Reading course: Bayesian analyses of the replication crisis

Many researchers agree that there is a problem in psychology. It has been observed that many experiments which initially produce positive results fail to replicate when they are repeated. This phenomenon has come to be known as the replication crisis, and it is often discussed not only in relation to psychology, but also in other scientific fields (medicine is the other most famous example). The existence of a substantial number of experiments that appear to support a scientific hypothesis but cannot be replicated puts pressure on the credibility of psychological science. It is therefore crucial to understand the causes of the replication crisis and to assess the extent to which it reflects flaws in scientific practice.

In this reading course, we will look at two arguments that employ Bayesian thinking to explain the replication crisis, namely Oberauer and Lewandowsky (2019) and Bird (2021). Common to these two arguments is that they use Bayesian updating to show that replication failures should be expected in scientific fields with certain structural features. Bird (2021) focuses on the role of significance thresholds and the quality of the hypotheses that are tested in a scientifical field. Oberauer and Lewandwosky (2019) look at how the quality of the theories developed in a field expectedly affects its replicability. Throughout the weekend, we will discuss the two arguments and their implications for improving the replicability of psychological experiments. As a basis for our discussion of the papers, we will give presentations to introduce you to the replication crisis and to the statistical tools that the two arguments concern.

Bird, A. (2021). Understanding the Replication Crisis as a Base Rate Fallacy. *British Journal for the Philosophy of Science*, *72*(4), 965-993.

Oberauer, K., & Lewandowsky, S. (2019). Addressing the theory crisis in psychology. *Psychonomic Bulletin & Review*, *26*(5), 1596-1618. https://doi.org/10.3758/s13423-019-01645-2