Experiment 2 analyses

I tried to think in terms of questions rather than in terms of analyses. I suggest we only keep the analyses that answer a specific question (at least to start with).

The first four questions are about the relationships between RTs and cognitive skills. Several papers (Jongman et al., 2015a, 2015b; Shao et al., 2012) have shown that cognitive skills (attention, inhibition) predict picture naming latencies, but they did not use a PWI task. This analysis could serve as a conceptual replication of those findings. Moreover, I am pretty sure that we can find in this same literature, null effect (i.e., absence of correlations) or discrepancies in terms of which cognitive skills predict picture naming. There is also this idea that cognitive skills predict lexical access when it is more difficult (i.e., with actions) that we can build on.

**Question 1**: **Do cognitive skills predict RTs?**

* Experiment 1 data, Analysis: predict reaction times of baseline condition only, cognitive skills as fixed effects
* If effects are found, we try to replicate them with the data of Experiment 2, only the slow block

**Question 2: Do cognitive skills predict RTs more when the task is more difficult?**

* Experiment 2 data, Analysis: predict reaction times of baseline condition only, cognitive skills and speed condition as fixed effects
  + How interested are you in the interaction here? I’m wondering if it would be more straightforward to interpret if we nested the cognitive skills within speed condition to test whether cognitive skills predict reaction times in either speed group, rather than the interaction, which would test whether cognitive skills predict RTs differently for each speed group. But the interaction can be interesting to test, as well.
  + Not sure. Doesn’t the question require that we get an interaction?

**Question 3: Do cognitive skills, when measured within the language task (Intra-individual variance) predict RTs?**

* **Experiment 1 data, Analysis: predict reaction times of baseline condition only, intra-individual variance (calculated with only baseline condition trials) as fixed effect**

**Question 4: Does the relationship between cognitive skills, when measured within the language task (Intra-individual variance) and RTs become stronger when the task is more difficult?**

* **Experiment 2 data, Analysis: predict reaction times of baseline condition only, intra-individual variance and speed block as fixed effects**

Which trials should we use to calculate the intra-individual variance? For Question 3, I think it makes most sense to calculate it with only the trials in the baseline condition (especially since we know participants differ in the magnitude of interference effects). However, we have baseline trials in both the speeded and slow blocks for Experiment 2. Would it make sense to just use all the baseline condition trials to calculate variability, regardless of speed block? We could fit a linear model including all baseline condition trials that predicts RTs with speed block as a fixed factor. Then we could take the absolute value of the mean of the residuals for each participant. That way, the effect of speed block would be captured in the residuals. Do you think that will work, or do you have other suggestions?

Yes, I think that it should work and it makes sense. (Now I think that it would be interesting to know whether the IIV measure differs across blocks, this could answer the “additional question”

The second series of question relates to the relationship between interference effects and cognitive skills. The size of the semantic interference effect has been related to attention by several authors. We can hypothesize that the participants will be more attentive in the speeded version of the task (one way to check whit would be to show that the variance is smaller in this task?). We would therefore expect smaller interference effects in this task. Does this make sense?

* Yes, this makes perfect sense. What do you think of the following?
* Analysis 1: compare variance between blocks (I can see if we have enough data to do a Bayesian model that predicts the standard deviation.) yes
* Analysis 2: Experiment 2, interaction between interference and speed, only first block for a between-subjects manipulation of speed block yes
* Analysis 3: , interaction between interference and speed, both speed blocks (within-subjects manipulation of speed block). yes

I think Analyses 2 and 3 answer slightly different questions and would both be interesting. We can certainly pick one that we’re more interested in and say the other is exploratory, though, especially if we get concerned about doing a number of tests. Yes, good point, we can perhaps first look at the effect of block order, and if it seems that the participants were highly influenced, then go for analysis 2, alternatively, we assume that they will not be highly influenced by block order, go for analysis 3 first and run analysis 2 as an exploratory analysis in case analysis 3 does not show the “expected pattern”

Additional question: are participants who are fast (compared to the others) in the normal version also fast in the speeded version. Would inform on whether the RTS measure intrinsic properties /abilities of the participants or only how participants decide to perform a specific task (in the latter case, we can expect that

Analysis: correlation of mean RTs in fast and normal blocks?

* Also, we could test whether the IIV measure is highly correlated across blocks (see above)