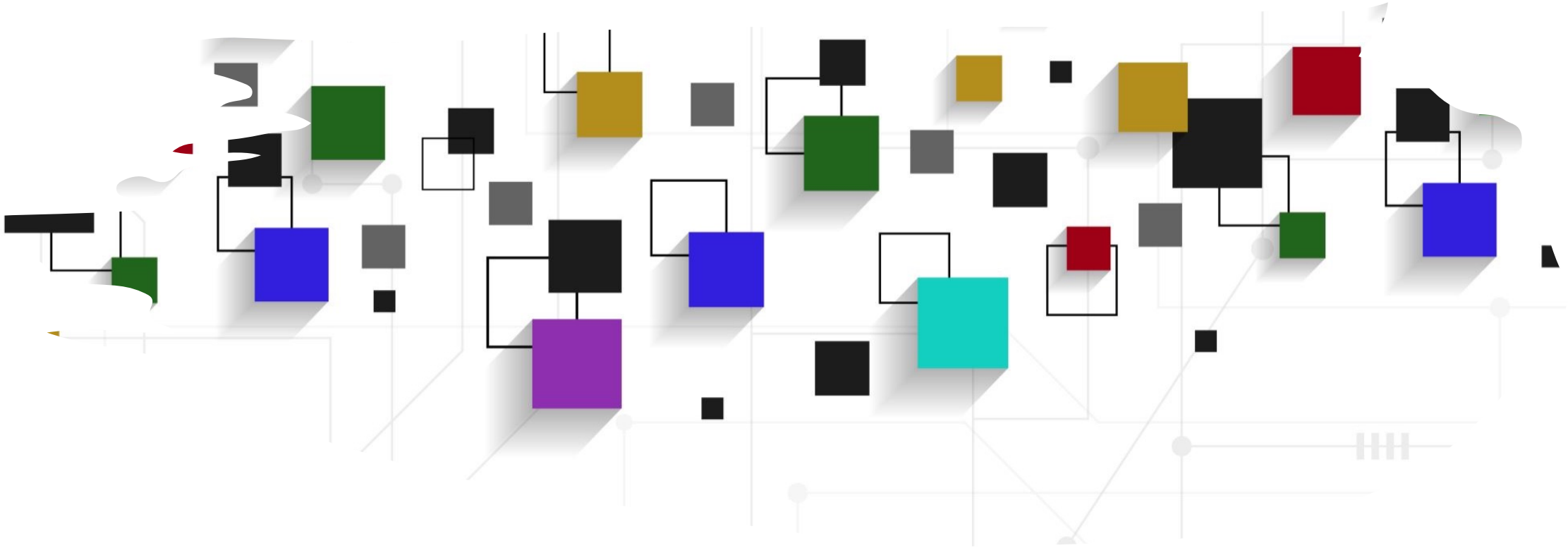


CogLab: Replication

WEEK 2

recap: Sep 1, 2022

- what we covered:
  - course overview
  - canvas
- your to-dos were:
  - W1 (syllabus) quiz
  - complete class survey
  - completing the experiment
  - submitting CITI training certificate
  - reading Frank and Saxe (2012)

today's agenda

- office hours
- your project groups
- class survey responses / questions
- open science: challenges & solutions
- Frank & Saxe (2012) discussion
- project meet & greet

office hours / Kanbar 217

- Tuesdays, 9-10 am
- Thursdays, 9-10 am
- Thursdays, 4-5.30 pm
- Fridays, 9-11 am
- next week: unavailable in the morning (Tue/Thurs)

project groups & milestone #1

- groups:
  - Jennifer, Jess, Dyana (group folder link)
  - Uma, Gia, Kavya (group folder link)
  - Stephen, Nick, Ella (group folder link)
- milestone #1: **bookmark** project document
  - due Sep 10
  - group name
  - APA-style citation to review article + 250-word reflection
  - self-assessment
  - accountability contract

What would you do with your time if money/parents/other life pressures weren't a thing?

I would want to start a health counseling business

Travel around the world to write and photograph for National Geographic

I would spend my time gardening, painting, cooking, doing photography of people and decorating my home over and over again.

Hike, spend time by the ocean, sing in a band

hang out with my grandparents, family, and friends, travel, dance

Go to the beach a lot and travel in general

I would travel in a band playing bass

food truck, build gardens (landscape architecture)

background / research methods

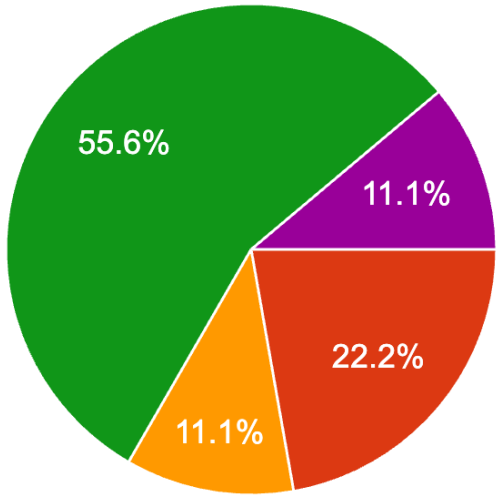
How would you describe your experience with experimental research methods?

9 responses

background / statistics

How would you describe your knowledge of statistics?

9 responses

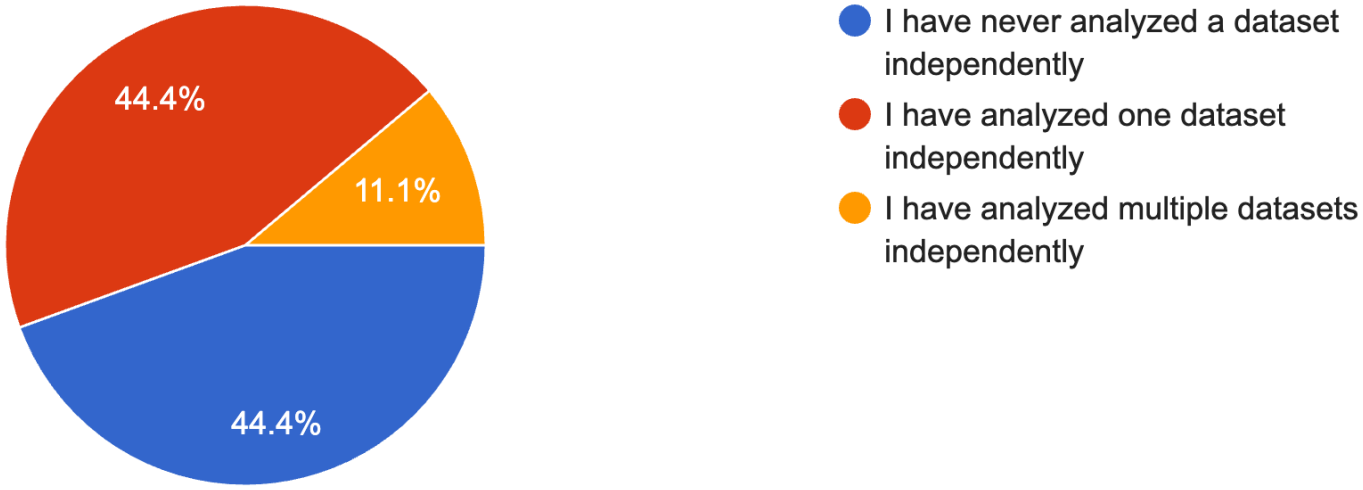


- I have no formal knowledge of statistics
- I know the basics of descriptive statistics (e.g., calculating means, histograms, etc.)
- I know the basics of inferential statistics (e.g., t-tests, ANOVAs, etc.)
- I have learned about basic statistical analysis (descriptive and inferential)
- Currently enrolled in Data Analysis and completed AP Statistics in high school

background / analysis

How would you describe your experience with conducting statistical analysis?

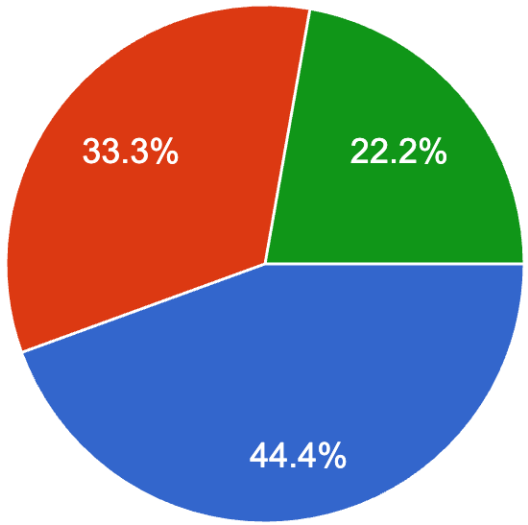
9 responses



background / coding

How would you describe your coding experience?

9 responses



- I have never used code in my life
- I know the basics of writing code
- I have some experience in one programming language
- I have coded in more than one programming language

Q&A

How often do you recommend that groups meet with you to discuss final project milestones?

understand if you are going fast we don't want to slow you down out of personal laziness but rather to thoroughly understand something. But if I am clinging to info that is nonessential to continuing the flow let me know

To ensure that we don't miss due dates, where do you suggest we look for pending assignments (the website, canvas, or both)?

words that come to mind when I say "open science"

Nobody has responded yet.

Hang tight! Responses are coming in.

open science & reproducibility

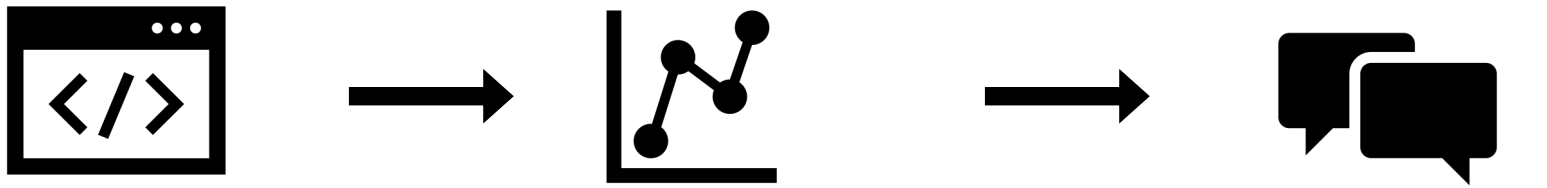
adapted from Pownall et al. 2021

think-pair-share

- based on your experiences and the video, **think** [2 minutes] about ways to go wrong in:
  - designing a study
  - analyzing a study
  - communicating a study
- **triple up** and discuss with a classmate (random) [3 minutes]
- **share** with roles for reporting:
    - person whose birthday is *earliest* in the year [design]
    - person whose birthday is *latest* in the year [analyze]
    - person whose hometown is closest to Maine [communicate]

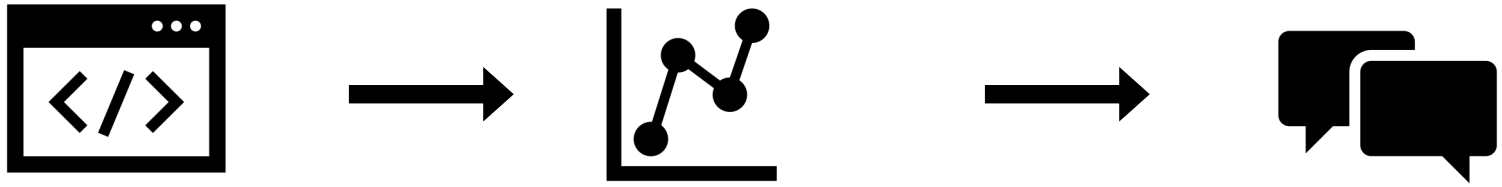
adapted from Pownall et al. 2021

ways to go wrong in doing science



design → analyze → communicate

ways to go wrong in doing science



design

software errors

experimenter bias

low statistical power

analyze

coding errors

statistical errors

incomplete documentation

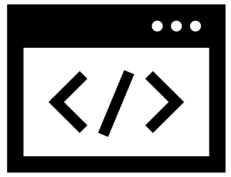
communicate

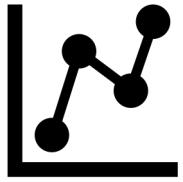
publication bias

file drawer effect

Strand, J. (2021). Error Tight: Exercises for Lab Groups to Prevent Research Mistakes. Retrieved from: ErrorTight.com. doi:10.31234/osf.io/rsn5y

the solution: open science





design

pre-registration

researcher blind paradigms

power analysis

analyze

open-source software [R]

open code and materials [github/jsPsych]

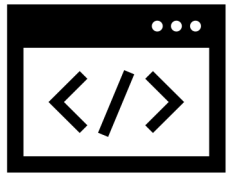
communicate

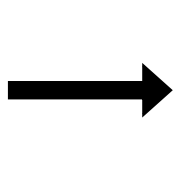
pre-prints

open-access publishing

Strand, J. (2021). Error Tight: Exercises for Lab Groups to Prevent Research Mistakes. Retrieved from: ErrorTight.com. doi:10.31234/osf.io/rsn5y

the solution: teaching replication!





design

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Frank and Saxe (2012)

- jot down your reactions to the paper
- link on course website and slides
  - https://padlet.com/akumar85/2bfhfi465xthgash
  - 5 minutes

the story so far...



Eleven years of student replication projects provide evidence on the correlates of replicability in psychology

Veronica Boyce[1,*], Maya Mathur[1], Michael C. Frank[1]

[1]Stanford University

Abstract

Cumulative scientific progress requires empirical results that are robust enough to support theory construction and extension. Yet in psychology, some prominent findings have failed to replicate, and large-scale studies suggest replicability issues are widespread. The identification of predictors of replication success is limited by the difficulty of conducting large samples of independent replication experiments, however: most investigations re-analyse the same set of ~170 replications. We introduce a new dataset of 176 replications from students in a graduate-level methods course. Replication results were judged to be successful in 49% of replications; of the 136 where effect sizes could be numerically compared, 46% had point estimates within the prediction interval of the original outcome (versus the expected 95%). Larger original effect sizes and within-participants designs were especially related to replication success. Our results indicate that, consistent with prior reports, the robustness of the psychology literature is low enough to limit cumulative progress by student investigators.

Table 1: The unadjusted Pearson correlations between each individual predictor and the subjective replication score. See Methods for how these variables were coded.

r	p	Predictors
0.333	0.000	Within participants design (versus between participants)
0.182	0.015	Log number of trials
0.150	0.047	Open data
0.080	0.294	Non psychology (versus cognitive psych)
0.075	0.322	Other psychology (versus cognitive psych)
0.064	0.399	Publication year
0.002	0.979	Open materials
-0.027	0.725	Stanford affiliation of original authors at time of replication
-0.047	0.536	Log ratio between replication and original sample sizes
-0.108	0.155	Log original sample size
-0.158	0.037	Switch to online for replication (versus same modality for original and replication)
-0.246	0.001	Social psychology (versus cognitive psych)
-0.267	0.000	Single vignette (versus multiple items/inductions per condition)

why should **you** care?

- as *practitioners* of science
  - broadening access to literature
  - improving quality of literature
  - mitigating stress, panic, and shame
- as *consumers* of science
  - critical and informed citizens
  - implementing evidence-based practices and policies

adapted from Student Initiation for Open Science

[109] Data Falsificada (Part 1): "Clusterfake"

Posted on June 17, 2023 by Uri, Joe, & Leif

This is the introduction to a four-part series of posts detailing evidence of fraud in four academic papers co-authored by Harvard Business School Professor Francesca Gino.

In 2021, we and a team of anonymous researchers examined a number of studies co-authored by Gino, because we had concerns that they contained fraudulent data. We discovered evidence of fraud in papers spanning over a decade, including papers published quite recently (in 2020).

Support Data Colada's Legal Defense

Simine Vazire is organising this fundraiser.

Created 1 day ago • Other

Data Colada Are Being Sued for Raising Scientific Concerns about Published Research: Support Their Legal Defense

project meet & greet

- sit with your group & locate all materials
- come up with a plan for milestone #1
- ask any questions that are coming up

experiment review

- think back to the language experiment you did
- what kinds of tasks did you perform?
- what do you think the experiment was about?

next class

- **before** class
  - *prep* : QALMRI/SPARK tutorial
  - *prep* : Savic et al. (2022) paper
- **during** class
  - research design
  - your experiment data!