

# Affrication Patterns and Perceptual Tendencies in Canadian and European French

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**Overview:** In Canadian French, coronal stops affricate (/t, d/ → [t͡s, d͡z]) before high front vowels and glides (/i, y/ and /j, ɥ/)—e.g. *petit* “small” [pət͡si]. Non-allophonic affricates also exist and they lack the same environmental restrictions (e.g. *tsé* “y’know”, *mouche tsé-tsé* “tse-tse fly”), but they are rare. Our paper is an experimental investigation of how these affrication patterns affect French speakers’ perceptual tendencies. Results from Can. French speakers (n=13) in Experiment 1 suggest that the rareness of non-high-front vowels after affricates biases them towards hearing high front vowels after affricates. In Experiment 2, their perception of an affricate-stop continuum was more categorical before the non-high-front /e/ (where stops and affricates are contrastive) than before the high front /i/. Preliminary results on an exploratory sample of European French speakers living in Quebec (n=6) suggest a similar effect in Experiment 1 but not Experiment 2.

**Previous Research:** Experiment 1 builds on findings that listeners are biased against perceiving sound sequences that are phonotactically impossible in their language (Massaro & Cohen 1983, Dupoux et al. 1999). Experiment 2 builds on established effects of categorical perception: a sharper change in perception from one sound to another if they are different phonemes (Liberman et al. 1957).

**Experiment 1** involved a 10-step vowel continuum from [e] to [i], presented after either a stop or an affricate in a French pseudo-word (e.g. [fot\_] and [fot͡s\_]). Participants identified whether they heard “é” or “i” at the end. A repeated measures ANOVA on the Can. French speakers’ results found that they were much less likely to identify hearing an “é” after an affricate ( $F(1,12)=51.28, p<0.001$ ), as seen in Figure 1. Preliminary results from the Eur. French speakers in Quebec suggest a similar effect.

**Experiment 2** involved a 10-step consonant continuum from [t͡s] to [t] (and [d͡z] to [d]), presented before either a high front vowel [i] or a mid front vowel [e] in a French pseudo-word (e.g. [fo\_i] and [fo\_e]). Participants identified whether they heard a “ts”/“dz” sound or a “t”/“d” sound. For the Can. French speakers, there was no overall effect of following vowel on which consonant they identified hearing ( $F(1,12)=0.002, p=0.97$ ), but there was an interaction between the following vowel and step on the continuum ( $F(1,12)=2.74, p<0.001$ ) due to the steeper slope when followed by [e]. The affricate-stop continuum was perceived more categorically when the two sounds are contrastive, in accordance with previous findings on categorical perception. A similar effect is *not* suggested in the Eur. French preliminary results.

**Conclusion:** Experiment 1 results suggest that in perception speakers use awareness of how common a sound sequence is, rather than just whether it is phonotactically possible. Experiment 2 results suggest categorical perception effects (sharp change in perception when across phoneme boundaries) for the same pair of sounds when listening to them in different environments.

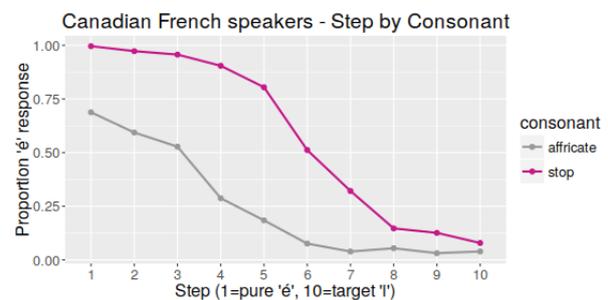


Figure 1: Vowel Continuum (Exp. 1)

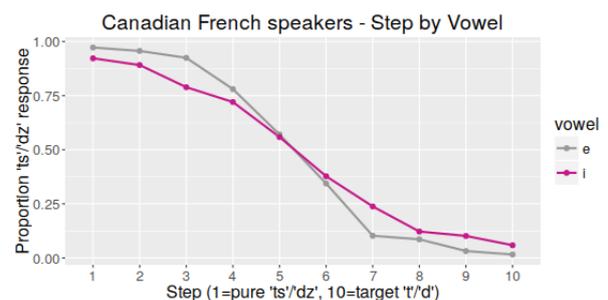


Figure 2: Consonant Continuum (Exp. 2)

## References:

- Dupoux, Emmanuel, Kazuhiko Kakehi, Yuki Hirose, Christophe Pallier, & Jacques Mehler. 1999. "Epenthetic vowels in Japanese: A perceptual illusion?". In *Journal of Experimental Psychology: Human Perception and Performance*, 25 (6). 1568-1578.
- Liberman, Alvin M., Katherine Safford Harris, Howard S. Hoffman, & Belver C. Griffith. 1957. "The discrimination of speech sounds within and across phoneme boundaries". In *Journal of Experimental Psychology*, 54 (5).
- Massaro, Dominic W., & Michael M. Cohen. 1983. "Phonological context in speech perception". In *Perception & Psychophysics*, 34 (4). 338-348.