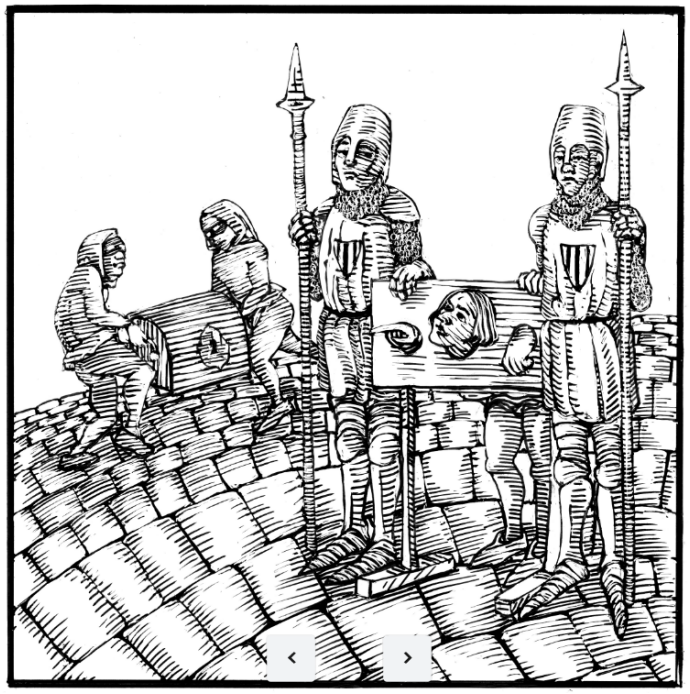


The Sin of Corruptibility

I was doing fine, but then I became impatient, overambitious, reckless.

—Diederik Stapel, 2012

The Sin of Bean Counting

Not everything that counts can be counted, and not everything that can be counted counts.

—William Bruce Cameron, 1963

Who is this guy?

Who is this guy?

Who is this guy?

I was alone in my fancy office at University of Groningen.… I opened the file that contained research data I had entered and changed an unexpected 2 into a 4.… I looked at the door. It was closed.… I looked at the matrix with data and clicked my mouse to execute the relevant statistical analyses. When I saw the new results, the world had returned to being logical. (p. 145)

I preferred to do it at home, late in the evening, when everyone was asleep. I made myself some tea, put my computer on the table, took my notes from my bag, and used my fountain pen to write down a neat list of research projects and effects I had to produce.… Subsequently I began to enter my own data, row for row, column for column…3, 4, 6, 7, 8, 4, 5, 3, 5, 6, 7, 8, 5, 4, 3, 3, 2. When I was finished, I would do the first analyses. Often, these would not immediately produce the right results. Back to the matrix and alter data. 4, 6, 7, 5, 4, 7, 8, 2, 4, 4, 6, 5, 6, 7, 8, 5, 4. Just as long until all analyses worked out as planned. (p. 167)

Psychology must learn a lesson from fraud case (Wicherts, 2011)

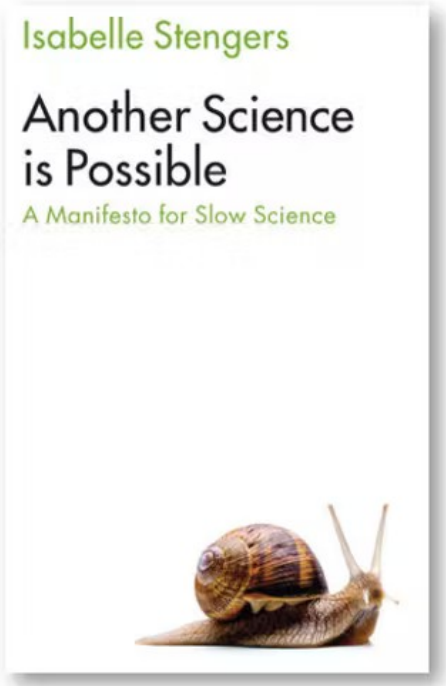
"The interim report of the investigating committee revealed that Stapel often refused to share his research data with colleagues, even co-authors on papers. To scientists in other fields, this may seem extraordinary; to psychologists it is sadly common practice."

- almost **3/4 of researchers** who had published a paper in a high-impact psychology journal **had not shared their data** *(more with the Sin of Data Hoarding)*
- it is not unusual for data that are shared to list variables only as VAR00001 through VAR00019, with **no further explanation**.
- **co-authors rarely verify a study's analysis**

Psychology must learn a lesson from fraud case (Wicherts, 2011)

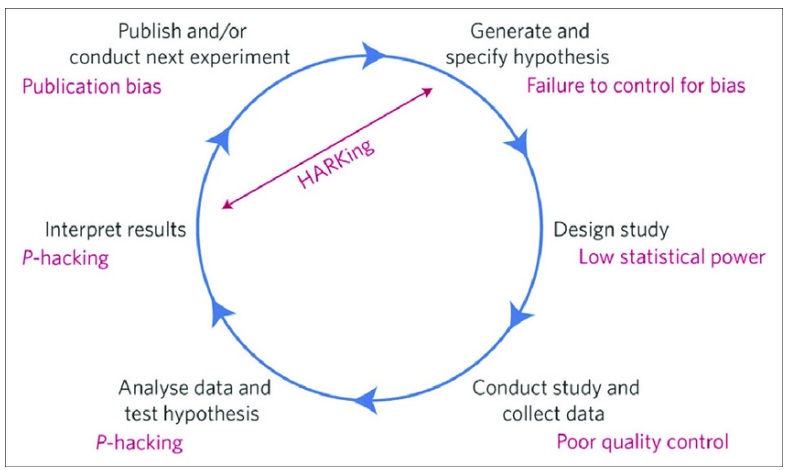
- readers of published papers are shown **dense summaries of results**
- sharing data: there are practical problems, including the need to keep data or participants confidential
  - these can be solved by embargoes on releasing data for longitudinal studies, guidelines for pre-processing raw data, proper anonymity and **exemptions where necessary**
- **a 'co-pilot' model**, in which we share data between us for double-checking and preventing embarrassing errors

But why would they do it?



Professor A: "Our application success rates are too low!"
Professor B: "That's right, and we don't pull in as much grant funding as these other universities, here look at this list."
Professor C: "We need more grants!"
Professor A: "Yes, more grants! But how?"
Professor C: "We must *apply* for more grants! Then we will get more grants."
Professor B: "Brilliant! And let's also be sure to apply for more *expensive* grants. Then we'll rank higher on these arbitrary league tables that show which universities spend the most public money."
Professor A: "Oh yes, it's *very* important to spend more public money. How else will the world know how brilliant we are?"
[Everyone nods sagely]

Slow Food and Slow Science is not slowing down for its own sake, but increasing quality. Slow science means getting into the nitty gritty, just as the podding of fresh peas with your fingers is part of the production of a high quality meal. Science is a slow, steady, methodical process, and scientists should not be expected to provide quick fixes for society's problems.[35]



Impact factor

- A well-intentioned measure of **journal** quality
- Started in 1979, now calculated by a private company Clarivate

IF = number of citations / number of publications in two preceding years

Impact factor – examples

Nature: 50

Science: 47

European Journal of Psychological Assessment: 3

Czechoslovak Psychology: 0.5

Testforum: NA

Article Influence Score

- An alternative to IF that measures influence of a journal
- Recently implemented as **the** metric that decides funding in Czech Republic
- Mean AIS = 1
- **Omits journal-level self-citations**

AIS = journal's citation influence / number of articles over five years

AIS – examples

Nature: 24

Science: 22

European Journal of Psychological Assessment: .96

Czechoslovak Psychology: .06

Testforum: NA

h-index

- Measure of **author** quality, comparable within fields
- Started in 2005
- Intedned to be better than raw number of papers or raw number of citations... but correlates r = .90 with the raw number of papers, oops.

Among all publications of an author, at least *h* of them received at least *h* citations.

h-index – examples

Albert Einstein: 117

Albert Bandura: 208

Eric-Jan Wagenmakers: 101

Jordan Peterson: 55

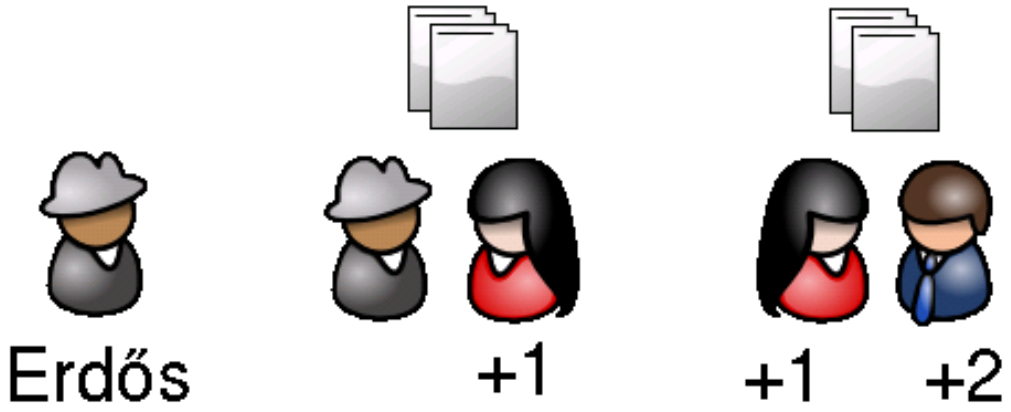
David Šmahel: 28

Stanislav Ježek: 19

Erdös number

- The only measure of author quality that makes sense
- The only measure of author quality that measures something real

E_N = How many co-
authors separate you from the mathematician Pál Erdös



On 20 September 1996, at the age of 83, he had a heart attack and died while attending a conference in Warsaw.[17] These circumstances were close to the way he wanted to die. He once said,

> I want to be giving a lecture, finishing up an important proof on the blackboard, when someone in the audience shouts out, 'What about the general case?'. I'll turn to the audience and smile, 'I'll leave that to the next generation,' and then I'll keel over.[17]

Other idiosyncratic elements of Erdős's vocabulary include:[32]

•Children were referred to as "epsilons" (because in mathematics, particularly calculus, an arbitrarily small positive quantity is commonly denoted by the Greek letter (ε)).
•Women were "bosses" who "captured" men as "slaves" by marrying them. Divorced men were "liberated".
•People who stopped doing mathematics had "died", while people who died had "left".
•Alcoholic drinks were "poison".
•Music (except classical music) was "noise".
•To be considered a hack was to be a "Newton".
•To give a mathematical lecture was "to preach".
•Mathematical lectures themselves were "sermons".[33]
•To give an oral exam to students was "to torture" them.

Erdös number – examples

Albert Einstein: 2

Albert Bandura: NA

Eric-Jan Wagenmakers: 3

Jordan Peterson: NA

David Šmahel: NA

Stanislav Ježek: NA

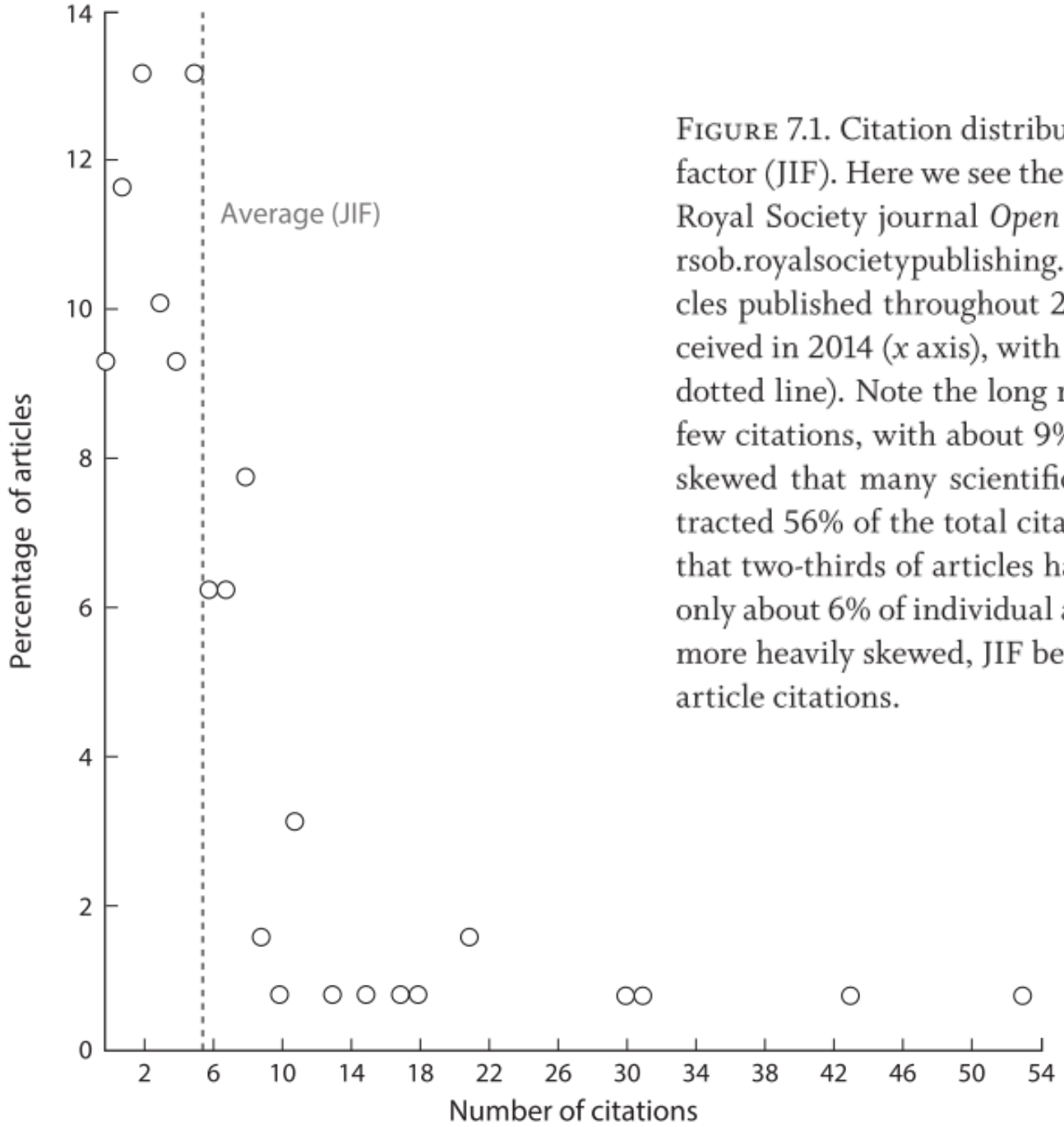
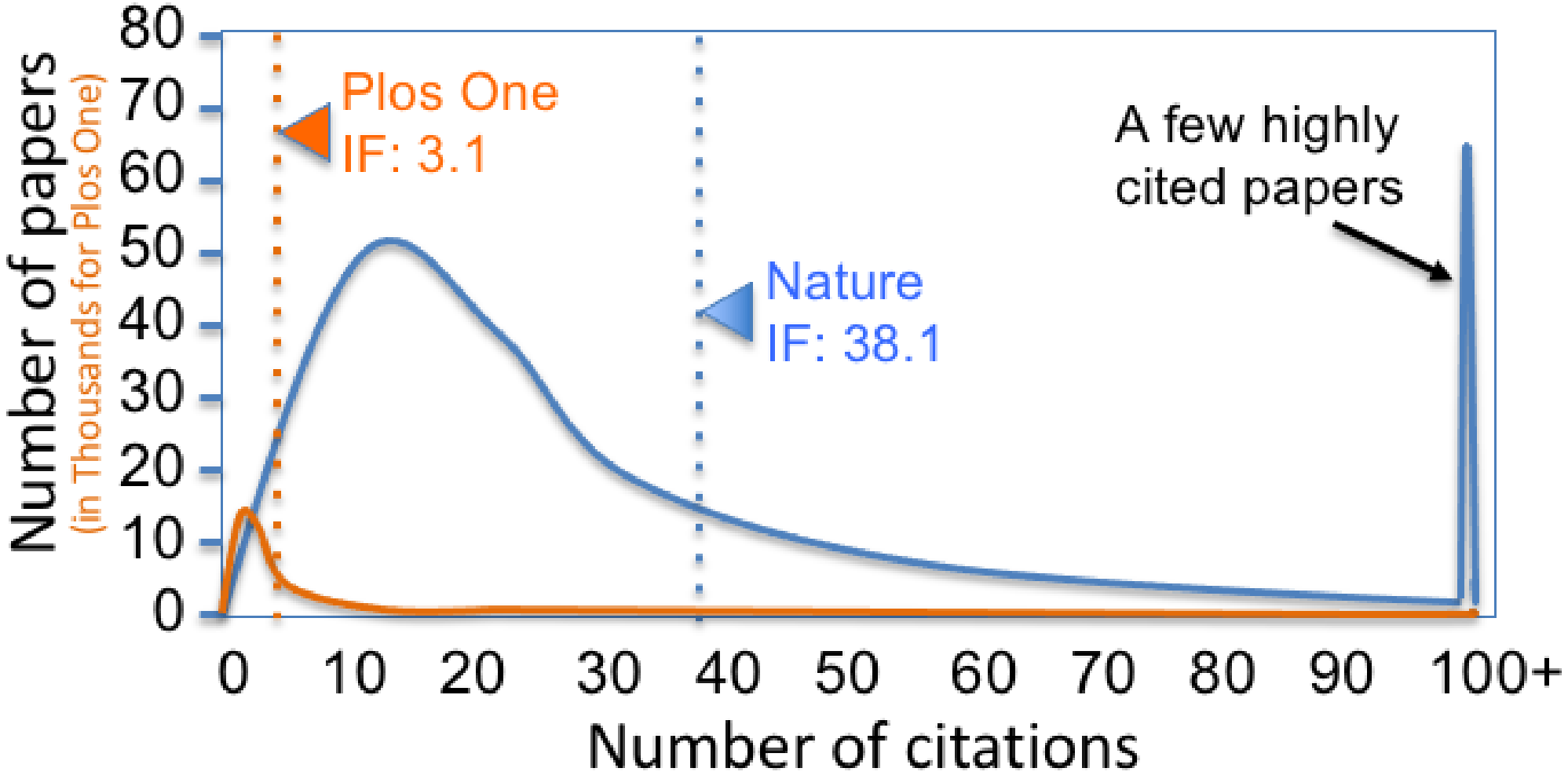


FIGURE 7.1. Citation distributions highlight the meaningless nature of the journal impact factor (JIF). Here we see the distribution of citations used to calculate the 2014 JIF for the Royal Society journal *Open Biology* (the results shown here were extracted from http://rsob.royalsocietypublishing.org/citation-metrics). The chart plots the percentage of articles published throughout 2012–2013 (*y* axis) according to how many citations they received in 2014 (*x* axis), with the JIF calculated as the average of this distribution (vertical dotted line). Note the long rightward tail, or right skew, in which most articles received few citations, with about 9% attracting none at all. *Open Biology* is actually less severely skewed that many scientific journals—here, the top 20% most highly cited papers attracted 56% of the total citations. Even so, the degree of skewness is sufficient to ensure that two-thirds of articles had *fewer* citations than the JIF, and the JIF itself represented only about 6% of individual articles published. As these distributions become broader and more heavily skewed, JIF becomes increasingly meaningless as an indicator of individual article citations.


Number of papers
(in Thousands for Plos One)
80
70
60
50
40
30
20
10
0
Plos One
IF: 3.1
Nature
IF: 38.1
A few highly
cited papers
0
10
20
30
40
50
60
70
80
90
100+
Number of citations

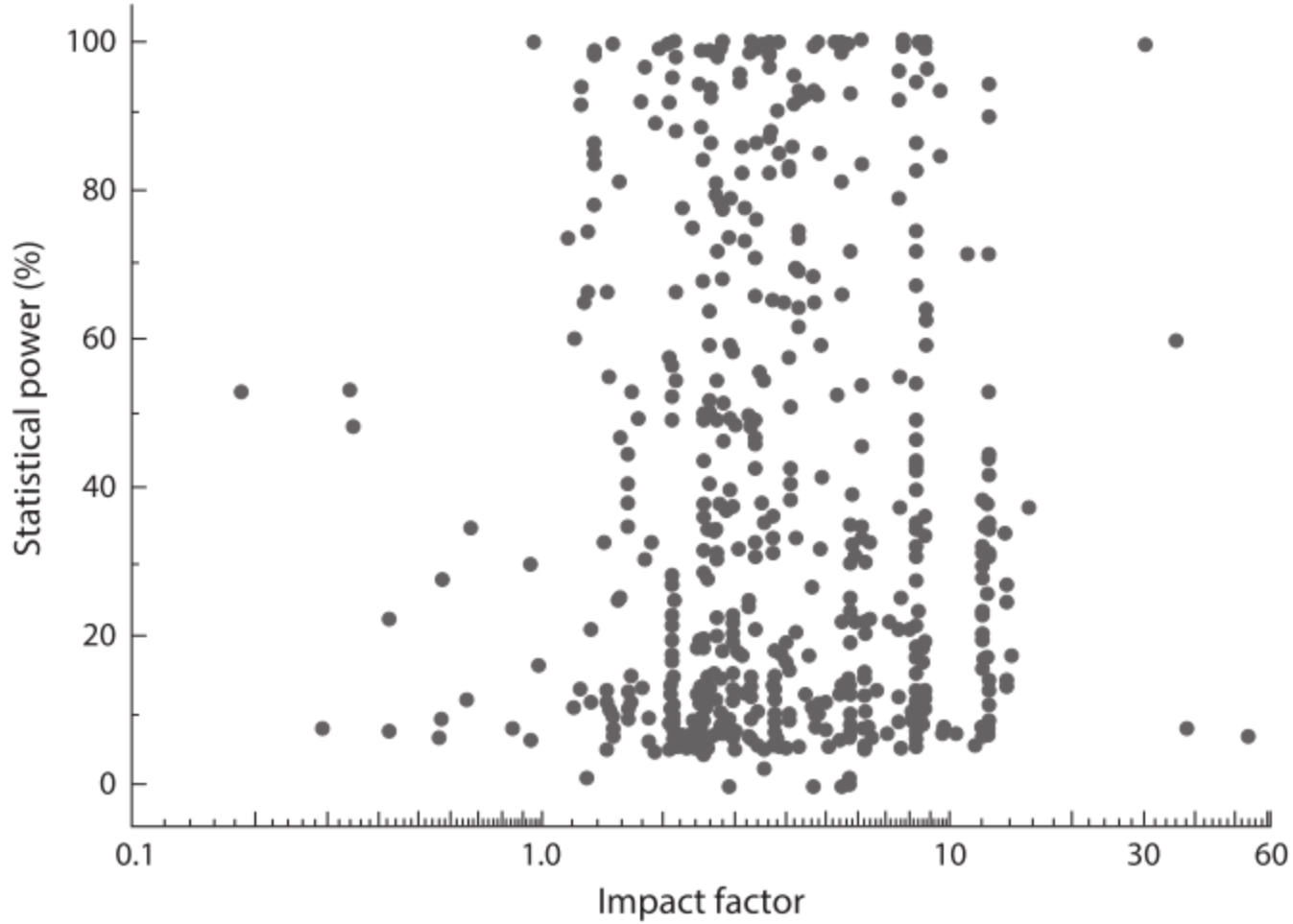
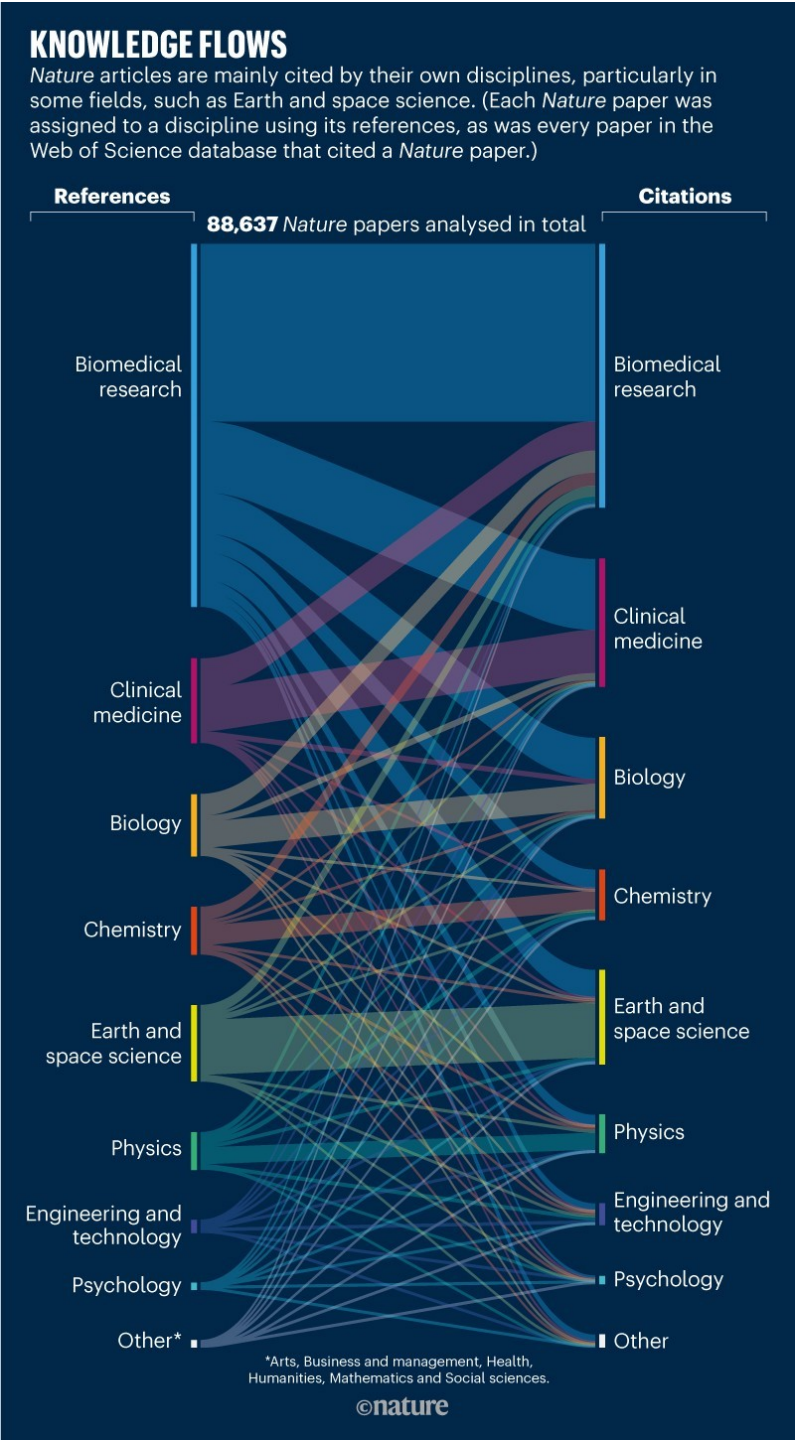


FIGURE 7.2. Brembs, Button, and Munafò (2013) found no discernible correlation between the statistical power of individual studies in neuroscience and the JIF of the journals in which those studies appeared. These results therefore provide no evidence that journals with higher JIFs publish more reproducible science.



A "popular" article has been published in nature. The graph maps articles in the domains covered by nature and its "daughter" journals:
- articles are mapped to citations
- the likelihood is high that papers from a certain discipline are cited by their own disciplines
- the lower we go, the less cross-disciplinary citation

QUESTION 1: Are measures that are heavily based on citations (without a correction) comparable across disciplines?

QUESTION 2: Having a look at the picture, how is psychology faring in the business?

https://www.nature.com/articles/d41586-019-03308-7?proof=t%3B

Reason distinguishes a ***"person approach"*** **to error from a** ***"system approach"*** (Reason, 2000):

He notes that **"high reliability" organizations** (including air traffic control centers, nuclear power plants, and nuclear aircraft carriers) are characterized by a **focus on error management at the systems level** more than the individual level.

Reason's logic has also been adopted in widespread attempts to reduce medical errors and **a focus on moving medicine from a "blame and shame"** cultural perspective to one of a **"reporting and feedback"** cultural perspective, with public reporting of individual and organizational performance being crucial (Leape, 2010).

6 core reasons for DRP

(1) career and funding pressures

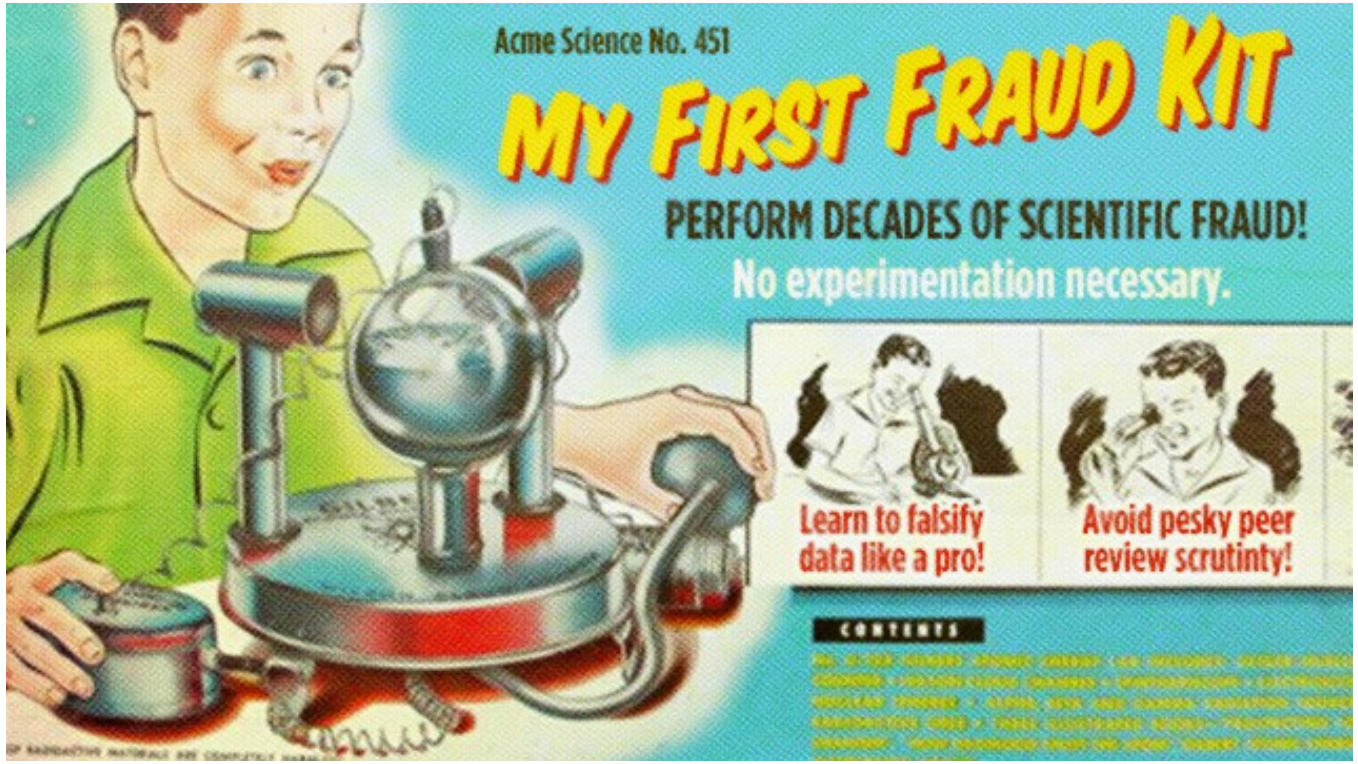
(2) institutional failures of oversight,

(3) commercial conflicts of interest,

(4) inadequate training,

(5) erosion of standards of mentoring, and

(6) part of a larger pattern of social deviance.



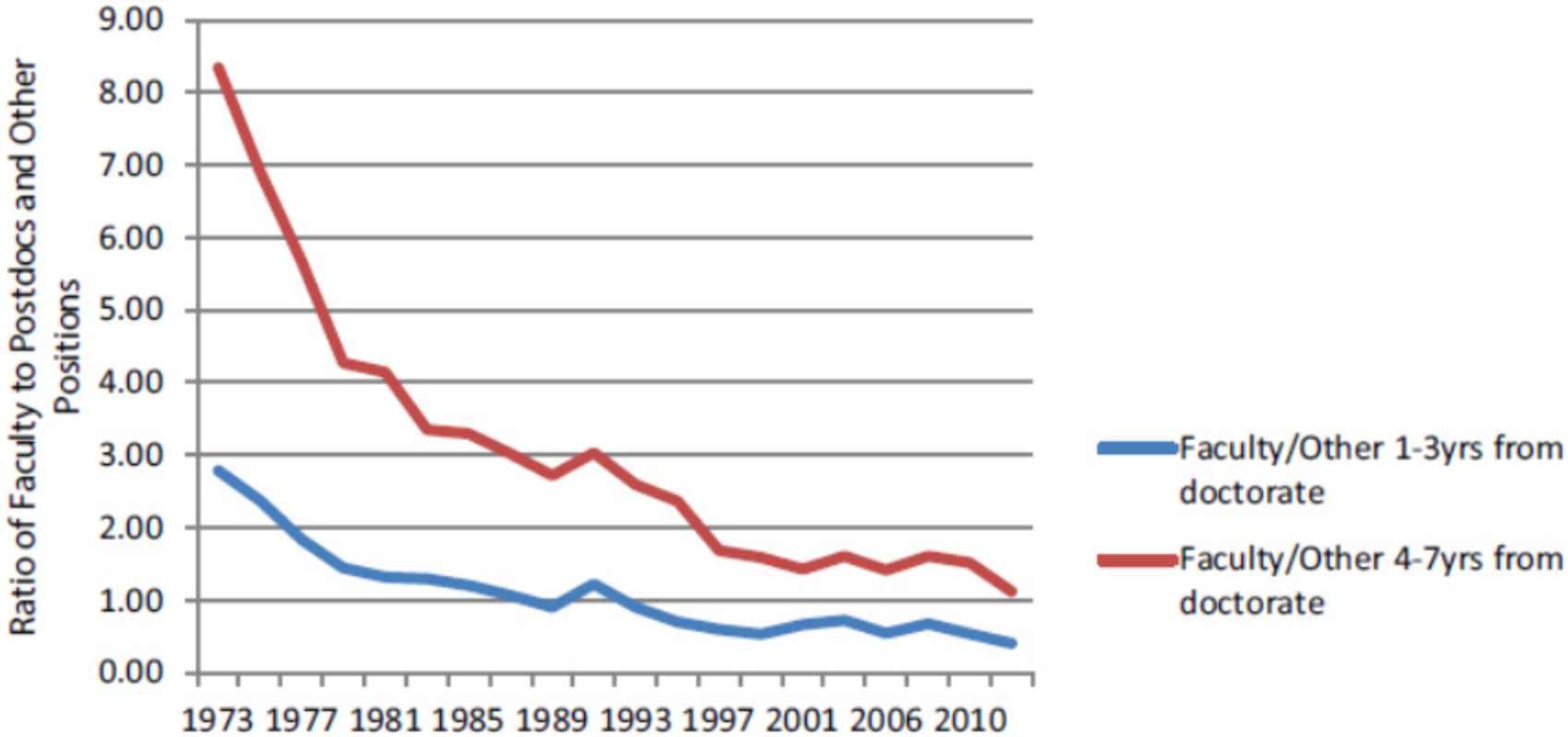


FIGURE 6-1 The ratio of faculty members to postdocs and other science, engineering, and health doctorates employed in academia has declined over time

SOURCE: Data taken from NSB, 2016.

Take home message

- Scientists **are incentivized to engage in fraud**
- Metrics that incentivize them are **fatally flawed**
- Fraud is not merely an issue of individual bad apples, but rather a larger **flaw of the whole academic culture**
- Resisting all bad research practices is **hard due to institutional (and personal) pressures**

Thank you for your attention!

Don't forget that **you will be quizzed on the sins of *Corruptibility* & *Bean counting next week*.**

And please fill in the feedback form. ☺

https://forms.gle/jL8D3pVxKddxWEGu8