

STATISTICAL RETHINKING 2023

WEEK 8

The data in `data(Monks)` are “like” and “dislike” nominations by 18 monks living in the same monastery over three time periods. Therefore the observed variables are counts from 0 to 3 of times monk A nominated monk B as liked or disliked.¹ Each row in the data is a pair of monks (a dyad). The variables are:

- `A`: Index number for first monk in dyad
- `B`: Index number for second monk in dyad
- `like_AB`: Number of times A nominated B as liked
- `like_BA`: Number of times B nominated A as liked
- `dislike_AB`: Number of times A nominated B as disliked
- `dislike_BA`: Number of times B nominated A as disliked

1. Use these data to estimate the amount of reciprocity in “like” nominations within dyads. You can ignore the “dislike” data for now. Use the social network example from the book to help, but you should modify it appropriately.

2. Now also analyze the “dislike” nominations. Estimate the amount of reciprocity in the “dislike” nominations and compare to the estimate from the “like” nominations. Does “like” or “dislike” have higher reciprocity? Be sure to compute the posterior contrast between the two estimates.

3. Now consider generalized liking and disliking. Add generalized “receiving” parameters to the model, analogous to receiving varying effects from the sharing example in the book/lecture. (Each monk only named 3 likes and 3 dislikes each time, so the amount of “giving” is fixed by design in these data.) Can you identify any individuals who are particularly liked/disliked, independent of the dyadic relations?

4-OPTIONAL CHALLENGE. The monks belonged to 4 different “factions” struggling against one another for control of the monastery’s future. The factions were:

- Faction 1: Monks 1, 2, 7, 12, 14, 15, 16
- Faction 2: Monks 4, 5, 6, 9, 11
- Faction 3: Monks 3, 17, 18
- Faction 4: Monks 8, 10, 13

Build a model to estimate how faction membership influenced liking and disliking. Consider the faction memberships of both individuals in each dyad.

¹Source: Sampson, S. F. 1968. A novitiate in a period of change: An experimental and case study of relationships, Unpublished PhD dissertation, Department of Sociology, Cornell University.