

# Learning multiple pronunciation variants of French novel words with orthographic forms

Malte Viebahn, Audrey Bürki, James McQueen, Mirjam Ernestus, and Uli Frauenfelder

## Introduction

In conversational speech, the vowel schwa is often omitted. For example, the French word *chemin* (road) is often produced as *ch'min*. It has been argued that orthographic information plays an important role in how listeners learn and store such phonological variants.

Previous research has shown that orthographic information can induce the generation of schwa variants of schwaless novel words in word production<sup>[1]</sup>. In the present study, we investigate whether orthographic information can also generate schwa variants of schwaless words in word recognition.

## Design

We investigated this question using an artificial lexicon paradigm in which we taught participants novel words that either did or did not contain a schwa.

In an orthographic exposure phase, the words without schwa were presented with a printed form that either did or did not contain the letter <e>.

		Schwa presence	
		With schwa	No schwa
Spelling	with <e>	/pəlim/ <pelime>	/plim/ <pelime>
	no <e>	X	/plim/ <plime>

## Participants & Materials

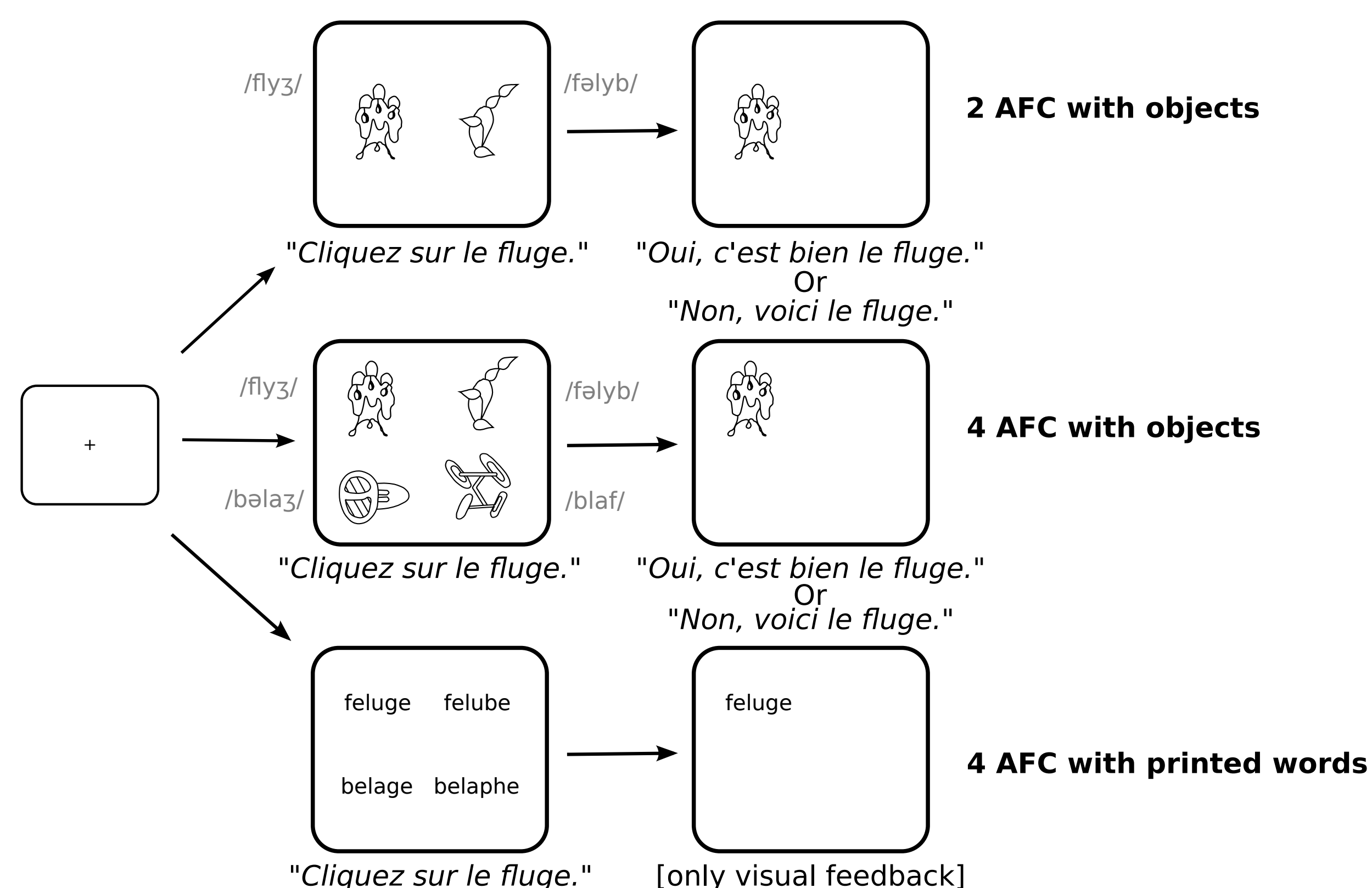
36 native French speakers from the University of Geneva.

40 novel French words consisting of 20 minimal pairs (e.g. *feluge* - *felube*).  
40 black-and-white drawings of non-existing objects.

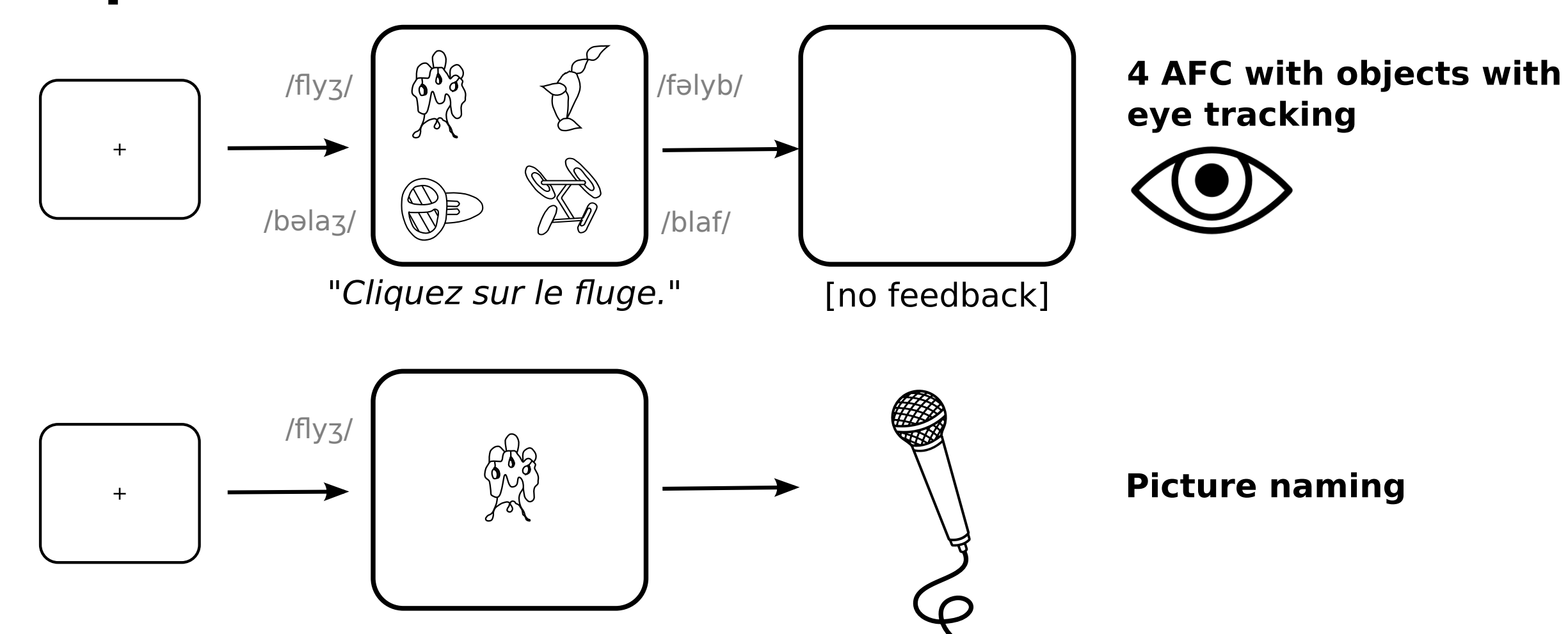
## Procedure

Day 1	Day 2	Day 3
2 AFC with objects	2 AFC with objects	2 AFC with objects
4 AFC with objects	4 AFC with objects	4 AFC with objects
4 AFC with printed words	4 AFC with printed words	4 AFC with printed words
4 AFC with objects		TEST: 4 AFC with objects + eye tracking
4 AFC with printed words		TEST: Picture naming

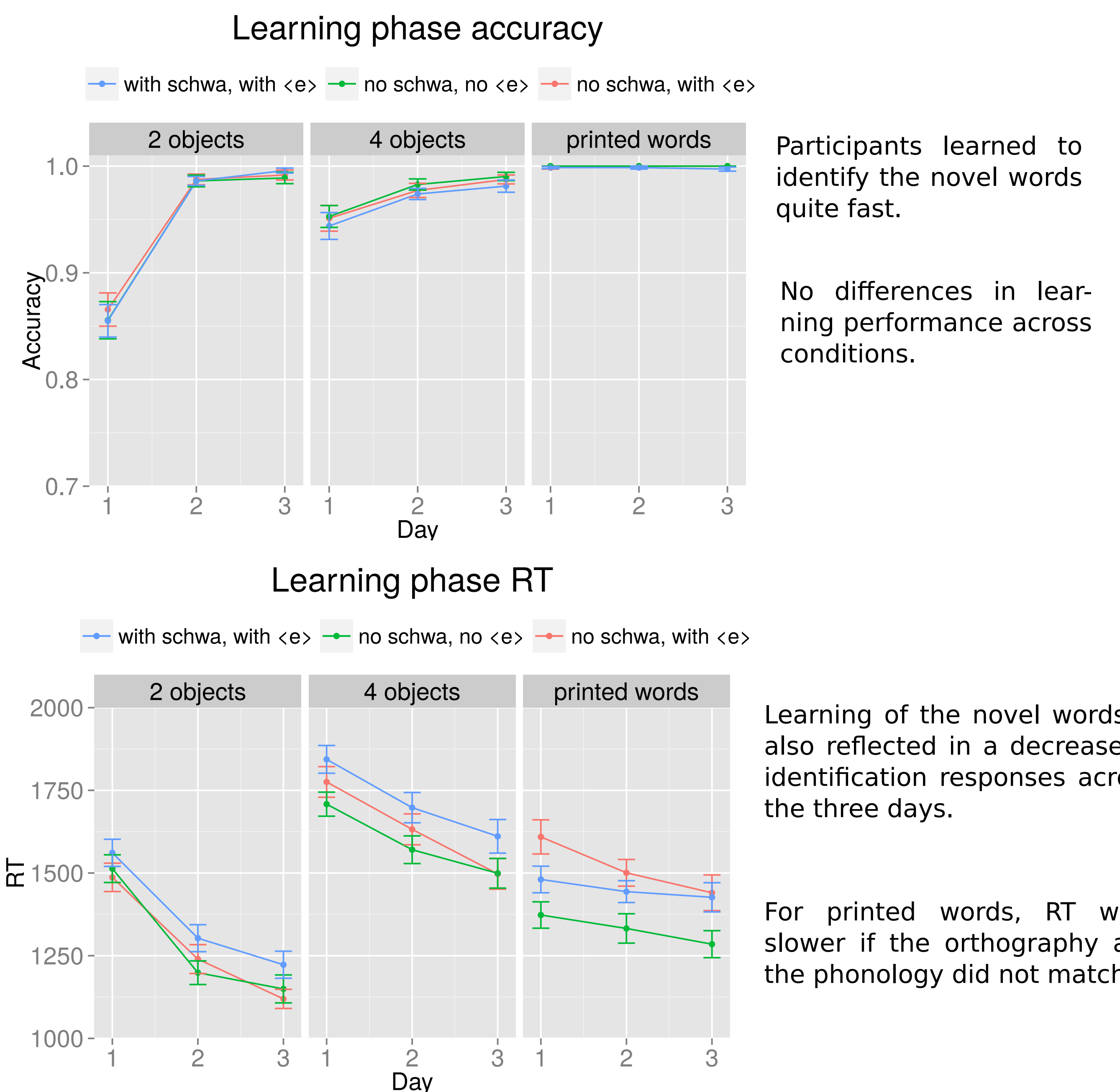
### Learning phase tasks



### Test phase tasks



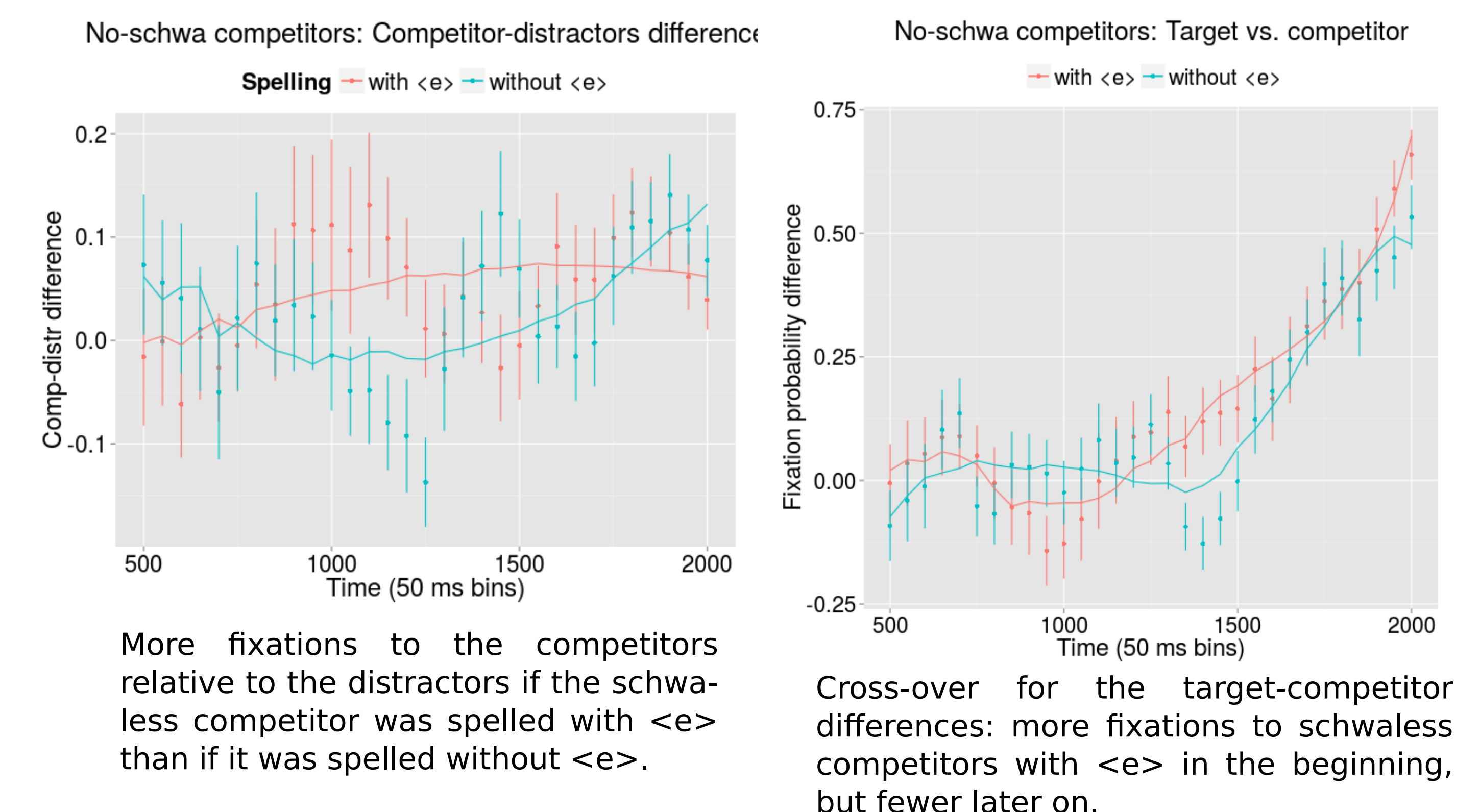
## Learning phase results



## Test phase results

### Eye movements

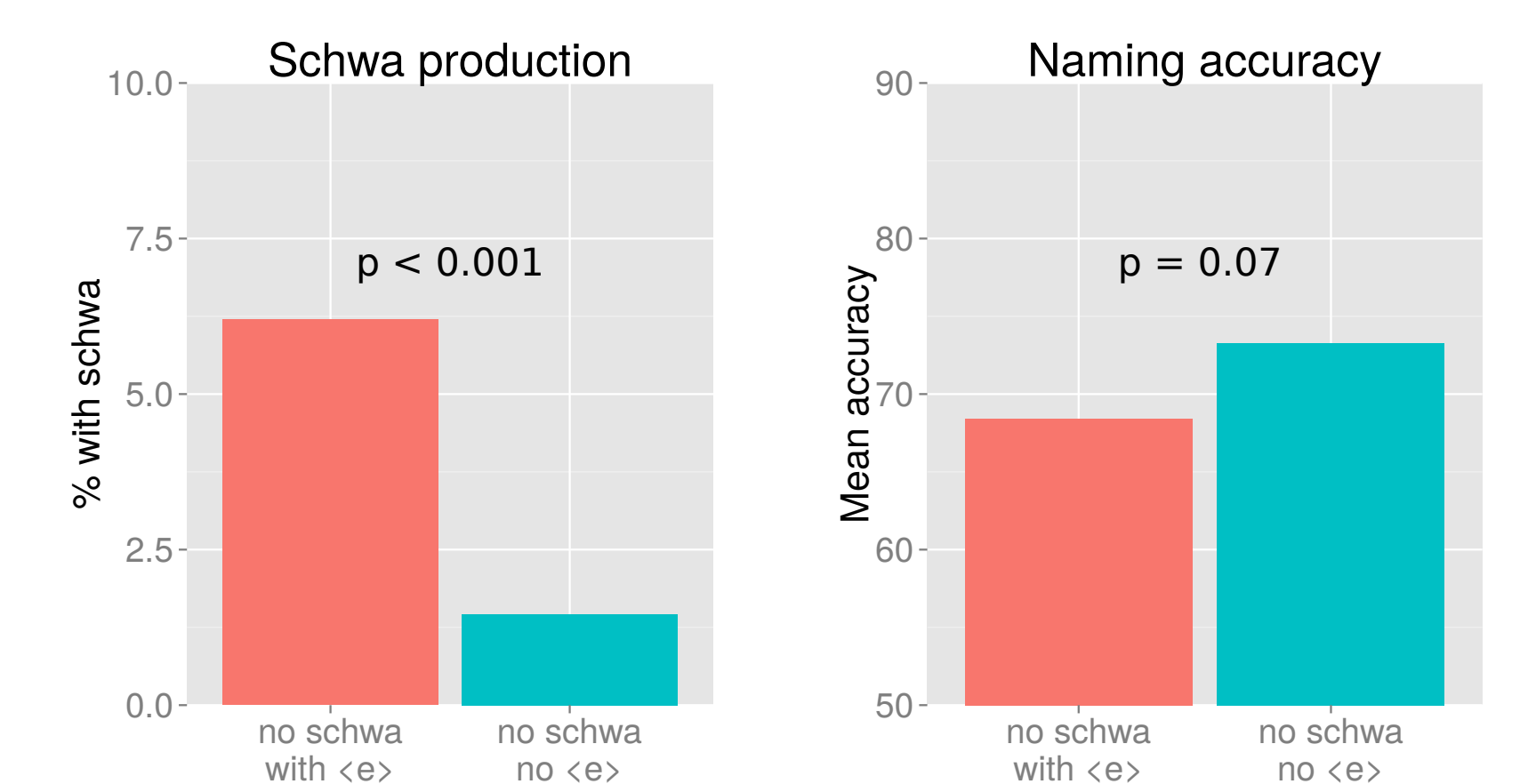
Fixation probabilities were modeled using Growth Curve Analysis<sup>[2]</sup>.



### Picture naming

Schwaless words spelled with <e> were more likely to be produced with schwa than schwaless words spelled without <e>.

Trend suggesting higher accuracy for schwaless words spelled without <e> than with <e>.



## Discussion & conclusions

Listeners were able to learn 40 novel French words quite quickly. Inconsistent orthographic information slowed down processing during learning but did not decrease accuracy.

More importantly, we found evidence for more lexical competition if schwaless words were spelled with <e> than without <e> during production and recognition.

These results suggest that learners can generate phonological variants based on orthographic information. These representations engage in lexical competition during speaking and listening.

## References

- [1] Buerki, A., Spinelli, E., & Gaskell, M. G. (2012). A written word is worth a thousand spoken words: The influence of spelling on spoken-word production. *Journal of Memory and Language*, 67(4), 449-467.
- [2] Mirman, D., Dixon, J. A., & Magnuson, J. S. (2008). Statistical and computational models of the visual word paradigm: Growth curves and individual differences. *Journal of Memory and Language*, 59(4), 475-494.