

Addressing lack of convergence

Simplify your random effects structure step by step. For an experiment with two factors (Factor 1 and Factor 2) we could simplify the participant and item random effects like this:

`(1 + Factor 1*Factor 2 | Participant) + (1 + Factor 1*Factor 2 | Item)`

`(1 + Factor 1*Factor 2 | Participant) + (1 + Factor 1+Factor 2 | Item)`

`(1 + Factor 1+Factor 2 | Participant) + (1 + Factor 1+Factor 2 | Item)`

`(1 + Factor 1+Factor 2 | Participant) + (1 + Factor 1 | Item)`

...

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).