Course Syllabus
(210212)

R for Reproducible Psychology

(3 hp, Spring 2021)

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R for Reproducible Psychology

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.

As an empirical science, Psychology requires researchers to collect and process lots of data. In the past, researchers have used mainly software that is proprietary and is menu driven. Because this software makes it difficult to document and share what analyses were done and how, researchers may have difficulties in reproducing even their own results a few months after their analyses. Accordingly, proprietary, menu-driven software has been an obstacle to reproducibility.

In contrast, the statistical software $R$ facilitates reproducibility. It is free, works on most platforms, and is developed by a large community of experts. $R$ is arguably the leader in statistical software. It is easy to learn and use with $R$ Studio, a free interface for $R$.


The goal of this course is to understand the basics of data processing in $R$. As such, the course does not cover statistics but focuses on reading in and processing data in $R$ with $R$ Studio. Students will explore key concepts in programming to help them conduct reproducible data processing. As part of the course, students will write a script to process their own data (or data relevant to their research field). 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 (about 20 hours of self-study). However, to facilitate understanding, students will have the opportunity to attend hands-on lectures (2-3 full days) on the main parts of data processing in $R$ and $R$ Studio.

To complete the exam, students will need to write an $R$ script that processes their own data (or data relevant to their research field). The script needs to fulfill basic programming criteria (as outlined in the course literature). Students will have to present their script in a seminar and explain how it works.

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

1. Explain the importance of reproducible data processing for psychological research.
2. Describe main data processing features in $R$ and $R$ Studio.
3. Use $R$ Studio to write an $R$ script that processes data.
**Requirements for participation**  
Admission to postgraduate education at a university in the social sciences or a related field.

**Forms of examination**  
Students write an R script in R Studio that processes their own data (or data relevant to their research field). The script needs to fulfill basic programming criteria (as outlined in the course literature). Students will have to present their script in a seminar and explain how it works.

**Grade**  
Students will earn pass or fail for their work. To pass the course, students need to write an R script in R Studio that processes their own data (or data relevant to their research field). The script needs to fulfill basic programming criteria (as outlined in the course literature). Students will have to present their script in a seminar and explain how it works.

**Course Literature**  
The list of scientific articles comprises several scientific articles and online resources (maybe 20 hours of self-study).