

If you think your random effects looks too sparse when settling on a model that converges, you could try dropping one effect term entirely and then simplifying the other:

$(1 + \text{Factor 1} * \text{Factor 2} | \text{Participant}) + (1 + \text{Factor 1} * \text{Factor 2} | \text{Item})$

$(1 + \text{Factor 1} + \text{Factor 2} | \text{Participant})$

$(1 + \text{Factor 1} | \text{Participant})$

$(1 + \text{Factor 2} | \text{Participant})$

...

You want to avoid random effects with just random intercepts (i.e., no slopes) as that can inflate the Type I error rate (Barr et al., 2013).

A few other LMM things...

- You can add participant and item covariates as fixed effects, and you can have a variety of continuous and categorical variables in your LMM. LMMs are *very* flexible.
- You'll find that sometimes several models fit your data - always run likelihood comparison tests to determine which is the best fit. If you have a selection where not one is statistically better than the others, choose the model that makes most *theoretical* sense.