Q9: Inspecting ordinal model (individual component)

Check a simple ordinal model with only one condition (StimGender) and intercept-only random effects per subjects, i.e., use this formula on the ordinal model (commented out right now):

# Boring ~ StimGender + (1|ResponseId)

Check the output of the model and answer the following three questions:

1. Are 1-5 responses selected equally likely?

2. Which of the values 1-5 does the model estimate to be the most likely response for the male StimGender?

3. It is sometimes suggested that in Likert scale, the middle response (i.e., 3) should be removed and scales should be even because otherwise people will predominantly go for the middle, non-committal response, and the results will be useless. Based on your findings, is this justified?

Hint: You will need to look at thresholds and translate those into probabilities on standardized normal distribution (i.e., normal distribution with mean 0 and st.d. 1). You will probably want to use pnorm. When you consider a condtion, you will have to move the mean. If you are lost, go back into the last slides of the last lecture, or check discussions of ordinal models in the last video and on Wikipedia

The code is that:

**fmm1 <- clmm(as.factor(Boring) ~ StimGender + (1|ResponseId),data = selfies)**

**summary(fmm1)**

We can get the result that:

**Cumulative Link Mixed Model fitted with the Laplace approximation**

**formula: as.factor(Boring) ~ StimGender + (1 | ResponseId)**

**data: selfies**

**link threshold nobs logLik AIC niter max.grad cond.H**

**logit flexible 2151 -2962.84 5937.68 363(2183) 5.81e-03 8.6e+01**

Random effects:

Groups Name Variance Std.Dev.

ResponseId (Intercept) 2.12 1.456

Number of groups: ResponseId 135

Coefficients:

Estimate Std. Error z value Pr(>|z|)

StimGenderMale -0.67133 0.08182 -8.205 2.3e-16 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Threshold coefficients:

Estimate Std. Error z value

1|2 -2.54026 0.15242 -16.667

2|3 -0.88721 0.14208 -6.244

3|4 0.04014 0.14070 0.285

4|5 2.57772 0.15639 16.483

p1<-pnorm(-2.54026, mean = -0.67133, sd = 1)

p2<-pnorm(-0.88721, mean = -0.67133, sd = 1)-p1

p3<-pnorm(0.04014, mean = -0.67133, sd = 1)-p1-p2

p4<-pnorm(2.57772, mean = -0.67133, sd = 1)-p1-p2-p3

p5<-pnorm(2.57772, mean = -0.67133, sd = 1, lower.tail = FALSE)

p1 = 0.0308162769352939

p2 = 0.383724366669212

p3 = 0.347062838989625

p4 = 0.237817561789323

p5 = 0.000578955616545263

So, for question1 the response is clearly unequal because the probability is not the same.

For the male stimgender, we can get the result that second response is the most likely response followed by number 4. I find that there is a little different between original data where most male choose 4 and followed by 2. I think that is because that the distribution is not the normal distribution. If we predict it as the normal distribution there will be some problems.

I don’t think this is justified,