STATISTICAL RETHINKING 2024
WEEK 4

You can use MCMC to solve these problems. But it's not required.

1. Revisit the marriage, age, and happiness collider bias example from Chapter 6. Run models `m6.9` and `m6.10` again (pages 178–179). Compare these two models using both PSIS and WAIC. Which model is expected to make better predictions, according to these criteria, and which model yields the correct causal inference?

2. Reconsider the urban fox analysis from last week's homework. On the basis of PSIS and WAIC scores, which combination of variables best predicts body weight (W, `weight`)? What causal interpretation can you assign each coefficient (parameter) from the best scoring model?

3-OPTIONAL CHALLENGE. The data in `data(Dinosaurs)` are body mass estimates at different estimated ages for six different dinosaur species. See `?Dinosaurs` for more details. Choose one or more of these species (at least one, but as many as you like) and model its growth. To be precise: Make a predictive model of body mass using age as a predictor. Consider two or more model types for the function relating age to body mass and score each using PSIS and WAIC.

Which model do you think is best, on predictive grounds? On scientific grounds? If your answers to these questions differ, why?

This is a challenging exercise, because the data are so scarce. But it is also a realistic example, because people publish *Nature* papers with even less data. So do your best, and I look forward to seeing your growth curves.