

Dialect differences in the temporal characteristics of vowels:

A comparison of standard (Parisian) and Swiss French

Joanne L. Miller¹, François Grosjean², Jean-Yves Dommergues³, and Michèle Mondini¹

¹Northeastern University, Boston, MA.; ²University of Neuchâtel, Switzerland; ³University of Paris 7, France

BACKGROUND

- The use of temporal (duration) information to distinguish vowels varies not only across languages, but also across dialects. A case in point is the two French dialects, **standard (Parisian) French** and **Swiss French**.
- The phonological systems of **standard French** and **Swiss French** are considered to be quite similar (Walter, 1982), but they differ in the role duration plays to distinguish pairs of vowels (Métral, 1977).
- Vowel duration plays only a minor role in **standard French**.
 - No vowel pairs are distinguished by temporal information alone.
 - There is only one clear case of a vowel pair, namely, /ɔ/ versus /o/ (e.g. *cotte, côte*), that is distinguished by temporal as well as spectral information.
- In contrast, vowel duration plays an important role in **Swiss French**.
 - Some vowel pairs, such as /i:/ versus /i/ (e.g. *vie, vit*) and /a:/ versus /a/ (e.g. *voie, voix*), are distinguished by temporal information alone.
 - Other vowel pairs, such as /ɔ/ versus /o/ (e.g. *cotte, côte*) are distinguished by temporal as well as spectral information.
- Earlier research has shown that **standard French** and **Swiss French** speakers perceive the /ɔ/ versus /o/ contrast differently, in line with the differential importance of vowel duration in the two dialects:
 - Using a trading relation paradigm and covarying spectral and temporal information, Gottfried and Beddor (1988) found that **standard French** speakers used only spectral information when identifying /ɔ/ versus /o/, ignoring temporal information.
 - Miller and Grosjean (1997) replicated this finding, but also found that **Swiss French** speakers used temporal as well as spectral information when identifying /ɔ/ versus /o/.

CURRENT STUDY

- In the current study, we examined whether the perceptual difference across dialects found in Miller and Grosjean (1997) is reflected in the specific temporal acoustic characteristics of /ɔ/ versus /o/ in the two dialects.
- Specifically, we asked whether the temporal difference between the two vowels is larger in **Swiss French** than in **standard French**.

Subjects

- Four male and four female native speakers of **standard French** were tested in Paris, France.
- Four male and four female native speakers of **Swiss French** were tested in Neuchâtel, Switzerland.

Stimulus Material

- Target stimuli were four monosyllabic CVC word pairs containing the two target vowels /ɔ/ and /o/: *cotte- côte; top-taube; pomme-paume; sotte-saute*.

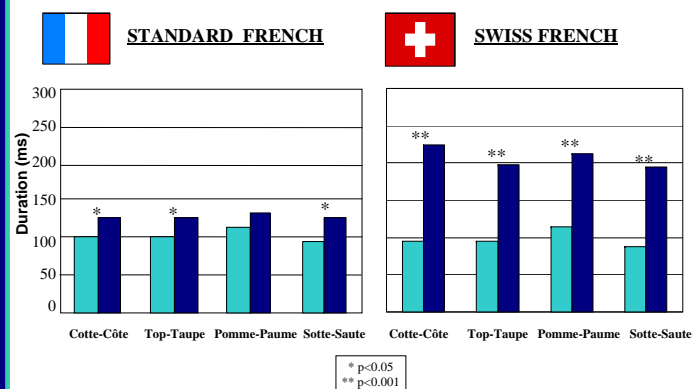
Testing Procedure

- Subjects produced each of the eight target words, interspersed with filler words, ten times. They produced the words in the neutral sentence frame, “*Je dis.....*”.
- Their speech was recorded on tape, sampled into a PC, and analyzed using CSL software (Kay Elemetrics Corp).

Measuring Procedure

- Vowel duration was measured for each target word from the onset of periodic energy following the word-initial voiceless consonant to the onset of closure for the final stop consonant (*cotte, côte, top, taube, sotte, saute*) or to nasal onset (*pomme, paume*).

RESULTS



Mean vowel duration (in ms) across the eight talkers within each dialect, for each target word, is shown in the graphs above.

Standard French

- All four word pairs were temporally differentiated; three of these differences reached statistical significance.
- The overall vowel duration difference between /ɔ/ and /o/ was **20 ms**.

Swiss French

- All four word pairs were temporally differentiated; all differences reached statistical significance.
- The overall vowel duration difference between /ɔ/ and /o/ was **110 ms**.

CONCLUSIONS

- The vowels /ɔ/ and /o/ are distinguished by duration in both **standard French** and **Swiss French**, as reported in the literature (Métral, 1977; Walter, 1982).
- However, the difference in duration between the two vowels is considerably larger and is more robust in **Swiss French** than in **standard French**.
- Thus the perceptual dialect difference reported by Miller and Grosjean (1997), using the trading relation paradigm, appears to reflect not only a difference in the role of vowel duration in the overall phonological systems of the two dialects, but also a difference in the specific temporal acoustic characteristics of /ɔ/ and /o/ in the dialects.

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