***Statistics for Humanities Researchers – day5***

**Read the following instructions with the Day3Exercise1.Rmd file open.**

**The exercises should have 2 outputs:**

* **This document with answers to the questions. Cut and paste any plot you’re asked to produce.**
* **The Rmd file with your code written in and “knitted”**

*Background:* Previous research suggests that pairs might outcompete individuals in a large array of problem solving (cf. Riccardo’s publication page). Here we try to extend these findings to a new domain: communication efficacy. Are pairs better able at communicating with a third party than individuals? We therefore designed an experiment in which first dyads and individuals would build Lego models to communicate abstract concepts to a third unknown party. We then published pictures of the models on the net and asked a new set of participants to guess which notion was represented in the models. Our hypothesis was that models produced by dyads would be easier to guess. In order to provide more flesh to this exercise, we also explored individual psychological traits in the builders: empathy and systemizing. We then ask: in the individually built models, do builders with higher empathy produce easier to guess models? What about individuals with higher systemizing?

The data you see is real data (though messy, as the experiment was designed by students).

*Exercise 1)* Warming up! Previous research by Simon Baron-Cohen shows that empathy is higher in women and systemizing is higher in men. Can you replicate that result in our data?

*Exercise 2)* Plot and statistically test our first hypothesis: Accuracy is affected by condition. Notice that the Rmd file instructs you to do this in 2 steps: i) with a simple model where condition is the only predictor of accuracy; ii) with a mixed effects model, where you also account for participants ID, concept represented and model ID. Comment on the difference in results.

*Optional 2a)* Are there other predictors you think would be important to add to the model?

*Optional 2b)* Can you think of any plot that could help you understand the difference in results when adding random effects?

*Exercise 3)* We have so far investigated the actual accuracy of the raters. What about the raters’ experience of communication clarity? Plot and statistically test the hypothesis that clarity is affected by condition and don’t forget the random effects! Briefly discuss the difference between Accuracy and Clarity. Which are the advantages and disadvantages of each?

*Exercise 4)* Now time to explore the impact of Empathy. Does EQ affect accuracy? Does it affect clarity?

*Exercise 5)* Now time to explore the impact of Systemizing. Does SQ affect accuracy? Does it affect clarity?