Course Syllabus
(200226)

Reproducibility

(3-5 hp, Spring 2020)

Coordinator:
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Reproducibility

In the last few decades, psychology has experienced a replication crisis: Many apparently well-established textbook findings have been impossible to replicate. Reasons for this include a likely abundance of false-positive results in the psychology literature (via questionable research practices), and the fact that many studies do not contain sufficient information to know what was done. For example, if it is unclear how the original data were processed and analyzed, reanalyses of these data may provide results that differ from the original results. So, not knowing all the steps that researchers took to obtain their results makes it impossible to gauge the robustness of any effect in psychology. Because reproducible results are critical for scientific progress, researchers need to do their utmost to ensure reproducibility. Two practices are particularly promising: Preregistration and data sharing.

The goal of this course is to understand how to conduct reproducible science. This course will allow students to explore key concepts in reproducibility and to help them conduct reproducible research. As part of the course, students will write a preregistration (actual or hypothetical) and learn how to share data (actual or hypothetical) via the Stockholm University depository. This course is offered as part of the research education for doctoral students at the Department of Psychology, Stockholm University.

Students are expected to read the course literature independently. Topics include reproducibility, preregistration, and data sharing. However, to facilitate understanding, students will have the opportunity to participate in discussion seminars on selected papers (ReproducibiliTea headed by Stephen Pierzchajlo and Rasmus Eklund). To complete the exam, students will need to study the literature and to complete the practical requirements (preregistration and data sharing).

The course can be taken for between 3 and 5 hp. All students will have to complete the practical requirements. For 3 hp, the reading list of scientific articles is about 150 pages long, and for each additional point (up to 5 hp), the reading list of scientific articles is extended by about 100 pages. Although a reading list is available, students may suggest alternative articles if these are more relevant for their own studies.

**Learning outcomes**
After completing the course, students are able to:

1. Explain the importance of reproducibility for psychological research.
2. Describe landmark studies and concepts in reproducibility.
3. Write a preregistration (hypothetical or actual) according to current best practice (see OSF.org).
4. Share data openly via the Stockholm University depository (figshare).

**Requirements for participation**
Admission to postgraduate education at a university in the social sciences or a related field.

**Forms of examination**
Students participate in at least five discussion seminars (ReproducibiliTea) or write two-page summaries and discussions of five landmark studies in reproducibility. Students write a preregistration (hypothetical or actual) according to best practice (see OSF.org). Students share data (hypothetical or actual) according to best practice via the Stockholm University depository. The topic for the preregistration needs to be approved by the course leader.
Grade
Students will earn pass or fail for their work in the discussion seminars, in the preregistration, and in data sharing. To pass the course, students need to participate in at least five discussion seminars (in person or by writing summaries), to write a preregistration (hypothetical or actual) according to best practice (see OSF.org), and to share data (hypothetical or actual) according to best practice via the Stockholm University depository.

Course Literature
The list of scientific articles comprises between about 150 pages (for 3 hp) and 350 pages (5 hp).

To obtain 3 hp, students need to study about 150 pages of scientific articles. Students may choose from the list below or propose other relevant articles.

1. Replication crisis

Reproducibility Now: Many studies don’t reproduce and why

Reproducibility narratives

Replicating landmark studies

Has the debate gone too far? Things will just turn out fine, won’t they?

And the future? The myth of self-correction

2. Questionable research practices

Examining analytic flexibility in Psychology

Examining analytic flexibility in Science

Questionable Research Practices
Analytical flexibility illustrated

Statistics as a ritual

3. Hypothesis generation vs. testing

Differentiating confirmation and exploration

Scientific creativity through the historical lens

4. Reproducible science

Reproducible science overview

Replication - important or not?

Open science

Making neuroimaging reproducible

Is writing part of open science?
5. Preregistration

**Preregistration revolution: what to preregister and how?**


**Preregistered studies versus non-preregistered studies in psychology**

6. Open data

**The case for open access**

**Open data: challenge or solution?**