



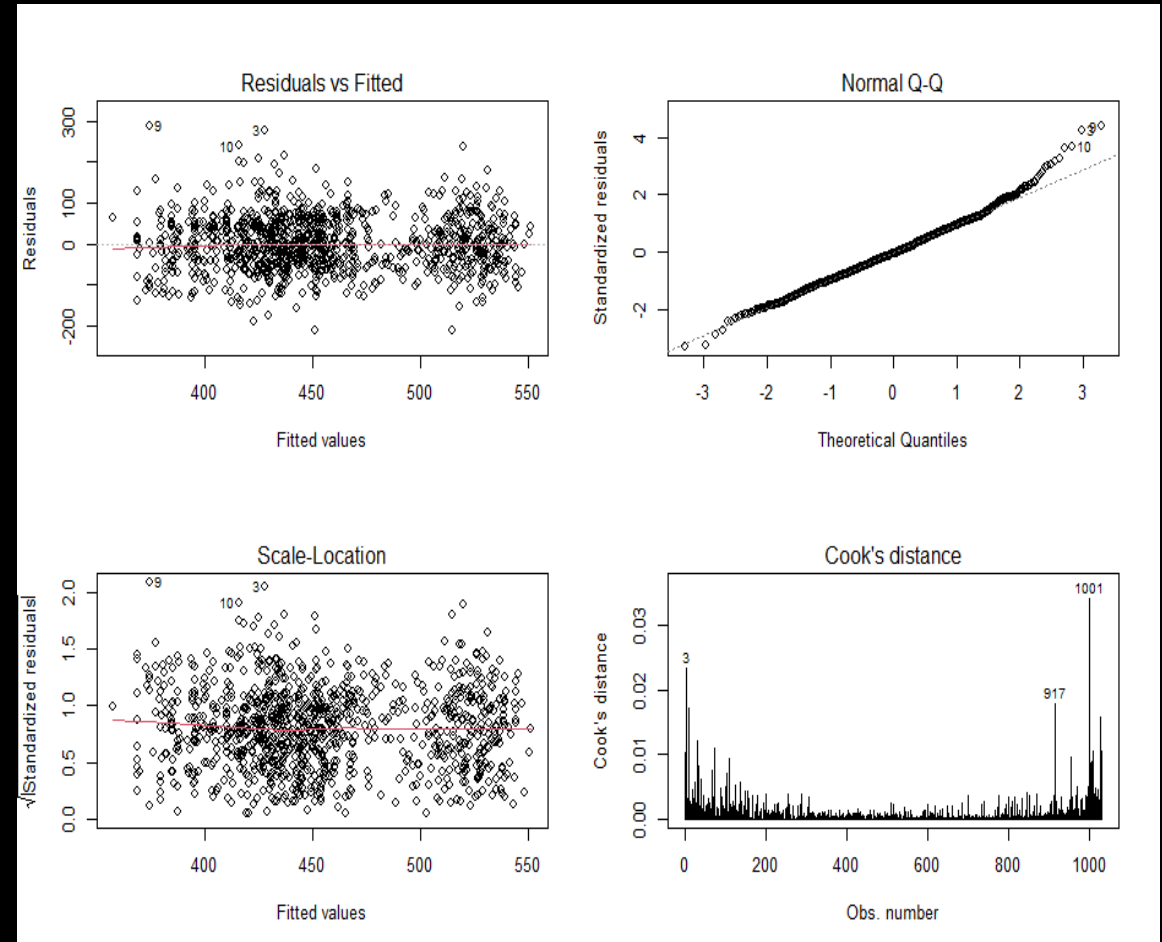
# Model Assumptions

# Model Assumptions: Linear regression

- Nature of the model
  - the relation between predictor and outcome has to be linear
- Nature of the errors (i.e., residuals)
  - normal and independent of each other

# Model Assumptions: Simple regression `lm()`

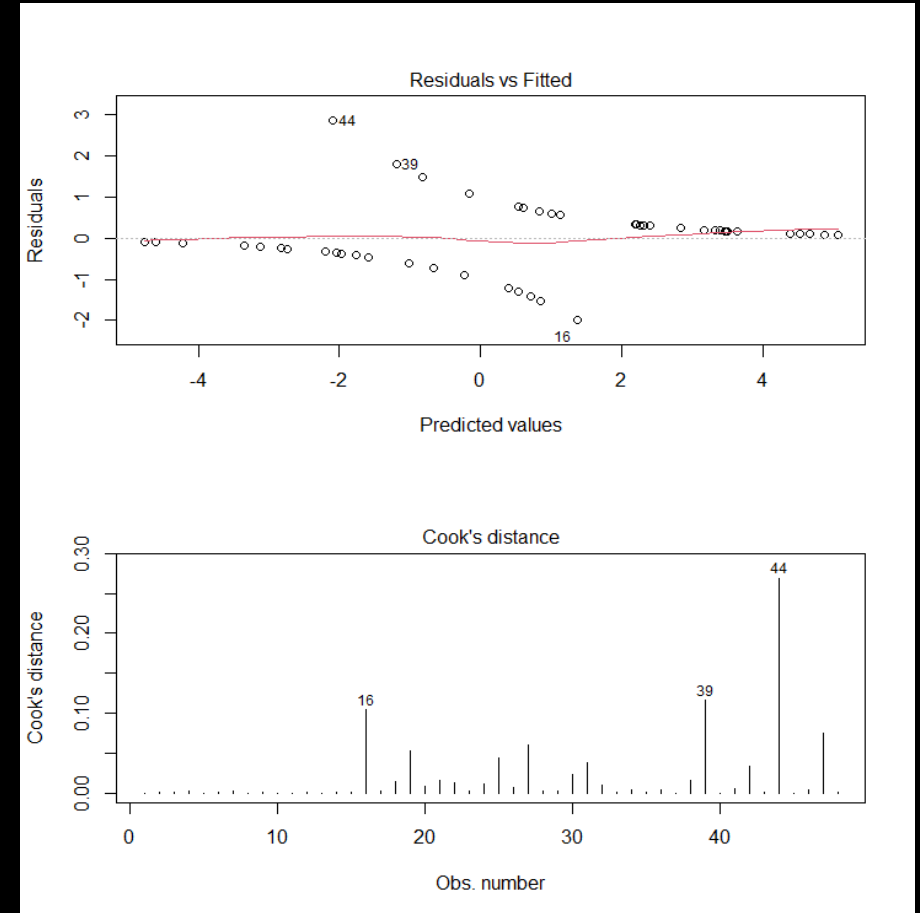
- Required(LINE):
  - Linearity of relationships
  - Independence of residuals
  - Normality of residuals
  - Equal variances for residuals
- Desirable:
  - uncorrelated predictors  
(no collinearity)
  - no outliers



# Model Assumptions: Simple regression glm()

For binomial DVs, (logistic regression)

- Required:
  - LINEAR relationships between IVs and log-odds
  - ~~Normality of residuals~~
  - ~~homogeneity of variance~~
  - **Independence of residuals**
- Desirable:
  - uncorrelated predictors (no collinearity)
  - no “bad” (overly influential) observations
  - large samples (due to maximum likelihood fitting)



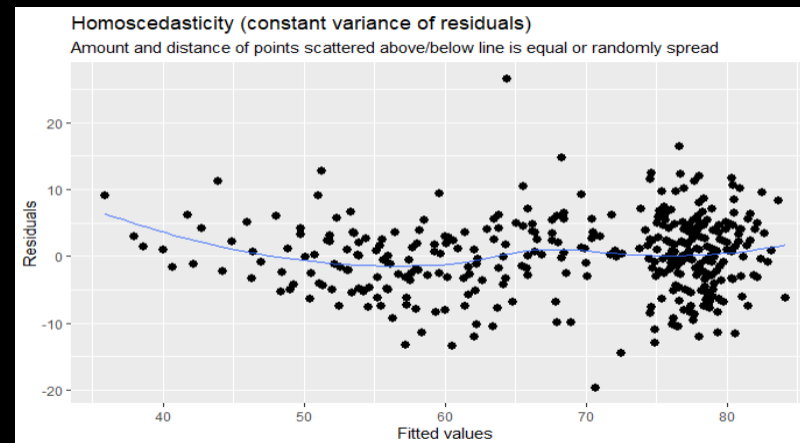
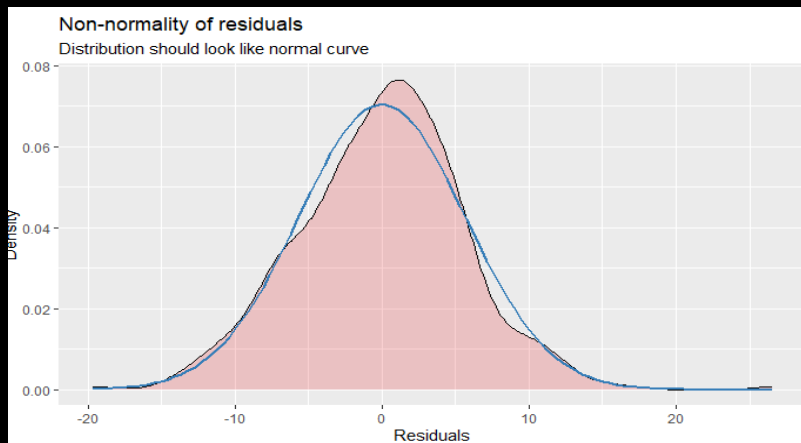
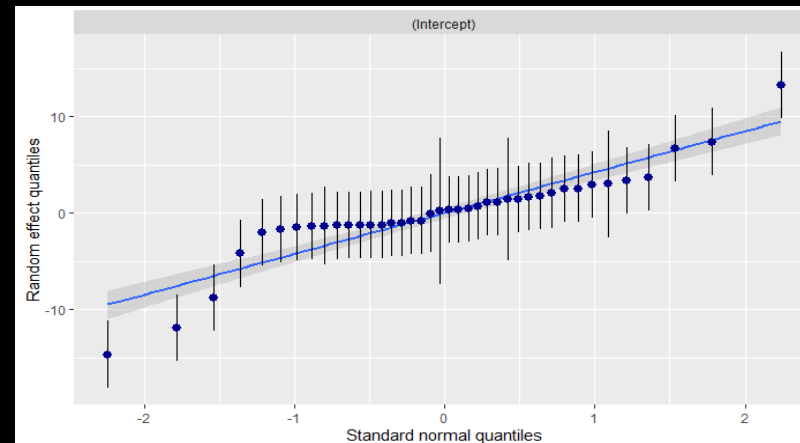
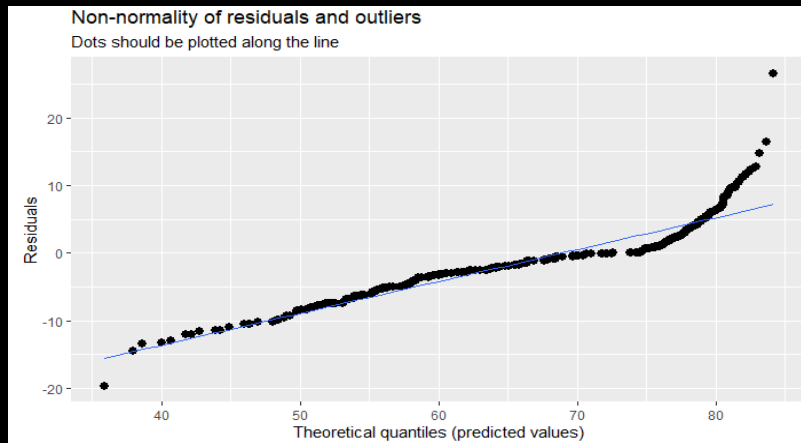
# Model Assumptions: Mixed-effects Models

Similar to simple linear regressions model

- Error is random
- Residuals at multiple levels
  - Level1 residuals: mean = 0, variance constant (R code: `residual()` )
  - Level2+ residuals: mean = 0, variance constant (R code: `ranef()` )

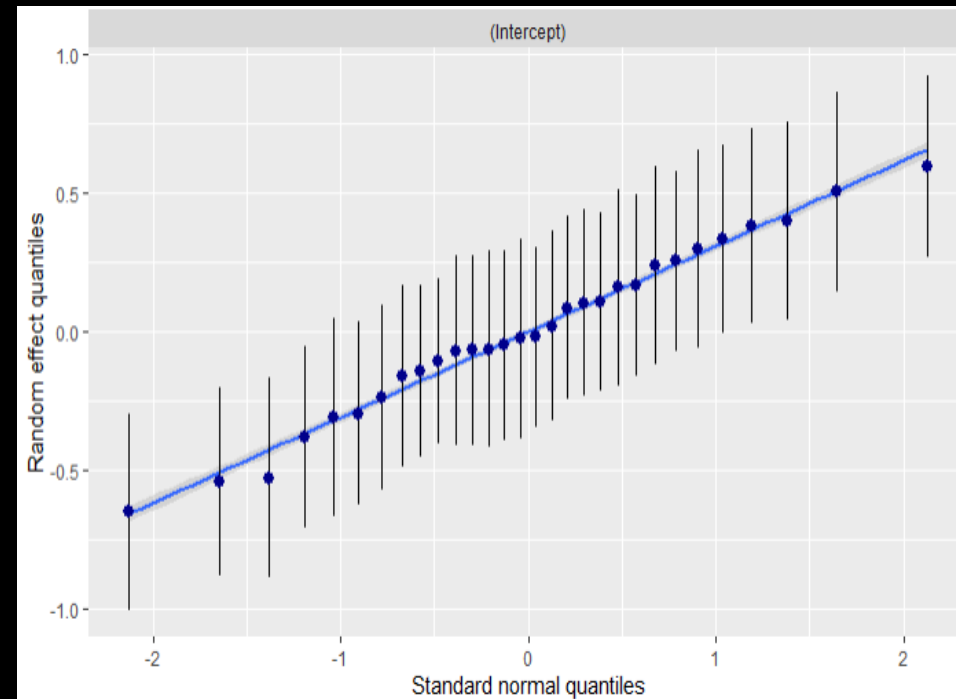
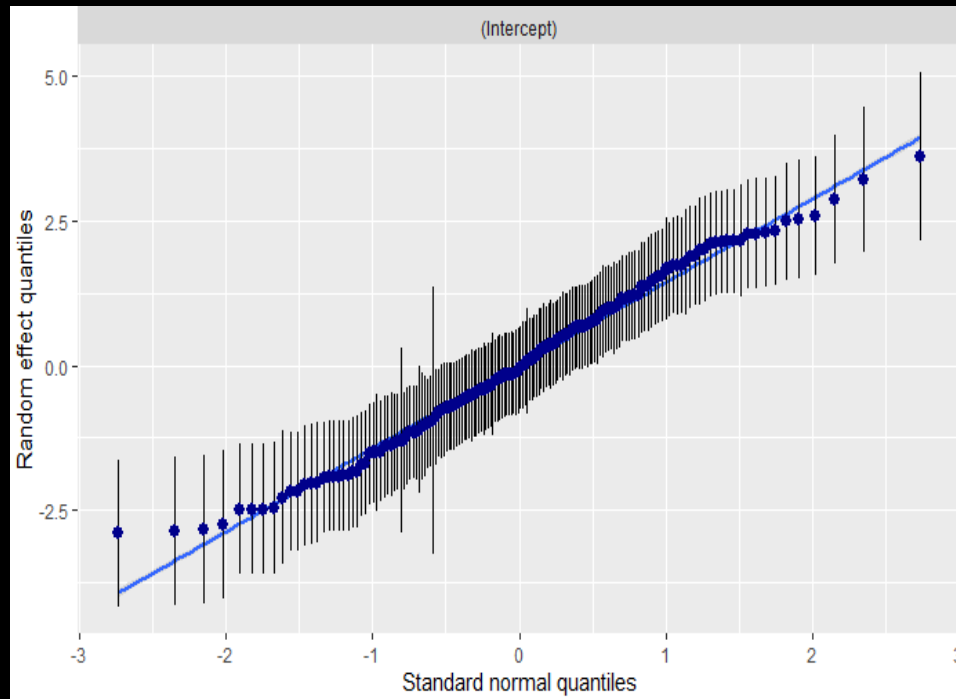
# Model Assumptions: Mixed Models – lmer()

```
plot_model(mMixed_reduced , type = "diag")
```



# Model Assumptions: Mixed Models – glmer()

```
plot_model(m3_dataISD, type = "diag")
```



# Exercise for Friday

The 'cheese data': Simulated data based on real psycholinguistic findings on structural priming.

- Two Predictors :
  - 2-level factor "Prime"
    - (a): Tom gave Spike some flowers.
    - (b): Tom gave some flowers to Spike.
  - 2-level factor "communication" (video- vs audio-call)
- Binary outcome: (a) or (b)?
  - (a) Gromit gave ... (Wallace some cheese)
  - (b) Gromit gave ... (some cheese to Wallace).

