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The processing of passive sentences in L1 and L2 German and French

Evidence from an eye-tracking task

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1. Previous studies

Humans have a linguistic and cognitive preference for agents in production and comprehension. Their default strategy by understanding sentences to assign an agent role to the first animate element (Griffin & Bock 2000). But recent research has shown variability in processing sentences and apprehending events according to several factors: visual salience, reading direction, morphosyntactic flexibility, voice (Sauppe et al. 2021). Whereas a recent study has shown that speakers better process active than passive sentences in English and Spanish (Lee and Doherty 2019), voice does not make a difference in processing sentences in German in another one (Cristante and Schimke 2020).

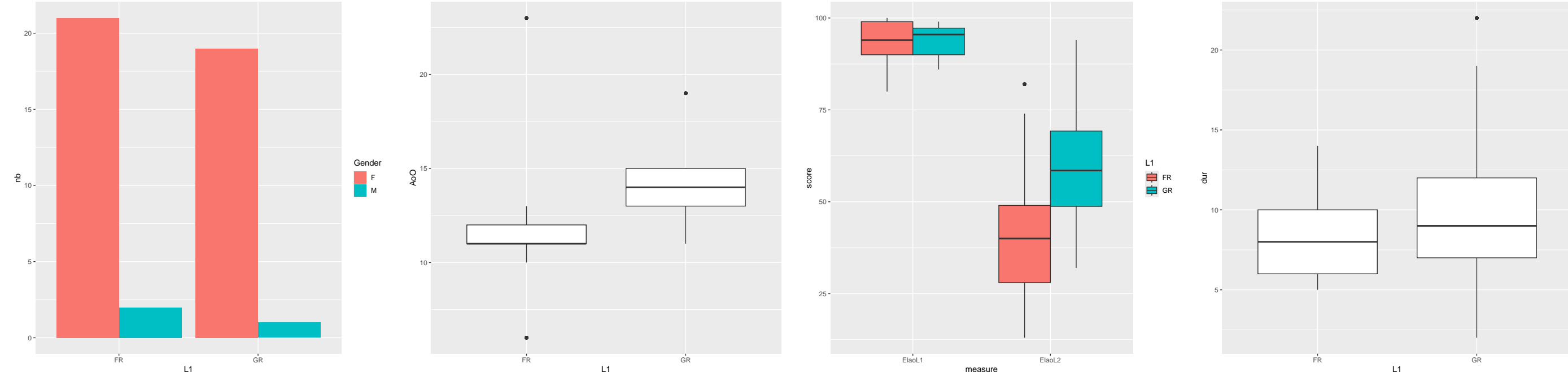
2. This study: comparing the processing of passive and active sentences by bilingual German-French speakers

1. Is there a difference (accuracy and reaction time) in understanding passive vs active sentences (voice condition), in L1 German and French (L1 condition), in L2 vs L1 (L condition) ?
2. Is there a cognitive difference (picture apprehension) in resolving the comprehension task in those conditions (voice, L1, L)?

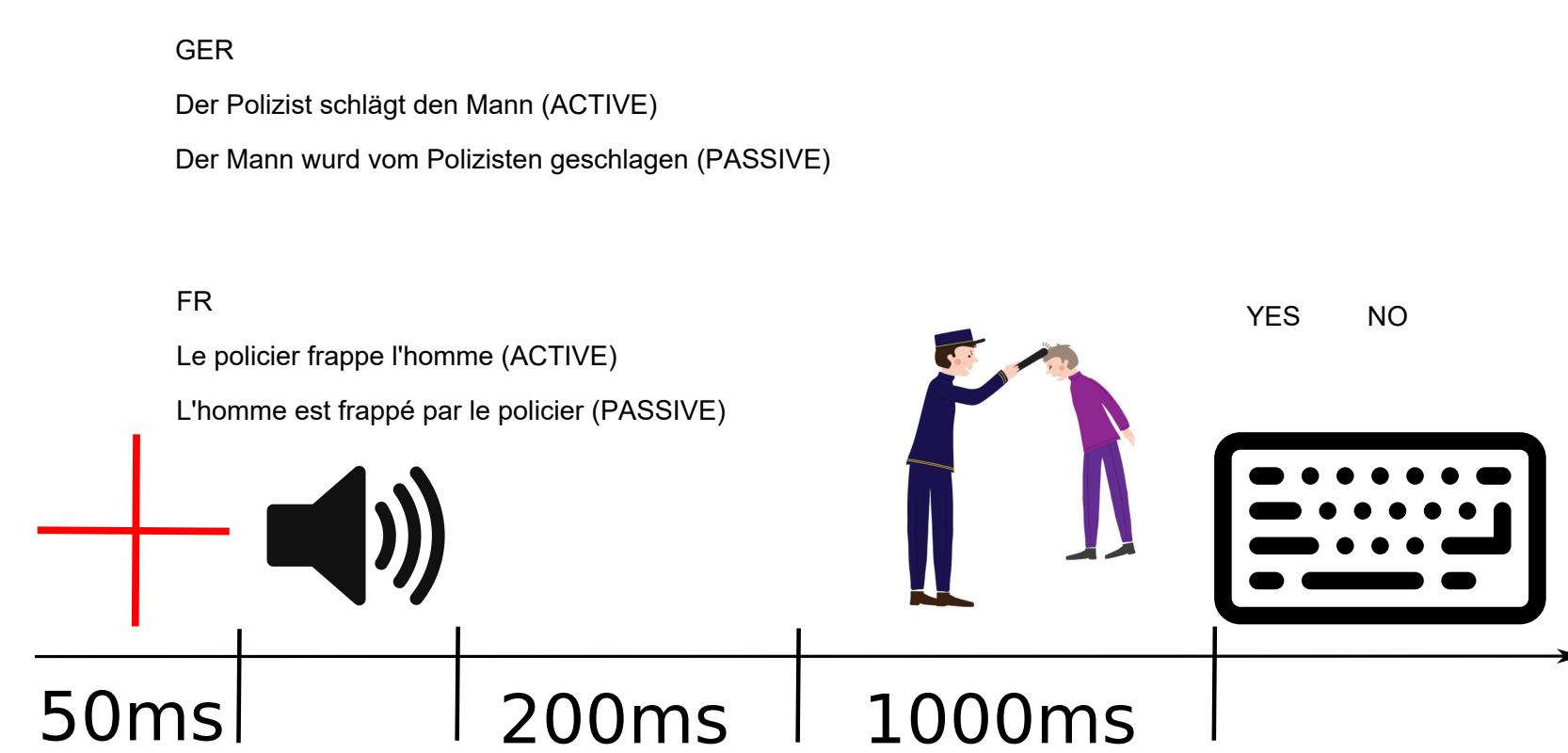
3. Methodology

a. Participants

- N= 43, 20 L1 German, 23 L1 French



b. Comprehension Task



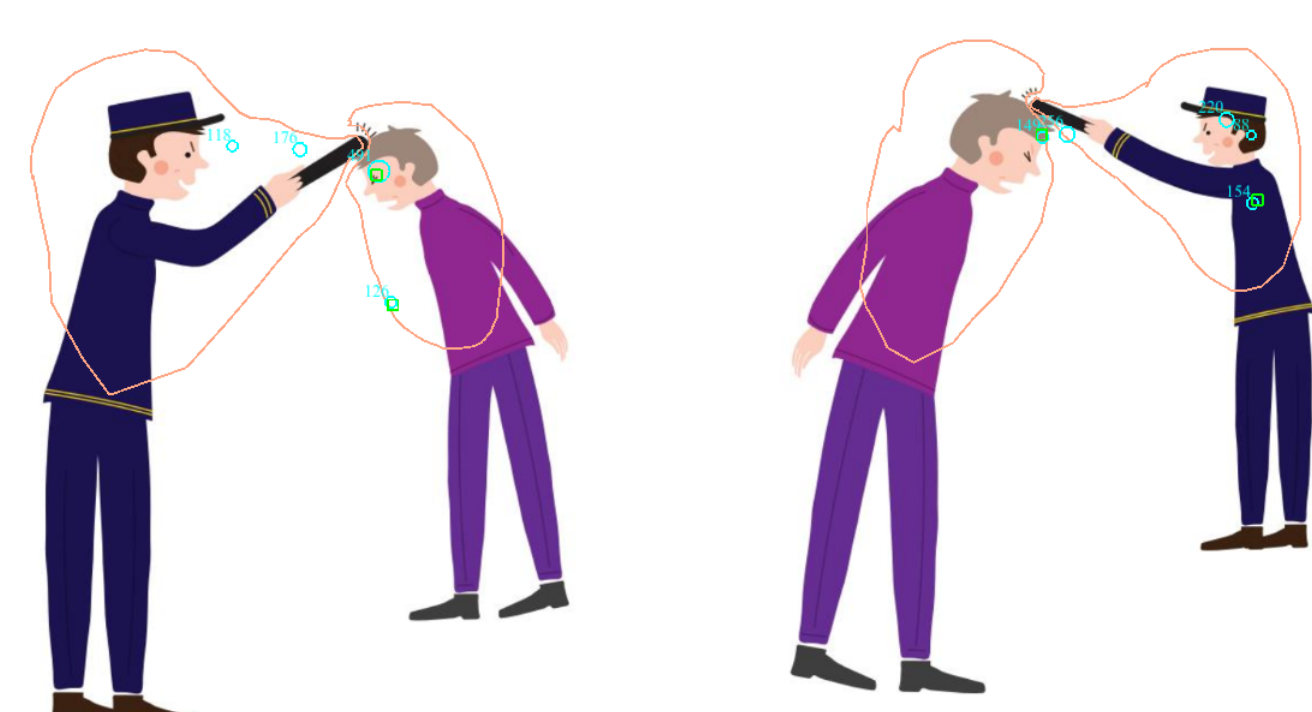
c. Experimental design

- 32 audio stimuli, 16 targets: 4 verbs (hitting, brushing, washing, pinching)



- 2 conditions: voice (passive vs active sentence) + iconicity (coherent vs incoherent picture)
- 4 training items, 12 fillers
- T1: L1 (German, French) or L2 (French, German) T2 (1 week after): L2 or L1

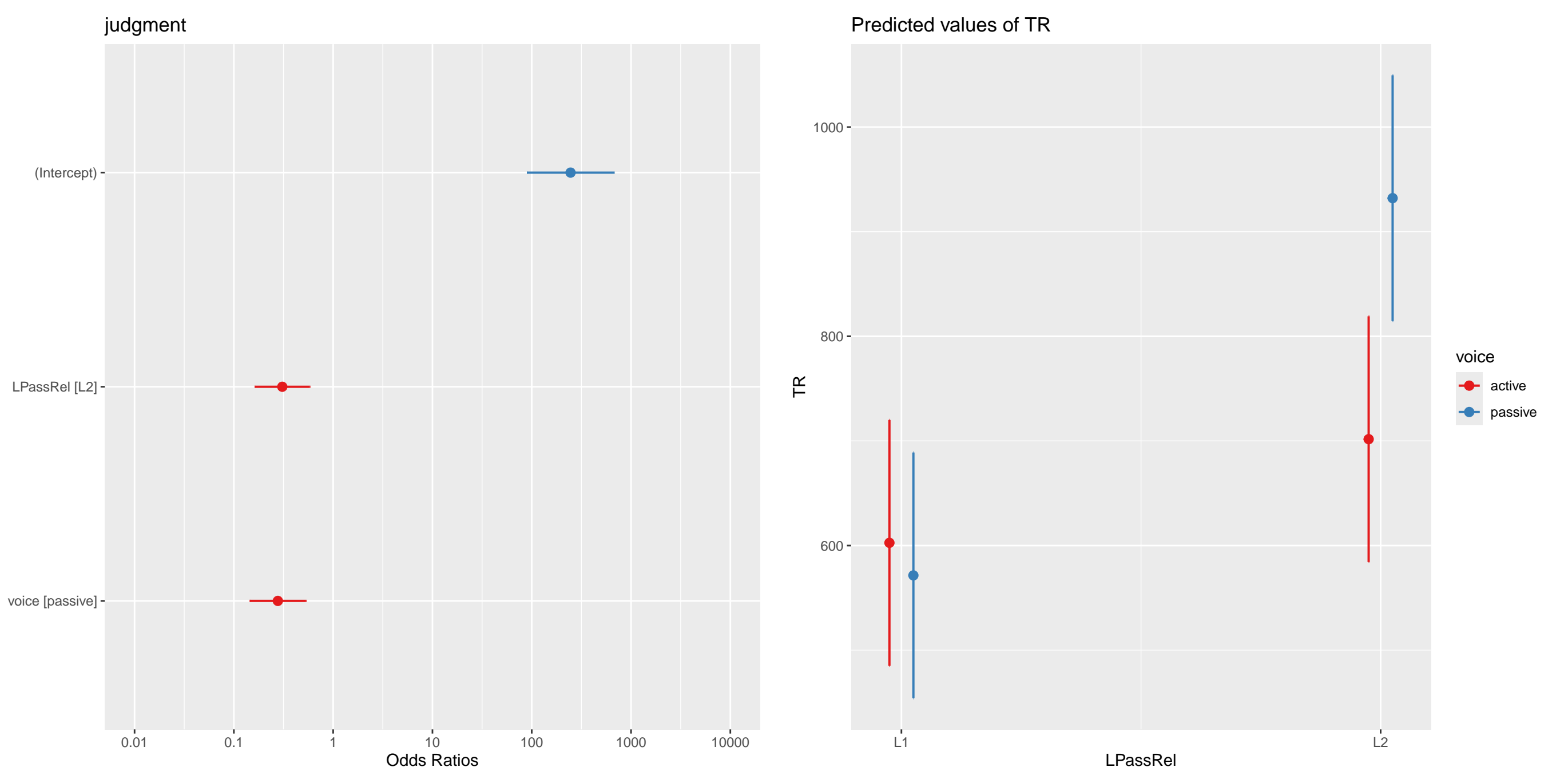
d. 2 Areas of Interest: Agent, Patient



4. Results

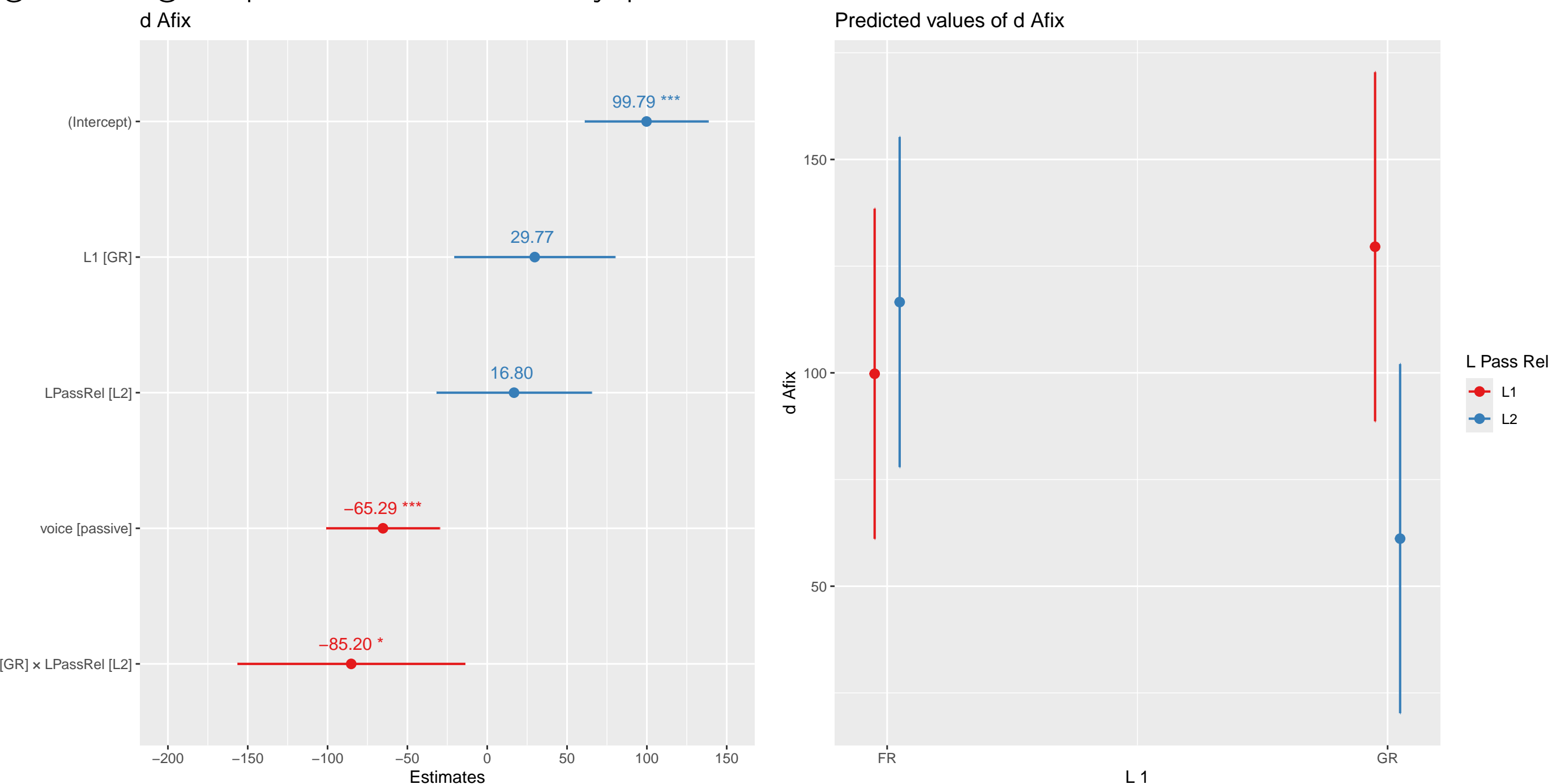
a. Comprehension: Accuracy and Reaction Time in L1, L2, FR and GR

- Accuracy reduced by passive voice and L2 (vs L1)
- Reaction Time increased by L2 and passive voice in L2

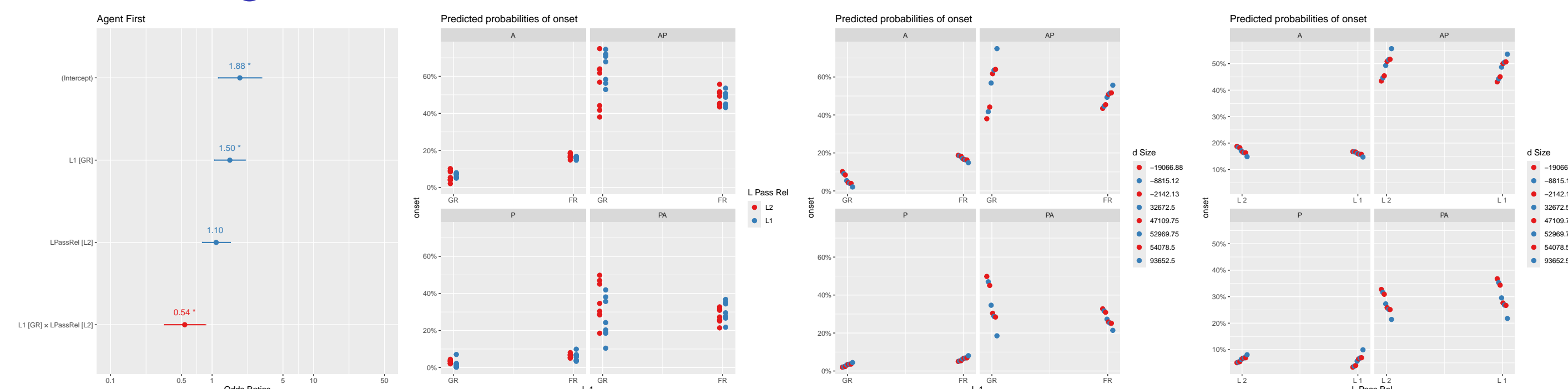


b. Picture apprehension: Agent Preference?

- dAfix = agent fixation total t minus patient fixation total t
- general agent preference reduced by passive voice and L2 in German natives



c. Path: Agent first?



5. Research answers

1. The model predicts that understanding passive sentences is less accurate than understanding active sentences and less accurate in L2 than in L1. The model also predicts an increased reaction time in L2 and especially with passive sentences. But the model does not predict any difference according to L1 (French vs German).
2. In the best model, voice is the only factor making a difference in online picture apprehension: participants look predictably less in the Agent Area of Interest when they hear passive sentences. L1 German participants even look less in it when they hear passive sentences in L2 French. There is a slight tendency for L1 German participants to first look at the patient when they hear passive sentences in L2 French. Overall, the gaze trajectory seems to be predicted by the size of the areas of interest not by voice, L1 nor language status.

6. Conclusion

The off-line and online data analysis shows no difference in processing passive sentences between L1 German and L1 French. But voice makes a difference in accuracy and preferential looking. The passive sentences in L2 French also have an effect on gaze allocation: participants process them like active sentences. This could be explained by the *se faire* auxiliary.

7. References

[1] Griffin Z.M., Bock K. (2000). What the eyes say about speaking. *Psychological science* 11 (4), 274-279. [2] BockLee, J., Doherty, S. (2019). Native and nonnative processing of active and passive sentences: The effects of processing instruction on the allocation of visual attention. *Studies in Second Language Acquisition*, 41(4), 853-879. [3] Sauppe, S., Flecken, M. (2021). Speaking for seeing. Sentence structure guides visual event apprehension. *Cognition* 206. [4] Cristante V., Schimke S. (2020). The processing of passive sentences in German. Evidence from an eye-tracking study with seven- and ten-year-olds and adults. *Language, Interaction and Acquisition* 11:2, 163-195.

The data has been collected with the help of Birgit Füreder (Salzburg), Matthias Heinz (Salzburg), David Imbert (Nantes) and Dietmar Röhm (Salzburg).