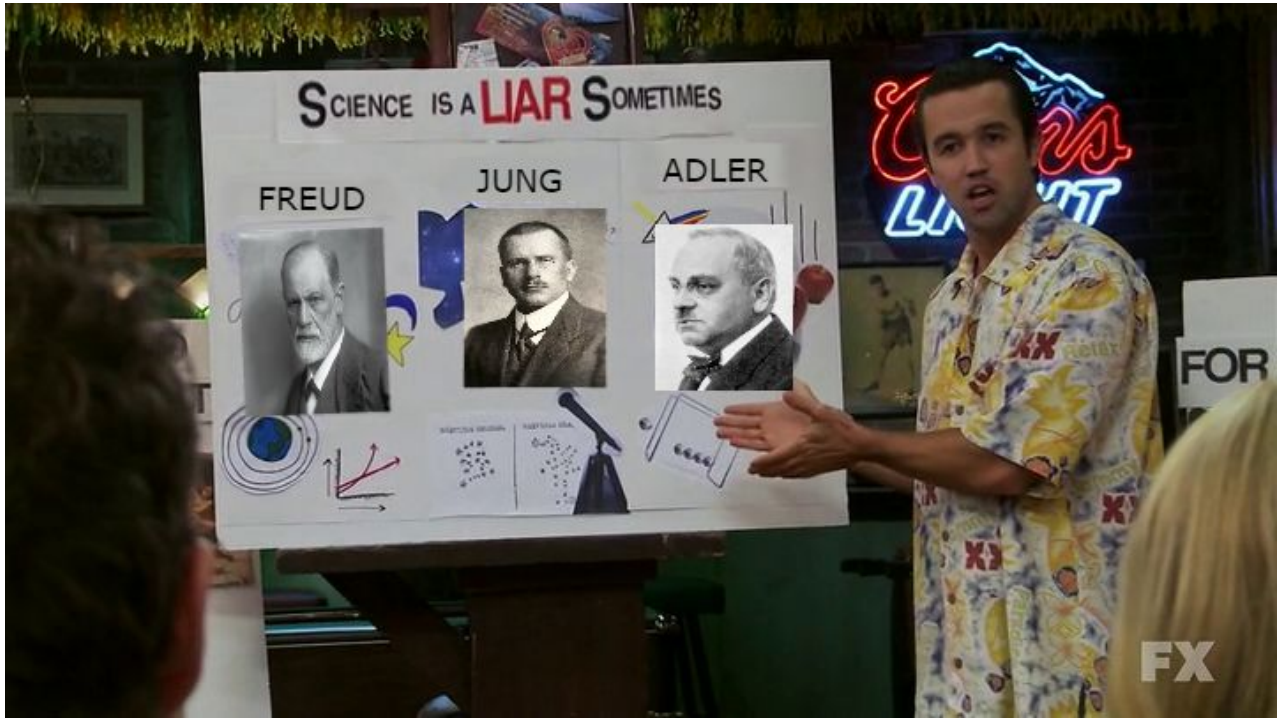
Science is a liar (sometimes):

Questionable practices in research and communication



TELETHON KIDS INSTITUTE
Discover. Prevent. Cure.

CSIRO

Proudly supported by the people of Western Australia through Channel 7's Telethon

Dr Blake Cavve
Postdoctoral Researcher
Youth Mental Health Team, Telethon Kids Institute

Dr Matthew Andreotta
Postdoctoral Fellow
Environment, CSIRO

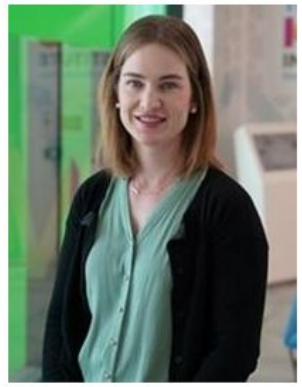
Telethon Kids
Research Integrity Advisors

Adrienne Gregory
Tenders Support
Adelaide

Bec Langford
Clinikids

Camille Gibson
Research Nurse
Vaccine Trials

Marie Blackmore
Child Disability Team



Beth Tippett
Healthy Skin Team

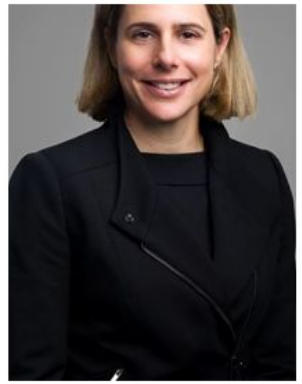
Blake Cavve
Mental Health Team

Jane Pillow

Ben Jackson

Elizabeth Davis

Glenn Pearson



Catherine Elliott

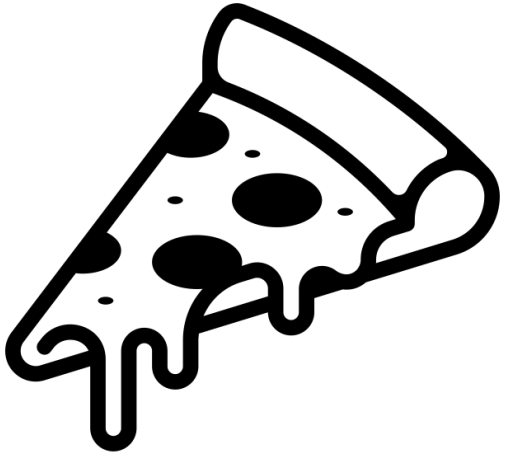
Scenario

You're a PhD student. You get the opportunity to spend some time overseas in the lab of a famous, well regarded and prolific researcher. This is a good opportunity for you to publish some media friendly research (which is important for your future employment and funding prospects).

This academic gives you a large, detailed dataset from a self-funded, "failed" study which had null results and asks you to work until you find something interesting (and publishable) in this data set.

- Would you go?
- Assuming you decide to go, how would you approach finding an effect in this data set?

Scenario



- PhD student from Turkey (2013)
- Brian Wansink (prestigious Cornell Food and Brand Lab)
- Expert behavioural economics and nutrition
  - Environmental effects and “nudges”
- Told to “find something interesting” about all-you-can-eat buffets
- "This cost us a lot of time and our own money to collect. There's got to be something here we can salvage because it's a cool (rich & unique) data set."

Buzzfeed Report on Wansink’s lab (Lee, 2018)
https://goo.gl/trQ62R

Deliberate malpractice or misconduct

- Fabrication of data
  - Diederik Stapel (Behavioural economics) – 58 retracted studies (New York Times)
  - Joachim Boldt (Anesthesiology) – 194 retracted studies (retractionwatch leaderboard)
- Data tampering
  - See New York Times piece and Data Colada's report on Dan Ariely (Honesty) and Francesca Gino (Honesty)
- Plagiarism
  - Tortured Phrases (Guillaume Cabanac, Cyril Labbé, Alexander Magazinov; Nick Wise)
- Most participant ethics
  - Dan Ariely – Electric shocks (suspended from MIT)
- Lawfare, intimidation, and suppression of publication
  - D.A.R.E drug abstinence
  - Francecsa Gino suing Data Colada

Tortured Phrases (found)	Established Phrases (expected)
bosom disease	breast cancer
bosom malignancy	breast cancer
bosom malignant	breast cancer
gastric corrosive	gastric acid
multidrug opposition	multidrug resistance
protein articulation	protein expression
receptive oxygen species	reactive oxygen species
twofold visually impaired	double blind

Questionable Research Practices (QRPs)

"exploitation of the grey area of acceptable practice."

- Researchers have to make many decisions, that do not have clear unambiguous answers:
  - Lack clear research question, hypothesis, theory
  - Important
  - Novel
  - Statistically significant

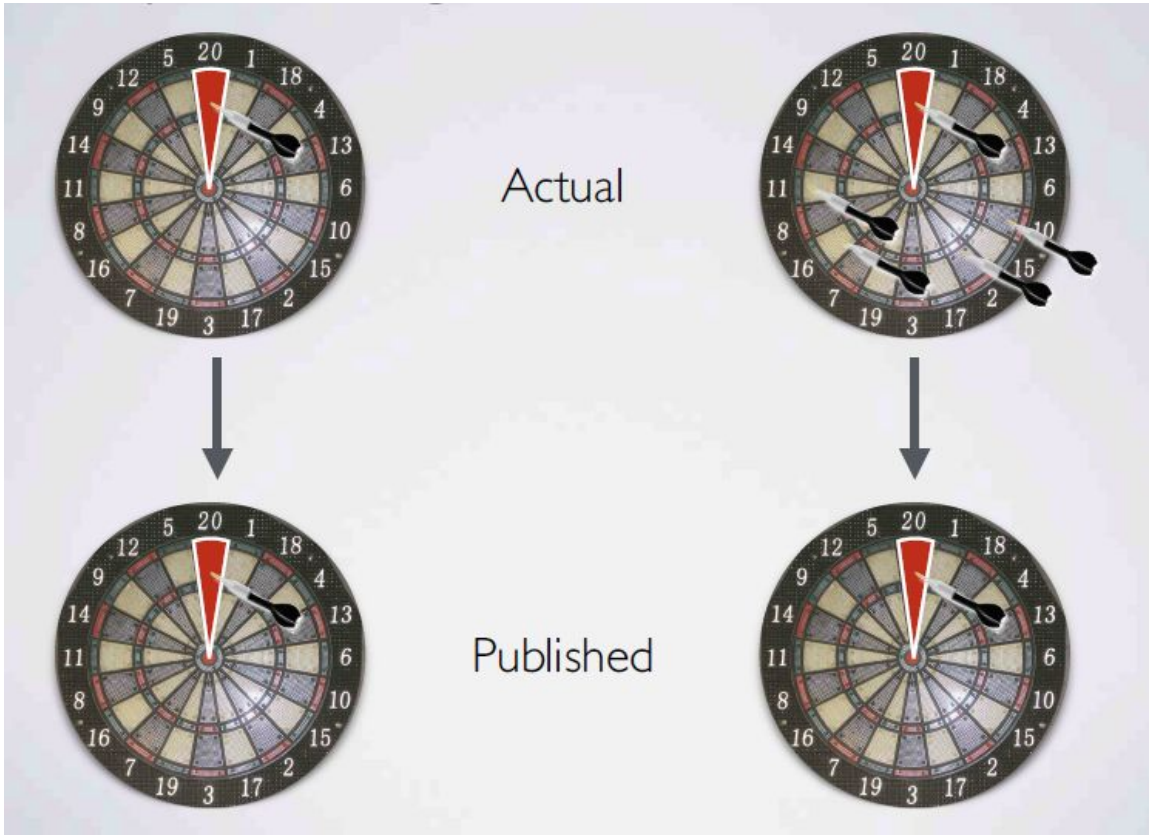
QRPs:
Study

- *Failing to report all of a study's dependent measures*
- *Failing to report all of a study's conditions*
- *Selectively reporting studies that "worked"*
- *Selective removal/ inclusion of outliers*

QRPs: *Study*

P-hacking / B-hacking

Unplanned and undisclosed flexibility in analysis - running multiple analyses until you "find something".



Schönbrodt
https://osf.io/bh7zv/?action=download&version=1

- This is also what Brian Wansink not only advocated, but praised the PhD student working with him for
- This is how a null result was turned into 4 (now retracted) papers

Wansink's infamous blog entry
https://goo.gl/jF9Nki
Buzzfeed Report on Wansink's lab (Lee, 2018)
https://goo.gl/trQ62R

I would like you to really dig into this to find a number of situations or

First, look to see if there are weird outliers (in terms of how much they ate). If there seems to be a reason they are different, pull them out but specially note why you did so, so that this can be described in the method.

Here's some things to do.

I don't think I've ever done an interesting study where the data "came out" the first time I looked at it. The interesting stories come from seeing when things -- like the 1/2 price buffet -- works and when it doesn't.

Wansink's infamous blog entry
https://goo.gl/jF9Nki
Buzzfeed Report on Wansink's lab (Lee, 2018)
https://goo.gl/trQ62R

Second, think of all the different ways you can cut the data and analyze subsets of it to see when this relationship holds. For instance, if it works on men but not women, we have a moderator. Here are some groups you'll want to break out separately:

- "Males
- Females
- Lunch goers
- People sitting alone
- People eating with groups of 2
- People eating in groups of 2+
- People who order alcohol
- People who order soft drinks
- People who sit close to buffet
- People who sit far away
- And so on …"

Third, look at a bunch of different DVs. These might include

- "# pieces of pizza
- # trips
- Fill level of plate
- Did they get dessert
- Did they order a drink
- And so on …"

Wansink's infamous blog entry
https://goo.gl/jF9Nki
Buzzfeed Report on Wansink's lab (Lee, 2018)
https://goo.gl/trQ62R

This is really important to try and find as many things here as possible *before* you come. First, it will make a good impression on people and helps you stand out a bit. Second, it would be the highest likelihood of you getting something publishable out of your visit.

Work hard, squeeze some blood out of this rock, and we'll see you soon.

Best,

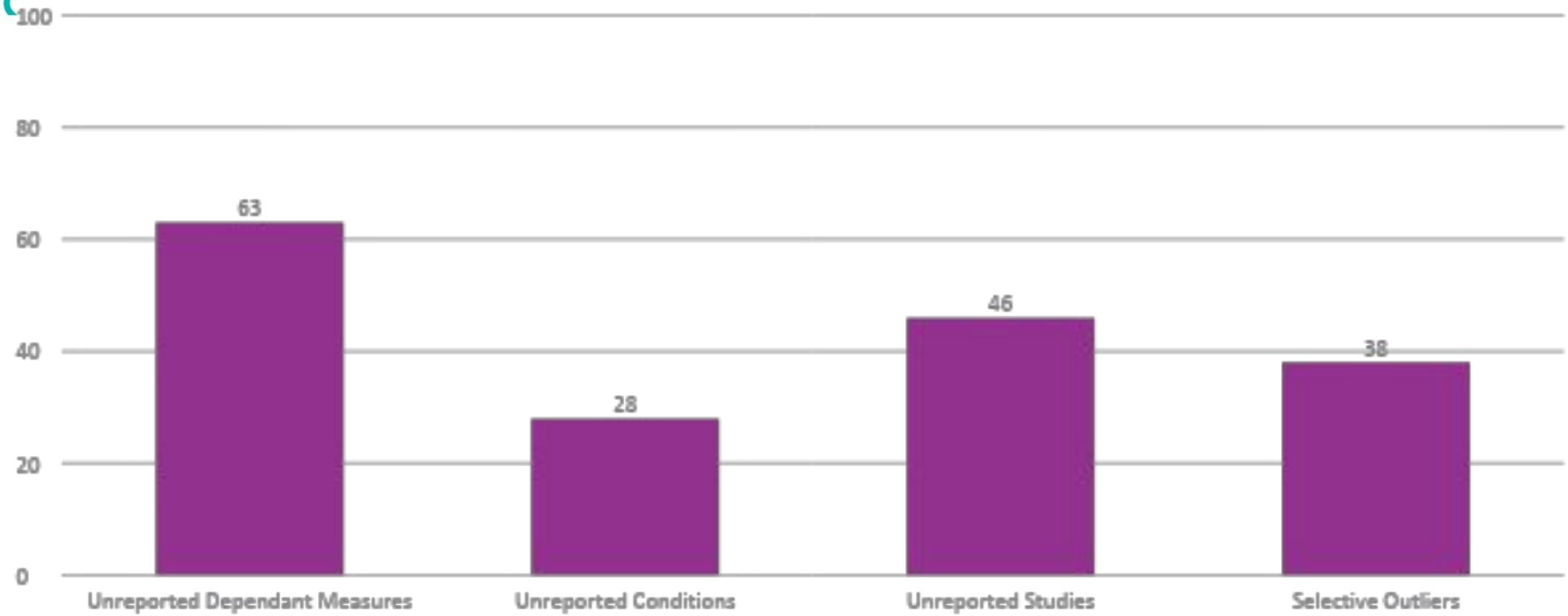
Brian

TELETHON KIDS INSTITUTE
Discover. Prevent. Cure.

p-hack your way to significance

https://goo.gl/zo518h

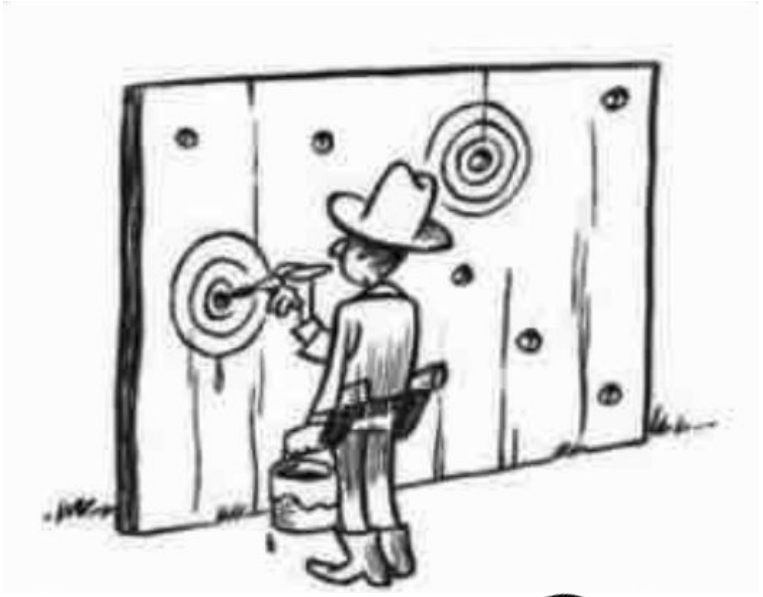
Estimating QRP prevalence: *Study*



John et al., (2011)
2000 U.S.-based psychologists
Mean Self Admission Rate

QRPs: *Manuscript*

- Concealing or not publishing selective results
- HARKing
- Salami slicing
- Round of *p*-values ($p = 0.054$ to $p < 0.05$)
- Misleading abstracts
- Publication process (peer-reviewed?)
- Conflict of interest



Misleading language


PLOS BIOLOGY

OPEN ACCESS PEER-REVIEWED

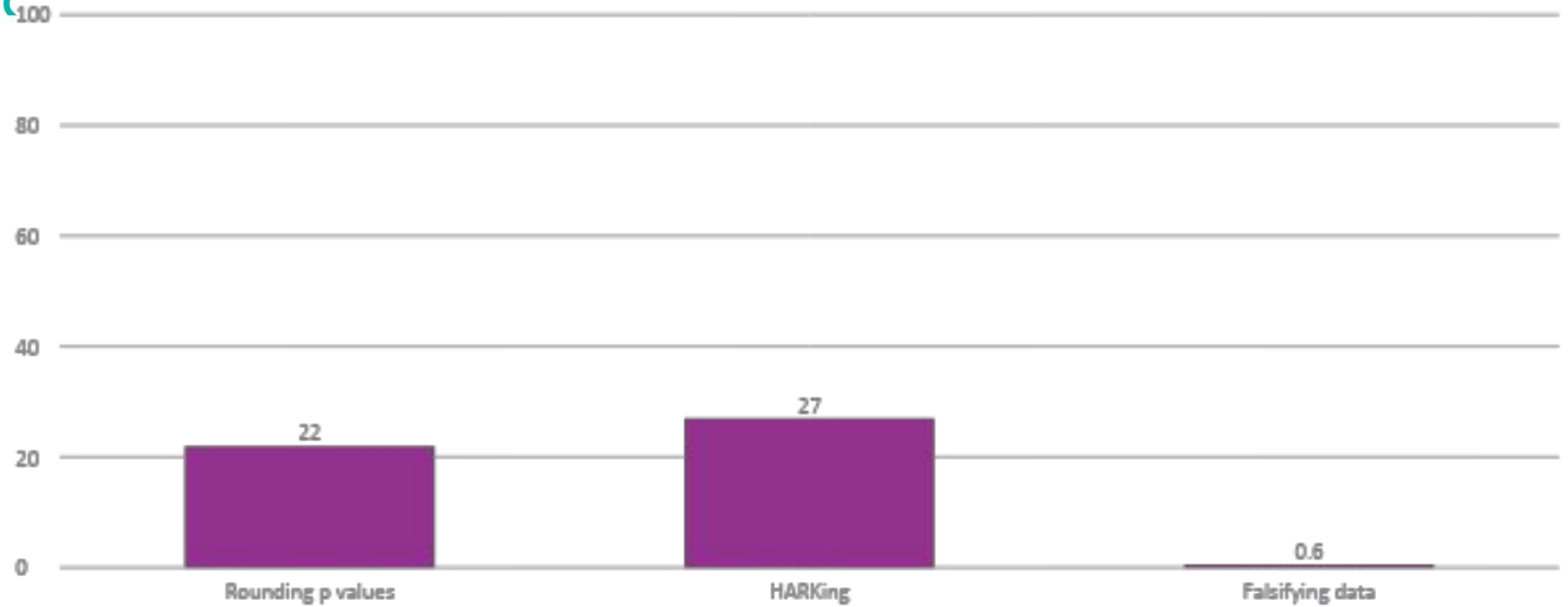
META-RESEARCH ARTICLE

Analysis of 567,758 randomized controlled trials published over 30 years reveals trends in phrases used to discuss results that do not reach statistical significance

Willem M. Otte, Christiaan H. Vinkers, Philippe C. Habets, David G. P. van IJzendoorn, Joeri K. Tijdink

Phrase	Median *p*
"A positive trend"	.07
"A statistical trend"	.08
"A strong trend"	.06
"Almost reached statistical significance"	.06
"Almost significant"	.06
"Approaching significance"	.06

Estimating QRP prevalence: Manuscript



John et al., (2011)
Mean Self Admission Rate

Estimating QRP prevalence: John et al., (2011)

- 91% of participants admitted to engaging in at least one QRP
- Respondents who admitted to a QRP tended to think that their actions were defensible
- but 35% of respondents indicated that they had doubts about the integrity of their own research on at least one occasion.

Impact

- Food and Brand Lab - Federal grants
  - National Institute of Health, the US Department of Agriculture, Private Industry, Not for Profits, and Research Foundations.

- Smarter lunchrooms movement
  - Recommendations and interventions are inspired by Wansink's research
  - Tens of millions of dollars in state and federal funds
  - 30,000 schools over 7 years

SLM Approach and Interventions
https://goo.gl/FpNSAe

Impact

User profiles for **brian wansink**

Brian Wansink
Former Professor, Cornell Food and Brand Lab
Verified email at Cornell.edu
Cited by 42569

"Brian Wansink's discoveries might very well change your life." - O, The Oprah Magazine

- Accessible, inspiring message: weight loss is possible via small environmental changes, without need for intense diets
  - two self-help-style books
  - 200 journal articles

From Mindless Eating to Mindlessly Eating Well: Brian Wansink at TEDxUVM 2012
TEDx Talks • 63K views • 5 years ago
NOTE: This new upload has improved audio; the initial upload had 245 views) BRIAN **WANSINK** Brian **Wansink** (Ph.D. Stanford

THE WALL STREET JOURNAL.

HEALTH JOURNAL

Putting an End to Mindless Munching

By Melinda Beck
Updated May 13, 2008 11:59 p.m. ET

The New York Times

5 Tips From 'Mindless Eating'

By DAVID LEONHARDT MAY 2, 2007

You = a producer and consumer of science

As a producer of science

- Record keeping and data dictionaries
  - Processes
  - Conditions
  - Crediting contributions
- Open Science Framework
  - Pre-registration of hypotheses and analyses
  - Sharing code and data
- Registered reports
- Exploratory research
- Write about the literature, not just a single study

You = a producer and consumer of science

As a consumer

- Beware of red flags
  - Study quality
  - Manuscript quality
- Dig deeper to find these
  - Google researcher names
  - Check conflicts of interest
  - Check journals
- Reflect. Is it too good to be true?

Resources

Additional p hacking strategies (Interactive app)
https://shiny.psy.lmu.de/felix/ShinyPHack/

Score and ignore: A radio listener's guide to ignoring health stories
https://academic.oup.com/jrssig/article/9/5/45/7029937

How scientists lie
https://howscientistslie.com

- Elisabeth Bik – image manipulation
- Paul Brookes - blog, science-fraud.org, closed due to legal threats in 2013
- Adam Marcus and Ivan Oransky - co-founders of Retraction Watch
- Guillaume Cabanac, Cyril Labbé, Alexander Magazinov - “tortured phrases” and the Problematic Paper Screener
- Nick Wise – pub peer contributor
- Nick Brown and James Heathers - Wansink investigation, Sample Parameter Reconstruction via Iterative TEchniques
- Brian Nosek - Open Science Framework

Telethon Kids
Research Integrity Advisors

Adrienne Gregory
Tenders Support
Adelaide

Bec Langford
Clinikids

Camille Gibson
Research Nurse
Vaccine Trials

Marie Blackmore
Child Disability Team

Beth Tippett
Healthy Skin Team

Blake Cavve
Mental Health Team

Jane Pillow

Ben Jackson

Elizabeth Davis

Glenn Pearson

Catherine Elliott

Please stay back or email to request future research integrity topics that interest you. E.g.,:

- Pre-registration and registered reports
- QRPs in collaboration
- QRPs in science journalism (*in mice* phenomenon)
- Publication bias
- QRPs in peer review
- Fake conferences
- Predatory journals, proceedings journals and paper mills