

# Improving the Transparency of Your Research One Step at a Time

Christina Bergmann

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Alexandra Sarafoglou

Kaitlyn Werner

# The Replication Crisis



Solutions!



# Pitfall...



“You have to  
preregister

# Pitfall...



“You have to  
preregister your  
Bayesian

# Pitfall...



“You have to  
preregister your  
Bayesian sequential

# Pitfall...



“You have to  
preregister your  
Bayesian sequential  
power analyses



# Pitfall...



“You have to  
preregister your  
Bayesian sequential  
power analyses on your  
openly available



# Pitfall...



“You have to preregister your Bayesian sequential power analyses on your openly available perfectly archived data

# Pitfall...



“You have to preregister your Bayesian sequential power analyses on your openly available perfectly archived data that you collected with Many Labs

# Pitfall...



“You have to preregister your Bayesian sequential power analyses on your openly available perfectly archived data that you collected with Many Labs while riding a unicorn.”

# Cherry picking what works for you



# Tools to improve transparency & rigor

1. Christina Bergmann:  
Multi-lab collaborations



2. Alexandra Sarafoglou:  
Bayesian stats



3. Kaitlyn Werner:  
Preprints








*But Wait...*  
**There's  
MORE!**

# Transparency





# Statistics

 Explore ▾

Q What do you want to learn?

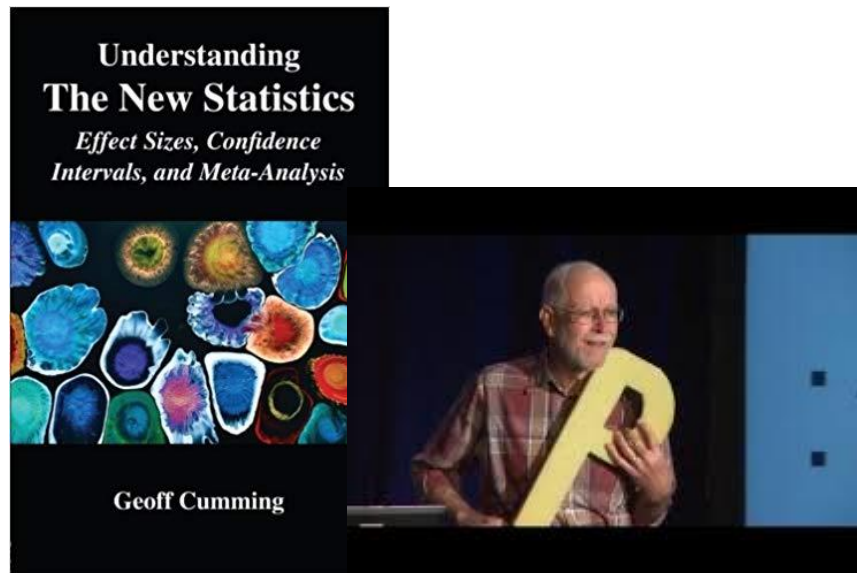
For Enterprise

Browse > Data Science > Probability and Statistics

Improving your statistical inferences

Offered By

 Technische Universiteit  
Eindhoven  
University of Technology



nature

human behaviour

Comment | Published: 01 September 2017

Redefine statistical significance

Daniel J. Benjamin✉, James O. Berger, [...] Valen E. Johnson✉

Nature Human Behaviour **2**, 6–10 (2018) | [Download Citation](#) ↓

We propose to change the default  $P$ -value threshold for statistical significance from 0.05 to 0.005 for claims of new discoveries.

# <http://statcheck.io>

The screenshot shows the web interface of statcheck.io. At the top is a navigation bar with links: statcheck // web, Home, Documentation, About/FAQ, and Contact. The main heading is 'statcheck' in orange, with a yellow circular arrow icon around the 'e'. Below this is the subtitle 'statcheck on the web'. A paragraph explains the tool's purpose: 'To check a PDF, DOCX or HTML file for errors in statistical reporting, upload it below. More information on this program is available [here](#).' It also notes '(Currently in beta - please [tell Sean](#) about any errors!)'. The upload section includes a 'Browse...' button, a file named 'Paper1.pdf', and an 'Upload complete' button. A 'Download Results (csv)' button is also present. A checkbox option 'Try to identify and correct for one-tailed tests?' is available. Below this is a table showing results for two entries. The table has columns: Source, Statistical Reference, Computed p Value, and Consistency. Entry 1 shows 'Paper1' with a t-test result and a consistent result. Entry 2 shows 'Paper1' with a Z-test result and an inconsistent result. The footer mentions the tool was created by Sacha Epskamp and Michèle B. Nuijten, with a web implementation by Sean C. Rife, and is powered by Rackspace.

statcheck // web Home Documentation About/FAQ Contact

## statcheck

statcheck on the web

To check a PDF, DOCX or HTML file for errors in statistical reporting, upload it below.  
More information on this program is available [here](#).

(Currently in beta - please [tell Sean](#) about any errors!)

Upload files (pdf, html, or docx):

Browse... Paper1.pdf

Upload complete

☐ Try to identify and correct for one-tailed tests?

Show 10 entries Search:

|   | Source | Statistical Reference     | Computed p Value | Consistency   |
|---|--------|---------------------------|------------------|---------------|
| 1 | Paper1 | $t(37) = -4.93, p < .001$ | 0.00002          | Consistent    |
| 2 | Paper1 | $Z = 1.54, p = .14$       | 0.12356          | Inconsistency |

statcheck by Sacha Epskamp and Michèle B. Nuijten // web implementation by Sean C. Rife

POWERED BY rackspace

## A “spellchecker” for statistics

# Preregistration



## Registered Replication Reports

Multi-lab, high-quality replications of important experiments in psychological science along with comments by the authors of the original studies.

# Multi-Lab Collaborations



Psychological Science Accelerator  
a distributed laboratory network



SIPS



**SOCIETY FOR THE  
IMPROVEMENT OF  
PSYCHOLOGICAL SCIENCE**

<https://improvingpsych.org>

@improvingpsych

**2019 meeting: July 7-9  
Rotterdam, the Netherlands**

# Summarizing:

There are many ways to improve transparency & rigor.

Start by cherry picking your favorite open science practice(s)!

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