STATISTICAL RETHINKING 2025
WEEK 5

1. The data in `data(NWOGrants)` are outcomes for scientific funding applications for the Netherlands Organization for Scientific Research (NWO) from 2010–2012 (see van der Lee and Ellemers doi:10.1073/pnas.1510159112). These data have a structure similar to the UCBAdmit data discussed in Chapter 11 and in lecture. There are applications and each has an associated gender (of the lead researcher). But instead of departments, there are disciplines. Draw a DAG for this sample. Then use the backdoor criterion and a binomial GLM to estimate the TOTAL causal effect of gender on grant awards. Now think: What kind of imaginary intervention or interventions could this effect reference? It might help to think what kind of experiment you could (or could not!) design to measure the same causal effect.

2. Now estimate the DIRECT causal effect of gender on grant awards. Use the same DAG as above to justify one or more binomial models. Then compute the average direct causal effect of gender, weighting each discipline in proportion to the number of applications in the sample. Refer to the marginal effect example in Lecture 9 for help. The structure is very similar. You can even reuse the code.