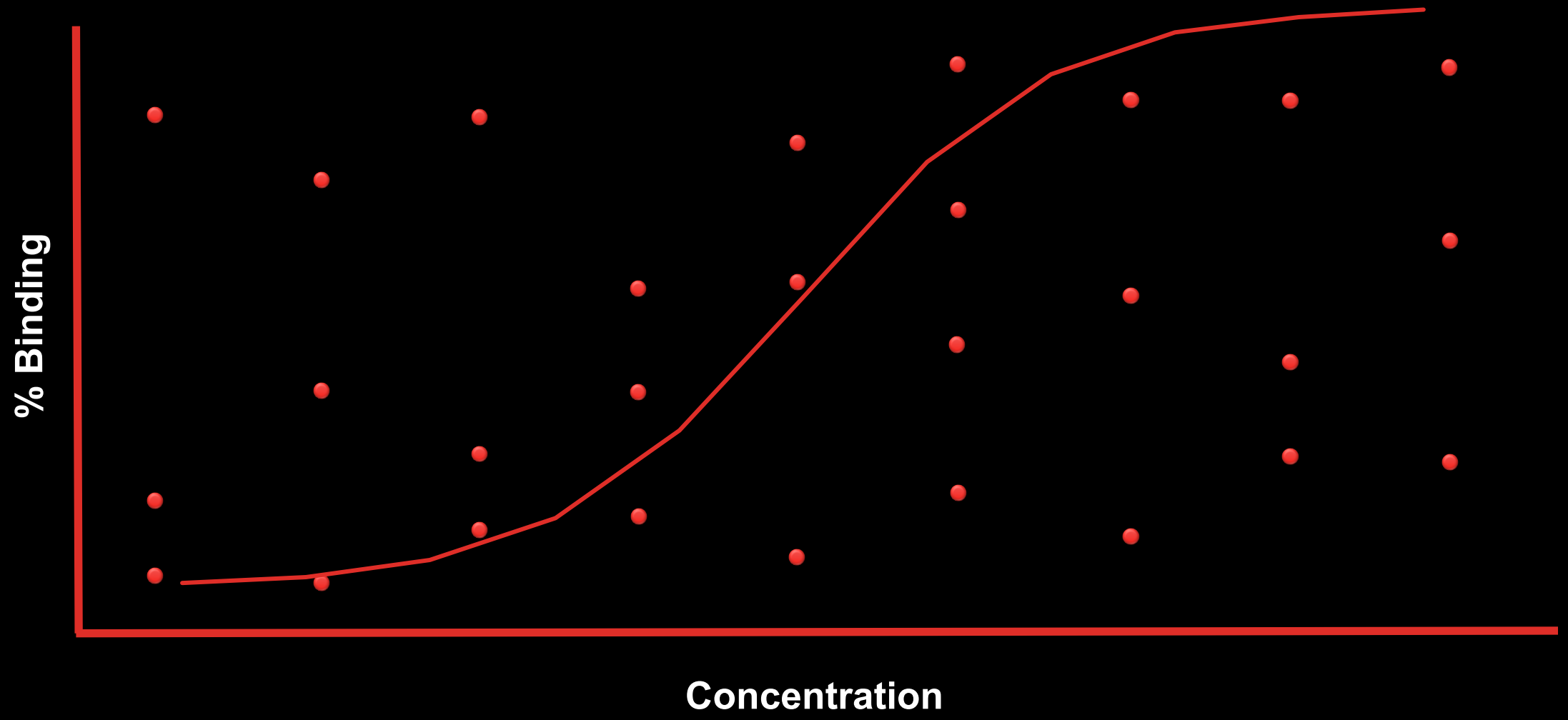
Research Integrity: Aligning Interventions and Goals

Michael Kalichman, UC San Diego

Symposium
Netherlands Research Integrity Network
December 14, 2021

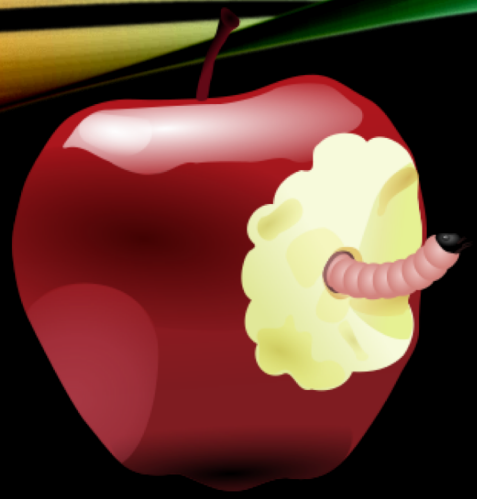
PERSONAL EXAMPLE (FROM THE LAST CENTURY…)



What is Research Integrity?

RESEARCH MISCONDUCT

Country	Name	Research Misconduct
Brazil	Claudio Airoldi	Duplicate publication
Canada	Adeel Safdar	Falsification
China	H. Zhong and T. Lui	Falsification
Denmark	Milena Penkowa	Fraud and embezzlement
France	Olivier Voinnet	Falsification
Germany/US	Jan Hendrik Schön	Fabrication and falsification
Iran/Australia	Ali Nazari	Falsification and plagiarism
Iraq	Elias Alsabti	Plagiarism
Japan	Yoshitaka Fujii	Fabrication
Netherlands →	Diederik Stapel	Fabrication and falsification
Norway	Jon Sudbø	Fabrication and falsification
Singapore	Alirio Melendez	Fabrication, falsification, and plagiarism
South Africa	Werner Bezwoda	Falsification
South Korea	Hwang Woo Suk	Falsification
US →	Robert Slutsky	Fabrication and falsification



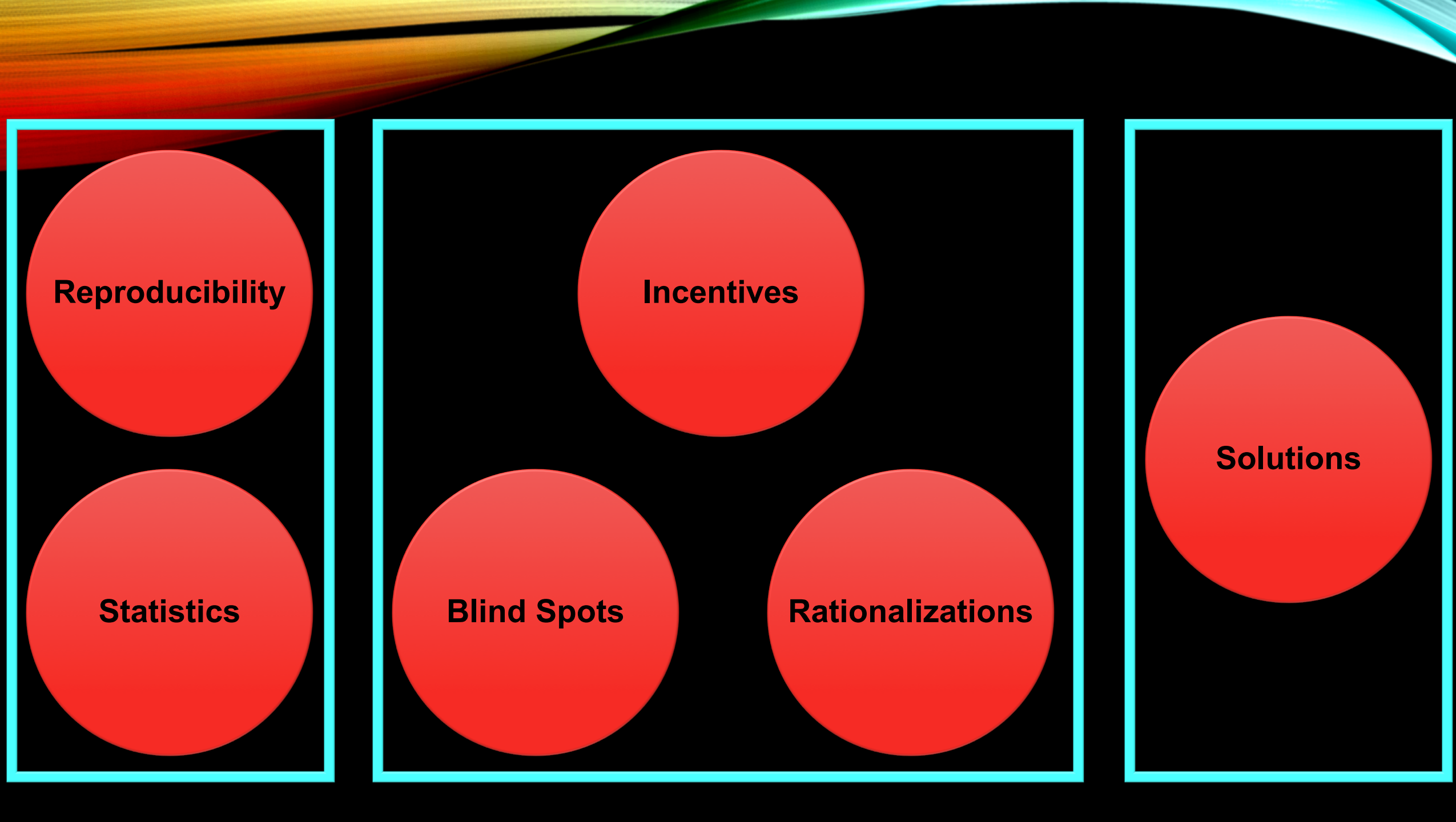
BAD APPLES?

Ariely et al:

Given the opportunity, people engage in ***beneficial dishonesty***

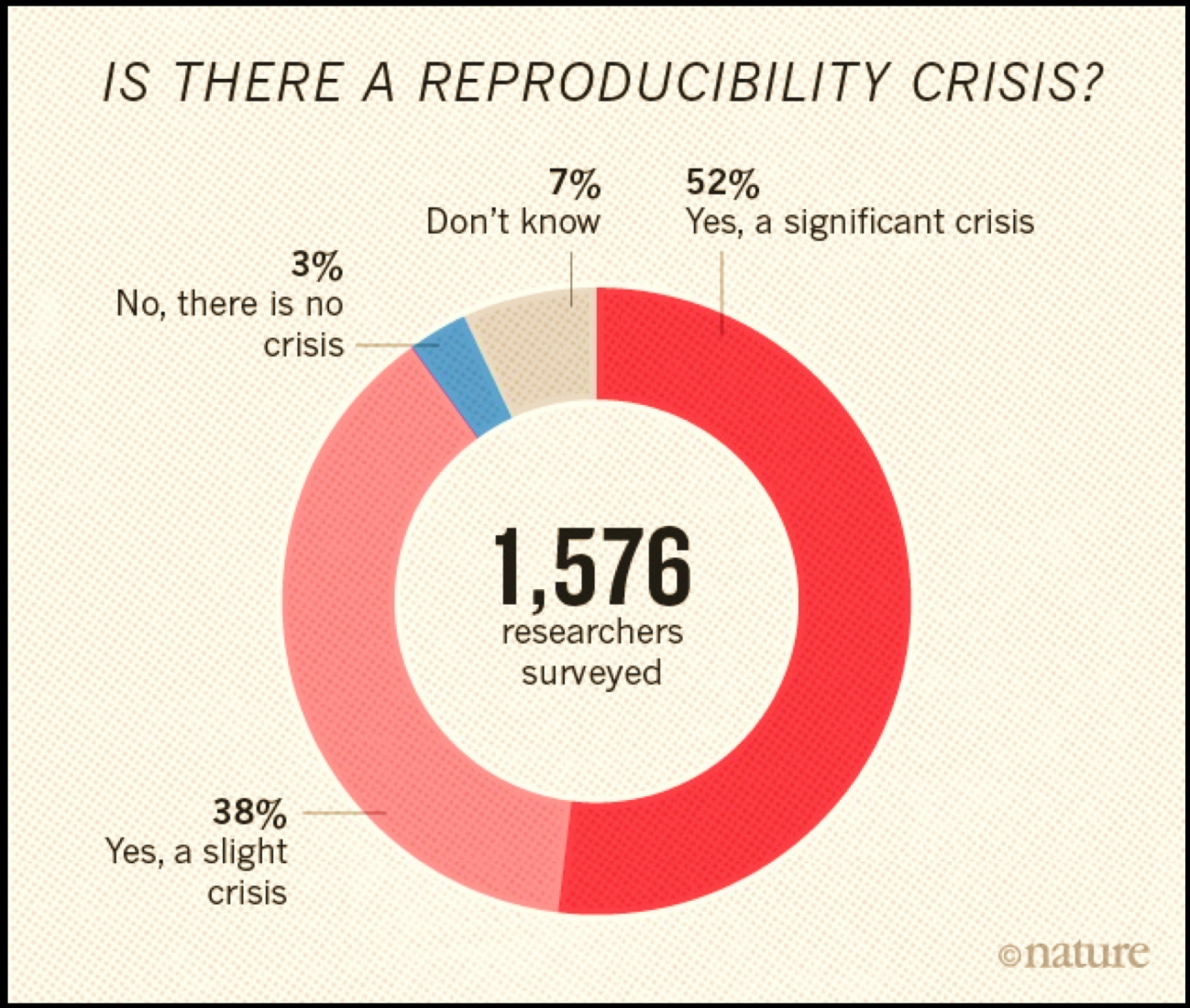
That means this is not just about someone else.

It's about all of us.


Reproducibility
Statistics
Incentives
Blind Spots
Rationalizations
Solutions

The Reproducibility Crisis

Research Ethics is ***not*** just about Research Misconduct



Baker M (2016): Is there a reproducibility crisis? Nature 533:452-454.

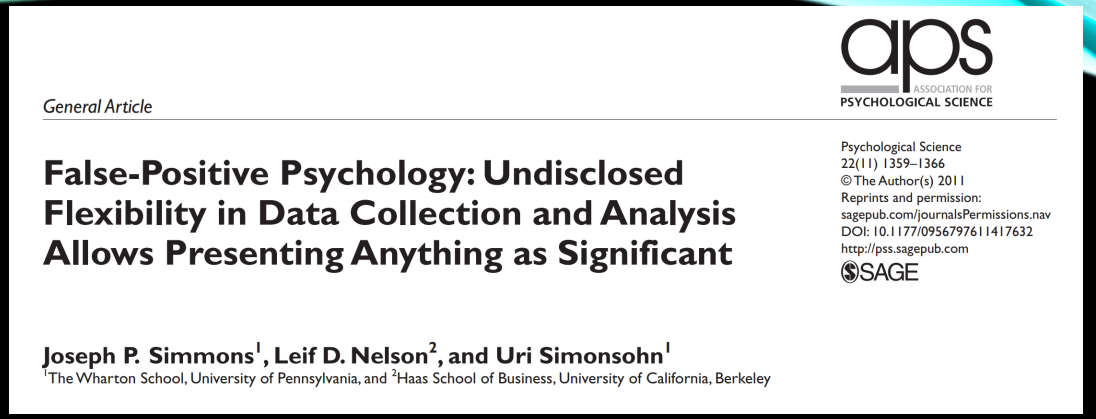
Essay

Why Most Published Research Findings Are False

John P. A. Ioannidis

- Research finding less likely to be true when (Ioannidis, 2005):
  - studies are smaller;
  - effect sizes are smaller;
  - greater number and lesser preselection of tested relationships;
  - greater flexibility in designs, definitions, outcomes, and analytical modes;
  - greater financial and other interests and prejudice; and
  - more teams chasing statistical significance.

Reproducibility



General Article

aps ASSOCIATION FOR PSYCHOLOGICAL SCIENCE

False-Positive Psychology: Undisclosed Flexibility in Data Collection and Analysis Allows Presenting Anything as Significant

Psychological Science
22(11) 1359–1366

DOI: 10.1177/0956797611417632
http://pss.sagepub.com
SAGE

Joseph P. Simmons[1], **Leif D. Nelson**[2], **and Uri Simonsohn**[1]
[1]The Wharton School, University of Pennsylvania, and [2]Haas School of Business, University of California, Berkeley

- Simmons et al. (2011):
- "…flexibility in data collection, analysis, and reporting **dramatically increases …false-positive rates**."
- "In many cases, a researcher is **more likely to falsely find evidence** that an effect exists than to correctly find evidence that it does not."

RESEARCH ARTICLE SUMMARY

PSYCHOLOGY

Estimating the reproducibility of psychological science

Open Science Collaboration*

- Reproducibility of Psychological Science (Open Science Collaboration, 2015).
- "…conducted replications of 100 experimental and correlational studies"
- Only **37%** of results still statistically significant.

Prinz et al., 2011

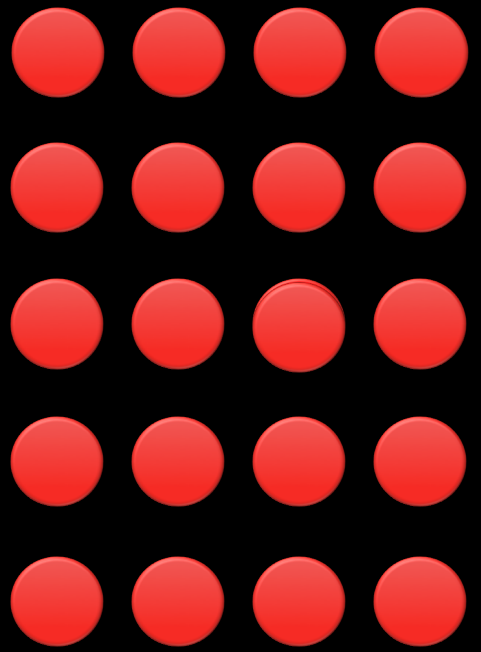
- "…data from 67 projects, most from oncology
- "In almost two-thirds of the projects…
  inconsistencies between published data and in-house data…
  in most cases, resulted in termination of the projects...."
- **~33%** at least partially replicable

Begley and Ellis, 2012

- Findings confirmed in only 6 of 53 "landmark" papers (**11%**)

WHAT IS “TRUE”?

$p<0.05$



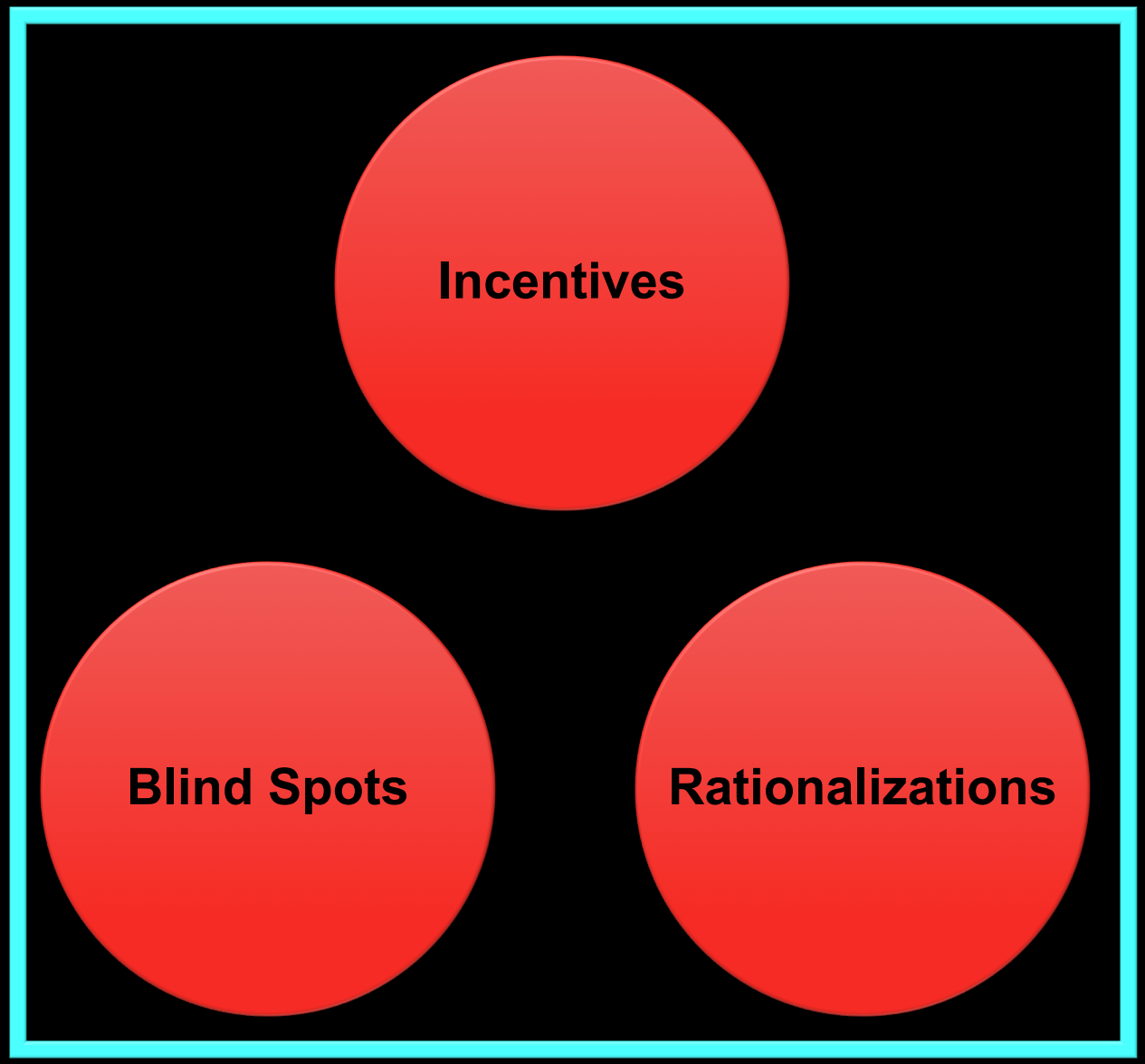
RONALD FISHER: P<0.05

"…P = .05, or 1 in 20, …
convenient to take this point as a limit in judging
whether a deviation is to be considered
significant or not."

- "The irony is that when … Fisher introduced the *P* value …, he did not mean it to be a definitive test.
- He intended it simply as an informal way to judge whether evidence was …worthy of a second look."

Nuzzo R (2014): Scientific method: Statistical errors. Nature 506:150-152.

Fisher RA (1925): *Statistical methods for research workers.* Oliver and Boyd, Edinburgh.


Incentives
Blind Spots
Rationalizations

WHY DO GOOD PEOPLE DO BAD THINGS?

Why would we choose to do something unethical?

Can we do something unethical without knowing?

	Knowing and Intentional
Research Misconduct	

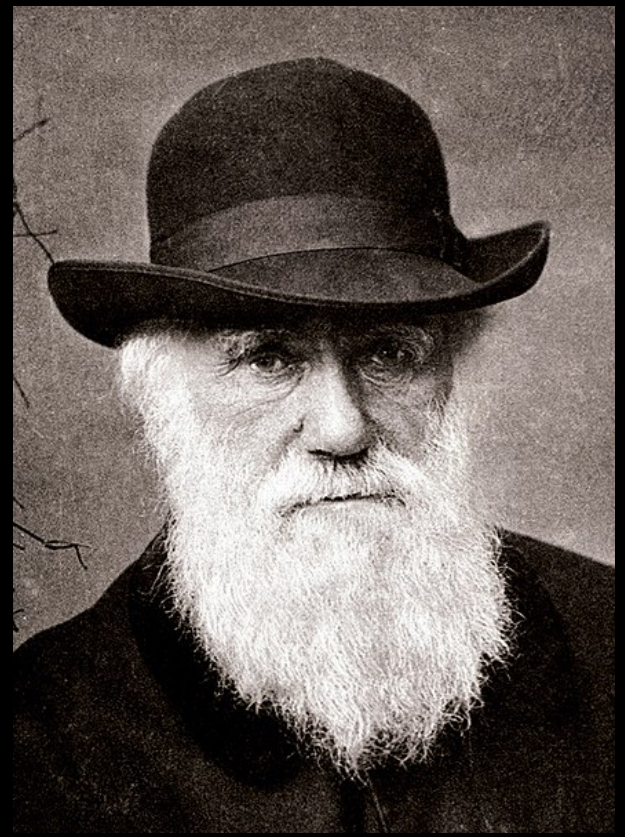
Incentives

Charles Darwin on Natural Selection

"…any variation,
…if …profitable to an individual …
will tend to the preservation of that individual."

Scientific community rewards are based on what we measure:

"Hiding behind the rhetorical shield of objectivity, metrics function… as disciplinary techniques while failing to measure anything worth measuring."
Biagioli M, 2020*



https://en.wikipedia.org/wiki/File:Charles_Darwin_1880.jpg

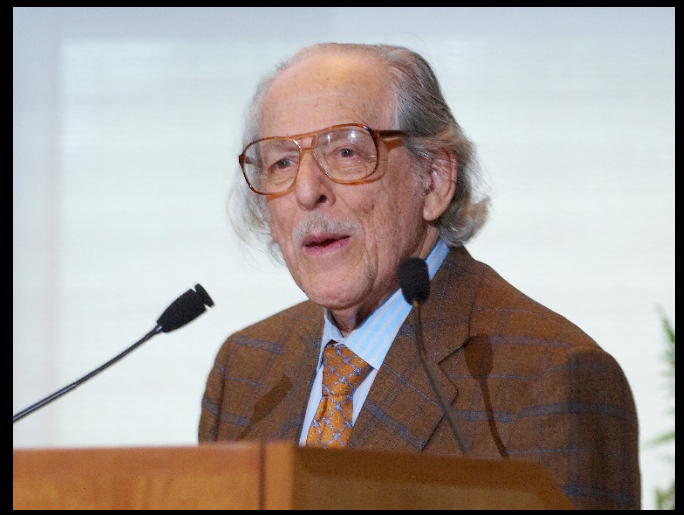
*https://lareviewofbooks.org/article/fraud-by-numbers-metrics-and-the-new-academic-misconduct

Darwin C (1860): On the Origin of Species: By means of natural selection or the preservation of favored races in the struggle for life. 2nd British edition, p. 61. Extracted from Darwin Online (http://darwin-online.org.uk/Variorum/1860/1860-61-c-1859.html)

JOURNAL IMPACT FACTOR

- First suggestion of Impact Factor:

  Garfield E (1955): Citation indexes to science:
  a new dimension in documentation
  through association of ideas. *Science* 122:108-111



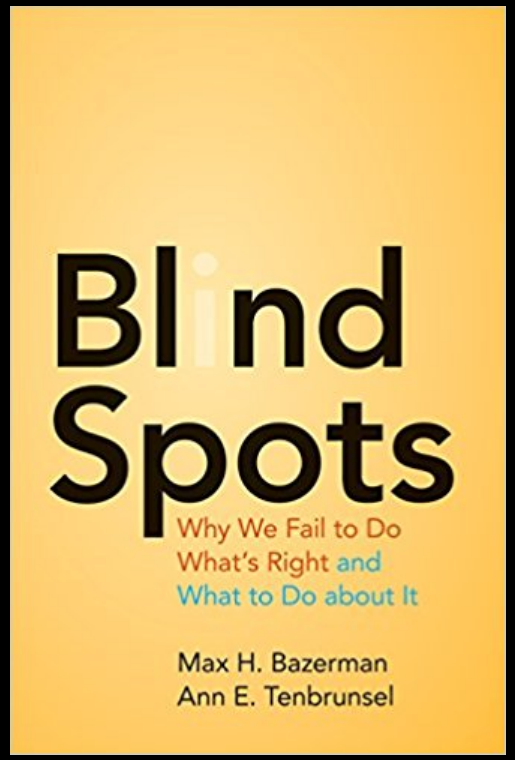
- "The source of much anxiety about Journal Impact Factors comes from their misuse in evaluating individuals... In many countries … I have found that in order to shortcut the work of looking up actual (real) citation counts for investigators the journal impact factor is used as a surrogate to estimate the count. I have always warned against this use. There is wide variation from article to article within a single journal as has been widely documented"

Garfield E (1998): The Impact Factor and Using It Correctly. Der Unfallchirurg. 101 (6): 413–414.

Blind Spots

- Bazerman and Tenbrunsel (2011): *Blind spots*

"Ethical interventions have failed and will continue to fail because they are predicated on a false assumption: that individuals recognize an ethical dilemma when it is presented to them."



Rationalizations

- Condemn the condemner: *blame accuser*
- Deny responsibility: *action or consequences unintentional*
- Deny injury: *little or no harm to others*
- Deny the victim: *they deserved it*
- Claim entitlement: *moral due, repayment for injustice*
- Appeal to higher loyalties: *just following orders, moral code*
- Claim its common practice: *others do it with impunity*

Heath J (2008): Journal of Business Ethics 83:595–614.

Solutions

Causes of failure to reproduce published work

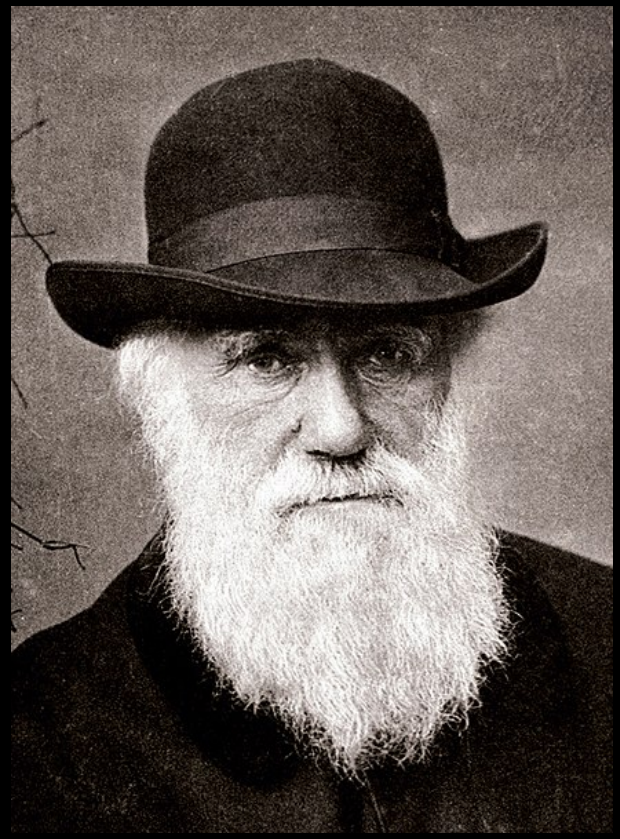
1. **Faulty replication**
2. **Fraud**
3. **Failures** of design, documentation, analysis, or reporting:
   - Intentional
   - Unintentional
4. **Unknown factors**

- Useful
- Easy and inexpensive
- Not typically done

HOW CAN WE DO BETTER?
(SELECTED EXAMPLES)

Change system to reward researchers who:

- Foster an open, transparent research environment
- Design experiments to minimize risk of bias
- Design experiments with adequate controls
- Keep good records
- Understand and use statistics appropriately
- Report accurately what was done
- Provide adequate training and mentoring for the next generation of scientists
- Align criteria for success with quality of scholarship



https://en.wikipedia.org/wiki/File:Charles_Darwin_1880.jpg

RICHARD FEYNMAN

Cal-Tech commencement address, 1974

"The first principle is
that you must not fool
yourself—
and you are the
easiest person to
fool."

This is not just about Ethics.

It is about ***Good Research Practices***.

The problem is not someone else,

it's all of us.

Thank you!