

Introduction and Aim

The concept of **short-term memory (STM) precision** has been defined as the **resolution** with which items are maintained in STM (Joseph et al., 2015).

- It has to be distinguished from STM **capacity**, which is binary.
- It refers to the **strength of activation** of items held in memory.
- It has mostly been studied in the visual domain (Zokaei et al., 2011; Burnett Heyes et al., 2012), but has received little interest in the verbal domain.

The present study assessed **the extent to which the manipulation of different levels of phonological similarity** can be used as a potential index of verbal STM precision.

Methods

- 60 french-speaking participants aged 18-30 (mean 22.63, SD 2.84) listened to 100 lists of 6 words at a rate of one word per second (**Fig. 1**).
- After a 3-second delay, a probe was presented, and participants had to decide whether it had been in the list or not.
- The delay consisted of articulatory suppression where participants had to say «Blablaba», «Bliblibli», «Blublublu» or «Blobalblo».
- Negative probes shared different degrees of phonological similarity (1-3 shared phonemes) with a word from the list.
- The position of the target word in the list varied.

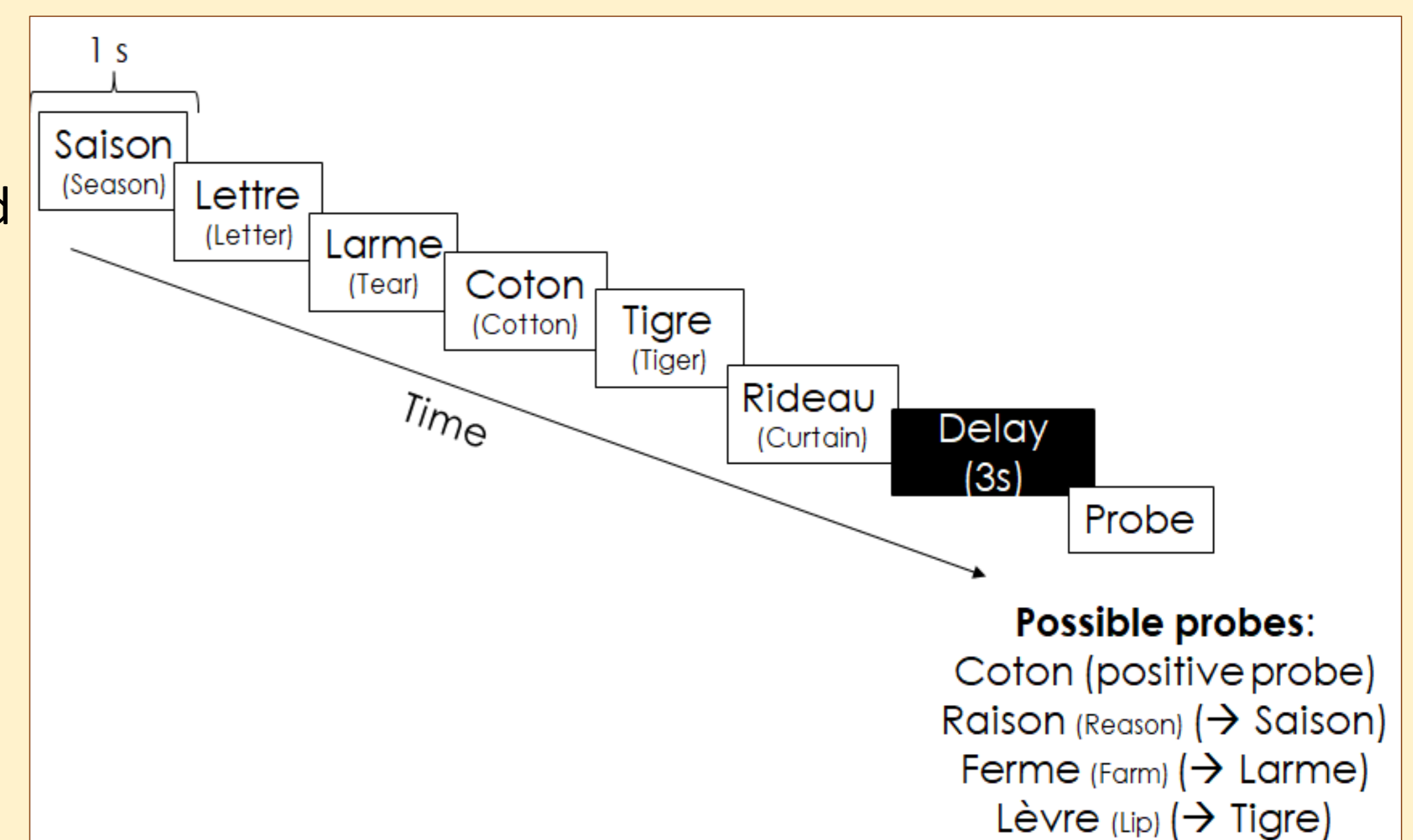
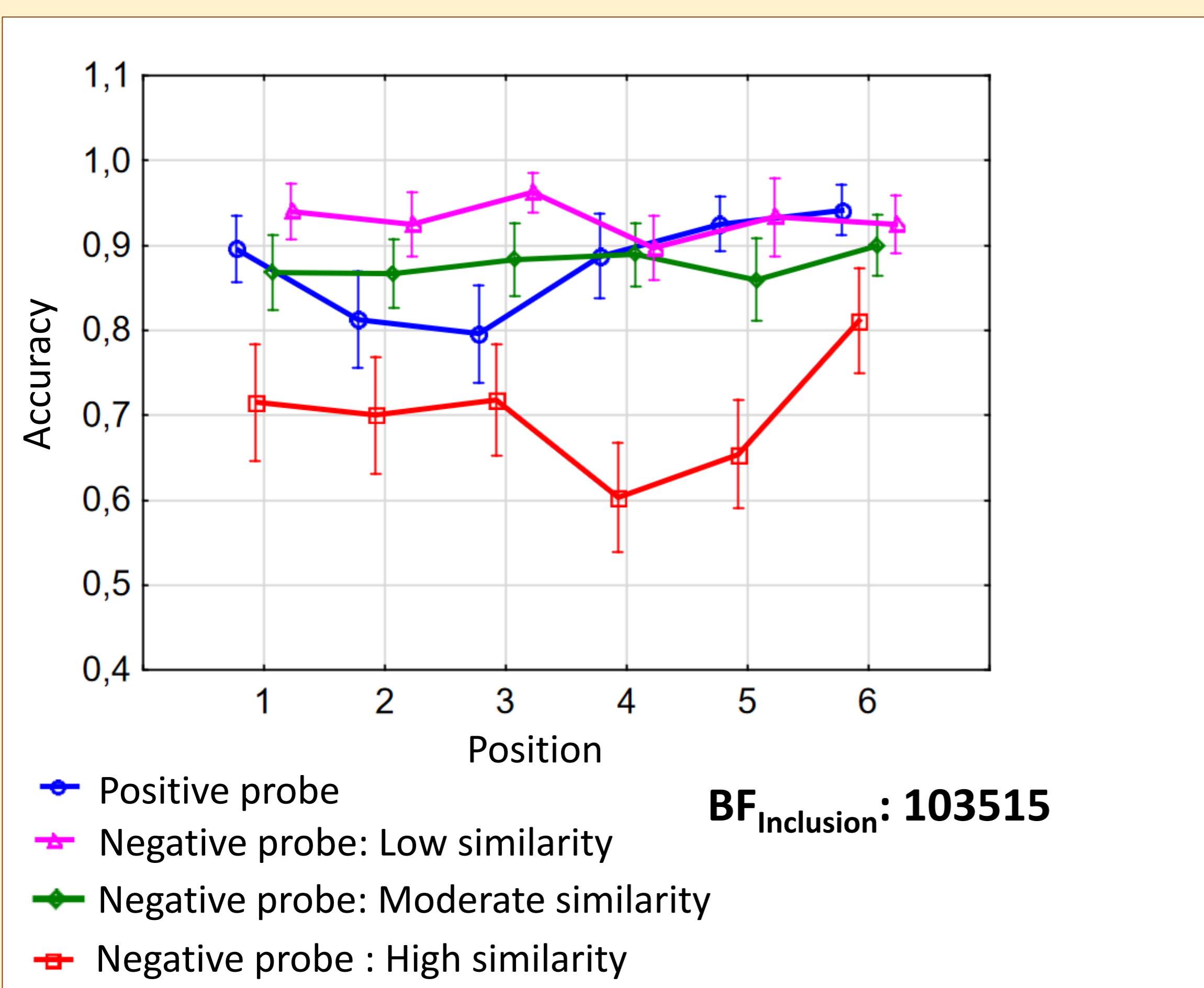


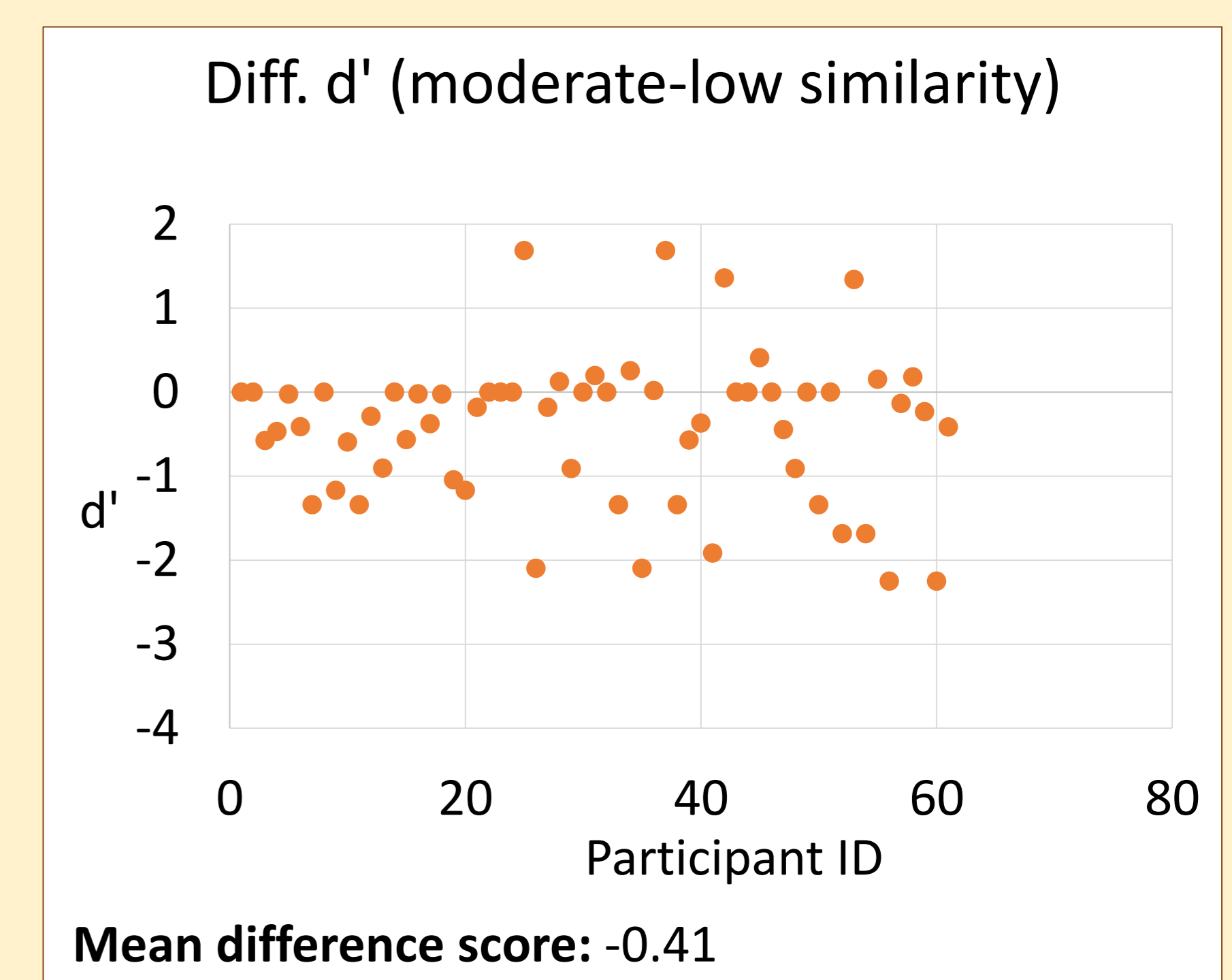
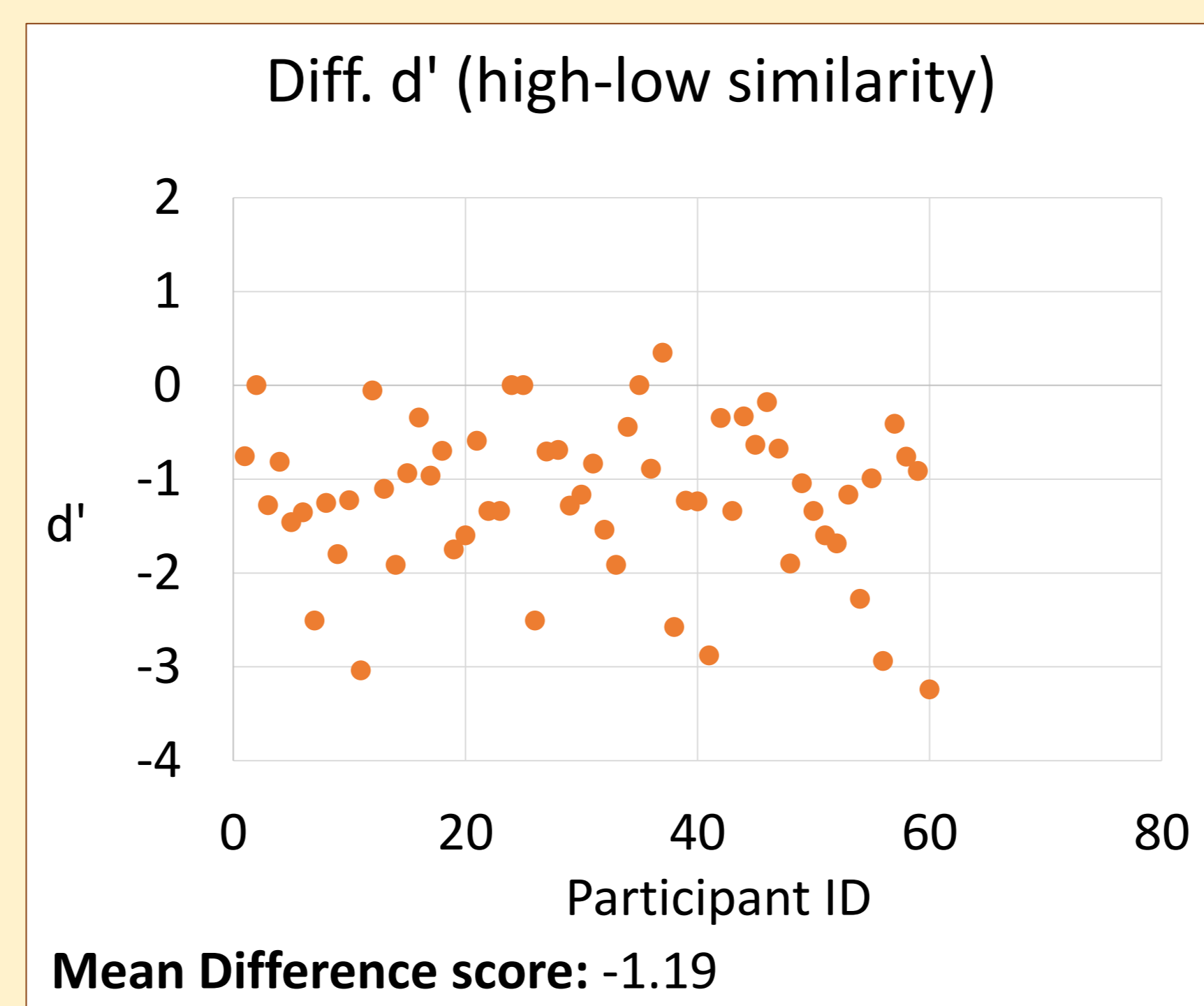
Figure 1: List of 6 words with varying levels of phonological similarity (respectively high, moderate and low) between target words and negative probe items.

Results

Bayesian repeated measures ANOVA 4 (condition) x 6 (position) Response accuracy for positive and negative trials



Inter-individual differences in STM precision: d' between-condition difference scores



Discussion

- We observed very strong evidence for an **influence of phonological proximity on STM probe recognition performance**: the more similar the negative probes to the target word, the higher the proportion of false recognition.
- The distribution of the d' difference scores suggests that at an **interindividual level**, there was significant **variability in the sensitivity to the phonological proximity** of distractors. While some participants were consistently misled by the distractors, others showed better resistance to phonological proximity, suggesting that their memory representations had a high level of phonological precision. Some participants displayed **reverse profiles** indicating that the probes in the moderate similarity condition may have occasionally acted as recognition cues.
- **A phonological similarity gradient appears to be a promising variable for the measurement of STM precision in the verbal domain.**

References

- Burnett Heyes, S., Zokaei, N., van der Staaij, I., Bays, P. M., & Husain, M. (2012). Development of visual working memory precision in childhood. *Developmental Science*, 15(4), 528-539.
- Joseph, S., Iverson, P., Manohar, S., Fox, Z., Scott, S. K., & Husain, S. (2015). Precision of working memory for speech sounds. *The Quarterly Journal of Experimental Psychology*, 68(10), 2022-2040.
- Zokaei, N., Gorgoraptis, N., Bahrami, B., Bays, P. M., & Husain, M. (2011). Precision of working memory for visual motion sequences and transparent motion surfaces. *Journal of vision*, 11(14), 1-18.

Contact

Bouffier Marion
 PhD Student F.R.S-FNRS
 Université de Liège
 Marion.bouffier@ulg.ac.be