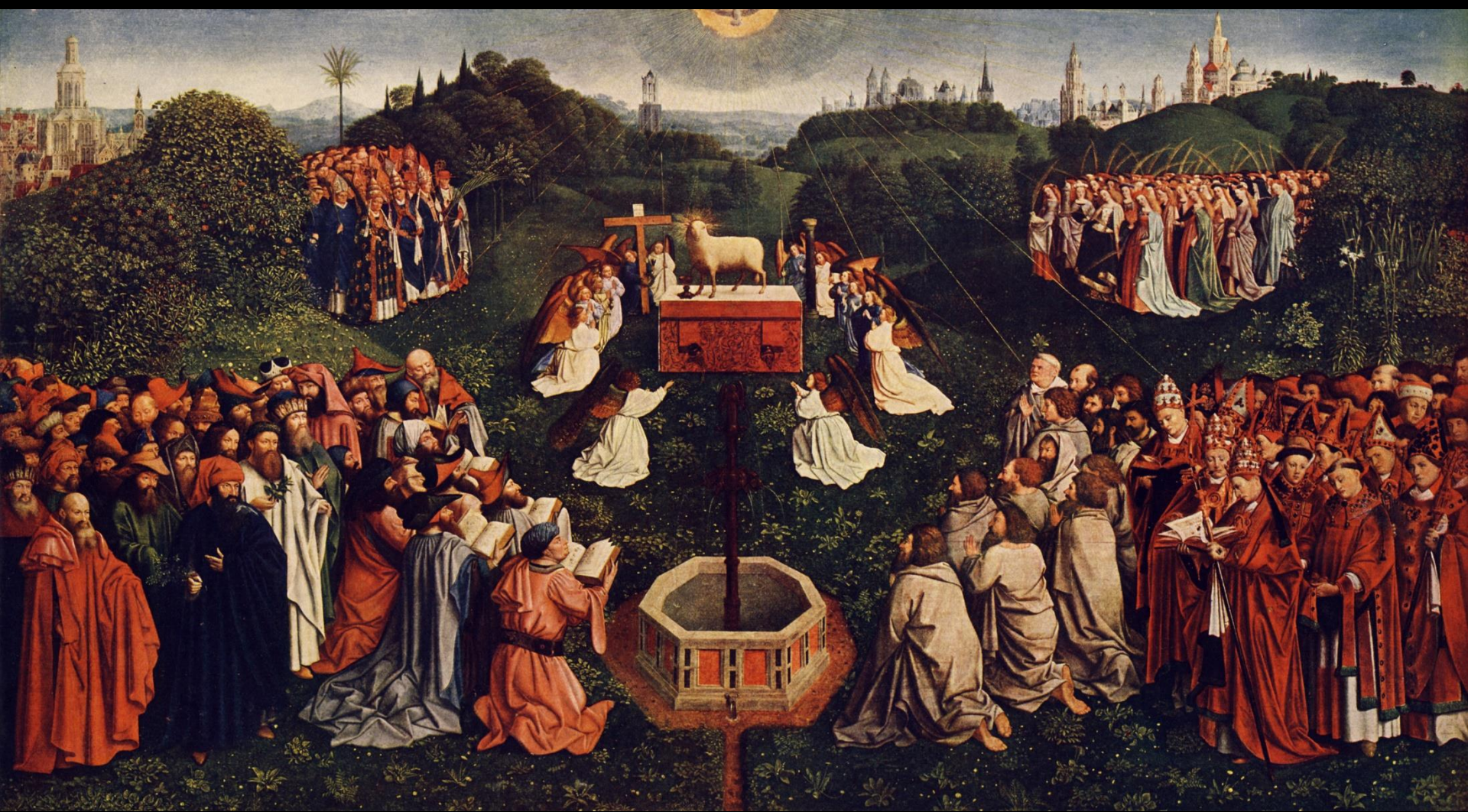


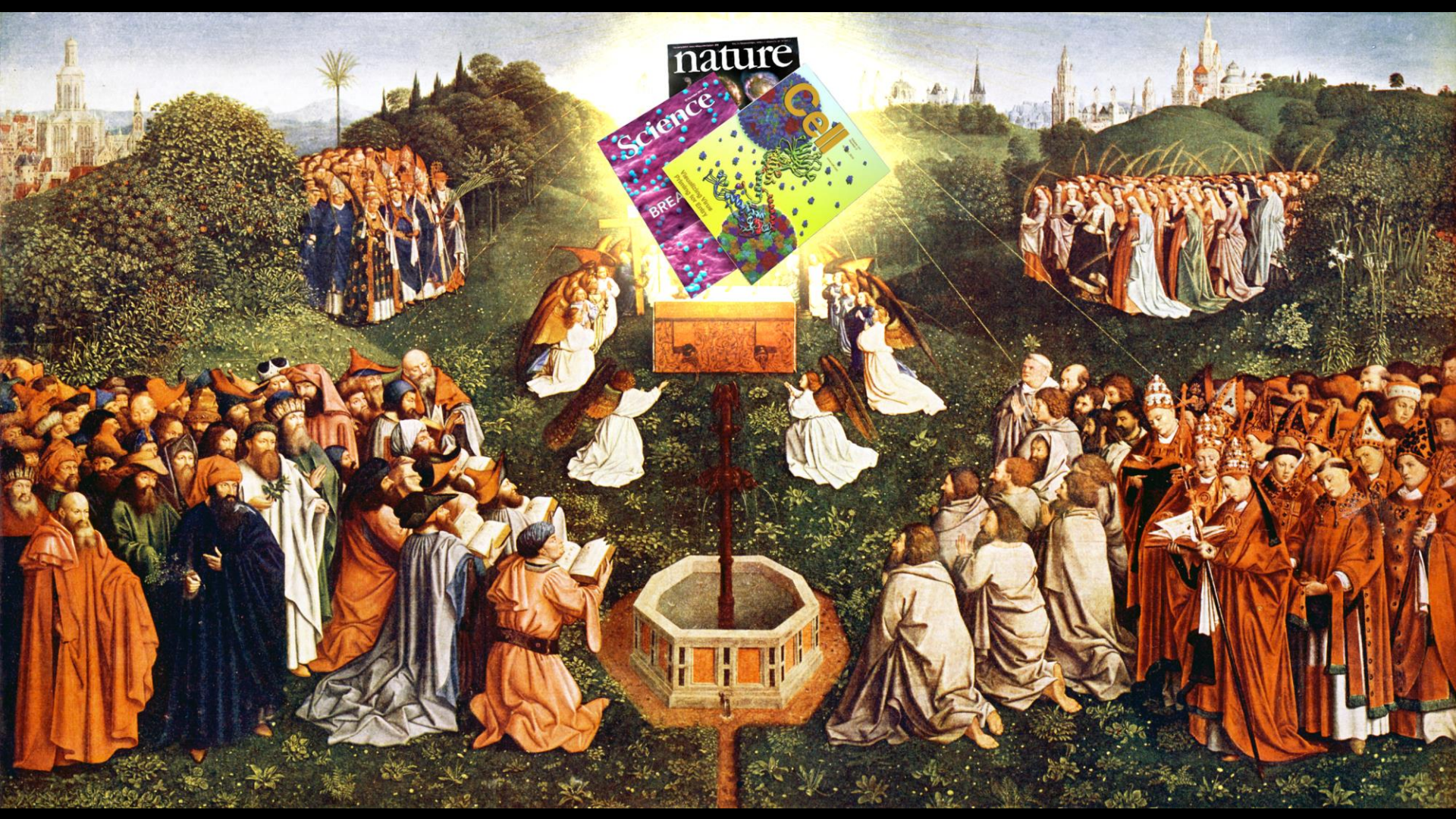
Prestigious journals struggle to reach even average reliability

Björn Brembs
Universität Regensburg
<http://brembs.net>

15th century: Adoration of the lamb



21st century: Adoration of the Glam



**SALE
ENDS
TODAY**



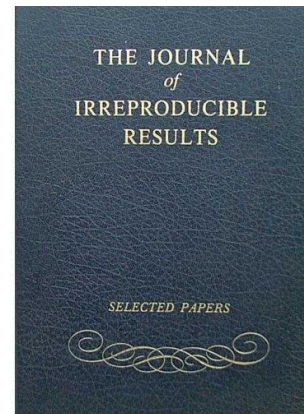


Main Problems with the IF

- Negotiable



- Irreproducible



- Mathematically unsound



The Impact Factor

Journal X IF 2023=

All citations from TR indexed journals in 2023 to papers in journal X

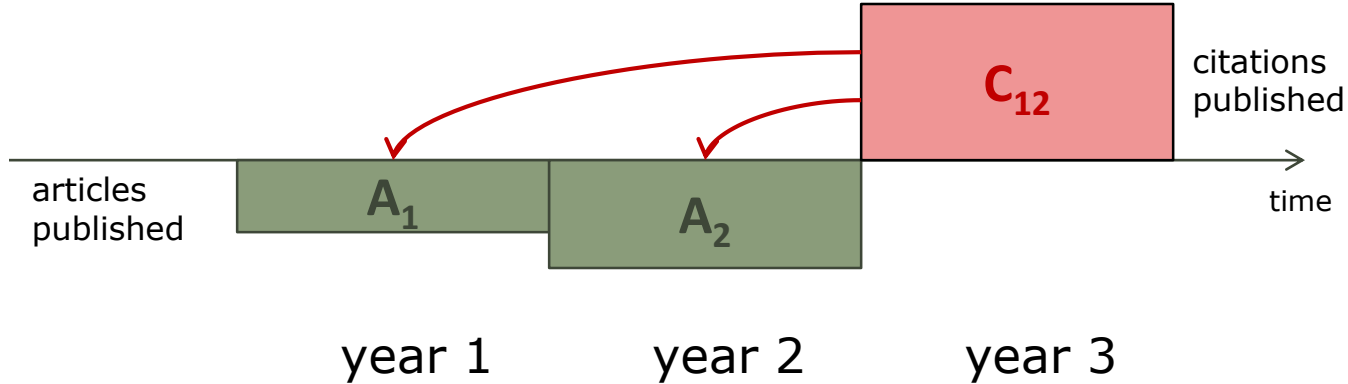
Number of citable articles published in journal X in 20021/22



€30,000-130,000/year subscription rates
Covers ~11,500 journals (Scopus covers ~16,500)

The Impact Factor

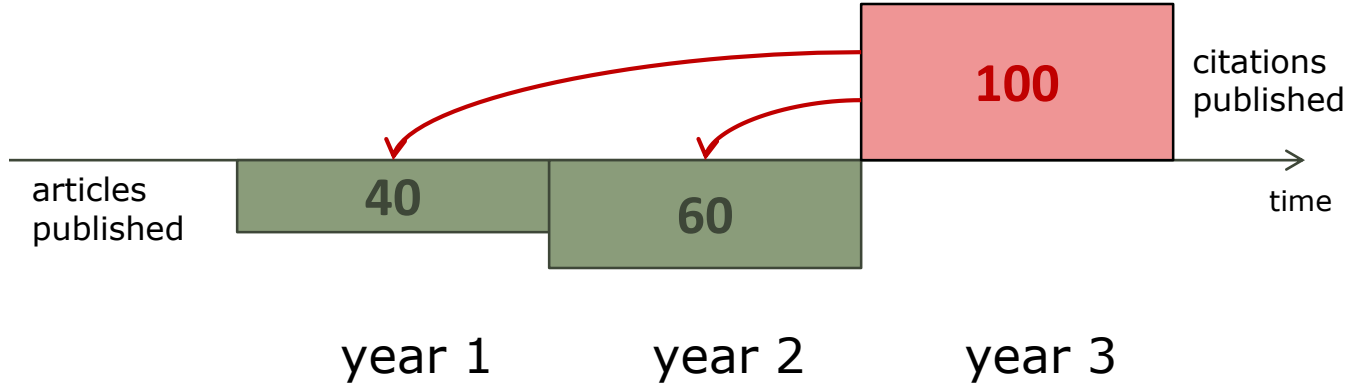
Introduced in 1950's by Eugene Garfield: ISI



$$IF(year\ 3) = \frac{C_{12}}{A_1 + A_2}$$

The Impact Factor

Introduced in 1950's by Eugene Garfield: ISI



$$\begin{aligned} IF(\text{year } 3) \\ &= \frac{100}{40+60} = 1 \end{aligned}$$

Negotiable

- PLoS Medicine, IF 2-11 (8.4)

(The *PLoS Medicine* Editors (2006) The Impact Factor Game. *PLoS Med* 3(6): e291.
<http://www.plosmedicine.org/article/info:doi/10.1371%2Fjournal.pmed.0030291>)

- Current Biology IF from 7 to 11 in 2003
 - Bought by Cell Press (Elsevier) in 2001...



Journal: CURRENT BIOLOGY

Mark	Journal Title	ISSN	Total Cites	Impact Factor	Immediacy Index	Citable Items	Cited Half-life	Citing Half-life
☐	CURR BIOL	0960-9822	20020	7.007	2.713	341	3.5	3.7
Cited Journal  Citing Journal  Source Data Journal Self Cites								

CITED JOURNAL DATA

CITING JOURNAL DATA

 IMPACT FACTOR TREND

Journal Impact Factor ⓘ

Cites in 2002 to items published in: 2001 = 3314 Number of items published in: 2001 = 528

2000 = 3917

2000 = 504

Sum: 7231

Sum: 1032

Calculation: $\frac{\text{Cites to recent items}}{\text{Number of recent items}} = \frac{7231}{1032} = 7.007$

Journal: CURRENT BIOLOGY

Mark	Journal Title	ISSN	Total Cites	Impact Factor	Immediacy Index	Citable Items	Cited Half-life	Citing Half-life
☐	CURR BIOL	0960-9822	22589	11.910	2.683	331	3.8	4.0
Cited Journal  Citing Journal  Source Data Journal Self Cites								

CITED JOURNAL DATA

CITING JOURNAL DATA

 IMPACT FACTOR TREND

RELATED JOURNALS

Journal Impact Factor ⓘ

Cites in 2003 to items published in: 2002 = 3628 Number of items published in: 2002 = 334

2001 = 3923

2001 = 300

Sum: 7551

Sum: 634

Calculation: $\frac{\text{Cites to recent items}}{\text{Number of recent items}} = \frac{7551}{634} = 11.910$

Journal: CURRENT BIOLOGY

Mark	Journal Title	ISSN	Total Cites	Impact Factor	Immediacy Index	Citable Items	Cited Half-life	Citing Half-life
☐	CURR BIOL	0960-9822	20020	7.007	2.713	341	3.5	3.7
Cited Journal Citing Journal Source Data Journal Self Cites								

[CITED JOURNAL DATA](#)[CITING JOURNAL DATA](#)[IMPACT FACTOR TREND](#)

Journal Impact Factor ⓘ

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Cited Journal Citing Journal Source Data Journal Self Cites								

[CITED JOURNAL DATA](#)[CITING JOURNAL DATA](#)[IMPACT FACTOR TREND](#)[RELATED JOURNALS](#)

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[Cited Journal](#)
[Citing Journal](#)
[Source Data](#)
[Journal Self Cites](#)

CITED JOURNAL DATA

CITING JOURNAL DATA

IMPACT FACTOR TREND

Journal Impact Factor ⓘ

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Journal: CURRENT BIOLOGY

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[Cited Journal](#)
[Citing Journal](#)
[Source Data](#)
[Journal Self Cites](#)

CITED JOURNAL DATA

CITING JOURNAL DATA

IMPACT FACTOR TREND

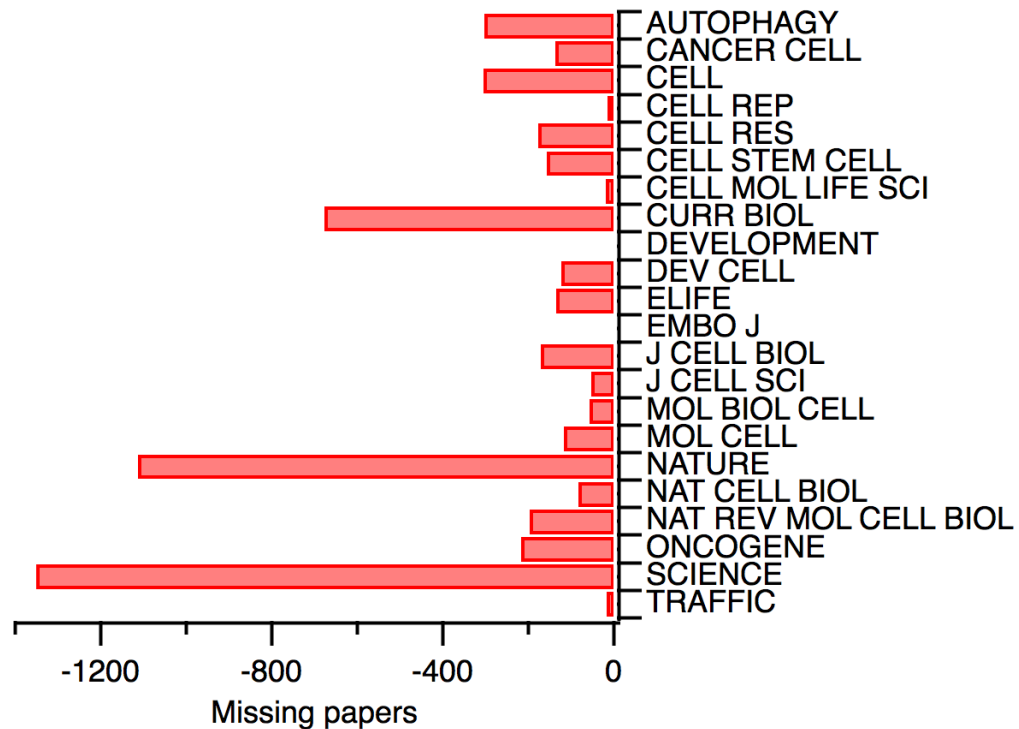
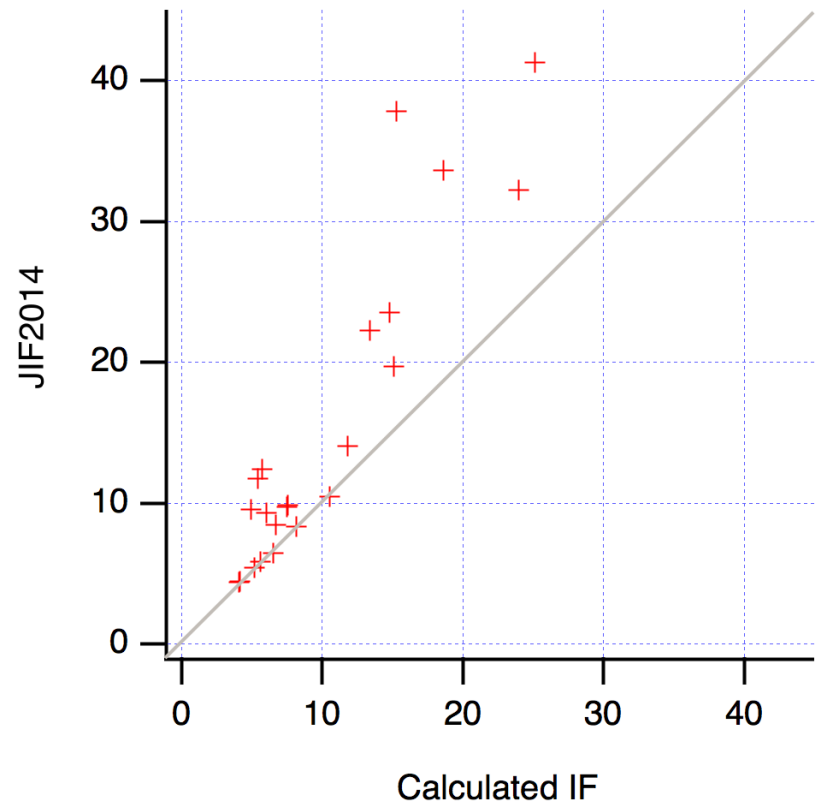
RELATED JOURNALS

Journal Impact Factor ⓘ

Cites in 2003 to items published in: 2002 = 3628
 2001 = 3923
 Sum: 7551
 Calculation: $\frac{\text{Cites to recent items}}{\text{Number of recent items}} = \frac{7551}{634} = 11.910$

Number of items published in: 2002 = 334
 2001 = 300
 Sum: 634

Negotiable



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EU agricultural reform fails on biodiversity

G. Pe'er^{*,†}, L. V. Dicks, P. Visconti, R. Arlettaz, A. Báldi, T. G. Benton, S. Collins, M. Dieterich, R. D. Gregory, F. Hartig, K. Henle, P. R. Hobson, D. Kleijn, R. K. Neumann, T. Robijns, J. Schmidt, A. Schwartz, W. J. Sutherland, A. Turbé, F. Wulf, A. V. Scott

[†]Corresponding author. guy.peer@ufz.de

Science 06 Jun 2014:
Vol. 344, Issue 6188, pp. 1090-1092
DOI: 10.1126/science.1253425

19 months later

[\[HTML\]](#) **EU agricultural reform fails on biodiversity**

G Pe'er, [LV Dicks](#), [P Visconti](#), [R Arlettaz](#), [A Báldi](#)... - Science, 2014 - sciencemag.org

Summary In December 2013, the European Union (EU) enacted the reformed Common Agricultural Policy (CAP) for 2014–2020, allocating almost 40% of the EU's budget and influencing management of half of its terrestrial area. Many EU politicians are announcing ...

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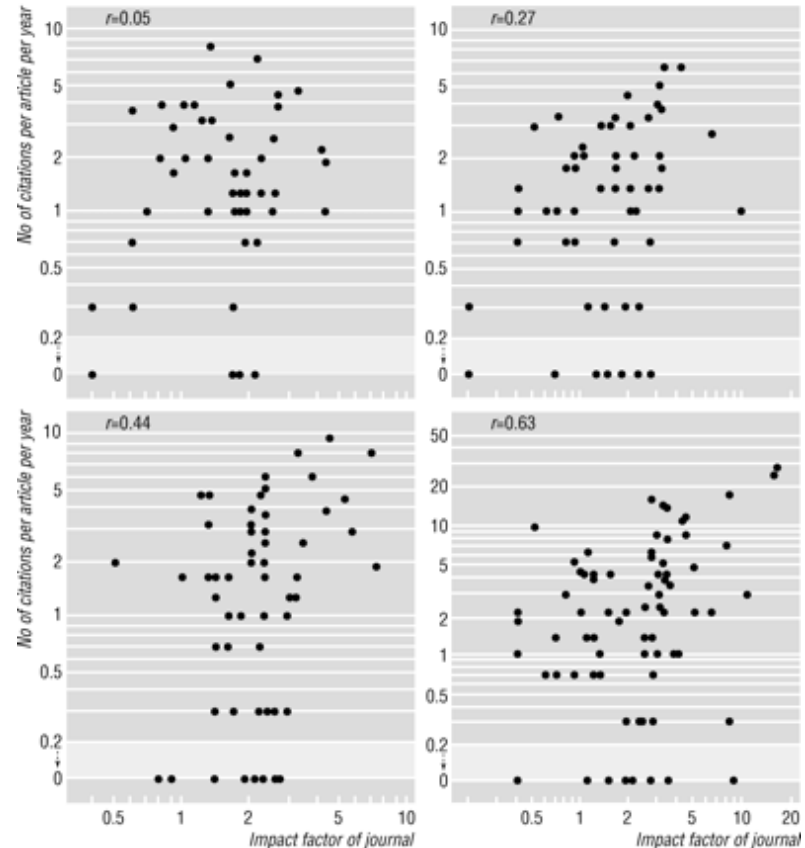
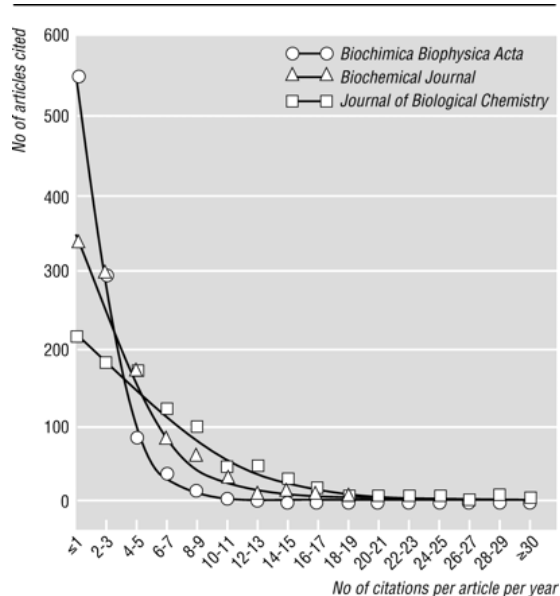
Not Reproducible

- Rockefeller University Press bought their data from Thomson Reuters
- Up to 19% deviation from published records
- Second dataset still not correct

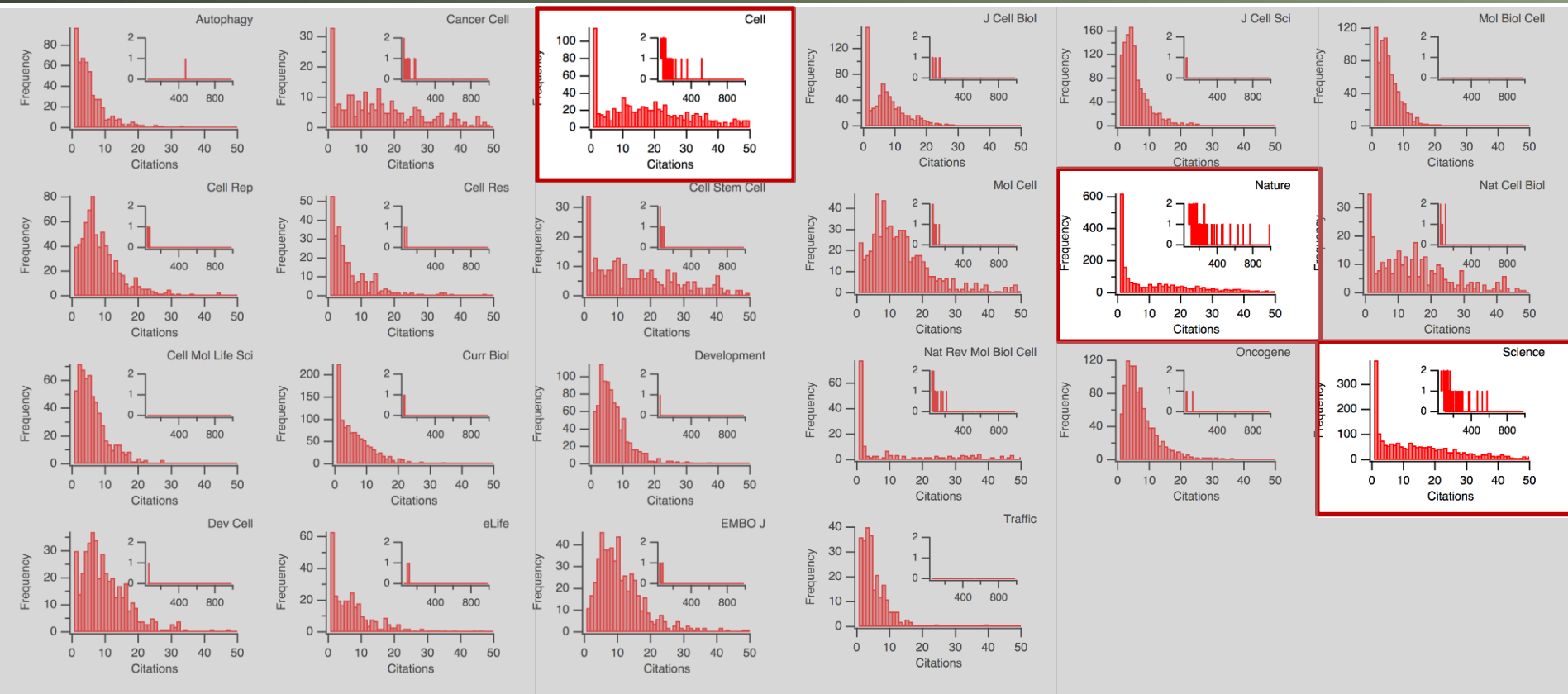


Not Mathematically Sound

- Left-skewed distributions
- Weak correlation of individual article citation rate with journal IF



Not Mathematically Sound

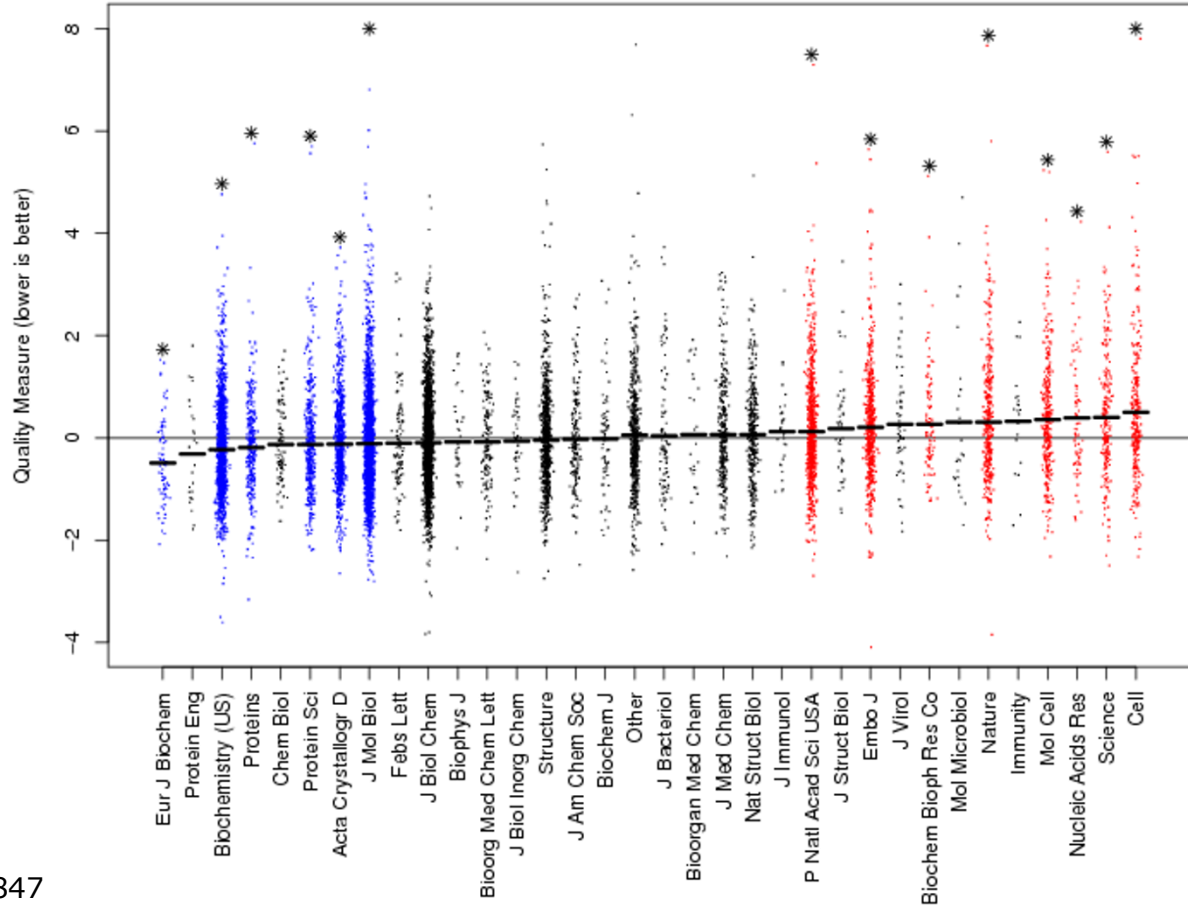


'QUALITY'

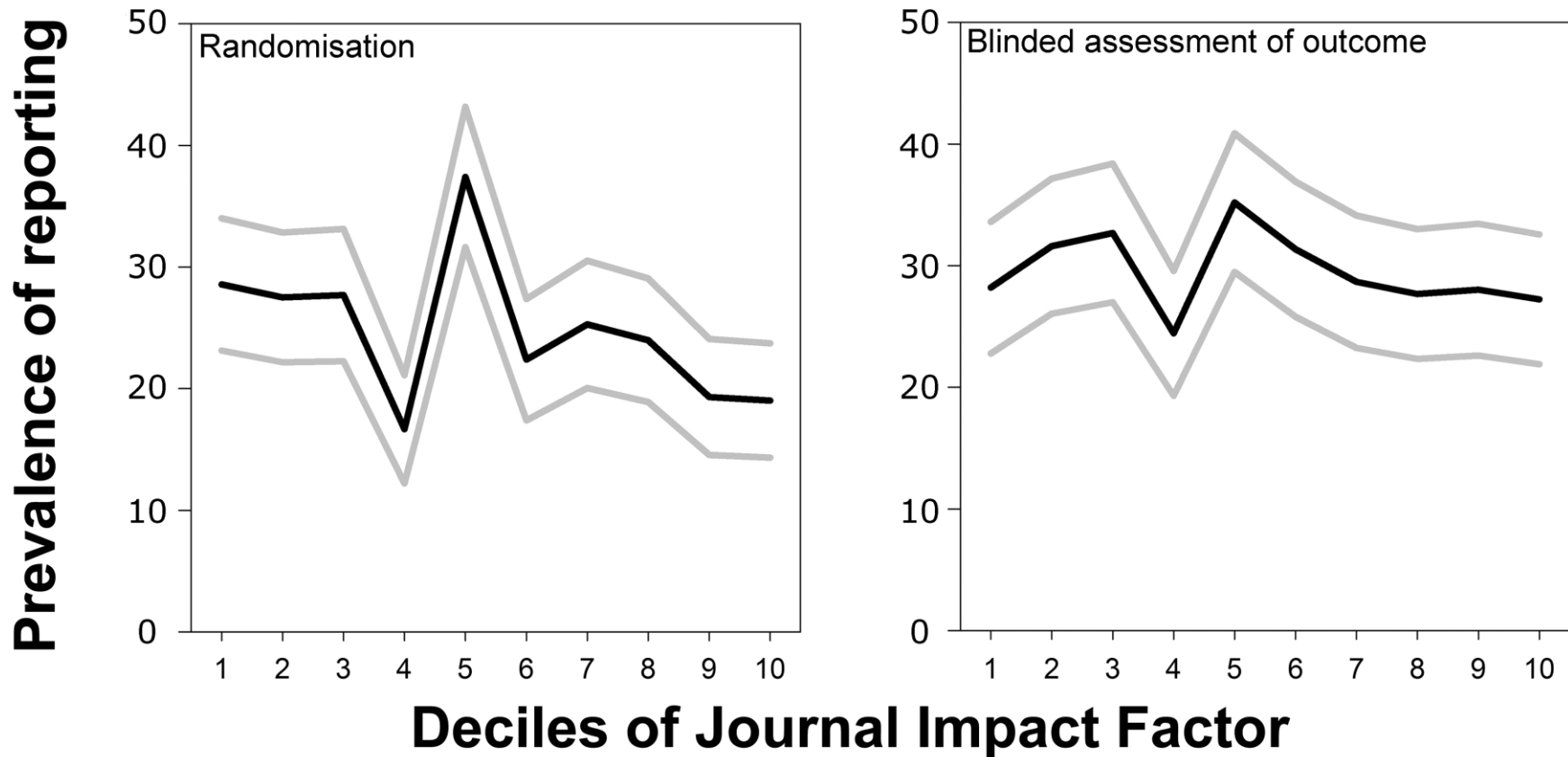


Is journal rank like astrology?

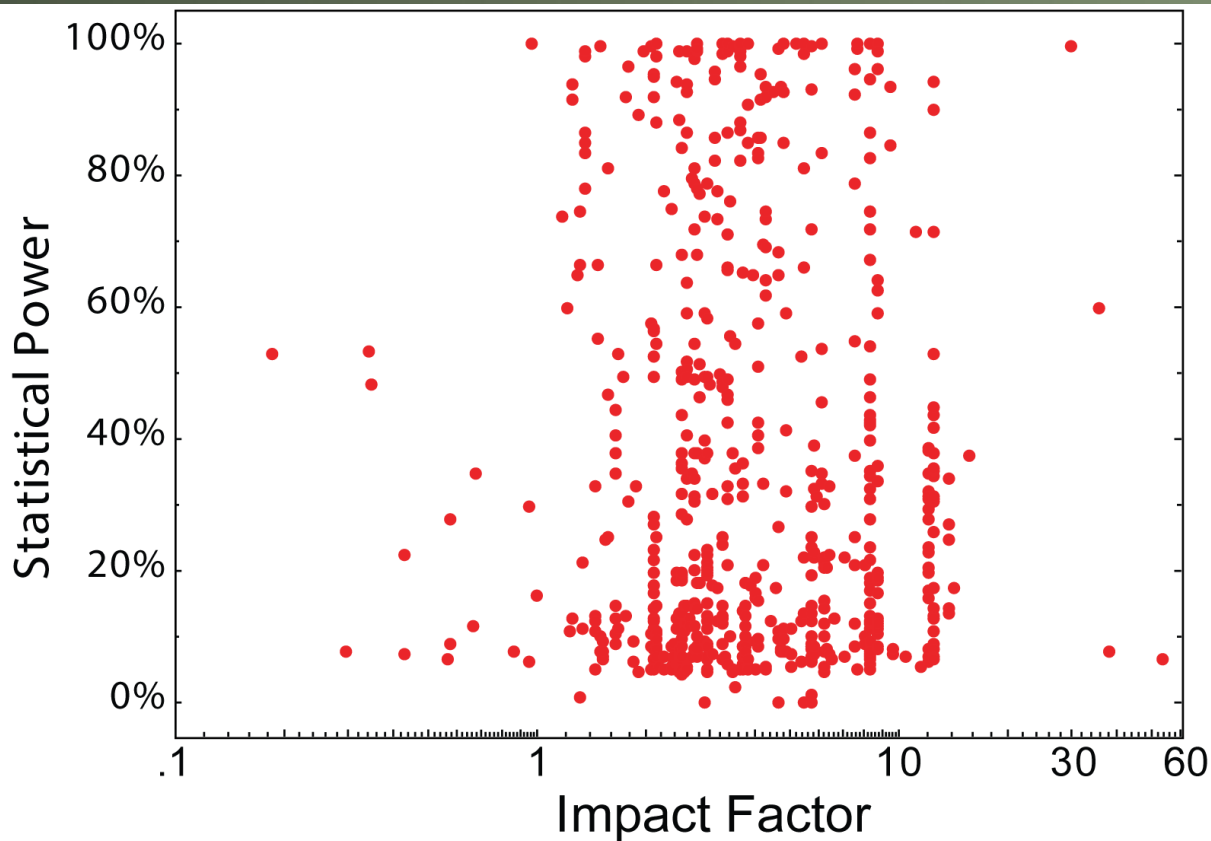
'Quality'



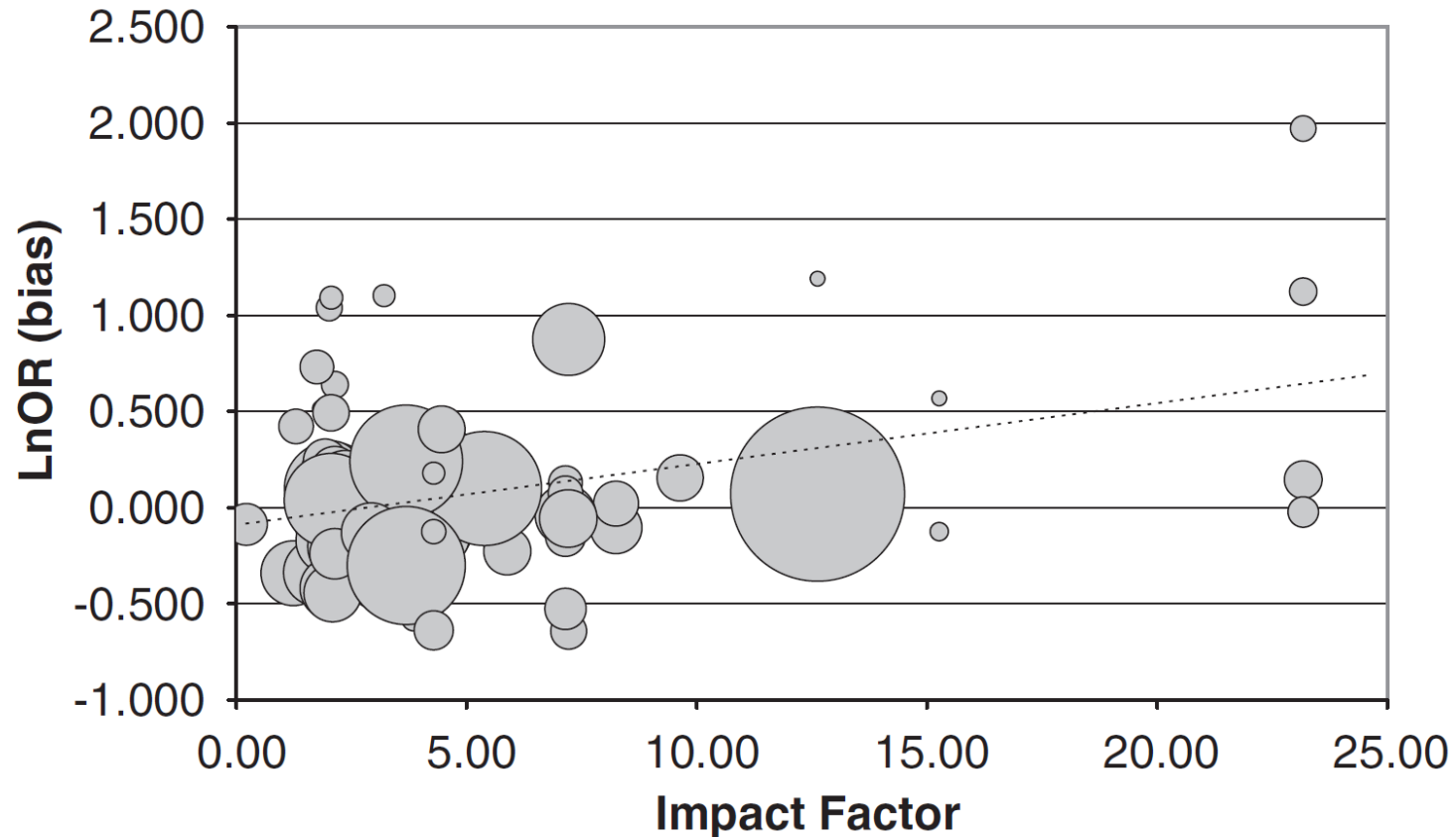
Methodology I



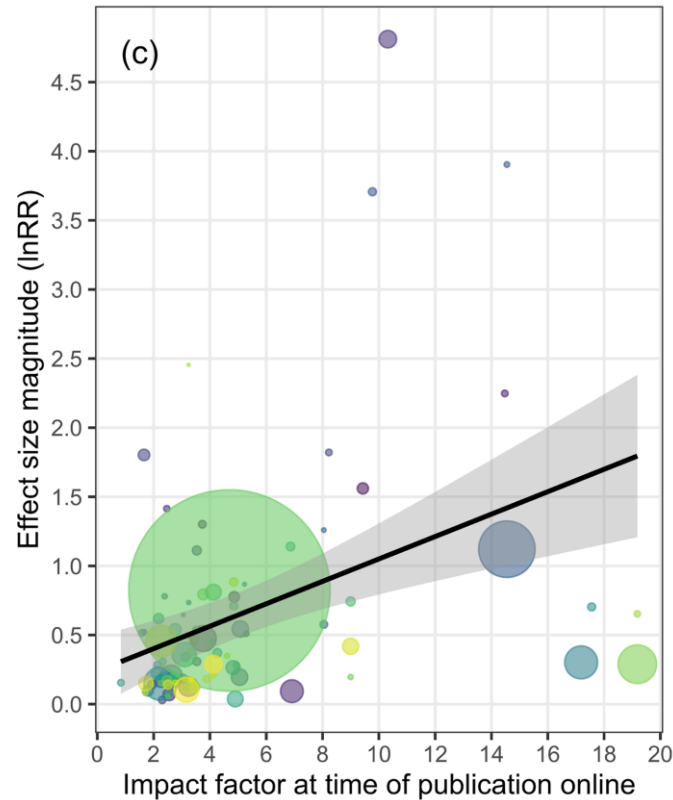
Methodology II



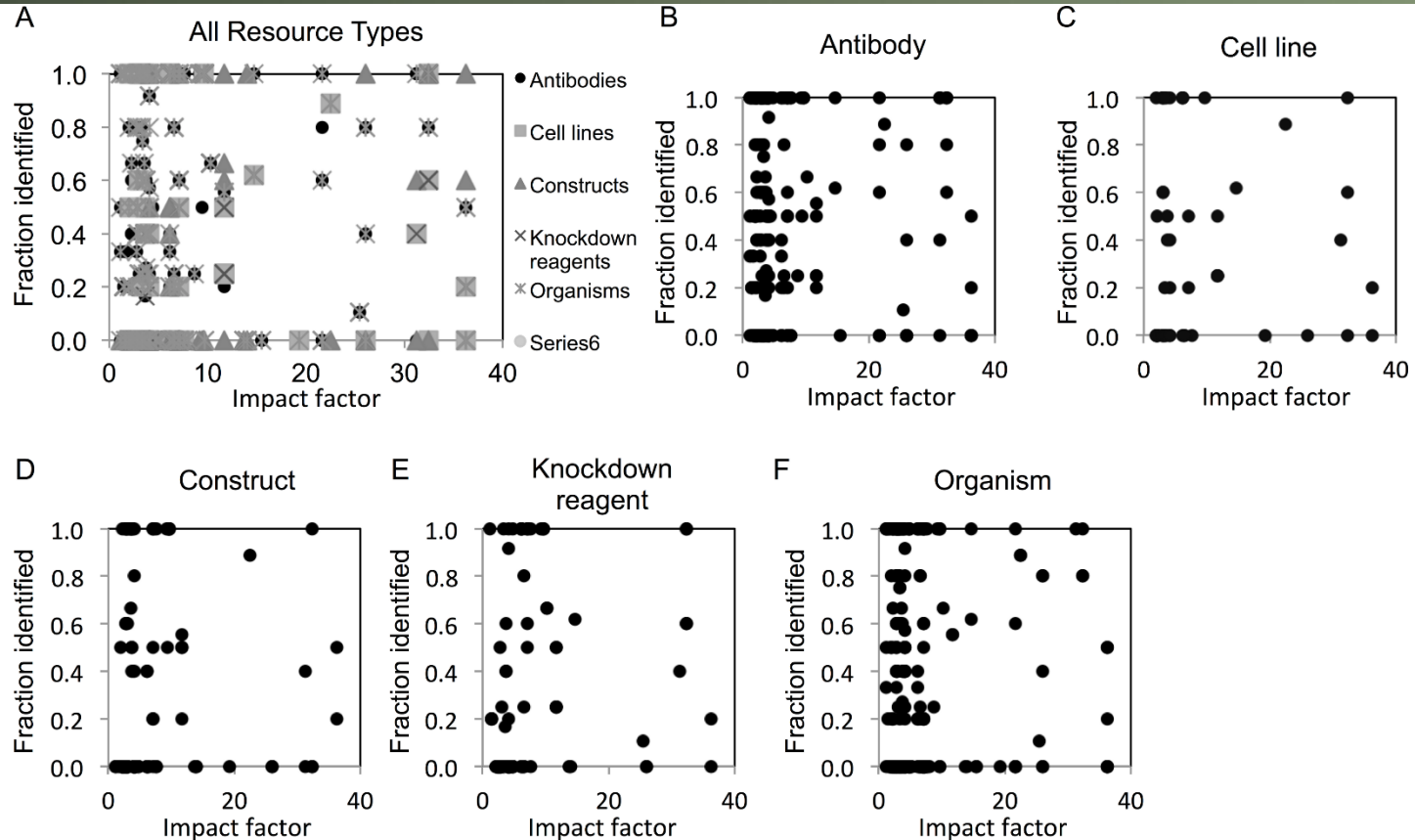
Methodology III



Methodology IV



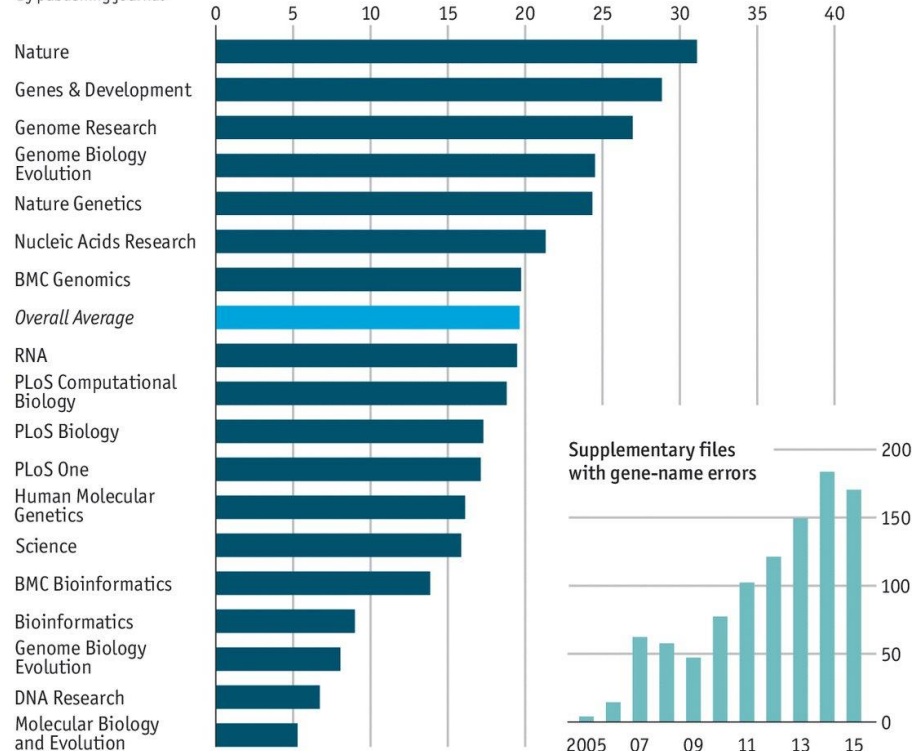
Methods Section



Excel Errors

#VALUE! error

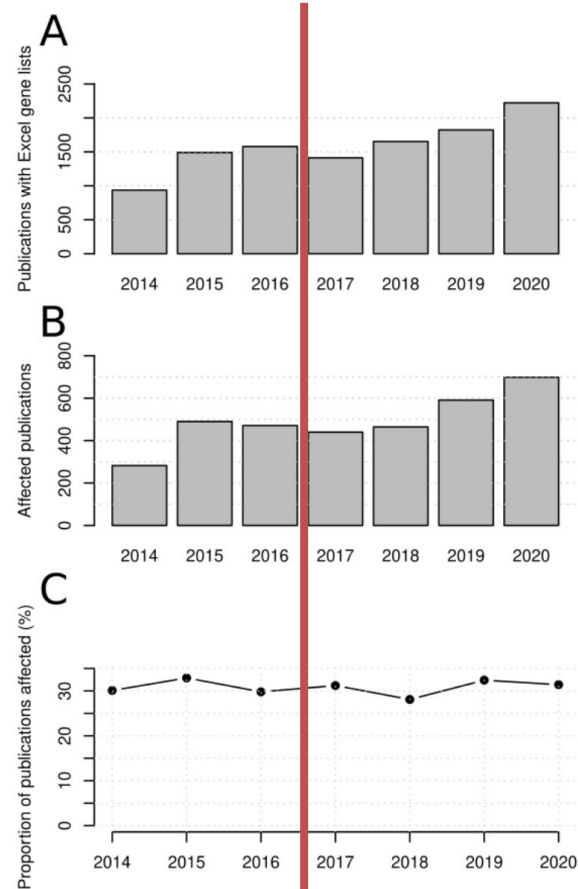
Genomics papers with spreadsheet errors in supplementary files, 2005-15, %
By publishing journal



Source: "Gene name errors are now widespread in the scientific literature", Ziemann, Eren and El-Osta, 2016

-omics studies

Excel Errors Continue



Renaming genes

THE VERGE

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VIDEO

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MICROSOFT REPORT SCIENCE

Scientists rename human genes to stop Microsoft Excel from misreading them as dates

99

Sometimes it's easier to rewrite genetics than update Excel

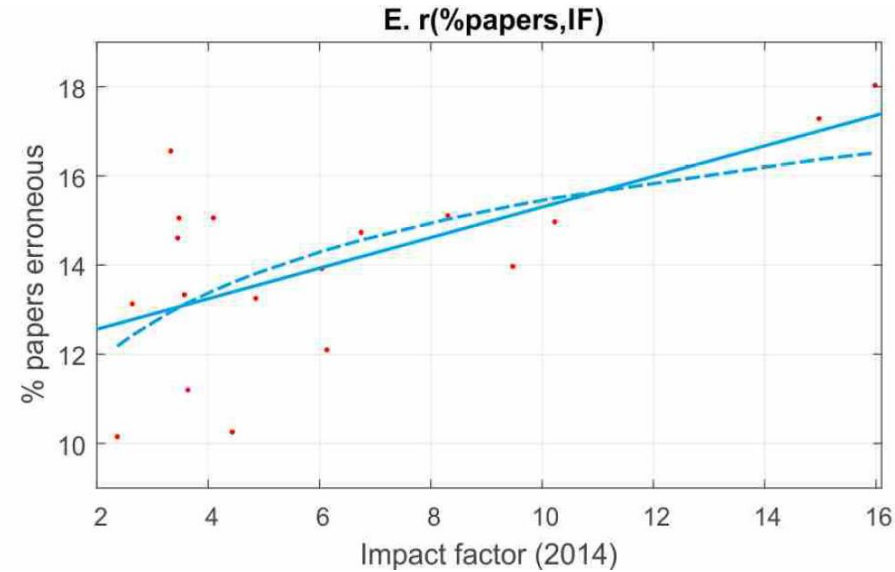
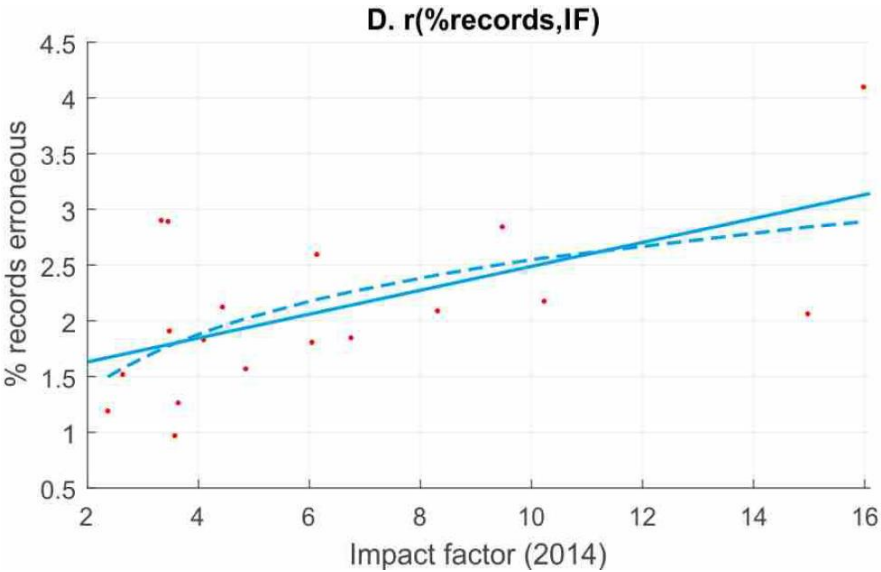
By James Vincent | Aug 6, 2020, 8:44am EDT



SHARE



p-Value Errors



Questionable Research Practices

QRP	Total <i>N</i>	<i>ND</i>	Top 8 journals		Non-Top 8 journals		% difference
			<i>N</i>	Percent (95% CI)	<i>N</i>	Percent (95% CI)	
Add/drop	339	48	182	72.0% (64.8%– 78.2%)	157	54.1% (46.0%– 62.0%)	17.8% ^{***}
Add data	339	48	182	25.3% (19.3%– 32.3%)	157	17.2% (11.8%– 24.2%)	8.1%
Drop data	339	48	182	46.7% (39.3%– 54.2%)	157	36.9% (29.5%– 45.0%)	9.8%
Add/drop covariates	351	49	189	74.1% (67.1%– 80.0%)	162	63.0% (55.0%– 70.3%)	11.1% [*]
Add covariates	351	49	189	74.1% (67.1%– 80.0%)	162	63.0% (55.0%– 70.3%)	11.1% [*]
Drop covariates	351	49	189	49.7% (42.4%– 57.1%)	162	8.6% (5.0%– 14.3%)	41.1% ^{***}
Change scale	157	24	84	51.2% (40.1%– 62.2%)	73	42.5% (31.2%– 54.6%)	8.7%

QUALITY?



“High-Impact” journals attract the most unreliable research

Science is optional

http://www.nature.com/authors/policies/peer_review.html

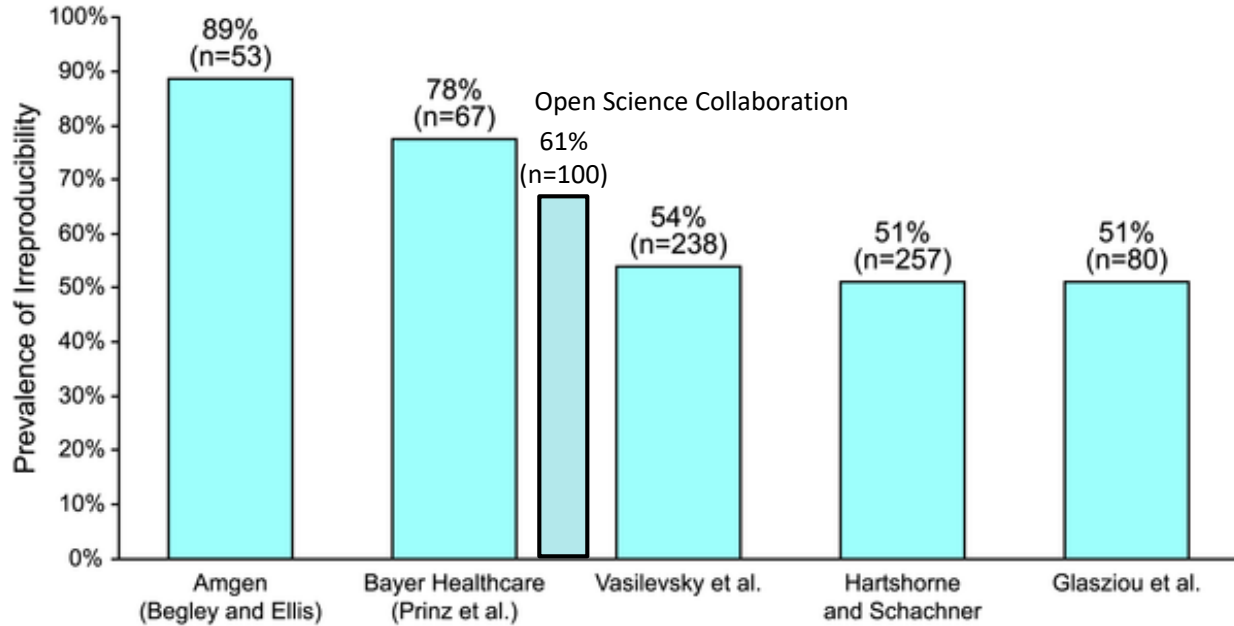
The ideal review should answer the following questions:

1. Who will be interested in reading the paper, and why?
2. What are the main claims of the paper and how significant are they?
3. Is the paper likely to be one of the five most significant papers published in the discipline this year?
4. How does the paper stand out from others in its field?
5. Are the claims novel? If not, which published papers compromise novelty?
6. Are the claims convincing? If not, what further evidence is needed?
7. Are there other experiments or work that would strengthen the paper further?
8. How much would further work improve it, and how difficult would this be? Would it take a long time?
9. Are the claims appropriately discussed in the context of previous literature?
10. If the manuscript is unacceptable, is the study sufficiently promising to encourage the authors to resubmit?
11. If the manuscript is unacceptable but promising, what specific work is needed to make it acceptable?

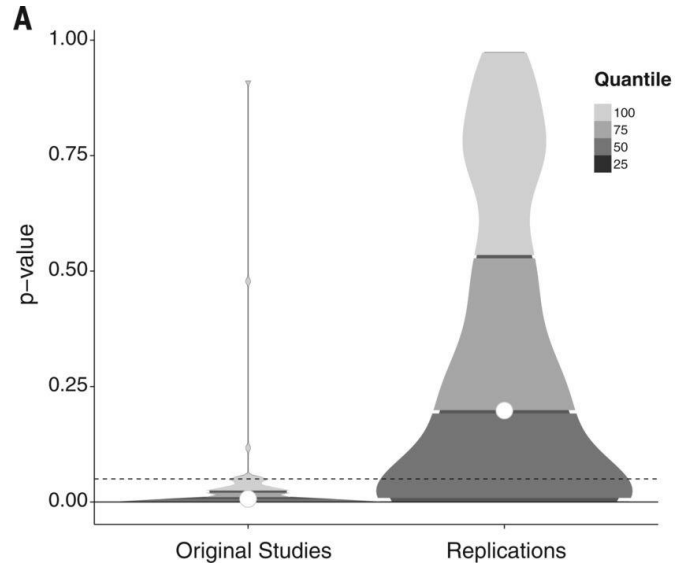
If time is available, it is extremely helpful to the editors if reviewers can advise on some of the following points:

12. Is the manuscript clearly written?
13. If not, how could it be made more clear or accessible to nonspecialists?
14. Would readers outside the discipline benefit from a schematic of the main result to accompany publication?
15. Could the manuscript be shortened? (Because of pressure on space in our printed pages we aim to publish manuscripts as short as is consistent with a persuasive message.)
16. Should the authors be asked to provide supplementary methods or data to accompany the paper online? (Such data might include source code for modelling studies, detailed experimental protocols or mathematical derivations.)
17. Have the authors done themselves justice without overselling their claims?
18. Have they been fair in their treatment of previous literature?
19. Have they provided sufficient methodological detail that the experiments could be reproduced?
20. Is the statistical analysis of the data sound, and does it conform to the journal's guidelines?
21. Are the reagents generally available?
22. Are there any special ethical concerns arising from the use of human or other animal subjects?

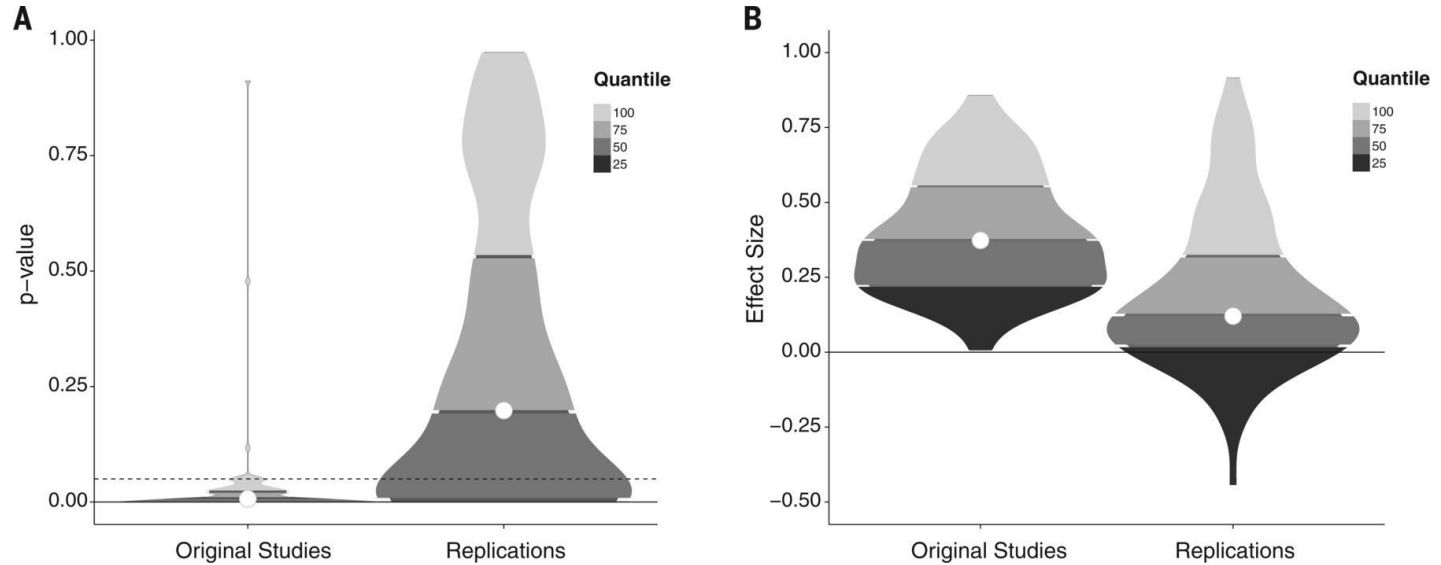
Irreproducibility



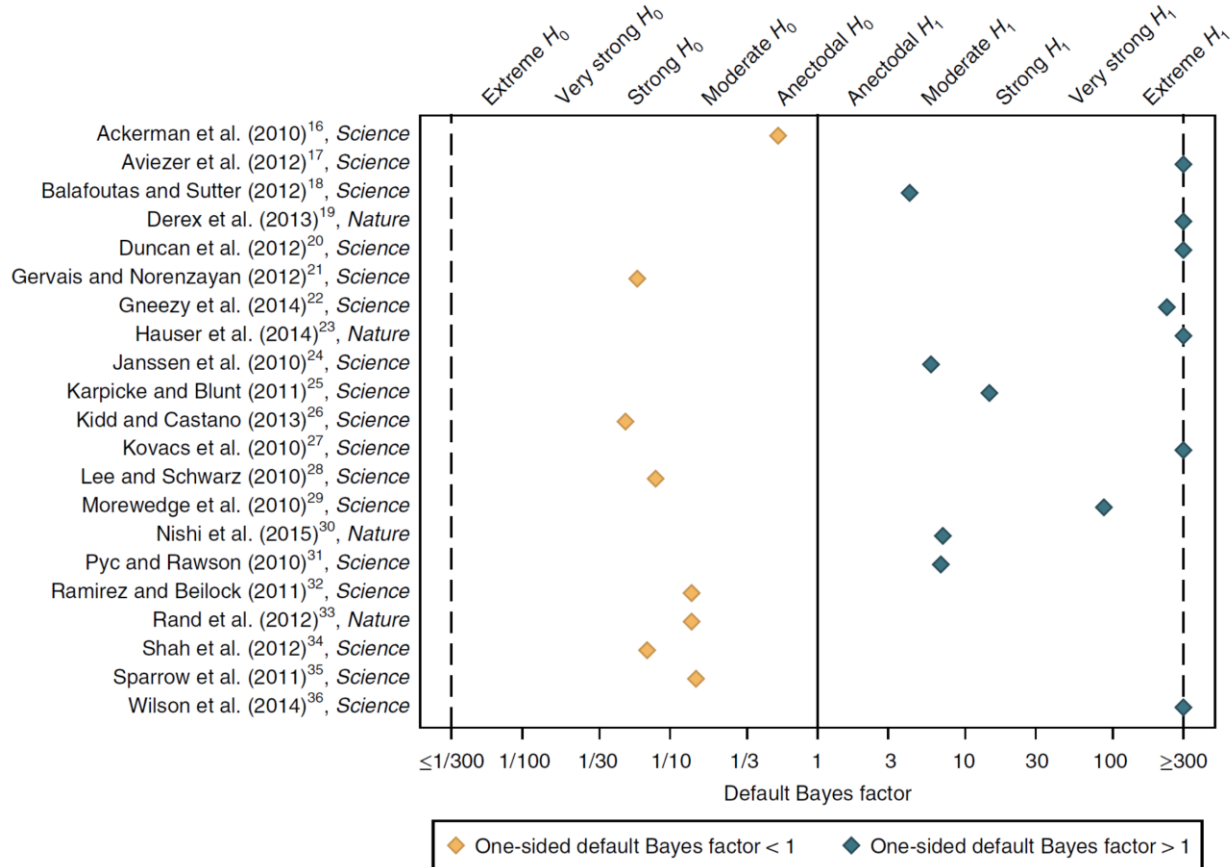
Replication in Psychology



Replication in Psychology

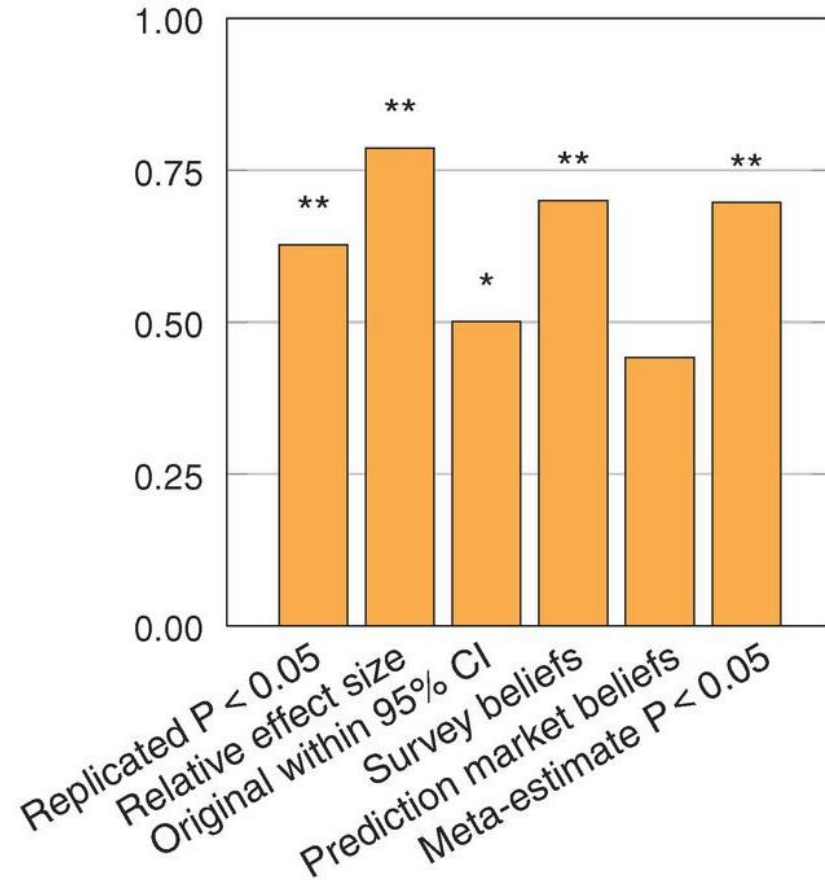


Social Sciences



Successful:
13/21: 62%

Economics



Successful:
11/18: 61%

Cancer Research: ~12% replication rate

COMPLETED
50 experiments

INITIATED
87 experiments

DESIGNED
193 experiments

BARRIERS

Total number

Papers

23

Experiments

50

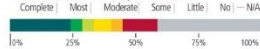
Effects

158

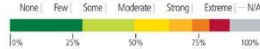
All outcomes

188

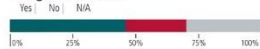
Modifications implemented



Modifications needed



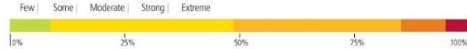
Reagents shared



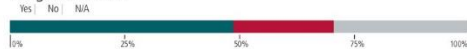
Authors helped



Protocol clarifications needed



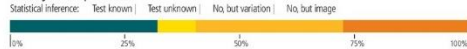
Reagents offered



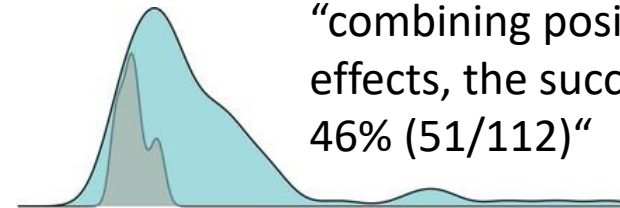
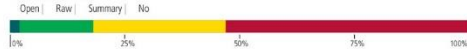
Code shared



Analysis reported



Data shared



“combining positive and null effects, the success rate was 46% (51/112)”

