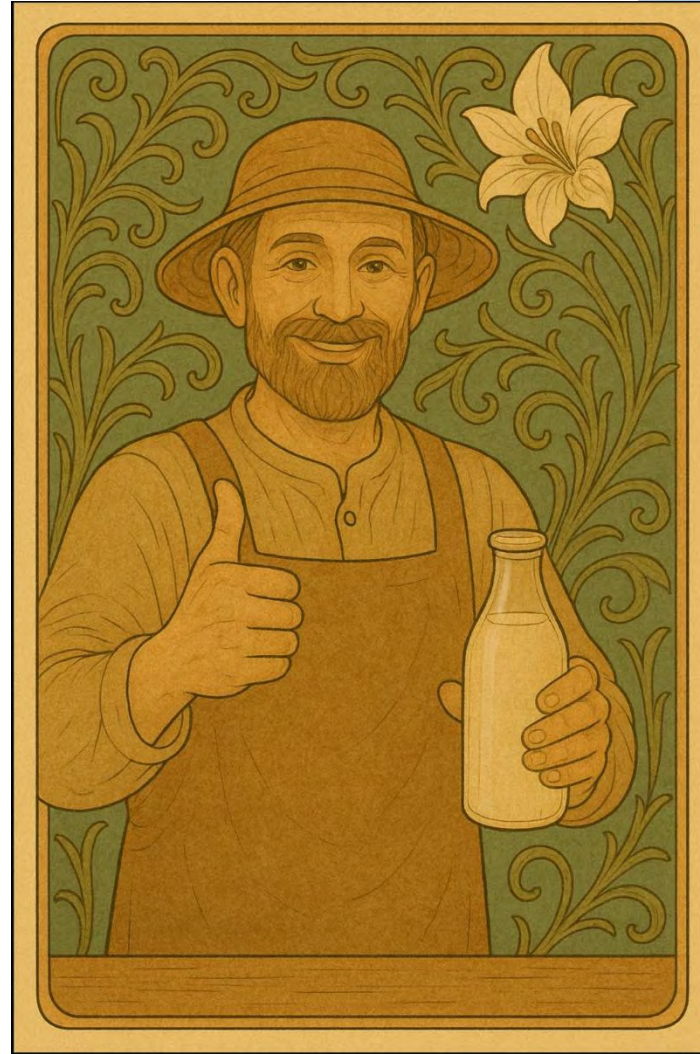
Joaquín Bahamondes
The University of Auckland
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I. La cultura científica



I. La cultura científica

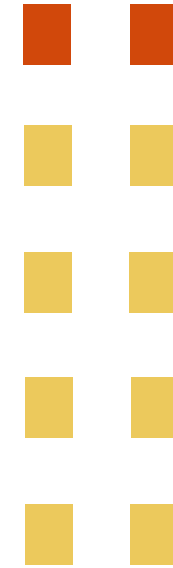
Negocio redondo
para el granjero.



I. La cultura científica

Sesgo de publicación

- Resultados “interesantes” ($p < .05$)



Positive results



$p < 0.05$

Negative results



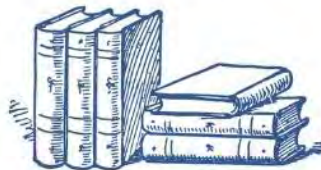
$p > 0.05$

I. La cultura científica



μ

Positive results



$p < 0.05$

Negative results



$p > 0.05$



I. La cultura científica



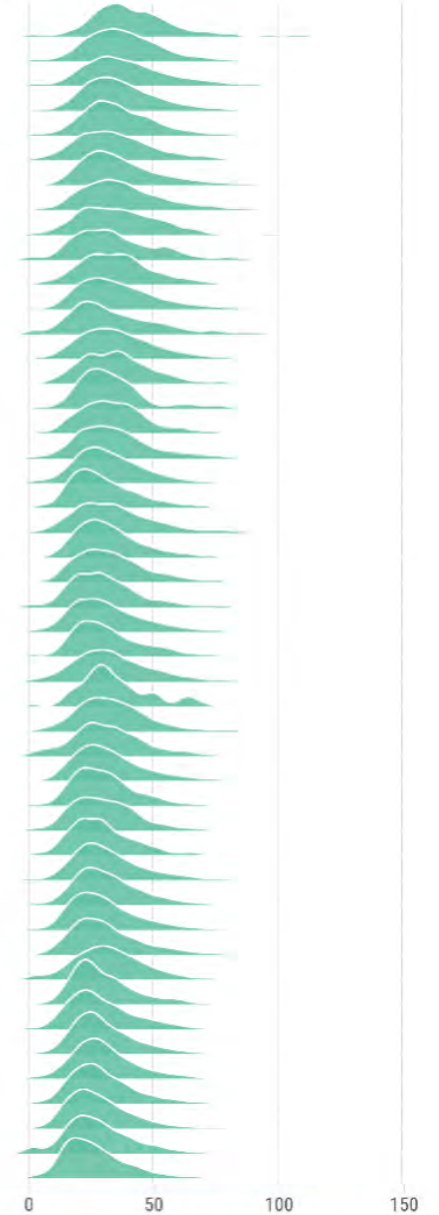
Un scientifique raconte qu'il n'aurait trouvé le point où les assurances
et la Terre se touchent...

Lag from submission to acceptance at top MDPI Journals



- ISPRS Int. J. Geo-Inf.
- Remote Sens.
- Water
- Sensors
- Forests
- Entropy
- Energies
- Minerals
- Atmosphere
- Toxins
- Healthcare
- Sustainability
- Viruses
- Int. J. Environ. Res. Public Health
- Agriculture
- Biosensors
- Biology
- Genes
- Nutrients
- Mar. Drugs
- Animals
- Materials
- Insects
- Micromachines
- Int. J. Mol. Sci.
- Pathogens
- Cancers
- Photonics
- Agronomy
- Brain Sci.
- Appl. Sci.
- Metals
- J. Mar. Sci. Eng.
- Pharmaceuticals
- Processes
- Electronics
- Molecules
- Mathematics
- J. Clin. Med.
- Membranes
- Symmetry
- Coatings
- Foods
- Nanomaterials
- Polymers
- Crystals
- Catalysts

2020



I. La cultura científica

La estructura normativa de las ciencias

Robert K. Merton (1973)

- **Comunalidad.** Todo bien científico debiese pertenecer a todo/a científico/a, para promover la colaboración colectiva.
- **Universalismo.** La validez de los productos científicos es independiente del estatus sociopolítico/atributos personales de sus participantes.
- **Desinterés.** Las instituciones científicas actúan en beneficio de una empresa científica común, en lugar de la ganancia personal de quienes están dentro cada la institución.
- **Escepticismo organizado.** Los presupuestos científicos deben ser expuestos a escrutinio crítico antes de ser aceptados.

I. La cultura científica

Normas vs. Contra-normas

Anderson et al.,
2007

<i>Communality</i> : Scientists openly share findings with colleagues.	<i>Secrecy</i> : Scientists protect their newest findings to ensure priority in publishing, patenting, or applications.
<i>Universalism</i> : Scientists evaluate research only on its merit, i.e., according to accepted standards of the field.	<i>Particularism</i> : Scientists assess new knowledge and its applications based on the reputation and past productivity of the individual or research group.
<i>Disinterestedness</i> : Scientists are motivated by the desire for knowledge and discovery, and not by the possibility of personal gain.	<i>Self-Interestedness</i> : Scientists compete with others in the same field for funding and recognition of their achievements.
<i>Organized Skepticism</i> : Scientists consider all new evidence, hypotheses, theories, and innovations, even those that challenge or contradict their own work.	<i>Organized Dogmatism</i> : Scientists invest their careers in promoting their own most important findings, theories, or innovations.
<i>Governance</i> : Scientists are responsible for the direction and control of science through governance, self-regulation and peer review.	<i>Administration</i> : Scientists rely on administrators to direct the scientific enterprise through management decisions.
<i>Quality</i> : Scientists judge each others' contributions to science primarily on the basis of quality.	<i>Quantity</i> : Scientists assess each others' work primarily on the basis of numbers of publications and grants.

I. La cultura científica

Normas vs. Contra-normas

Anderson et al.,
2007

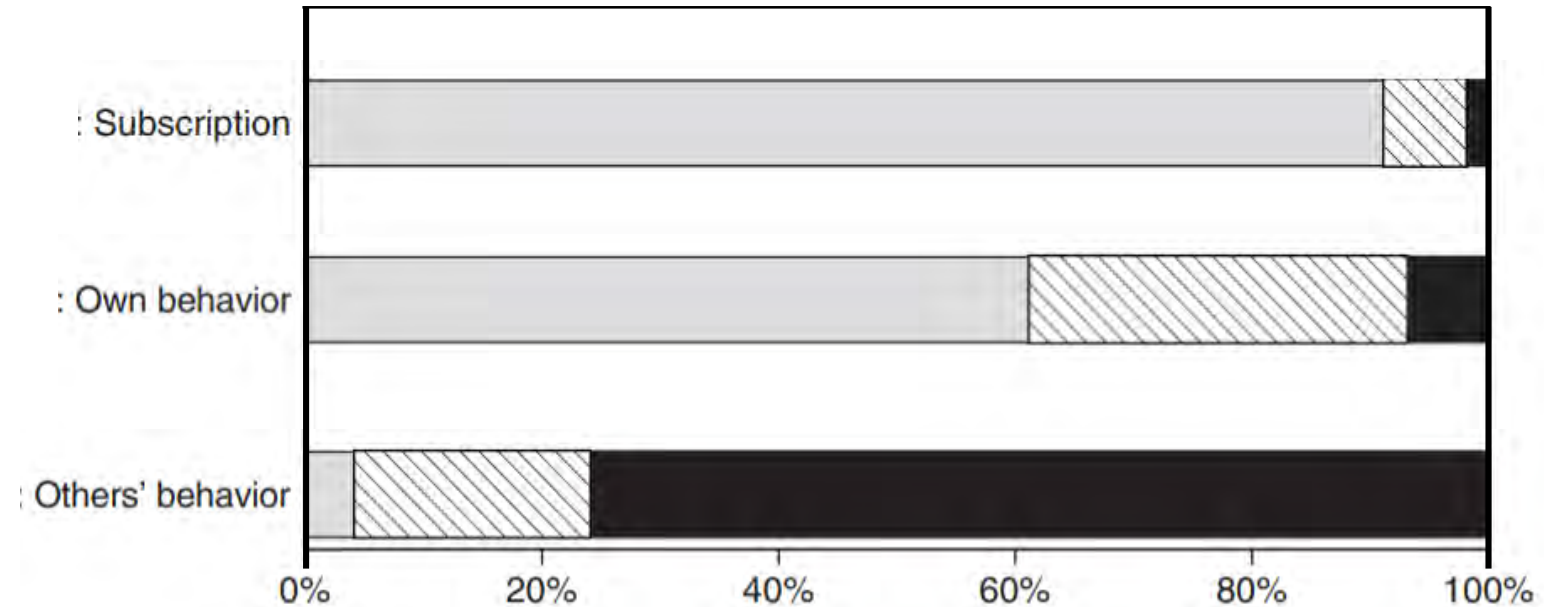


FIG. 3. Norm versus Counternorm Scores: Percent with Norm > Counternorm (dotted), Norm = Counternorm (striped), Norm < Counternorm (solid).

II. El área gris (QRPs)

Una cultura que promueve las contra-normas, ha favorecido el surgimiento de **prácticas cuestionables de investigación**



II. El área gris (QRPs)

Prácticas cuestionables de investigación (QRP)

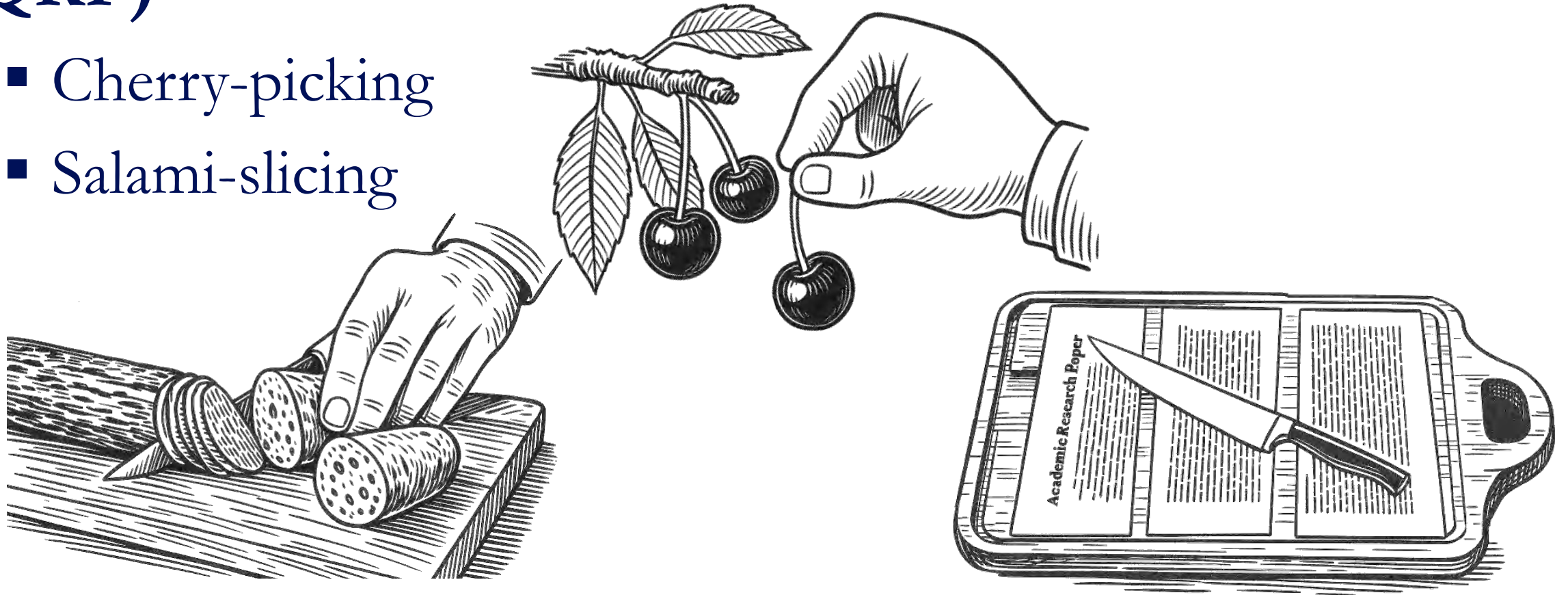
- HARKing
- p -Hacking



II. El área gris (QRPs)

Prácticas cuestionables de investigación (QRP)

- Cherry-picking
- Salami-slicing



III. Consecuencias

Crisis de replicabilidad

- Muchos de los estudios que definen lo que “sabemos” del comportamiento de las personas no son replicables.



[Published: 27 August 2015](#)

Over half of psychology studies fail reproducibility test

[Monya Baker](#)

[Nature \(2015\)](#) | [Cite this article](#)

34k Accesses | **60** Citations | **1330** Altmetric | [Metrics](#)

III. Consecuencias

Crisis de replicabilidad

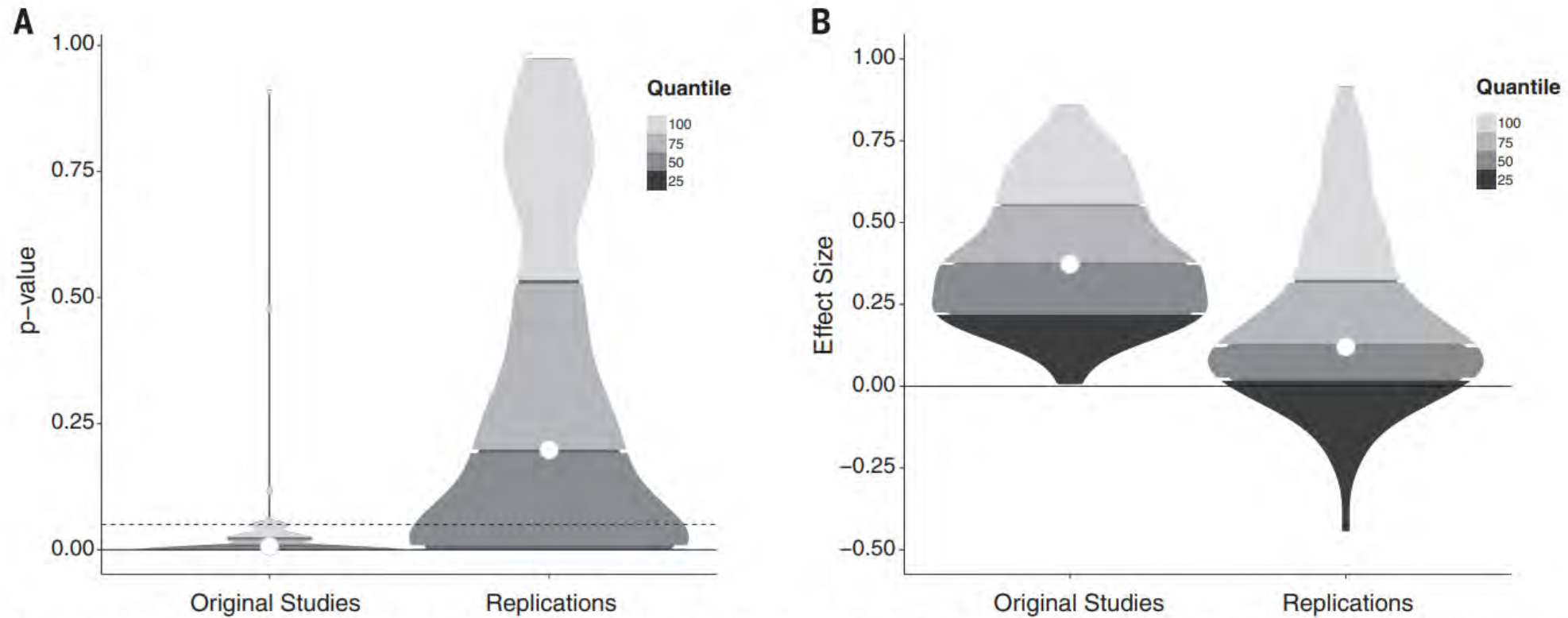
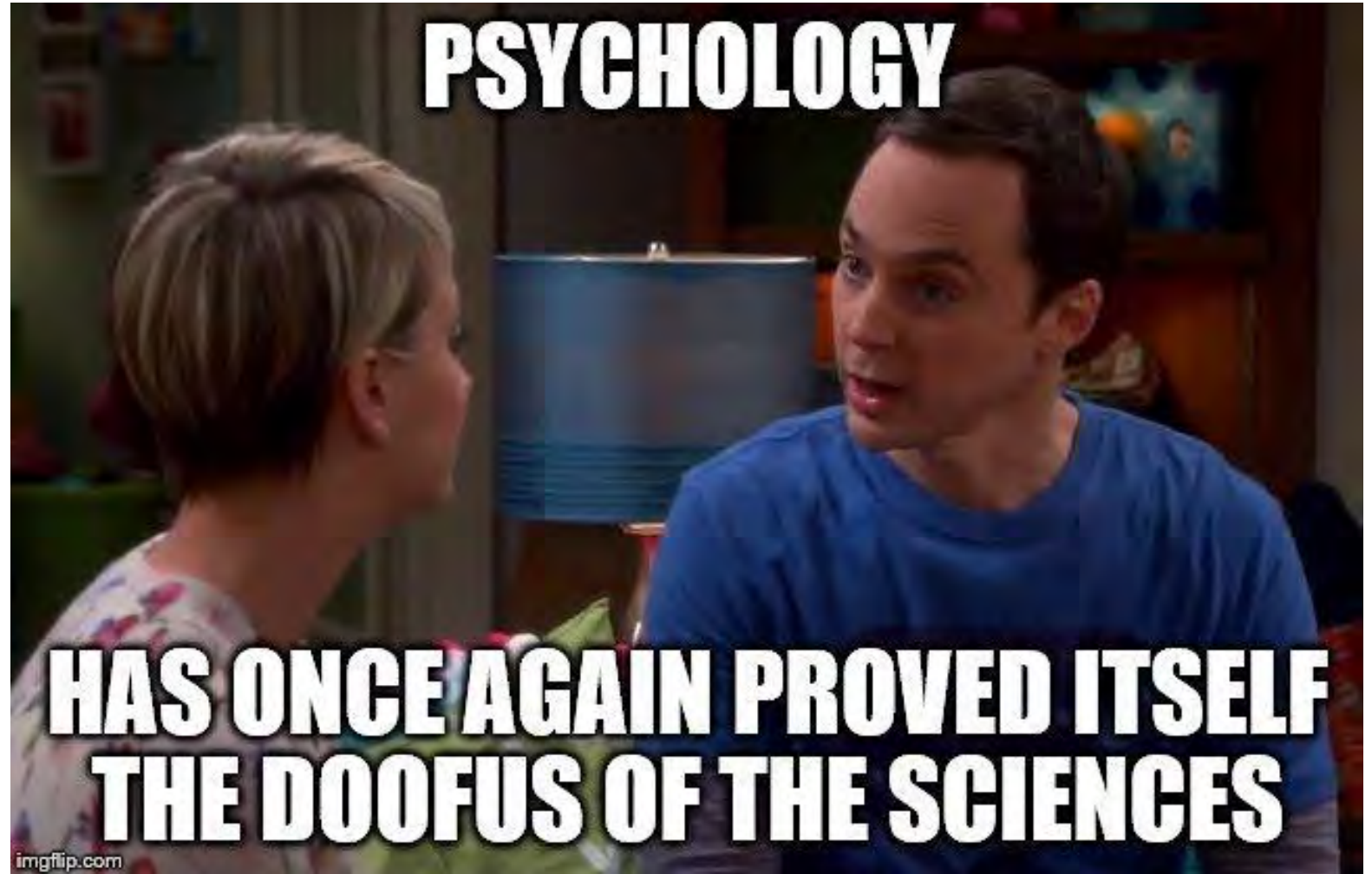


Fig. 1. Density plots of original and replication P values and effect sizes. (A) P values. (B) Effect sizes (correlation coefficients). Lowest quantiles for P values are not visible because they are clustered near zero.

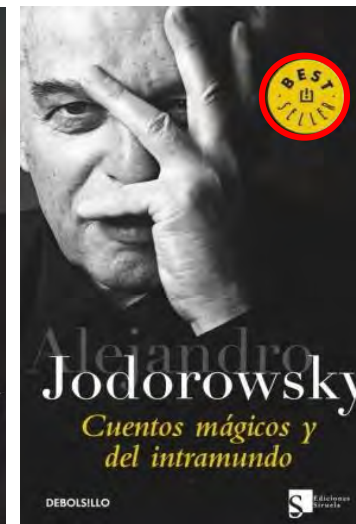
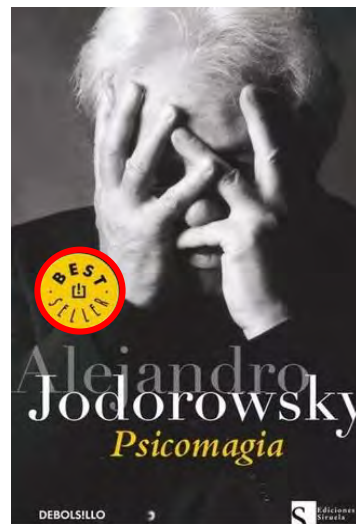
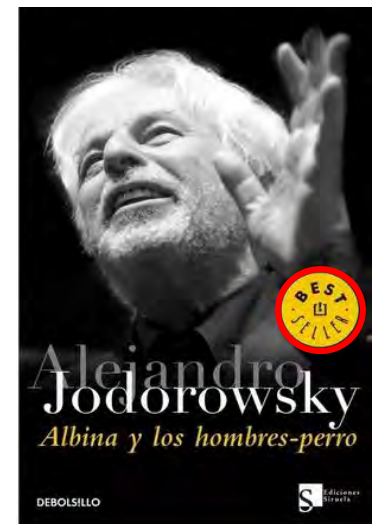
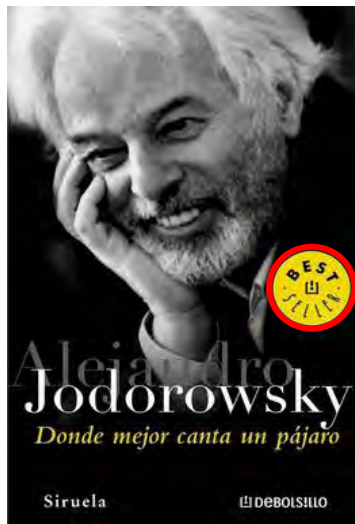
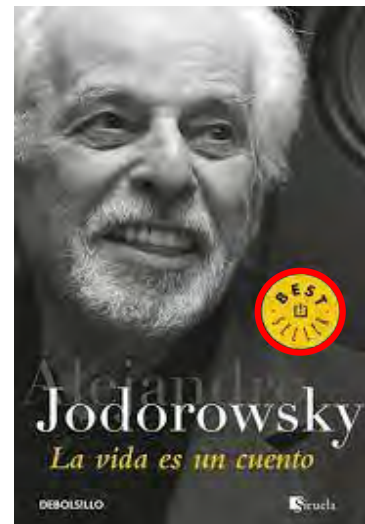
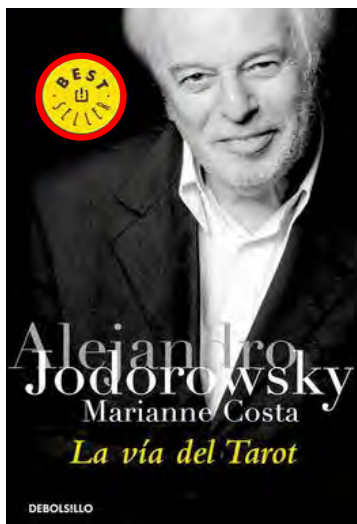
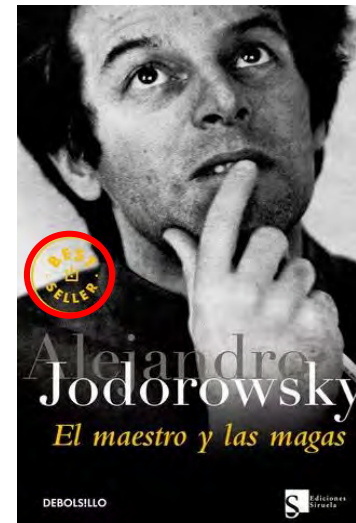
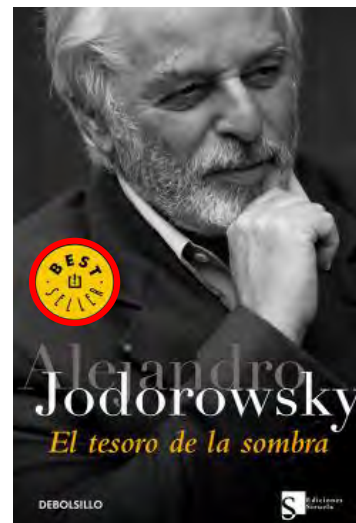
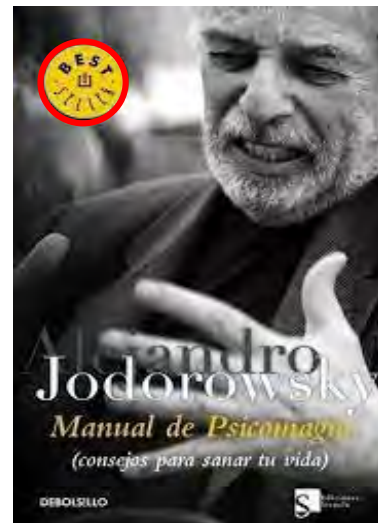
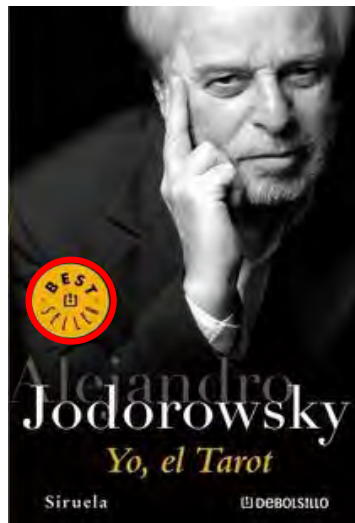
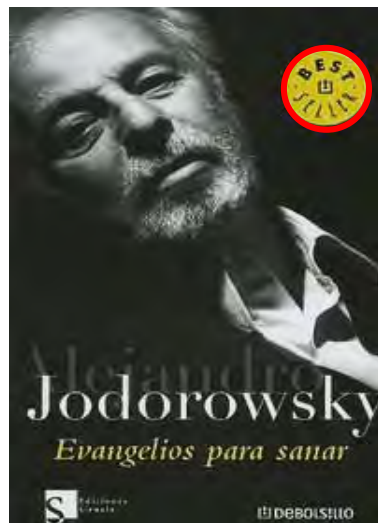
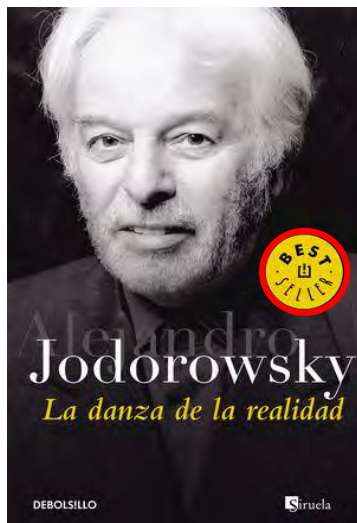
III. Consecuencias

La psicología es un caso ejemplar de la crisis de replicabilidad.

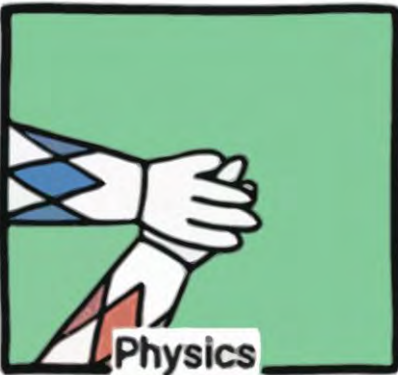
Indeterminación de sus objetos de estudio



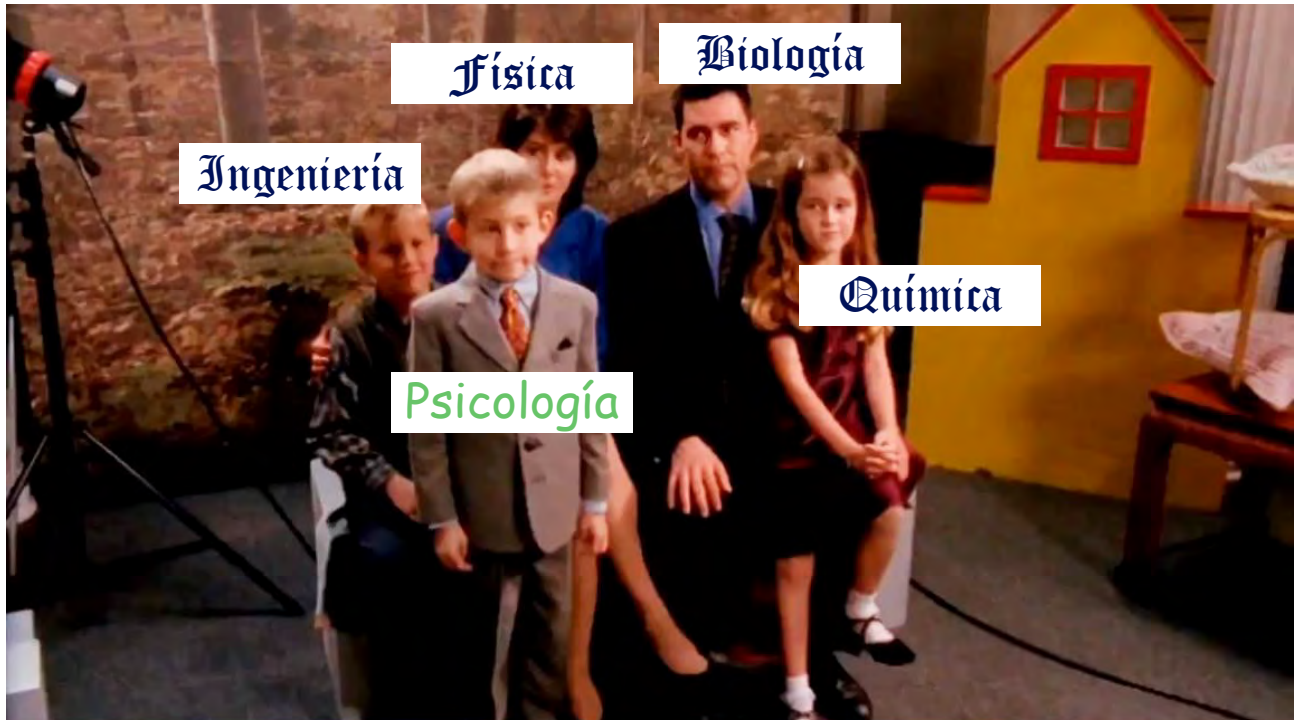
III. Consecuencias



SCIENTISTS, UNITE!



"STOP HARASSING US YOU PERVERTED SCUM, YOU ARE NOT EVEN REAL"



Física

Biología

Ingeniería

Química

Psicología



Psicología, sal de ahí!
Esa no es tu familia

Pero ... no estamos solos



III. Consecuencias

News Feature | Published: 25 May 2016

1,500 scientists lift the lid on reproducibility

[Monya Baker](#)

[Nature](#) 533, 452–454 (2016) | [Cite this article](#)

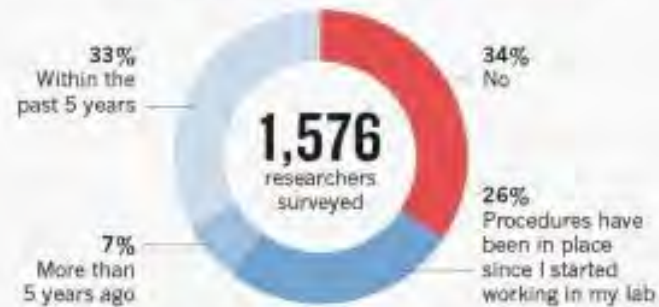
176k Accesses | 2149 Citations | 5194 Altmetric | [Metrics](#)

IS THERE A REPRODUCIBILITY CRISIS?



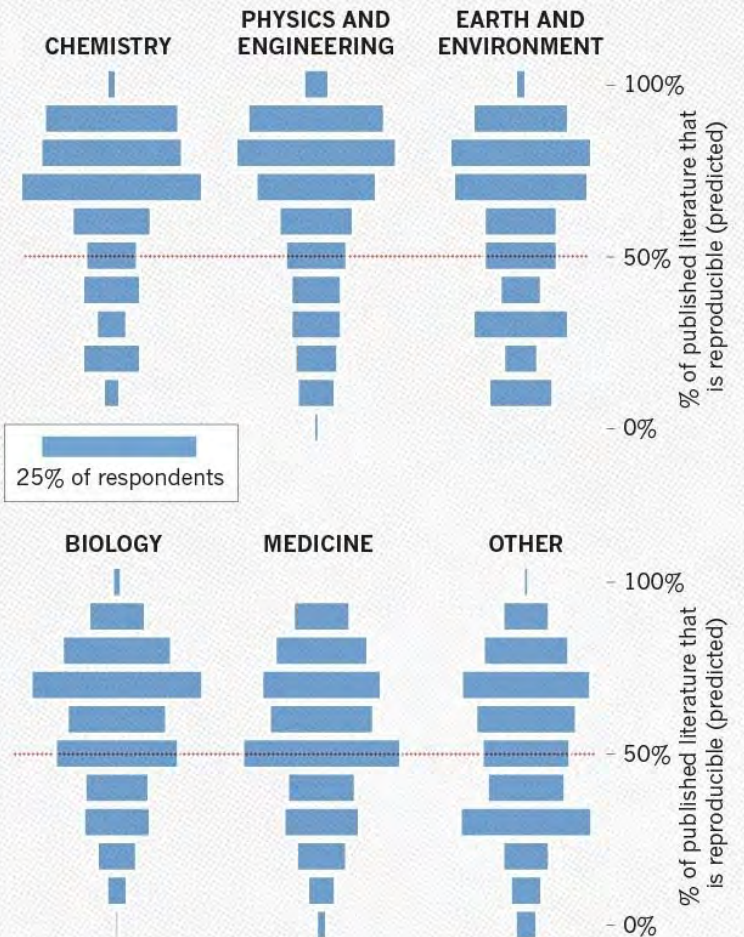
HAVE YOU ESTABLISHED PROCEDURES FOR REPRODUCIBILITY?

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



HOW MUCH PUBLISHED WORK IN YOUR FIELD IS REPRODUCIBLE?

Physicists and chemists were most confident in the literature.



Number of respondents from each discipline:
Biology 703, Chemistry 106, Earth and environmental 95,
Medicine 203, Physics and engineering 236, Other 233

©nature

III. Consecuencias

News Feature | Published: 25 May 2016

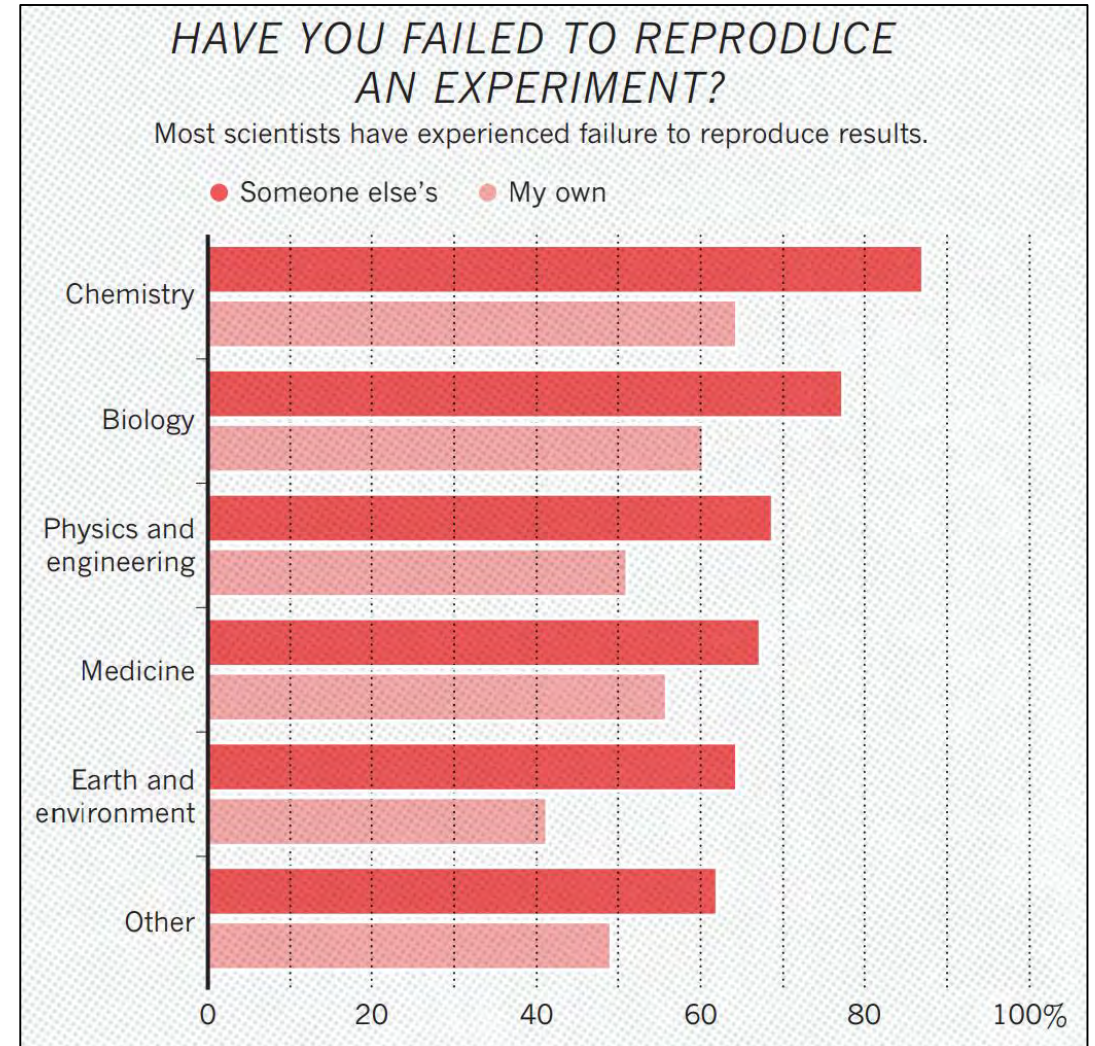
1,500 scientists lift the lid on reproducibility

[Monya Baker](#)

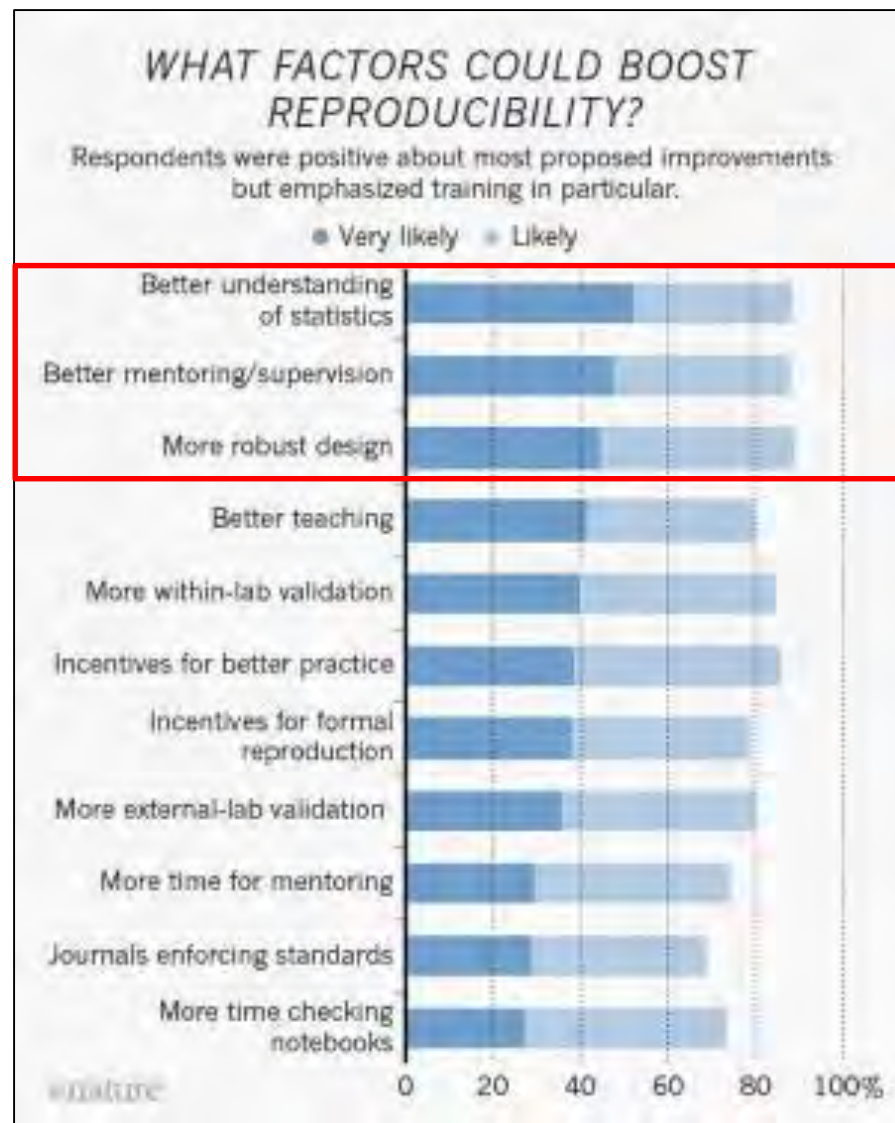
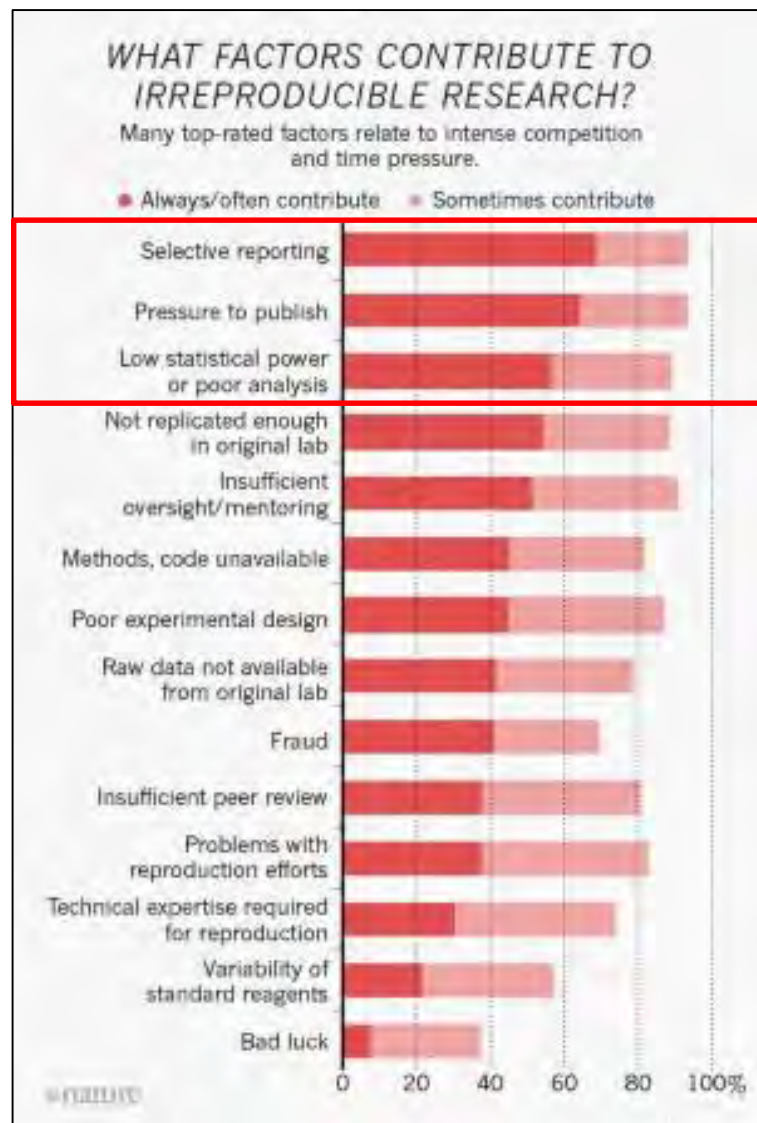
[Nature](#) 533, 452–454 (2016) | [Cite this article](#)

176k Accesses | 2149 Citations | 5194 Altmetric | [Metrics](#)

La *gran* mayoría de lo/as científico/as han fallado en replicar resultados de otros estudios alguna vez.



III. Consecuencias



IV. Apertura y replicabilidad

Basándose en los principios esenciales de la libertad académica, la integridad de la investigación y la excelencia científica, la **ciencia abierta** establece un **nuevo paradigma** que integra en la empresa científica **prácticas de reproducibilidad, transparencia, intercambio y colaboración** resultantes de la **mayor apertura** de los contenidos, las herramientas y los procesos científicos



**Recomendación de la UNESCO
sobre la Ciencia Abierta**

IV. Apertura y replicabilidad

Iniciativas a nivel internacional



IV. Apertura y replicabilidad

Iniciativas a nivel internacional



IV. Apertura y replicabilidad

Iniciativas a nivel internacional

Transparency Policies

Political Psychology mandates materials sharing as a condition for submission and publication. We also strongly encourage authors to share their data and scripts when submitting their manuscripts; however, sharing data and scripts is not required unless the manuscript is invited for revision. Materials/data/scripts can be shared privately while in the review process; however, if accepted, all materials/data/scripts must be made publicly available.

Open Science Practices

Transparency Guidelines

We take good, transparent, reproducible, and open science very seriously. This means that all published papers will have undergone screening regarding to what extent they have fulfilled [Transparency and Openness Promotion \(TOP\) Guidelines](#). The TOP Guidelines outline eight modular standards that can be implemented at three different levels (with Level I being the least, and Level III the most rigorous option):

IV. Apertura y replicabilidad

Iniciativas a nivel nacional

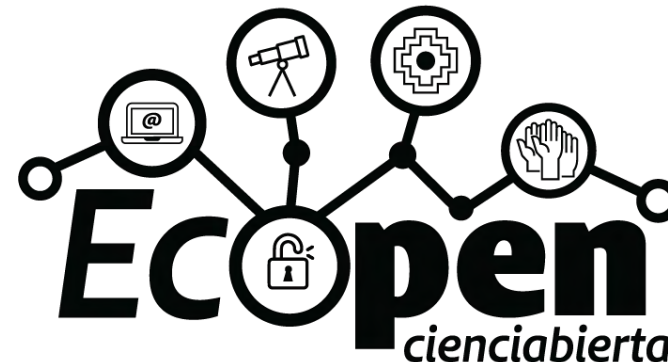


**Agencia Nacional de
Investigación y Desarrollo**



**acceso
abierto**

L I S 
Laboratorio de
investigación social **abierta**



IV. Apertura y replicabilidad

Buenas Prácticas

- Argumentación hipotética (a priori)
- Diseño y plan de análisis establecido
- Registro riguroso de procedimientos
- Consolidación de materiales

Herramientas

- Pre-registro
- Software de código abierto (R)
- Repositorio público (OSF)

IV. Apertura y replicabilidad

Repo Proyecto FONDECYT 11230903

Percepción de legitimidad y bienestar psicológico:
Avanzando la teoría sobre el efecto paliativo de las
creencias ideológicas

<https://osf.io/tpnwd/>

Wiki 






This site gathers all materials for project **Perceived legitimacy and psychological wellbeing: Advancing theory on the palliative effect of ideological beliefs**.

This work is funded by FONDECYT Grant #11230903 (ANID, Chile).

For further questions or comments, please contact lead researcher Dr. Joaquín Bahamondes, jbahamondes@ucn.cl.









[Read More](#)

Citation 

 Cite as:  Edit

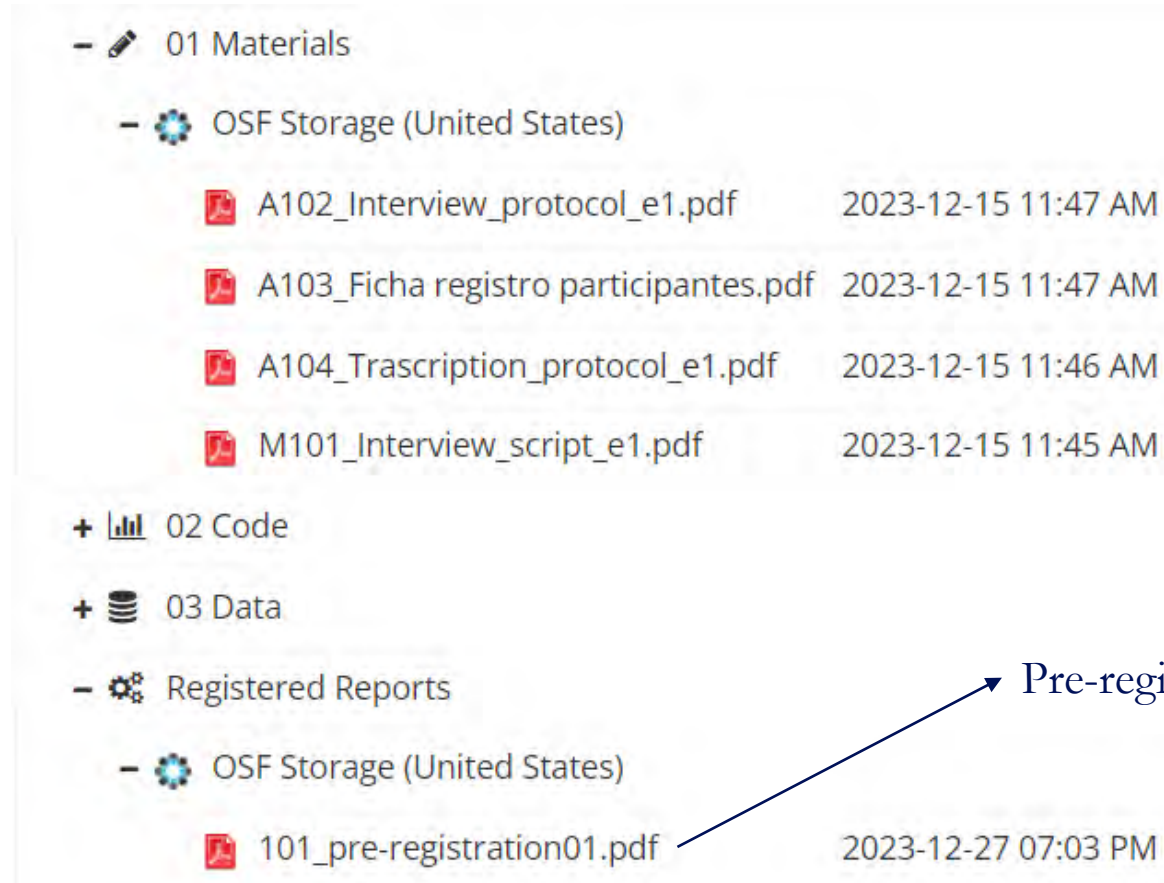
Bahamondes, J. (2023). Perceived legitimacy and psychological wellbeing: Advancing theory on the palliative effect of ideological beliefs. FONDECYT #11230903. Technical documentation. <https://doi.org/10.17605/OSF.IO/TPNWD>

Components Add Component Link Projects

-  **01 Materials** 
Bahamondes
-  **02 Code** 
Bahamondes
-  **03 Data** 
Bahamondes
-  **Registered Reports** 
Bahamondes
Pre-registrations for papers contained under the project

IV. Apertura y replicabilidad

Repo Proyecto FONDECYT 11230903



Protocolo de aplicación de entrevista

Ficha de registro participantes

Protocolo de transcripción

Guion de entrevista

Pre-registro (Estudio 01)

IV. Apertura y replicabilidad

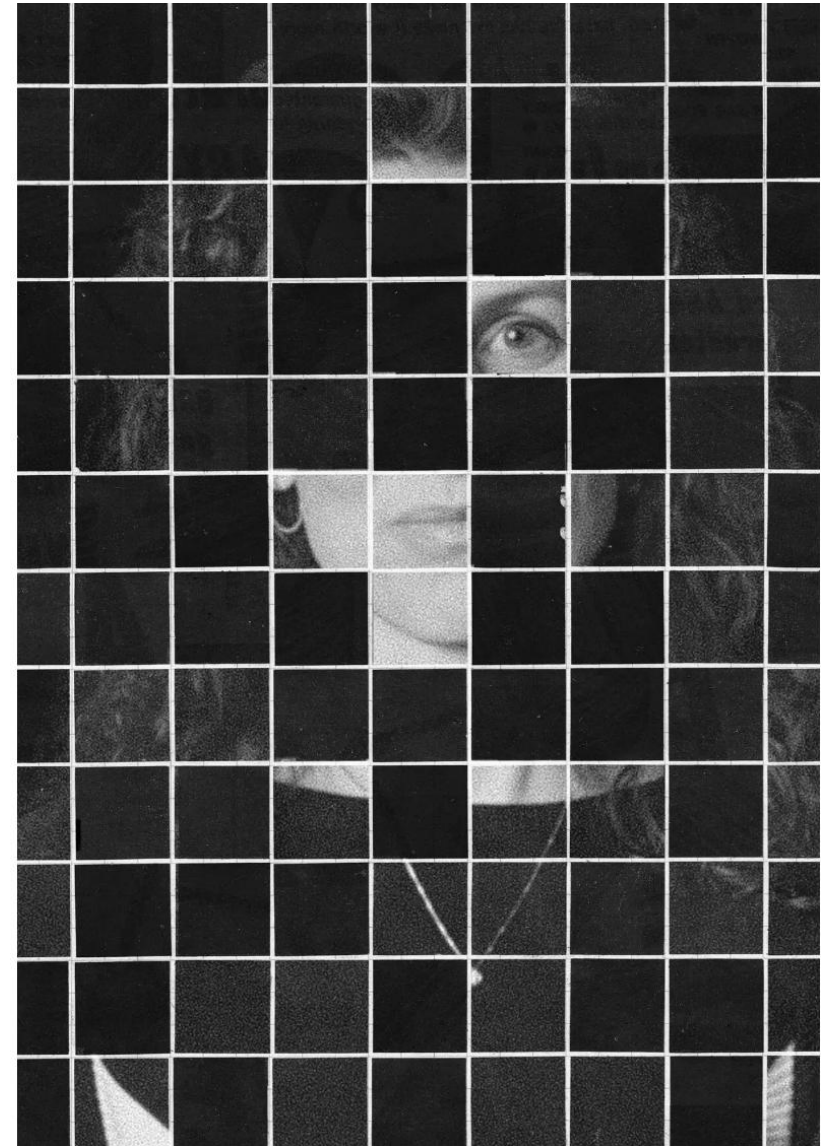
The New York Times

The Harvard Professor and the Bloggers

When Francesca Gino, a rising academic star, was accused of falsifying data — about how to stop dishonesty — it didn't just torch her career. It inflamed a crisis in behavioral science.



Thinking about evidence, and vice versa



IV. Apertura y replicabilidad



The screenshot shows the OSFHOME interface for a project titled "Reducing Dishonesty - Replication(s)". The page features a dark header with the OSFHOME logo and a navigation bar with tabs for "Reducing Dishonesty - Replication(s)", "Metadata", "Files", and "Wiki". The main content area displays the project title, a list of contributors (Ariella Kristal, AW, Francesca Gino, Nina Mazar, Dan Ariely), the creation and last update dates, and the category "Project". A "Files" section is visible, containing a message: "Files can now be accessed and managed under the Files tab."

 OSFHOME ▾

Reducing Dishonesty - Replication(s) Metadata Files Wiki

Reducing Dishonesty - Replication(s)

Contributors: [Ariella Kristal, AW](#), [Francesca Gino](#), [Nina Mazar](#), [Dan Ariely](#)

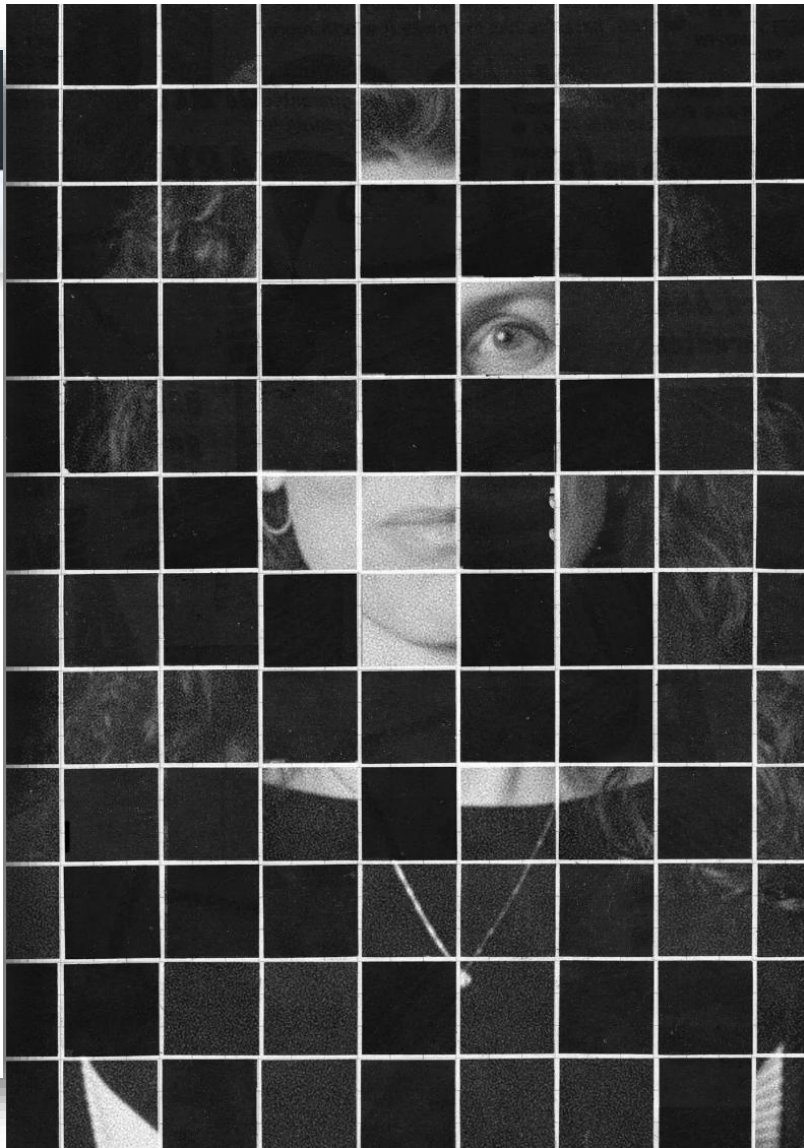
Date created: 2018-07-16 03:11 PM | Last Updated: 2023-11-06 04:28 PM

Category:  Project

Files

Files can now be accessed and managed under the Files tab.

IV. Apertura y replicabilidad



Thinking about evidence, and vice versa

[\[109\] Data Falsificada \(Part 1\): "Clusterfake"](#) (Data Colada, June 17, 2023)

[\[110\] Data Falsificada \(Part 2\): "My Class Year Is Harvard"](#) (Data Colada, June 20, 2023)

[\[111\] Data Falsificada \(Part 3\): "The Cheaters Are Out of Order"](#) (Data Colada, June 23, 2023)

[\[112\] Data Falsificada \(Part 4\): "Forgetting The Words"](#) (Data Colada, June 30, 2023)

[\[114\] Exhibits 3, 4, and 5](#) (Data Colada, September 16, 2023)

[\[118\] Harvard's Gino Report Reveals How A Dataset Was Altered](#) (Data Colada, July 9, 2024)

IV. Apertura y replicabilidad

In the Posted data, the participant said the event felt “authentic” but they rated the event as very inauthentic

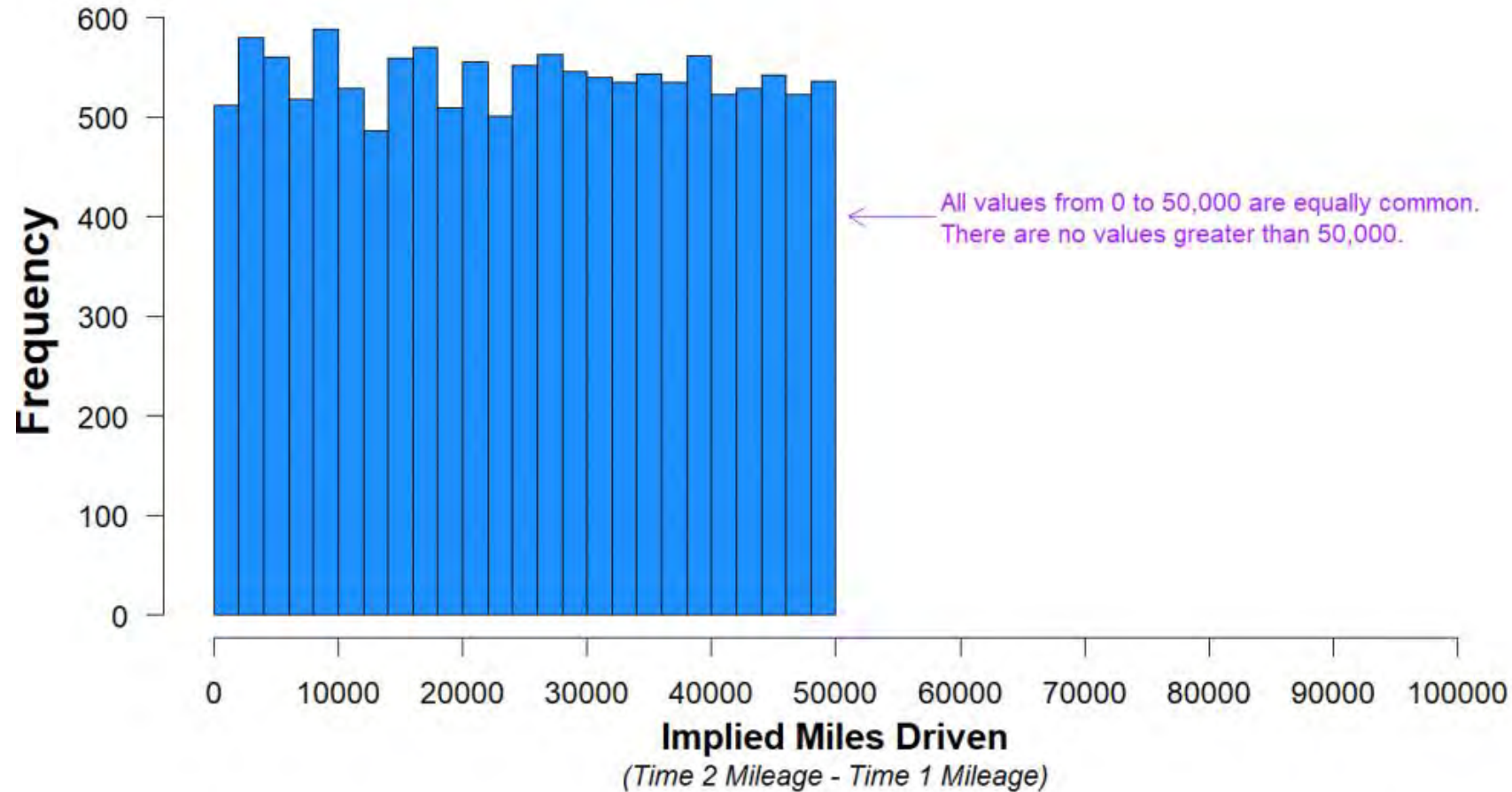
Participant 4

Dataset	Condition	Dirty	Tainted	Inauthentic	Ashamed	Wrong	Unnatural	Impure	AVG	Reflect on the Event
Posted	prevention	4	5	6	5	6	7	6	5.6	Talking, future, work, authentic, friendly
Original	prevention	1	1	1	1	1	1	1	1.0	Talking, future, work, authentic, friendly

In the Original data, the participant said the event felt “authentic” and they (sensibly) rated the event as “not at all inauthentic”

IV. Apertura y replicabilidad

Figure 1. Histogram of Miles Driven - Car #1 (N=13,488)



IV. Apertura y replicabilidad

Repositorio (anonimizado) para evaluación de pares

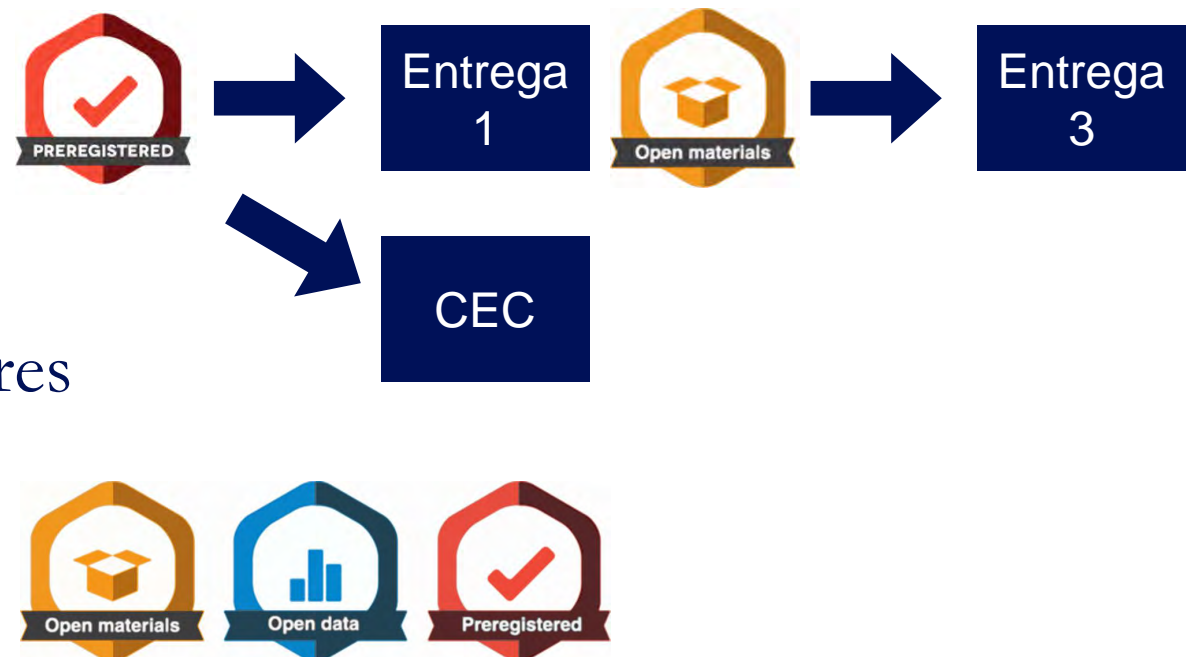
Name ^ v	Modified ^ v
- OSF Storage (United States)	
00_rcode.Rmd	2024-04-02 12:08 AM
codebook.xlsx	2024-04-03 09:10 AM
s01_data.csv	2024-04-02 12:07 AM
s02_data.csv	2024-04-02 12:07 AM
s03_data.csv	2024-04-02 12:07 AM



V. Implementaciones internas

Escuela de Psicología

- Inclusión de módulos en docencia (cursos de metodología)
- Pre-registro de tesis de pregrado
- Implementación de prácticas regulares de ciencia abierta en las tesis doctorales



***Implementación curricular**

V. Implementaciones internas

“Ecosistema” de procedimientos y herramientas

Diseño

- Manual metodológico (matriz)
- Pre-registro (hipótesis, diseño y plan de análisis)
- Protocolos
- Materiales (cuestionarios/guiones de entrevista)

Datos

- Código de gestión (estándares para Open data)
- Libro de códigos
- Repositorio

Análisis

- Software libre (código abierto)
- Código de análisis
- Repositorio

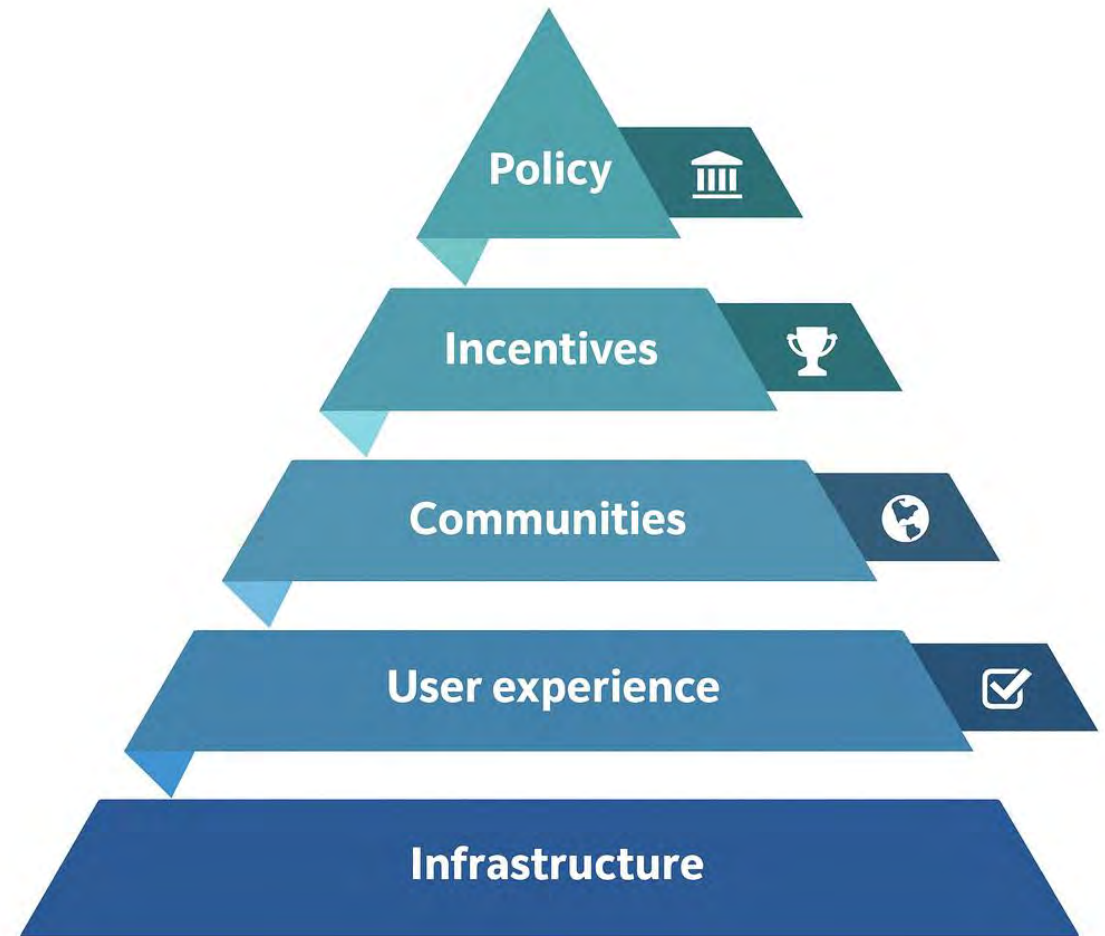


**“REPRODUCIBILITY
IS LIKE BRUSHING
YOUR TEETH. ONCE
YOU LEARN IT, IT
BECOMES A HABIT.”**

∴ Necesidad de cambio en el sistema

Lograr una alta confianza en las ciencias es un desafío sistémico (no individual)

(Nosek, 2023)




∴ Necesidad de cambio en el sistema

- Sistemas de incentivos
- Modelos de entrenamiento
- Normas de la comunidad

COMMENT

OPEN ACCESS

When will 'open science' become simply 'science'?

Mick Watson 

Genome Biology 2015 16:101 | <https://doi.org/10.1186/s13059-015-0669-2>

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Muchas gracias
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