

## **Do ‘verre’ and ‘vert’ ‘share’ the same phonological representation?**

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### **Context, aim and methods**

Psycholinguistic models of speech assume that each word is stored at multiple linguistic levels in the brain and in particular at the semantic, orthographic and phonological levels (Dell, 1986; Levelt et al, 1999). However, the set of representations of two distinct words may overlap, this is in particular the case of homophones. Today, it is still unclear how homophones are represented in the mental lexicon and different models account for various experimental results. For example, according to Levelt et al (1999), homophones have distinct representations at the conceptual, lemma and orthographic levels but share the same phonological representation.

In line with our previous work (Caudrelier et al., 2018; Caudrelier et al., 2019) we propose to test the hypothesis that homophones have different phonological representations. To do so, we plan to investigate whether when people learn to modify the production of the vowel in a word such as “vert”, this would then affect the production of “verre”. We will test this hypothesis using an experimental paradigm called “transfer of auditory-motor learning” consisting in changing the way a speaker produces a vowel by training him/her with an auditory perturbation. The results and the methods will be discussed with regards to more classical methods used in psycholinguistic to address the same question (effects of word frequency, duration etc; see e.g. Carramaza et al., 2001) and with regards to models of speech production).

### **Objectives of the internship**

- Review related work (a first list of references will be provided as a starting point)
- Design the experiment
- Recruit subjects and conduct the experiment
- Analyze the results, using statistical methods such as ANOVA or Linear Mixed Model.

The supervisors and collaborators will provide support and material for each step.

### **Applicants**

The applicants should have programming skills (Matlab or equivalent, and ideally R as well) to design the experiment, process and analyze data.

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Caramazza, A., Costa, A., Miozzo, M., & Bi, Y. (2001). The specific-word frequency effect: implications for the representation of homophones in speech production. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 27(6), 1430.

Caudrelier, T., Schwartz, J., Perrier, P., Gerber, S., & Rochet-Capellan, A. (2018). Transfer of learning: What does it tell us about speech production units? *Journal of Speech Language and Hearing Research*, 61(7), 1613–1625.

Caudrelier, T., Ménard, L., Perrier, P., Schwartz, J., Gerber, S., Vidou, C., & Rochet-Capellan, A. (2019). Transfer of sensorimotor learning reveals phoneme representations in preliterate children. *Cognition*, 192(11), 103973. <https://doi.org/10.1016/j.cognition.2019.05.010>