A Quantitative Analysis of Diphthongization in Montreal French

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Montreal French corpora

• 1971: 120 speakers (Sankoff et al. 1976)
• 1984: 60 original plus 12 younger speakers (Thibault and Vincent 1990)
• 1995: 12 original speakers plus 2 of younger 1984 speakers (Vincent et al. 1995)
  – Allow for both trend and panel comparisons
Today’s talk

I. Presentation of Montreal French vowel system based on acoustic analysis
II. Changes in the community
III. Changes across speakers’ lifetimes
Our sample

• 5 panel speakers
  – All recorded in 1971, 1984, 1995
  – 3 men, 2 women
  – All in their 20s in 1971

• 8 trend speakers
  – 4 recorded in 1971, 4 recorded in 1984
  – Each sample matched for age, sex, class
Today’s talk

I. Presentation of Quebec French vowel system based on acoustic analysis
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III. Changes across speakers’ lifetimes
Vowel inventory: oral vowels

- **i**: qui ‘who’
- **u**: coup ‘blow’
- **y**: lu ‘read’
- **ø**: je ‘I’
- **a**: patte ‘paw’
- **æ**: faite ‘fact’
- **ε**: fête ‘party’
- **e**: jeu ‘game’
- **ɛ**: faite ‘fact’
- **œ**: jeune ‘young’
- **œ**: pâte ‘pasta’

Examples:
- qui ‘who’
- lu ‘read’
- coup ‘blow’
Closed syllable laxing

- *qui* ‘who’
- *quitte* ‘leave’
- *lu* ‘read’
- *lutte* ‘fight’
- *coup* ‘blow’
- *coupe* ‘cut’
Measuring short oral vowels
All speakers’ short vowel means

- N = 5 tokens per vowel per speaker
- Log mean normalized (Nearey 1977)
- Circled pairs differ significantly on F1 & F2 axes (p < .001)

partie ‘part’

plus ‘more’

beaucoup ‘a lot’

petite ‘little’ (f.)

couples ‘couples’

plus’ ‘more’
Vowel length: Two sources

- Compensatory lengthening due to historical loss of /s/ or cluster simplification
- Vowels preceding /R/ and the voiced fricatives [z, v, ʒ, vR]
Length manifests as diphthongization

**j’ai ‘I have’**

**mêmes ‘same’**

**nouvelle ‘new’** (f.)

**glaise ‘clay’**

**critère ‘criterion’**

(MC 33-y-o male)

Bold symbols: glide targets

Ghislain N., 13–84
Measuring long vowels
All speakers’ means (including long vowels)

- N = 15 tokens per vowel per speaker
- Log mean normalized (Nearey 1977)
All speakers’ means (including long vowels)

Circled pairs differ significantly on F1 axis (p < .001)
Quality of the offglide

• Walker (1984): “a following semivowel that agrees with [the] vowel in frontness and rounding”
  – e.g. /ɛː/ [ɛj], /œː/ [œy], /ɑː/ [aw]

• Dumas (1981): “the offglide is closed and raised toward the homorganic closed vowel”
  – e.g. /ɛː/ [ɛi], /œː/ [aɪ], /ɑː/ [aʊ]
All speakers’ means: nuclei & offglides

Bold symbols: glide targets
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Are these vowel alternations…

• …a stable feature of the dialect?
• …an ongoing change?
• Our focus:
  – /œː/ e.g. coeur, creuse
  – /ɛː/ e.g. frère, glaise
  – /ɑː/ e.g. tard, âge
Is the community changing?

<table>
<thead>
<tr>
<th>Nucleus of /œ:/</th>
<th>Average F1 (Hz)</th>
<th>N</th>
</tr>
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<tbody>
<tr>
<td>1971 trend speakers</td>
<td>615</td>
<td>63</td>
</tr>
<tr>
<td>1984 trend speakers</td>
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</table>

\[ p = 0.067 \]

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<td>61</td>
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\[ p < 0.005 \]

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\[ p < 0.002 \]
Is the community changing?

• Average F1 of nucleus lowers significantly (p < 0.05) between 1971 and 1984 trend speakers:
  – i:, ε:, α:

• Average F1 of nucleus lowers, but not significantly, between 1971 and 1984 trend speakers:
  – all other long vowels
Today’s talk

I. Presentation of Quebec French vowel system based on acoustic analysis

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Are individuals changing? – /ɛ:/

• 2/5 panel speakers have significantly lowered their /ɛ:/ nucleus between 1971 and 1995
  – Claire R.: upper middle class F
    1971: 504 Hz, N = 15; 1995: 708 Hz, N = 14; p < 10^{-6}
  – Paul G.: working class M
    1971: 466 Hz, N = 48; 1995: 578 Hz, N = 16; p < 0.0002

• 1 panel speaker has significantly raised his /ɛ:/ nucleus between 1971 and 1995
  – Charles P.: upper middle class M
    1971: 533 Hz, N = 16; 1995: 504 Hz, N = 17; p < 0.05
Are individuals changing? – /ɛ:/

Claire R., 49-71, 84, 95
Are individuals changing? – /ɛ:/

[Image of a graph with labels and data points for 1971, 1984, and 1995]
Are individuals changing? – /ɛ:/
Are individuals changing? – /œ:/

- 2/5 panel speakers have significantly lowered their /œ:/ nucleus between 1971 and 1995
  - The same two who significantly lowered /ɛ:/
  - Claire R.: upper middle class F
    1971: 535 Hz, N = 15; 1995: 672 Hz, N = 15; p < 10^{-4}
  - Paul G.: working class M
    1971: 495 Hz, N = 25; 1995: 611 Hz, N = 15; p < 10^{-4}
Are individuals changing? – /ɔː:/
Are individuals changing? — /œː/
Are individuals changing? – /ɑ:/

• 3/5 panel speakers have significantly lowered their /ɑ:/ nucleus between 1971 and 1995
  – Lysiane B.: working class, upwardly mobile F
    1971: 702 Hz, N = 15; 1995: 818 Hz, N = 11; p < 0.05
  – Ghislain N.: middle class M
    1971: 645 Hz, N = 8; 1995: 750 Hz, N = 16; p < 0.005
  – Claire R.: upper middle class F
    1971: 516 Hz, N = 15; 1995: 705 Hz, N = 15; p < 10⁻⁴
Are individuals changing? – /α:/

Lysiane B., 7–71, 84, 95

1971
1984
1995
Are individuals changing? – /ɑː/
Are individuals changing? – /ɑː/
Summary of longitudinal findings

• /ɛ:/
  – Lowering is progressing through the community, and some malleable speakers follow the change.

• /œ:/
  – Lowering has been arrested in the community, but some malleable speakers perpetuate it as they age.

• /α:/
  – Lowering is progressing through the community, but longitudinally changing speakers show a different social profile than for the other two changes.
Provisional conclusions

• /ɑː/-lowering is a change from above.
  – Previous work (Kemp & Yaeger-Dror 1991) has shown stigmatization of raised back /ɔː/ variant of /ɑː/
  – This explains Lysiane’s change in the direction of the community, as well as Paul’s lack of involvement in the change
Provisional conclusions

• /ɑː/-lowering is a change from above.
• /ɛː/-lowering is a change from below.
  – Particularly malleable speakers follow it as they age.
Provisional conclusions

- /ɑː/-lowering is a change from above.
- /ɛː/-lowering is a change from below.
- /œː/-lowering is an older, stabilized change.
  - Cedergren, Clermont, & Côté (1981)’s apparent time analysis leads them to conclude that /œː/ diphthongization began at least as early as 1930-1935.
  - Our malleable speakers are still pushing it forward.
Further research in progress

• /œː/-lowering may have stabilized, but we think we see a new change of /œː/ flattening.
  – Monophthongization in the lowered position
/œ:/ flattening

(LMC 15-y-o female)

un ordinateur
‘a computer’

fleur ‘flower’

comme une sœur pour moi
‘like a sister to me’
/œ:/ flattening

(WC 49-y-o male)
/œː/ flattening
Further research in progress

• /œː/-lowering may have stabilized, but we think we see a new change of /œː/ flattening.
  – Monophthongization in the lowered position

• Redefining lengthening environments
(MC 20-y-o male)

très bonne enregistreuse
‘very good recorder’

dépression nerveuse
‘nervous depression’

ça fait peur aux gens
‘that scares people’

des longueurs
‘long periods’

Offglides are bold symbols
(same speaker, 13 years later (age 33))

Offglides are bold symbols
(same speaker, 11 years later (age 44))

Offglides are bold symbols

<table>
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<tr>
<th></th>
<th>/aC/</th>
<th>/aL/</th>
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<tr>
<td>m1</td>
<td>537</td>
<td>638</td>
</tr>
<tr>
<td>m2</td>
<td>1575</td>
<td>1431</td>
</tr>
<tr>
<td>m1-m2</td>
<td>-101</td>
<td>144</td>
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<tr>
<td>t</td>
<td>-2.15</td>
<td>1.76</td>
</tr>
<tr>
<td>P</td>
<td>&lt;0.025</td>
<td>&lt;0.05</td>
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Ghislain N., 13–95
Further research in progress

• /œː/-lowering may have stabilized, but we think we see a new change of /œː/ flattening.

• Redefining lengthening environments: less lowering of /œː/ in…
  – …morphologically complex words?
    • luxueuse ‘luxurious (f.)’ (cf. luxueux (m.))
    • peuvent ‘can-3pl’ (cf. peut (1sg))
  – …words that end in non-[R] lengthening consonants?
    • luxueuse, peuvent, œuvre
    • Santerre & Millo (1978)
Further research in progress

- /œ:/-lowering may have stabilized, but we think we see a new change of /œ:/ flattening.
- Redefining lengthening environments
- Examining the relationship between duration and diphthongization
The take-home message

• Speakers are capable of changing their vowel systems as they age…
  – …both with the community…
  – …and after the community has stabilized.

• Further work needs to be done to refine what we know about the phonological context of these changes.
Selected references


Thank you!

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- These slides available online at
  http://ling.upenn.edu/~laurel/NWAV37.pdf