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Assessing the impact of curriculum on open and transparent research practices

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The “credibility crisis” and open science

How Reliable Are Psychology Studies?

A new study shows that the field suffers from a reproducibility problem, but the extent of the issue is still hard to nail down.

ED YONG | AUG 27, 2015 | SCIENCE

nature International weekly journal of

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NATURE | NEWS

Over half of psychology studies fail reproducibility test

Largest replication study to date casts doubt on many published positive results.

Monya Baker

27 August 2

A WHOLE FIELD OF PSYCHOLOGY RESEARCH MAY BE BUNK. SCIENTISTS SHOULD BE TERRIFIED.

Slate

from Julia Strand: https://osf.io/bt49k

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Our project

Align research methods curriculum with open science research practices

Created materials for Psychology Research Methods:

- 3 video lectures (incl. publication bias, misconduct; questionable research practices; open science methods)
- Lab activities that emphasize reproducibility

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Assess whether new materials improve students' conceptual understanding of open science research practices

Developed the **Open Science Concept Inventory (OSCI)** to assess understanding of open and transparent research practices

- Evaluated impact of new materials in four sections of lab course on psychology research methods

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Open Science Concept Inventory (OSCI)

Study 1

- Developed scenarios related to key open science concepts
- Coded open-ended responses from *N* = 64 participants to create multiple-choice options (**best practices** and **common misconceptions**)

Study 2

- Evaluated multiple choice questionnaire of 41 vignettes with *N* = 262 undergraduates
- Used item response theory (IRT) analysis to select final set of 34 items

Target concept: Publication bias

David's research project is based on a well-known effect in the psychology literature. After attempting to replicate the effect in two experiments, David finds that he hasn't replicated the published findings despite using the same procedure and a large sample of participants. Concerned that he won't be able to publish non-significant results in a journal, he's considering abandoning the project.

Open-ended prompt for Study 1:

Would you advise him to abandon the project or not? Why or why not?

Multiple-choice options for Study 2:

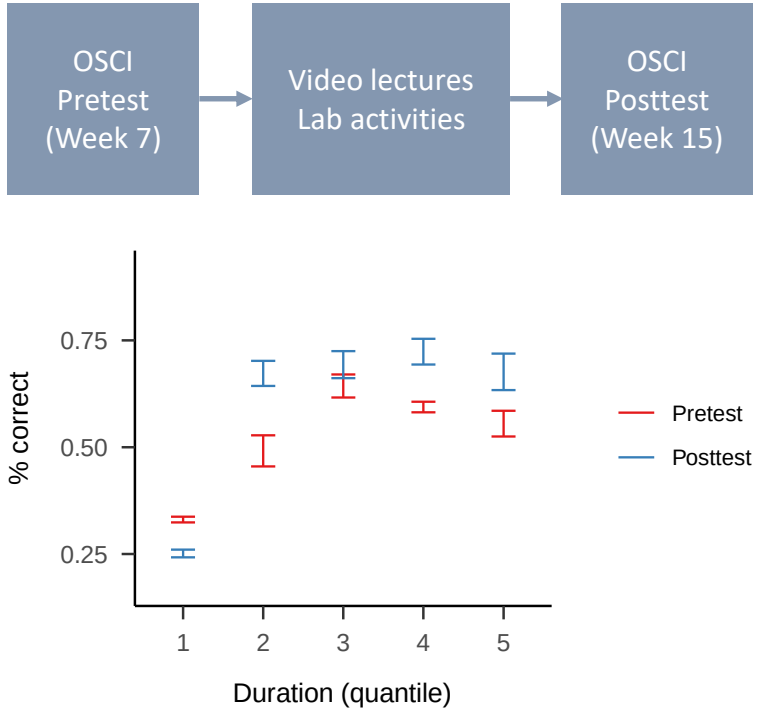
What should David do?

a. David should still try to publish the results of his project because non-significant findings are informative. (best response)
b. David should keep modifying the procedure until he obtains a significant effect that he can then publish.
c. David should not try to publish these results because replicating someone else's work is unethical.
d. David should not try to publish these results because non-significant results are not informative.

Assessing the new curriculum with the OSCI

Study 3

- *N* = 37 students from four sections of PSYC2103 completed the study in Fall 2019 and Spring 2020
- OSCI was robust at discriminating knowledge
- Performance improved from pre-test to post-test for students who spent longer completing the OSCI



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Summary

- We developed a curriculum and validated a concept inventory (OSCI) that can be used to assess conceptual understanding of robust and reproducible research practices
- Video lectures, assessment tool (OSCI), are openly available (OSF) and can be integrated in other research methods courses: https://osf.io/fejcn/

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