MOVING ON FROM THE "REPLICATION CRISIS": STUDENTS AS LEADERS IN THE RENAISSANCE OF PSYCHOLOGICAL RESEARCH

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On behalf of the Canadian Psychological Association Section for Students

THE REPLICATION CRISIS

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Scientists Replicated 100 Psy Studies, and Fewer Than Half Same Results

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The New York Times

Many Psychology Findings Not as Strong as Claimed, Study Says

SCIENCE

Psychology's Replication Crisis Is Running Out of Excuses

Another big project has found that only half of studies can be repeated. And this time, the usual explanations fall flat.

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BRIEF OVERVIEW OF TODAY'S DISCUSSION

- GOALS:
  - Raise awareness of the replication crisis in psychological science
  - Overview of currently recommended solutions within open science initiatives
  - Create an open conversation and brainstorm potential student-driven solutions

- AGENDA
  - 1. Overview of the replication crisis, questionable research practices, and the open science movement (10 minutes)
  - 2. Small group discussion (10 minutes)
  - 3. Large group discussion (10 minutes)

WHAT IS THE REPLICATION CRISIS

- Replicability (reproducibility): repetition of research study to determine if similar results can be attained
- "Replication crisis" – what is it all about?
- Open Science Collaboration 2015 – Brian Nosek et al.
  - 100 replication studies, 36% success rate of replication
- "Psychology's Renaissance" (Nelson, Simons & Simonsohn, 2017)

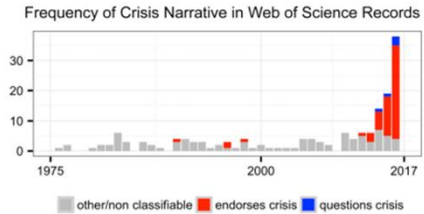

Fig. 1. Number of Web of Science records that in the title, abstract, or keywords contain one of the following phrases: "reproducibility crisis," "scientific crisis," "science in crisis," "crisis in science," "replication crisis," "replicability crisis." Records were classified by the author according to whether, based on title and abstracts, they implicitly or explicitly endorsed the crisis narrative described in the text (red), or alternatively questioned the existence of such a crisis (blue), or discussed "scientific crises" of other kinds or could not be classified due to insufficient information (gray). The complete dataset, which includes all titles and abstracts and dates back to the year 1933, is available in Dataset S1. This sample is merely illustrative, and does not include the numerous recent research articles and opinion articles that discuss the "science is in crisis" narrative without including any of the above sentences in the title, abstract, or keywords.

Fanelli (2018)

POTENTIAL CONTRIBUTING FACTORS

- Issues in research practices
  - Conducting inadequately powered studies → false positive findings
  - (Unintentional) questionable research practices
    - p-hacking, selective reporting, hypothesizing after results are known (i.e. HARKing)
- Incentive structure of academia (e.g., publish or perish, pressure to produce novel or surprising findings)
- Null findings are difficult to publish
- File-drawer problems
  - Journals only publish findings that are novel and statistically significant

OPEN SCIENCE: A POTENTIAL SOLUTION

- "Open Science is transparent and accessible knowledge that is shared and developed through collaborative networks" (Vincente-Saez, 2018)
- Open science tools and methods (examples)
  - Pre-Registration ("Registered Reports")
    - List of journals with this option: https://cos.io/rr/
  - Open Data
  - Open Materials
    - StatCheck: https://mbnuijten.com/statcheck/
    - Open Science Framework:https://osf.io/
    - Psych File Drawer: http://psychfiledrawer.org/

WHAT DO YOU THINK??

Is open science the solution to improving replicability of research?

Have you or have you considered implementing open science practices in your research? What methods did you use? What was the outcome?

As students, what are some barriers to adopting open science practices in our research?

BARRIERS TO OPEN SCIENCE

- Barriers to data sharing
  - Practicality
  - Concerns with confidentiality
  - Who owns the data?
- Lack of incentivization for open science practices
  - It takes extra time
- Barriers for students:
  - Supervisors may not agree
  - Limited control over data in collaborations
- Working in silos
  - Hard to coordinate large knowledge aggregation communities
- Changing behaviours and breaking from tradition is hard!

FINAL THOUGHTS

What are some other student-driven solutions, beyond open science? How can we strive to improve research practices and promote transparency?

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