

A Quantitative Analysis of Diphthongization
in Montreal French

Laurel MacKenzie

Gillian Sankoff

University of Pennsylvania

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

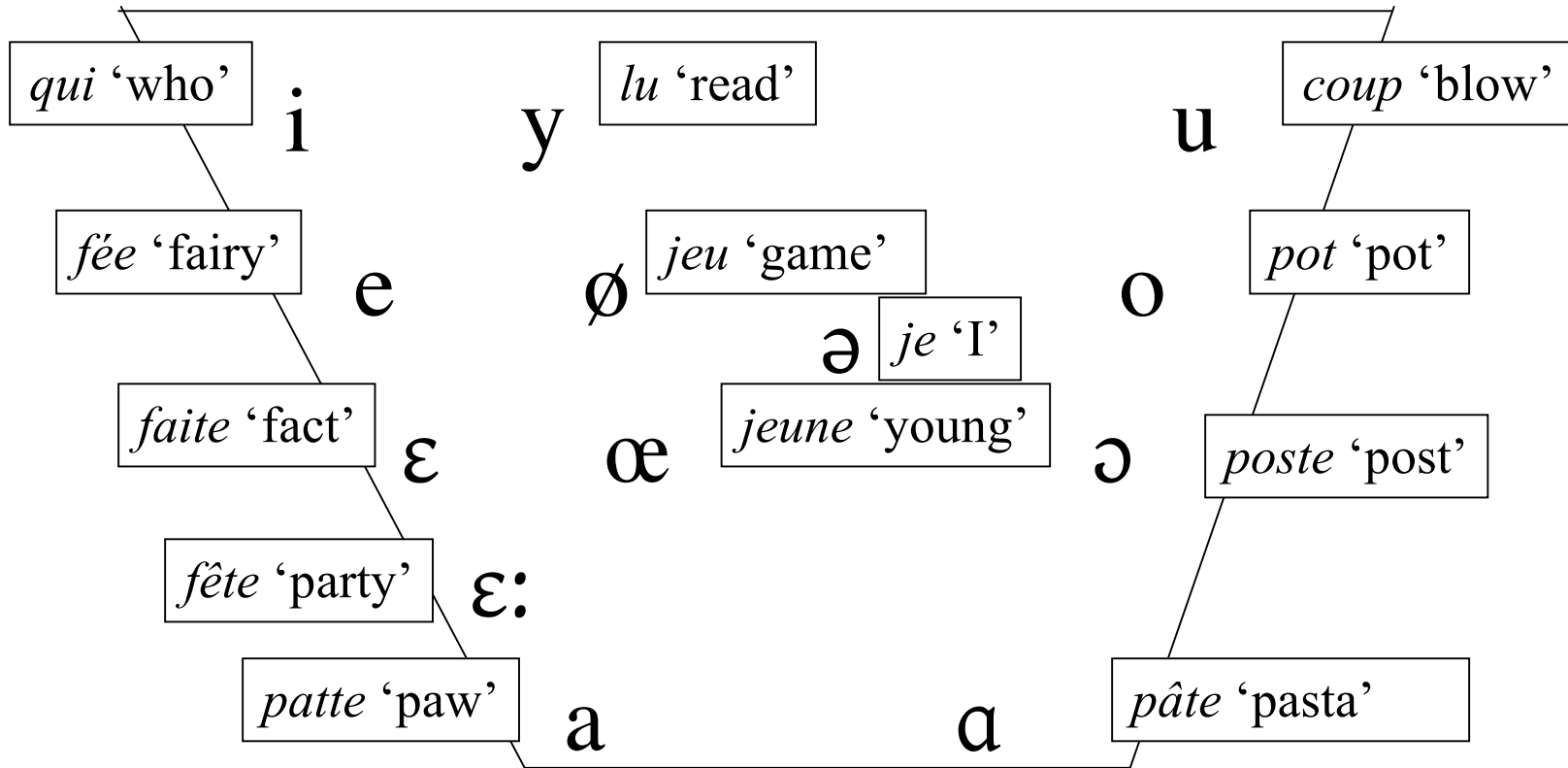
Our sample

- 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

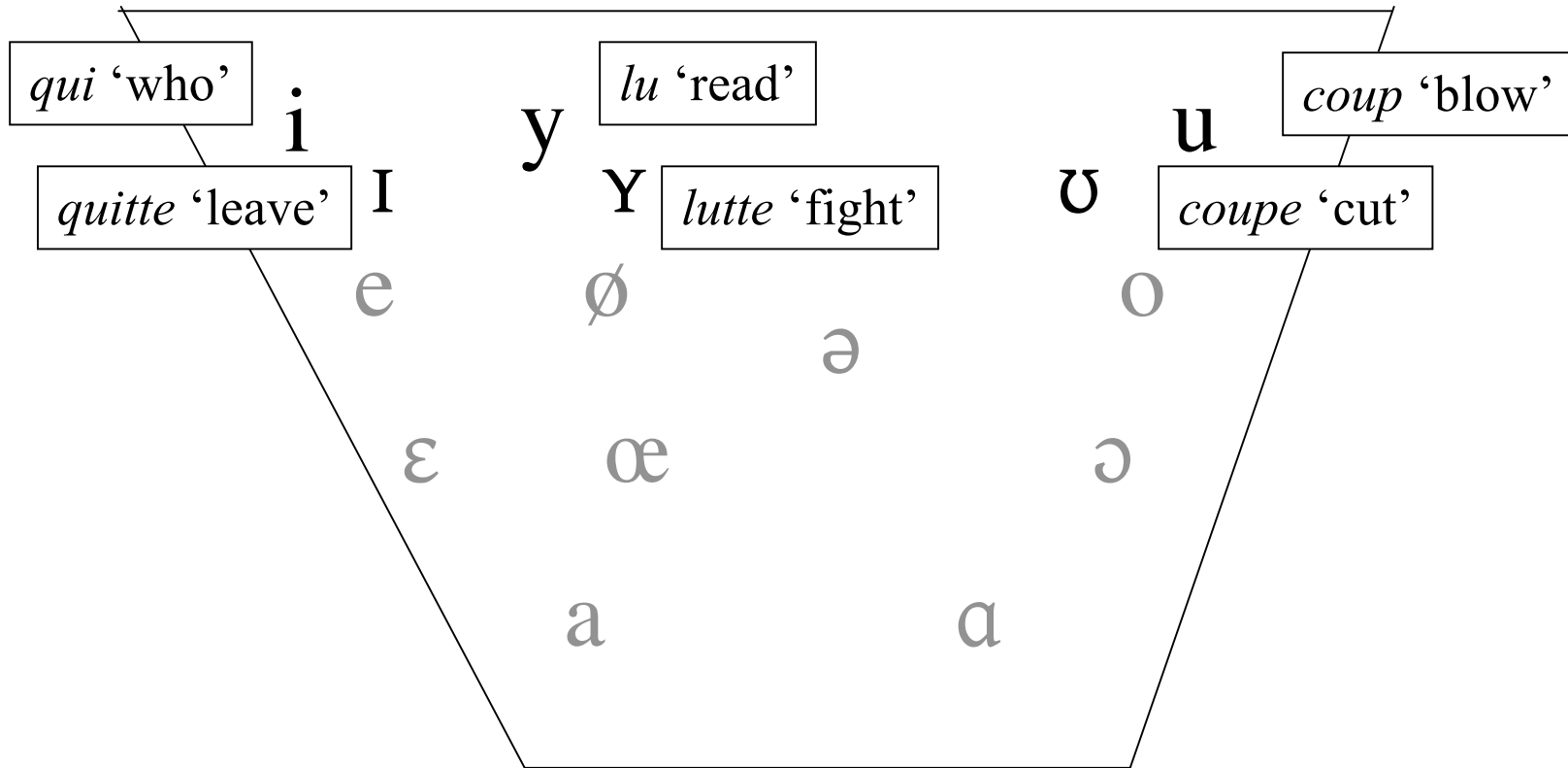
Today's talk

- I. Presentation of Quebec French vowel system based on acoustic analysis
- II. Changes in the community
- III. Changes across speakers' lifetimes

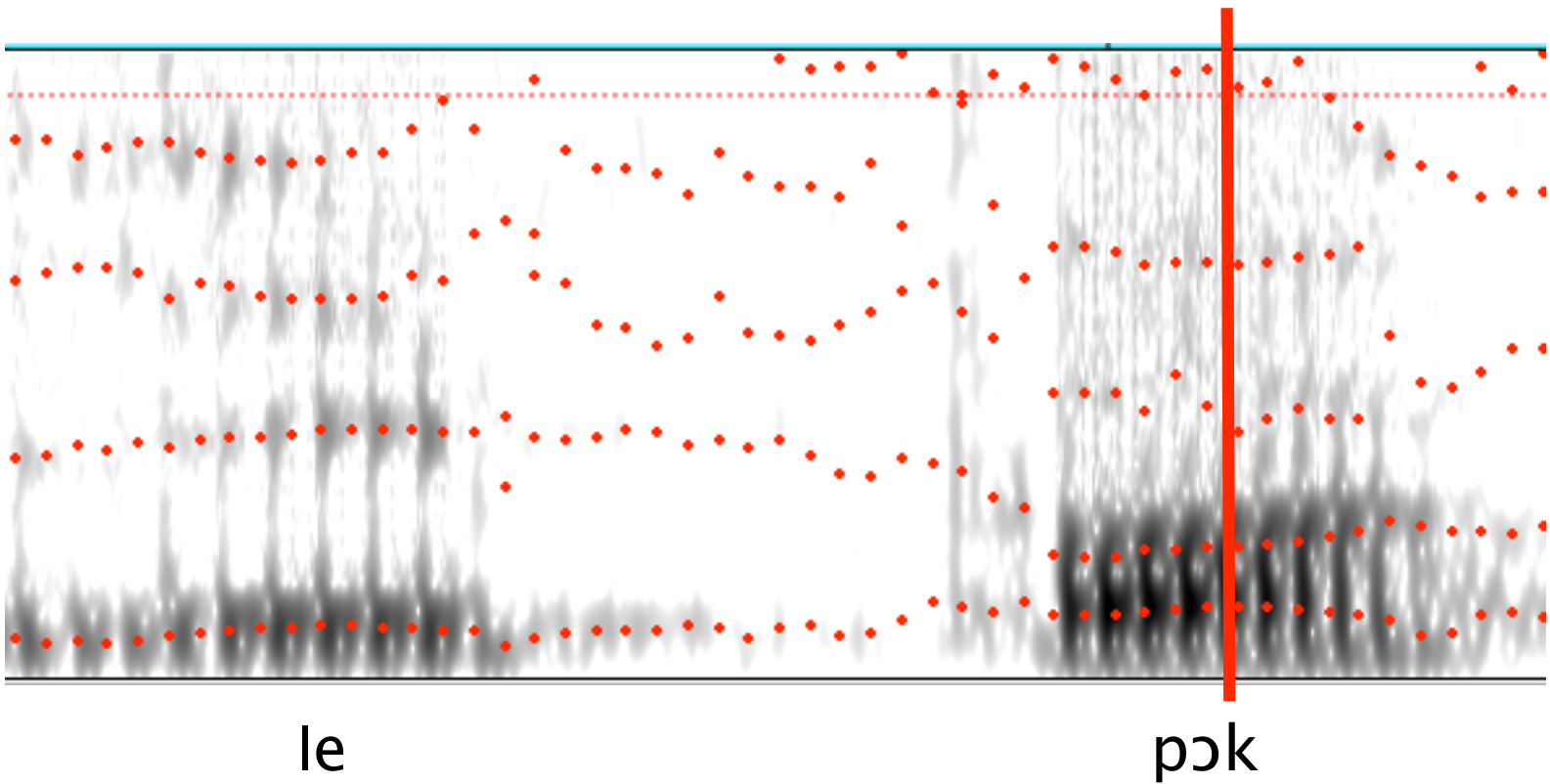
Vowel inventory: oral vowels



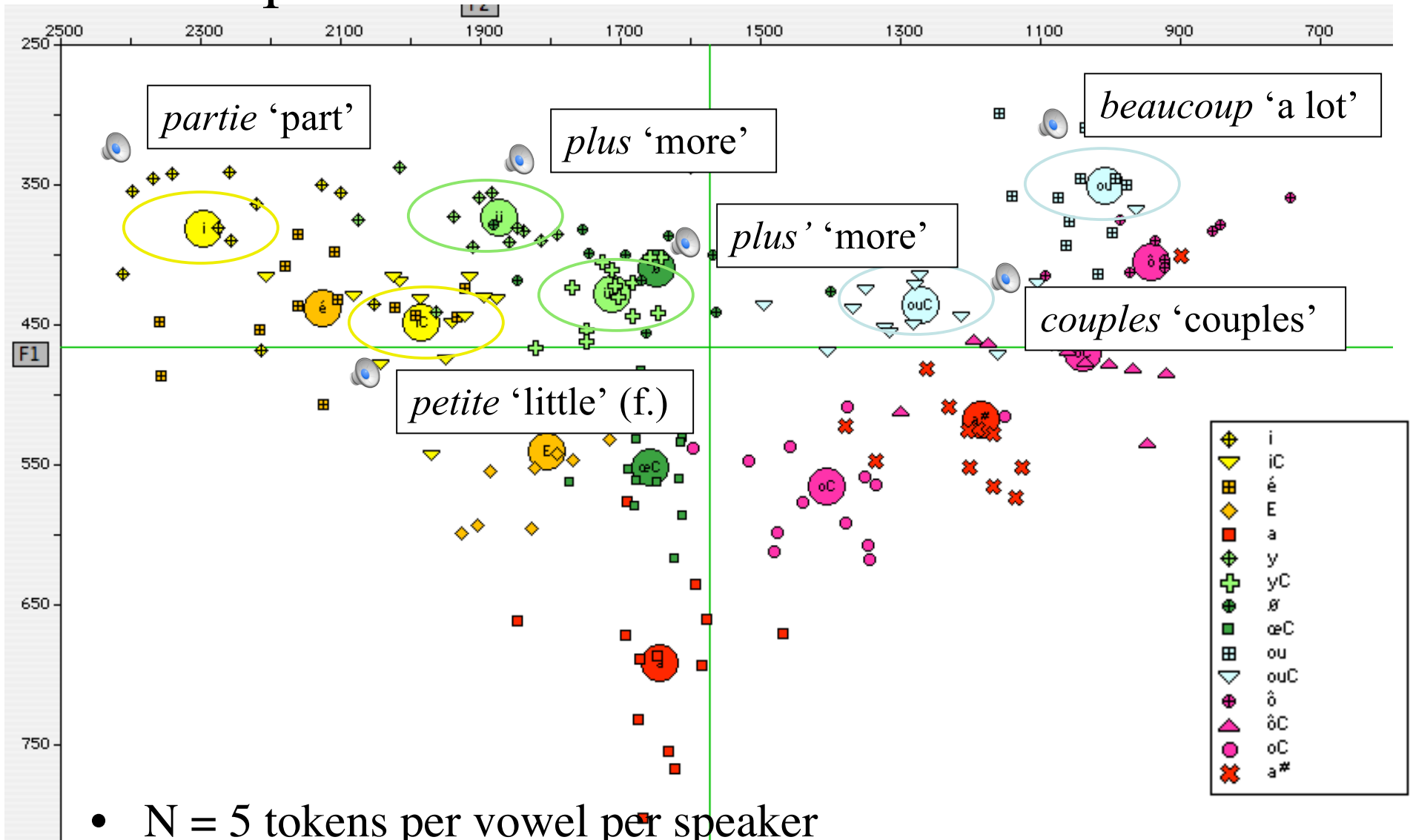
Closed syllable laxing



Measuring short oral vowels



All speakers' short vowel means

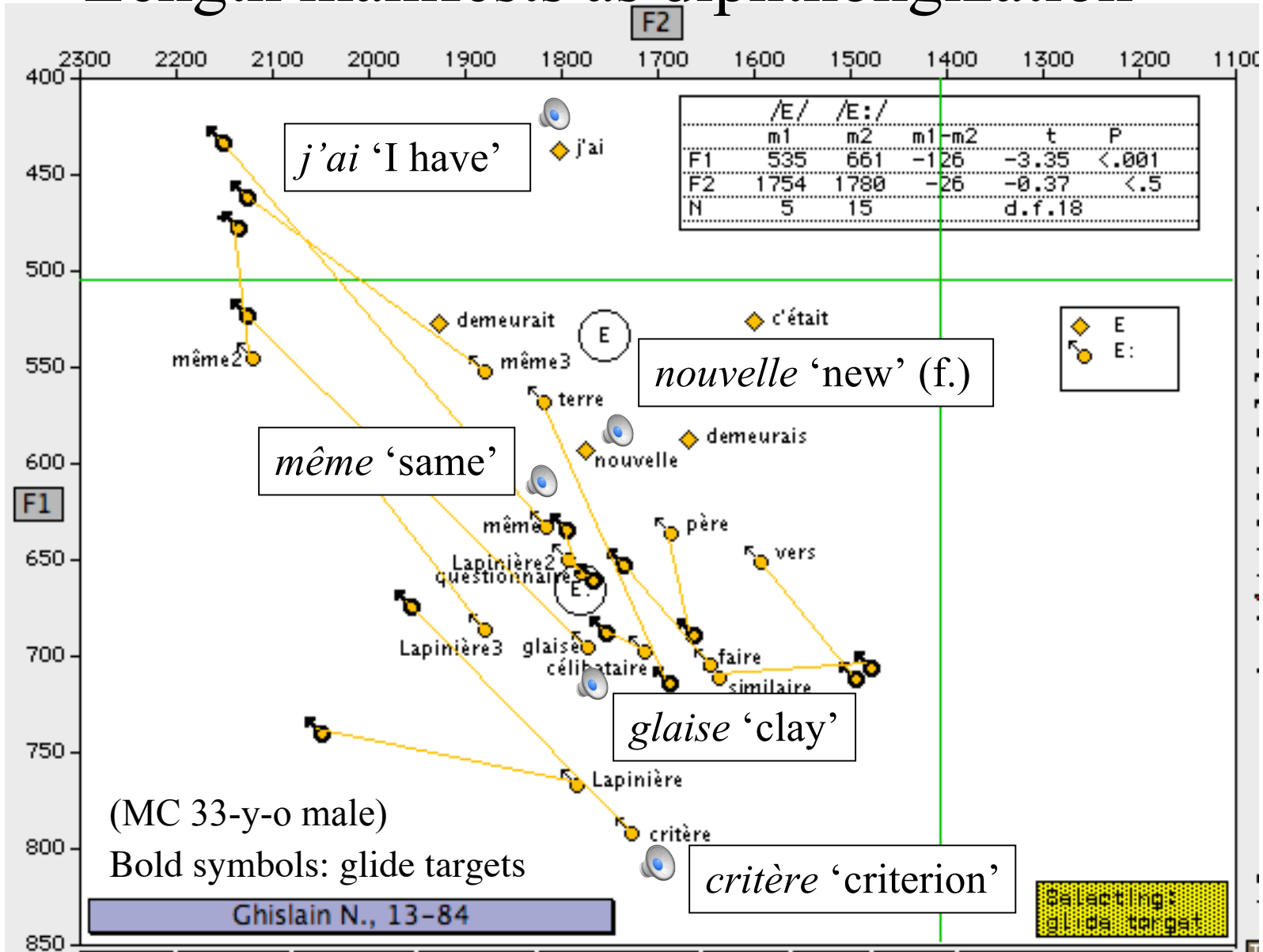


- N = 5 tokens per vowel per speaker
- Log mean normalized (Nearey 1977)
- Circled pairs differ significantly on F1 & F2 axes ($p < .001$)⁹

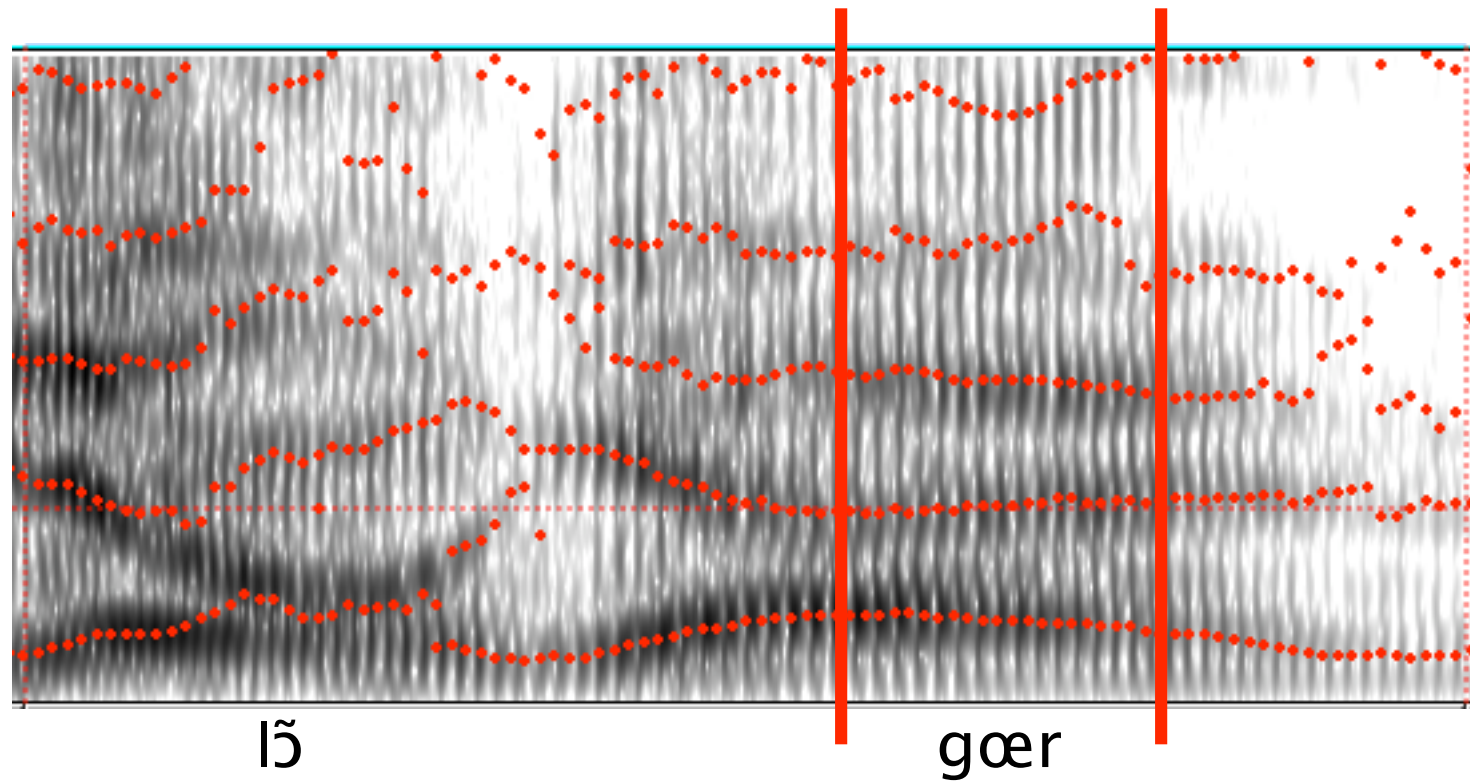
Vowel length: Two sources

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

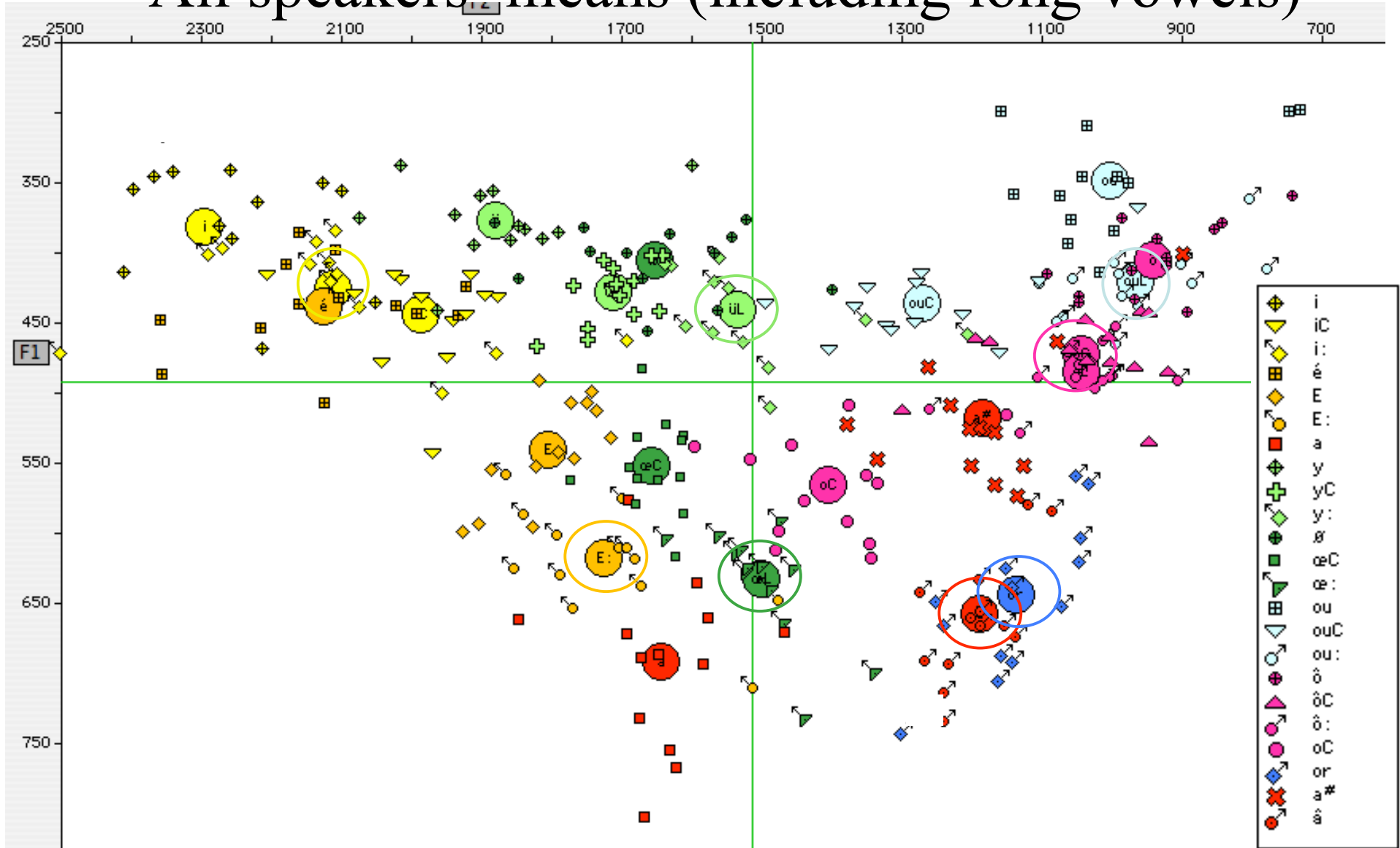
Length manifests as diphthongization



Measuring long vowels

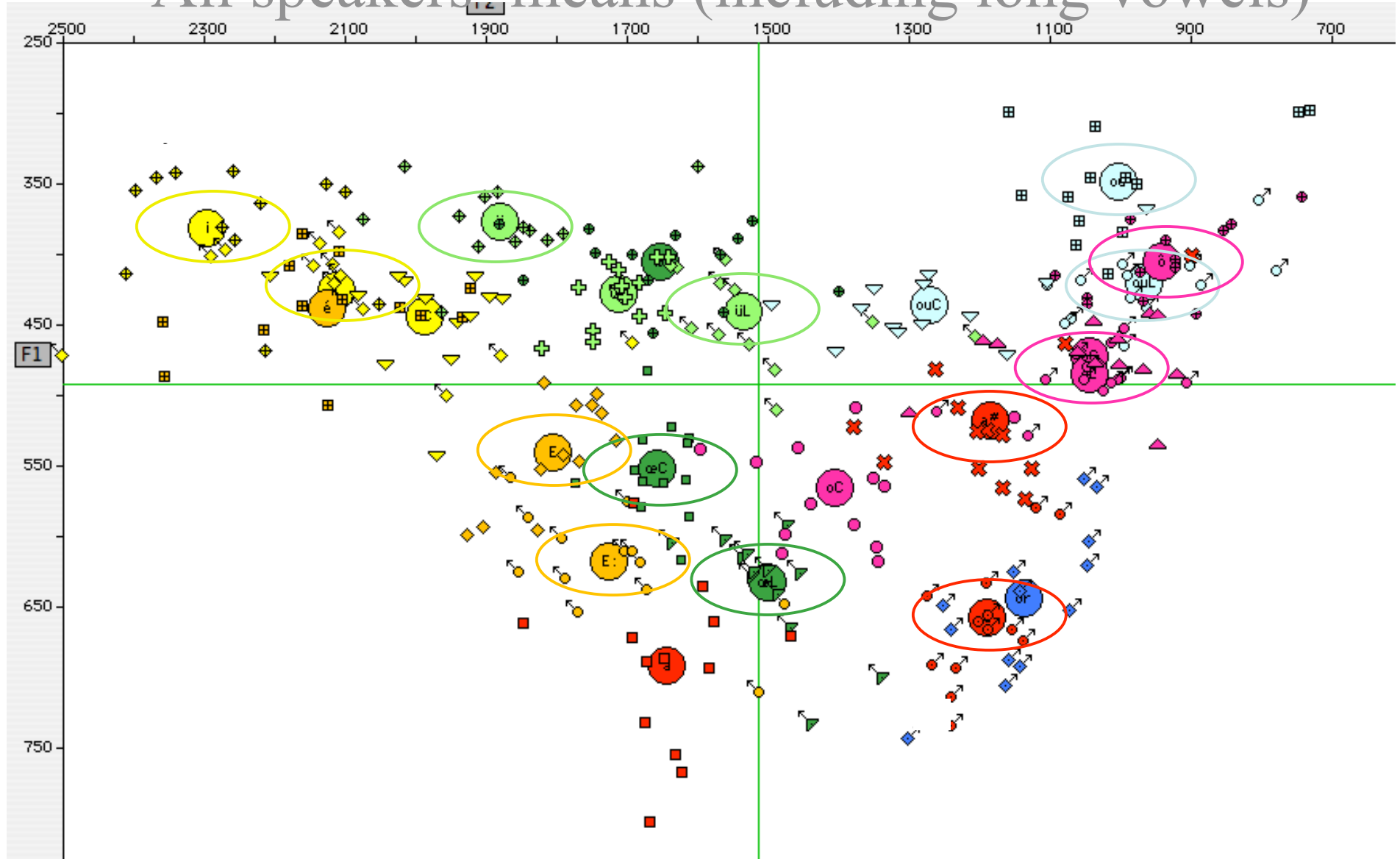


All speakers' means (including long vowels)



- N = 15 tokens per vowel per speaker
- Log mean normalized (Nearey 1977)

All speakers' means (including long vowels)

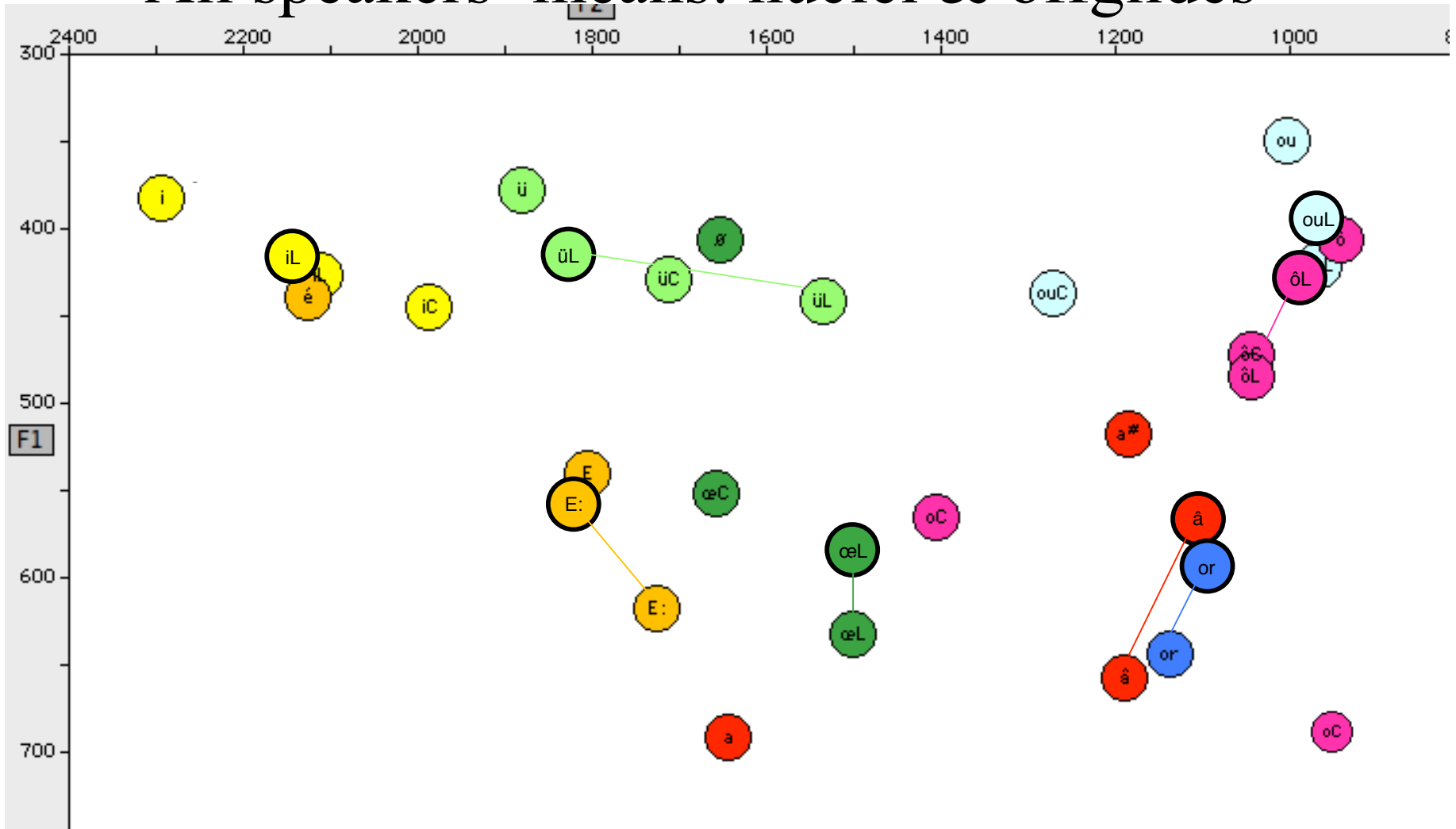


Circled pairs differ significantly on F1 axis ($p < .001$)

Quality of the offglide

- Walker (1984): “a following semivowel that agrees with [the] vowel in frontness and rounding”
 - e.g. /ɛ:/ [ɛj], /œ:/ [œy], /ɑ:/ [ɑw]
- Dumas (1981): “the offglide is closed and raised toward the homorganic closed vowel”
 - e.g. /ɛ:/ [ɛⁱ], /œ:/ [œ^y], /ɑ:/ [ɑ^u]

All speakers' means: nuclei & offglides



Bold symbols: glide targets

Today's talk

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

II. Changes in the community

III. Changes across speakers' lifetimes

Are these vowel alternations...

- ...a stable feature of the dialect?
- ...an ongoing change?
- Our focus:
 - /œ:/ e.g. *coeur, creuse*
 - /ɛ:/ e.g. *frère, glaise*
 - /ɑ:/ e.g. *tard, âge*

Is the community changing?

Nucleus of /æ:/	Average F1 (Hz)	N	
1971 trend speakers	615	63	} p = 0.067
1984 trend speakers	646	57	
Nucleus of /ɛ:/	Average F1 (Hz)	N	
1971 trend speakers	597	92	} p < 0.005
1984 trend speakers	646	61	
Nucleus of /ɑ:/	Average F1 (Hz)	N	
1971 trend speakers	627	61	} p < 0.002
1984 trend speakers	683	61	

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

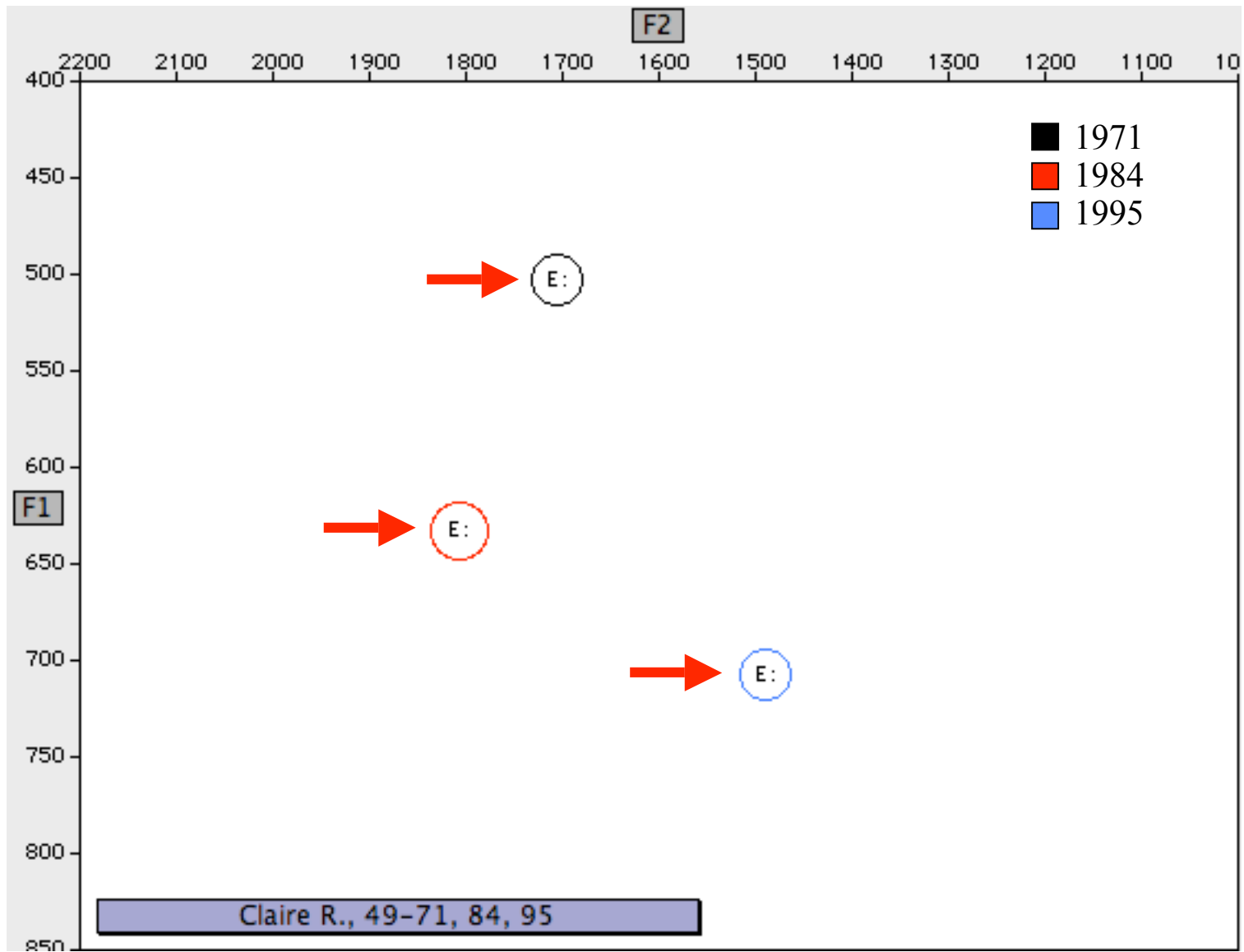
Today's talk

- I. Presentation of Quebec French vowel system based on acoustic analysis
- II. Changes in the community
- III. Changes across speakers' lifetimes**

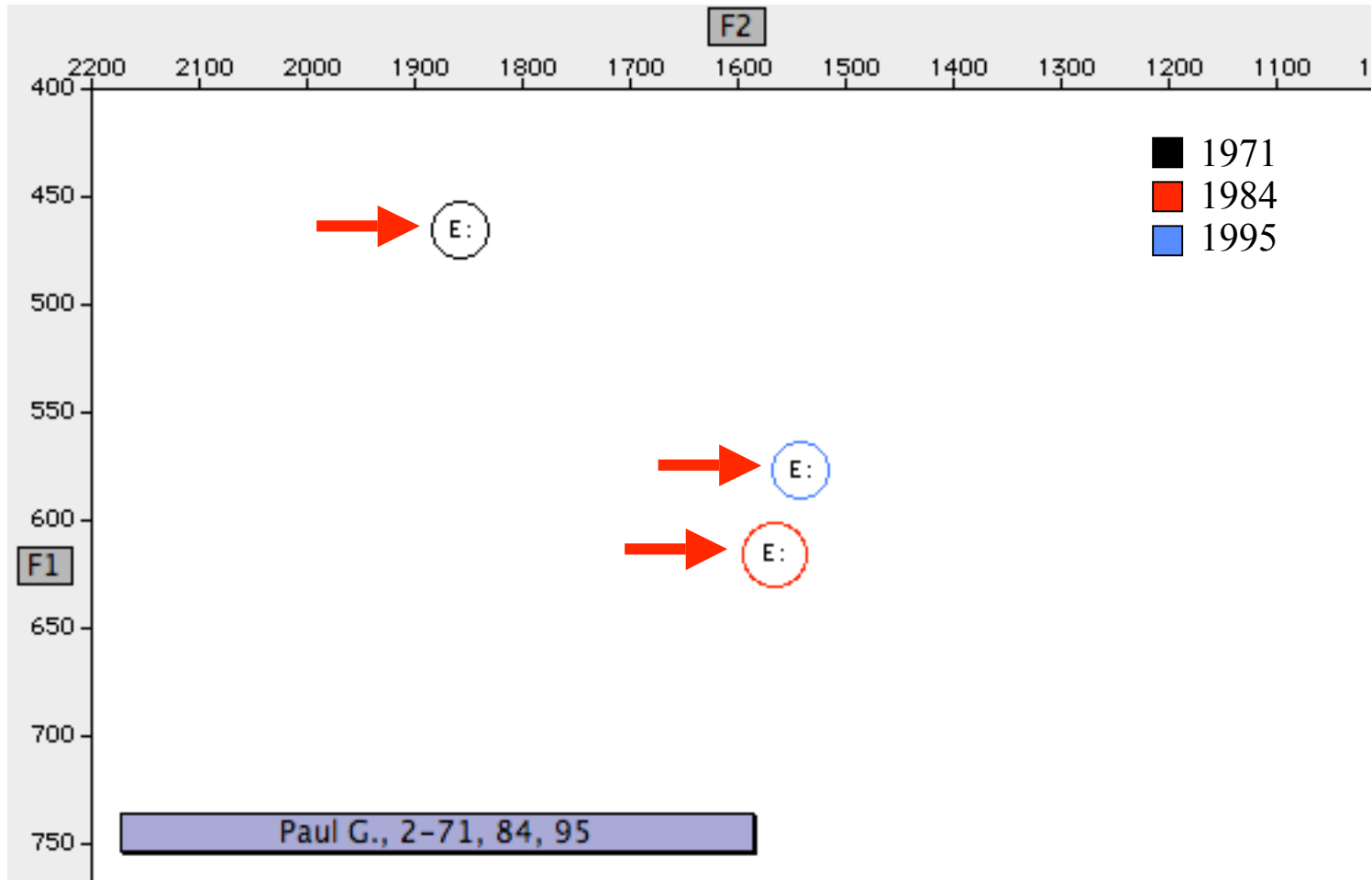
Are individuals changing? – /ɛ:/

- 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; $p < 0.05$

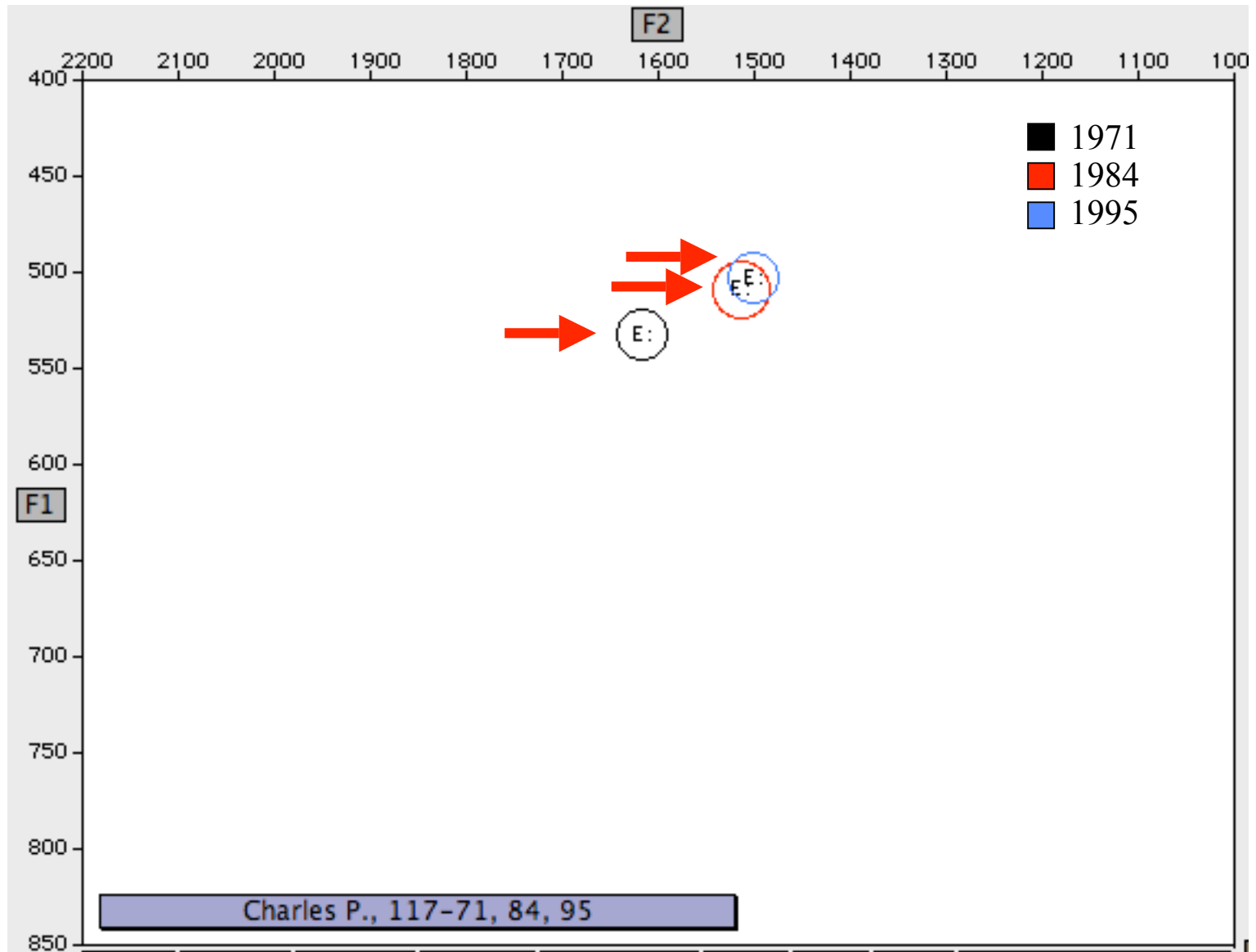
Are individuals changing? – /ε:/



Are individuals changing? – /ε:/



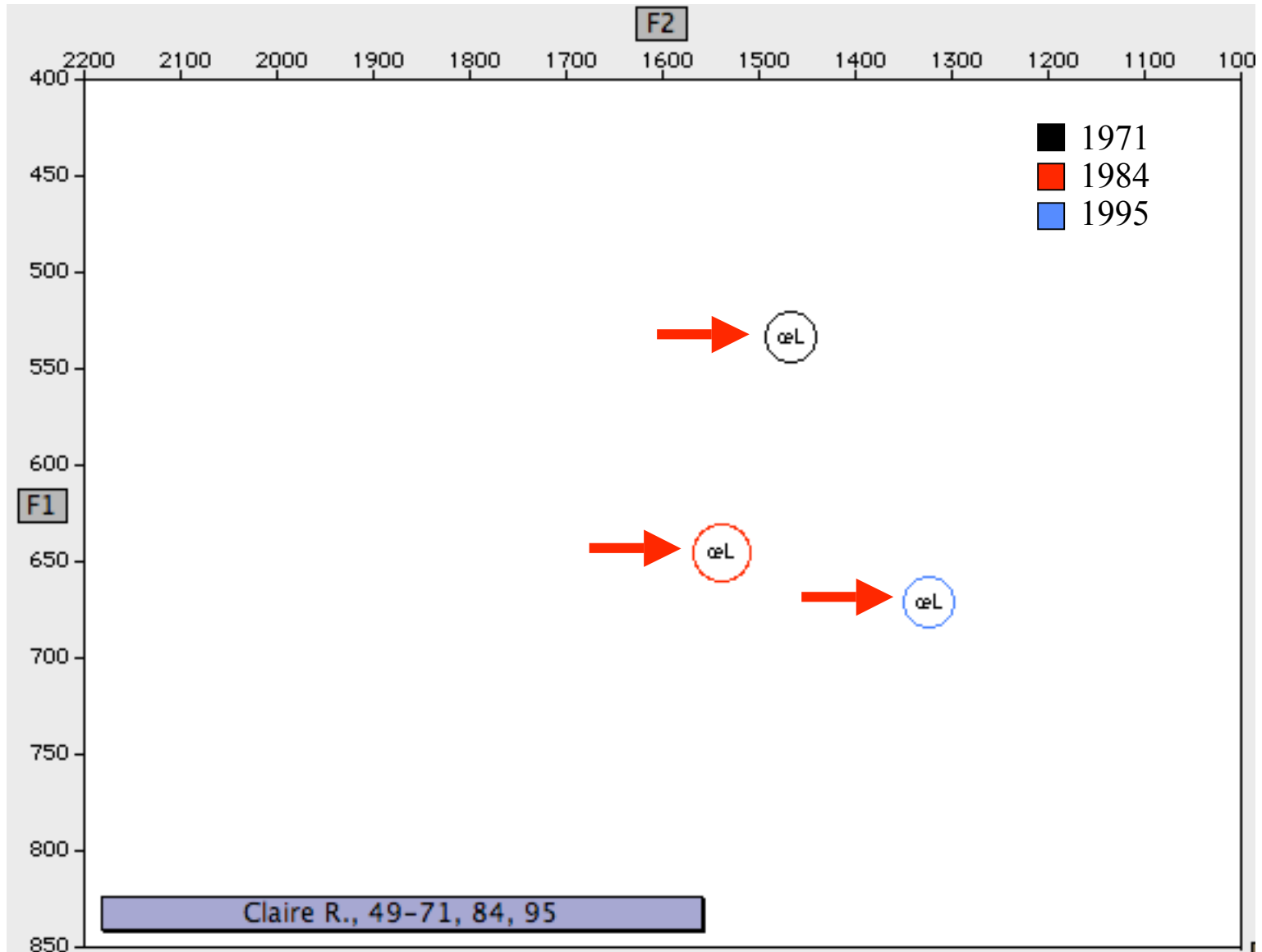
Are individuals changing? – /ε:/



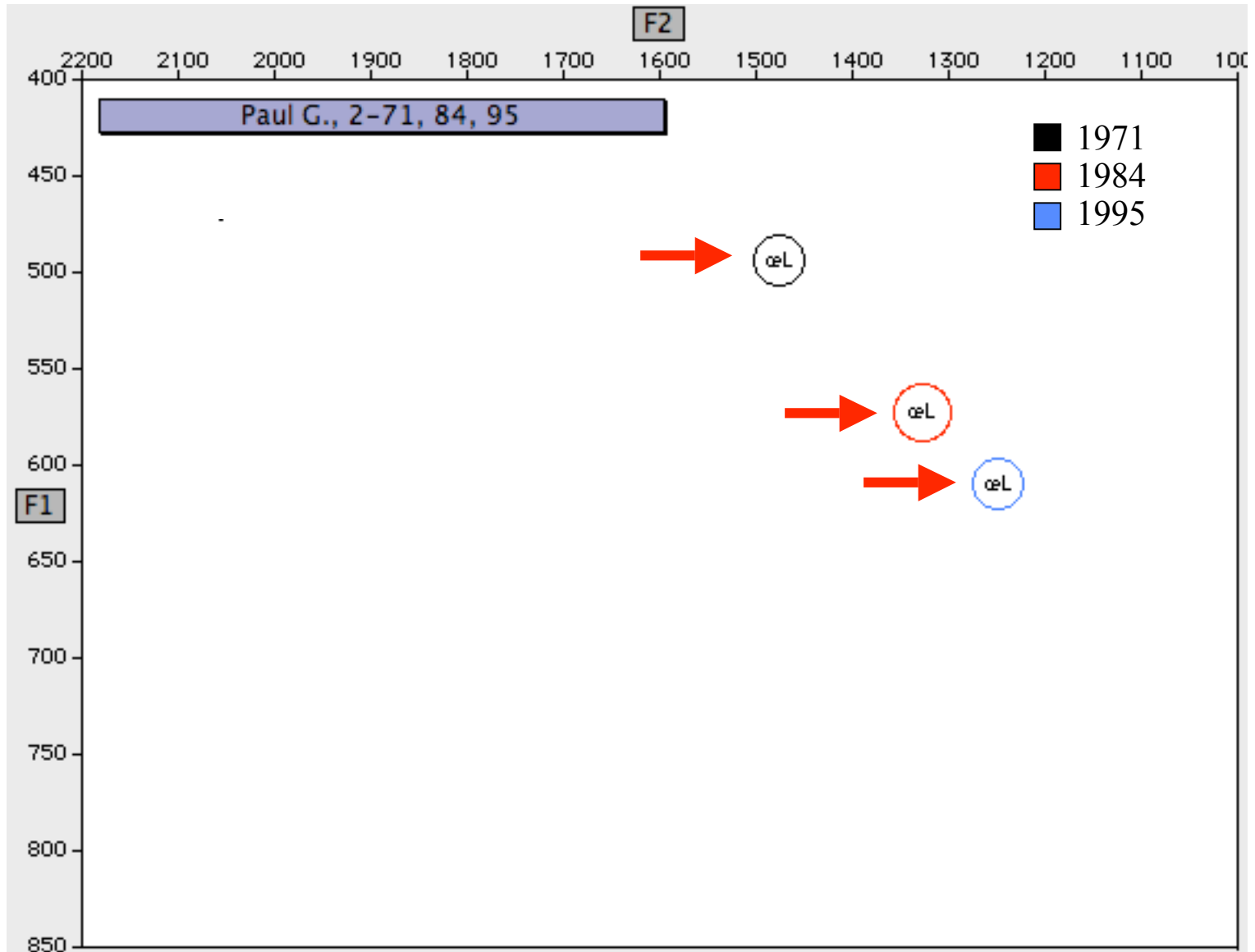
Are individuals changing? – /œ:/

- 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? – /æ:/



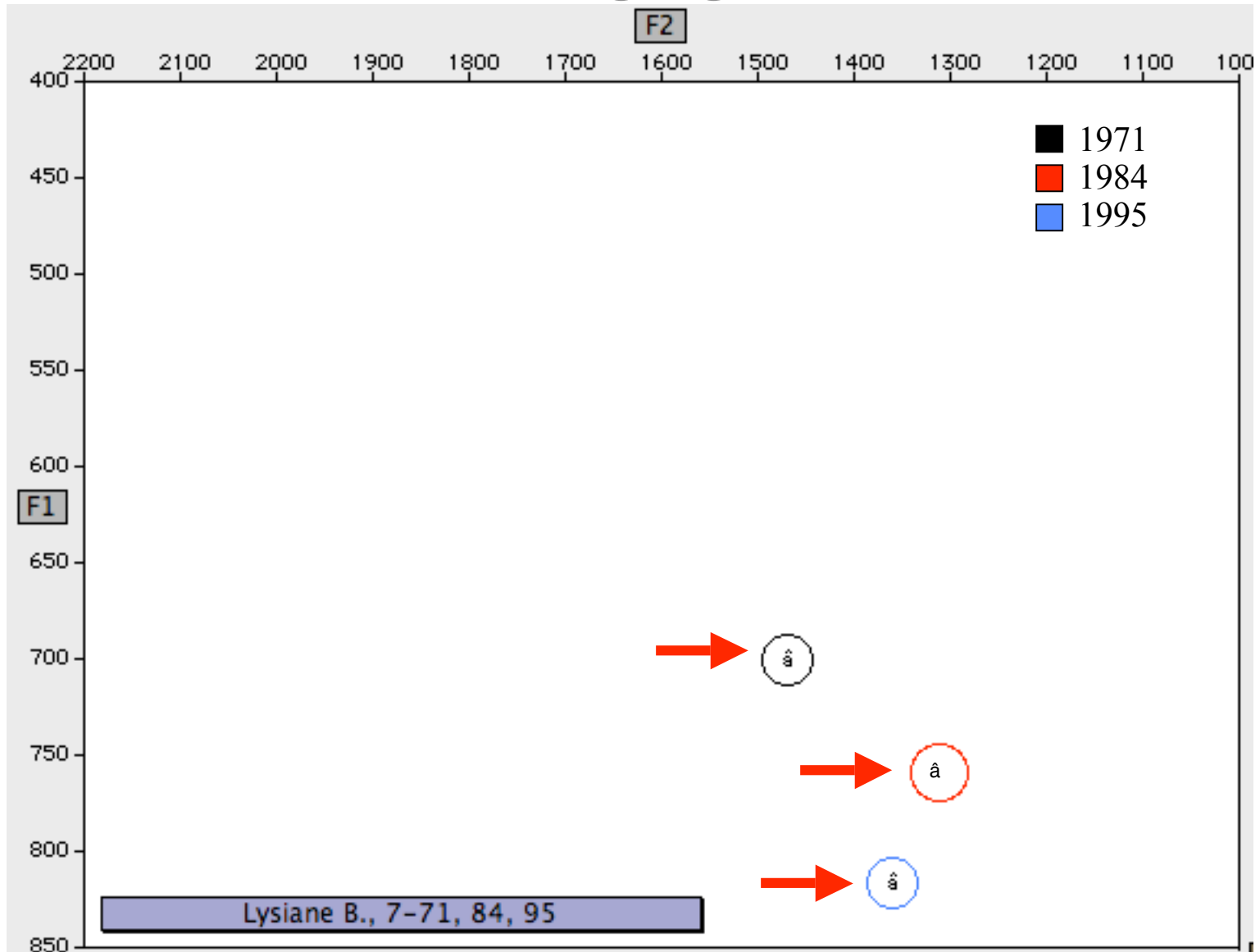
Are individuals changing? – /æ:/



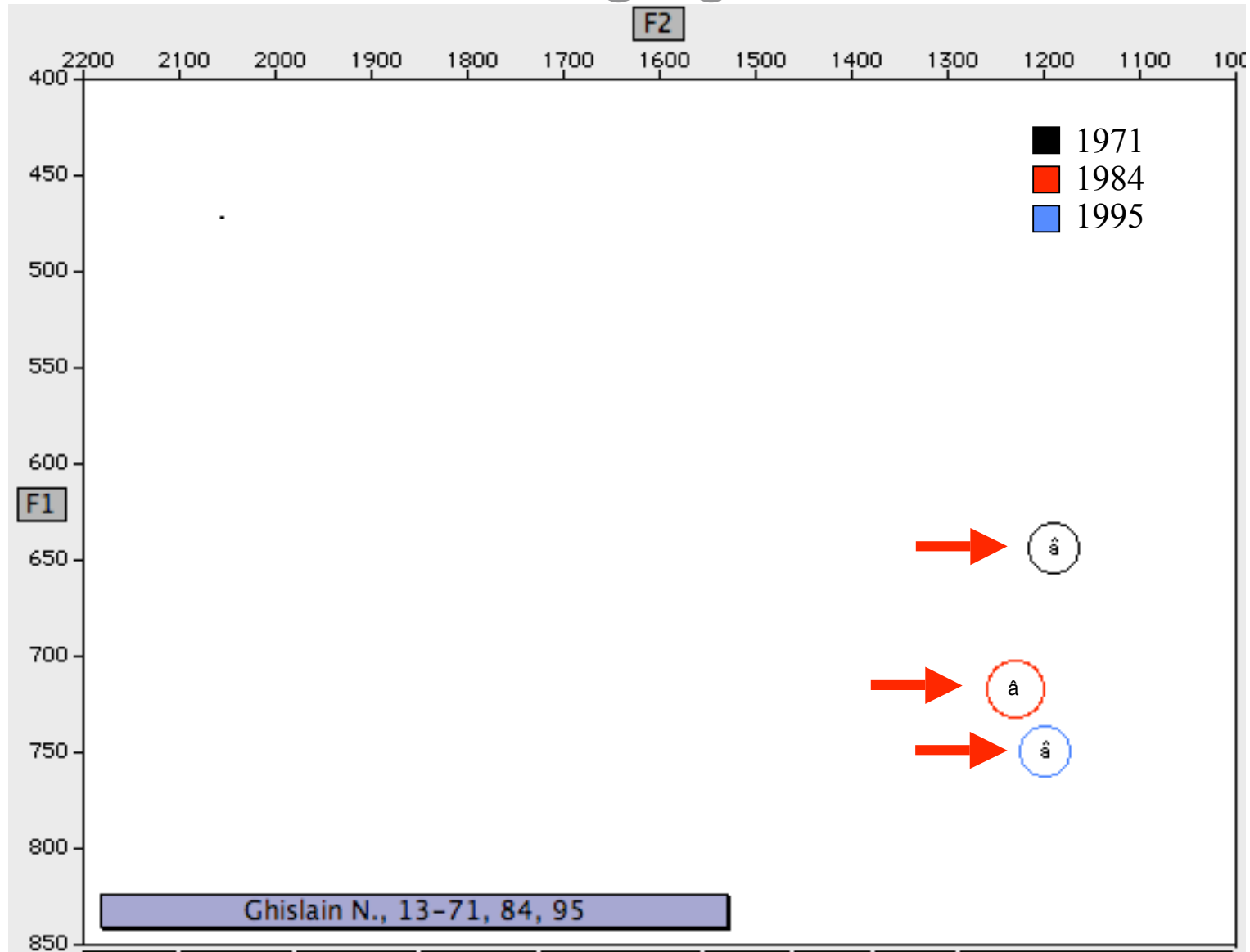
Are individuals changing? – /ɑ:/

- 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; $p < 10^{-4}$

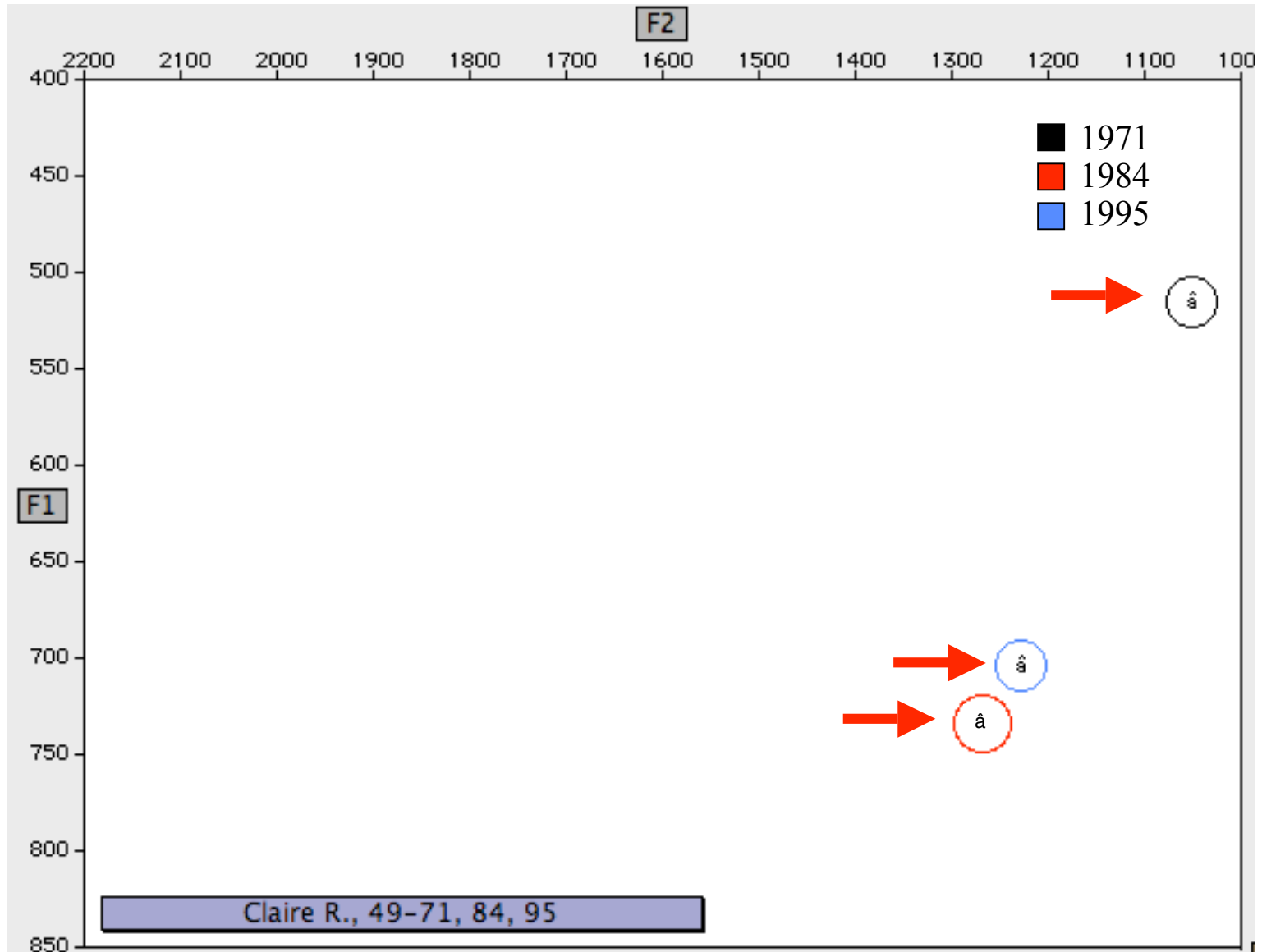
Are individuals changing? – /a:/



Are individuals changing? – /a:/



Are individuals changing? – /ɑ:/



Summary of longitudinal findings

- /ɛ:/
 - Lowering is progressing through the community, and some malleable speakers follow the change.
- /æ:/
 - Lowering has been arrested in the community, but some malleable speakers perpetuate it as they age.
- /ɑ:/
 - Lowering is progressing through the community, but longitudinally changing speakers show a different social profile than for the other two changes.

Provisional conclusions

- /ɑ:/-lowering is a change from above.
 - Previous work (Kemp & Yaeger-Dror 1991) has shown stigmatization of raised back /ɔ:/ variant of /ɑ:/
 - This explains Lysiane's change in the direction of the community, as well as Paul's lack of involvement in the change

Provisional conclusions

- /ɑ:/-lowering is a change from above.
- /ɛ:/-lowering is a change from below.
 - Particularly malleable speakers follow it as they age.

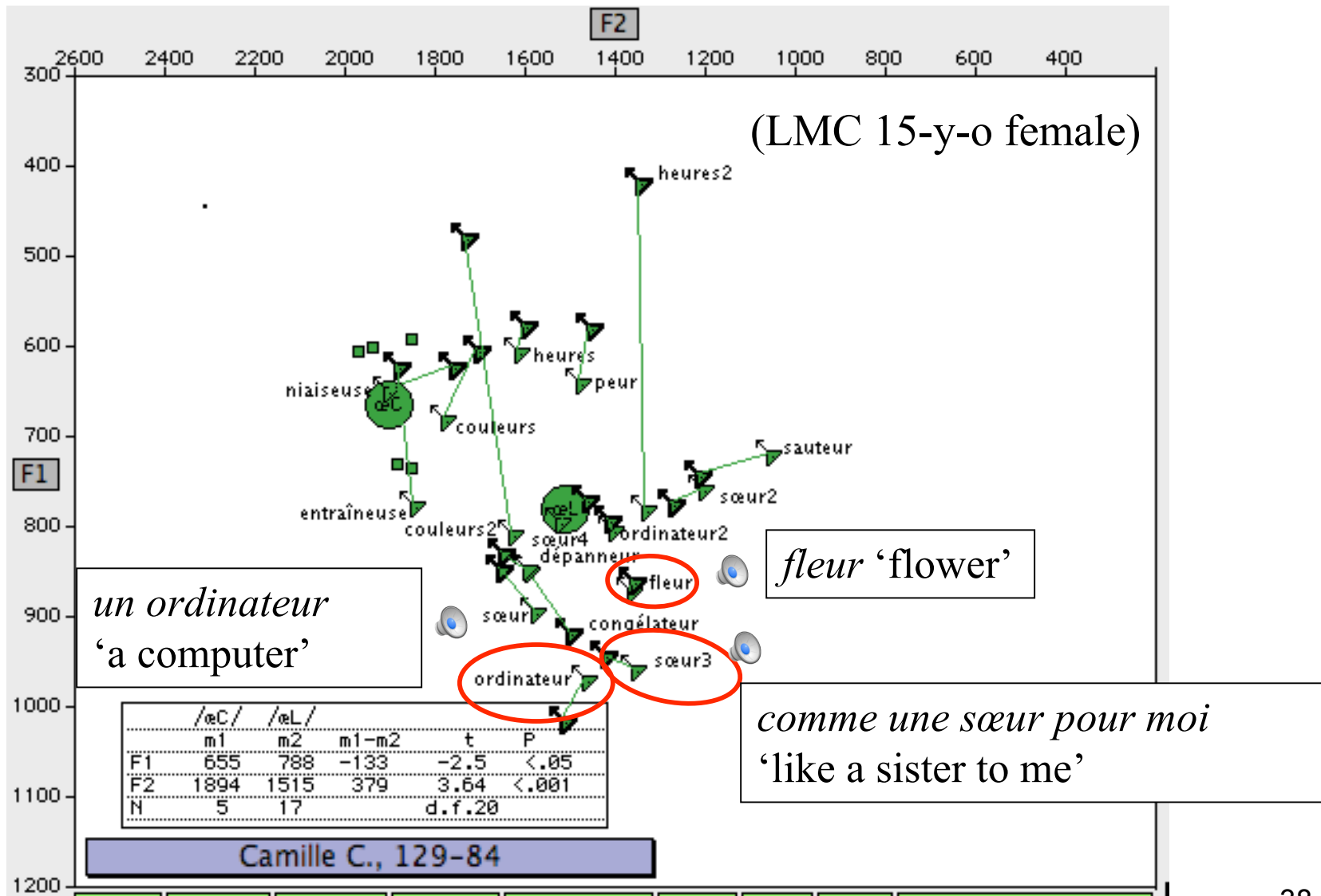
Provisional conclusions

- /ɑ:/-lowering is a change from above.
- /ɛ:/-lowering is a change from below.
- /œ:/-lowering is an older, stabilized change.
 - Cedergren, Clermont, & Côté (1981)'s apparent time analysis leads them to conclude that /œ:/ diphthongization began at least as early as 1930-1935.
 - Our malleable speakers are still pushing it forward.

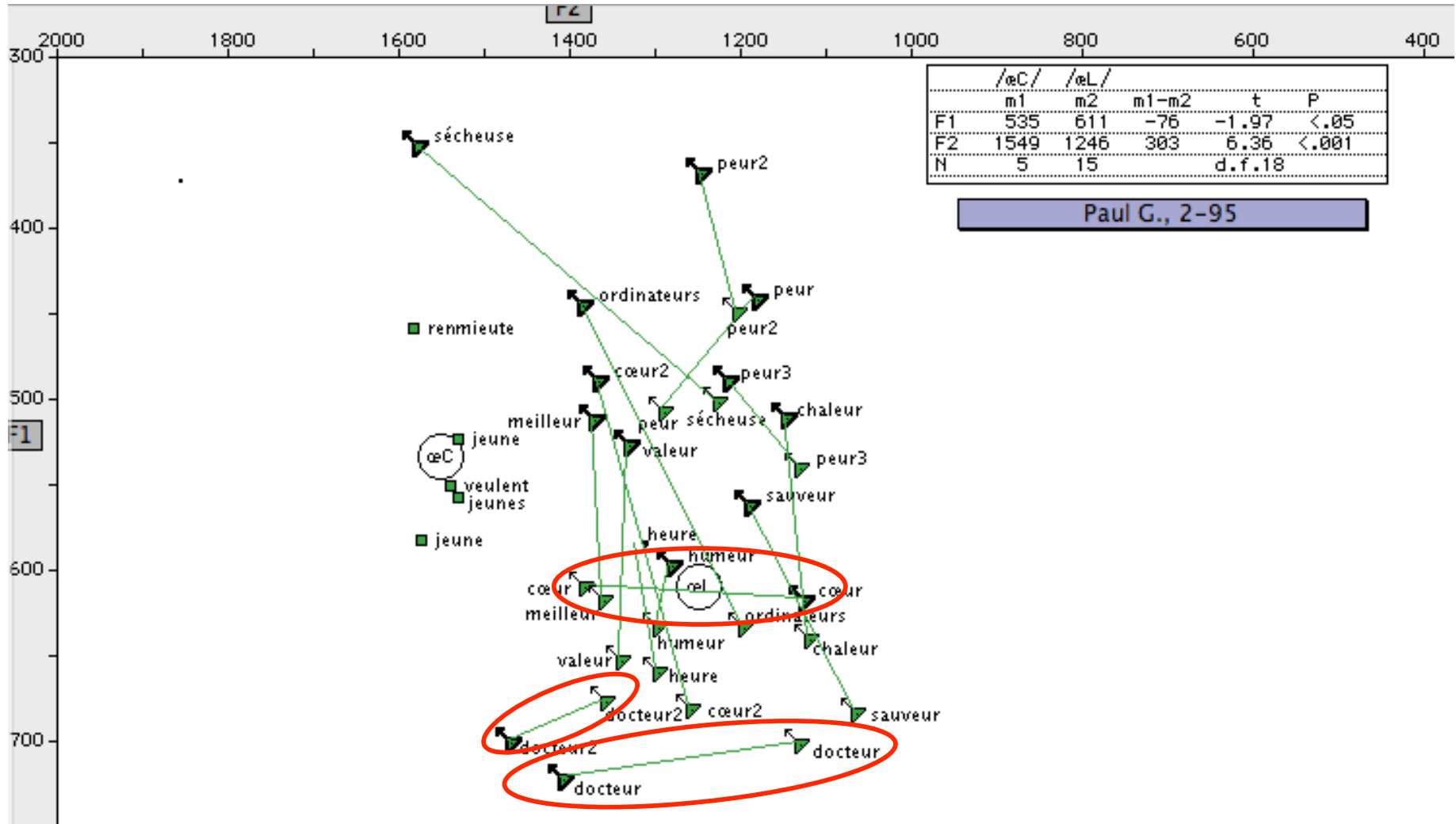
Further research in progress

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

/œ:/ flattening

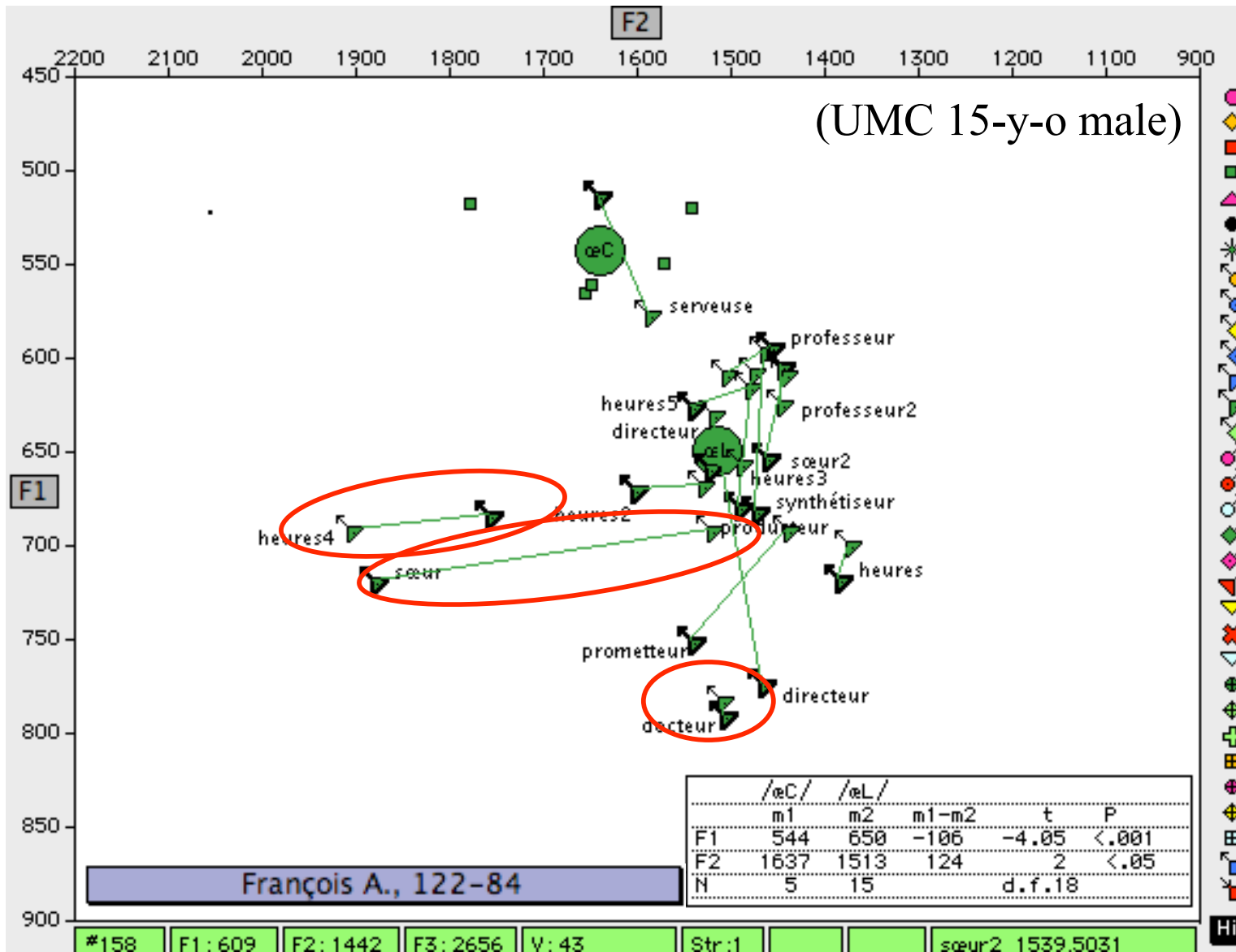


/œ:/ flattening



(WC 49-y-o male)

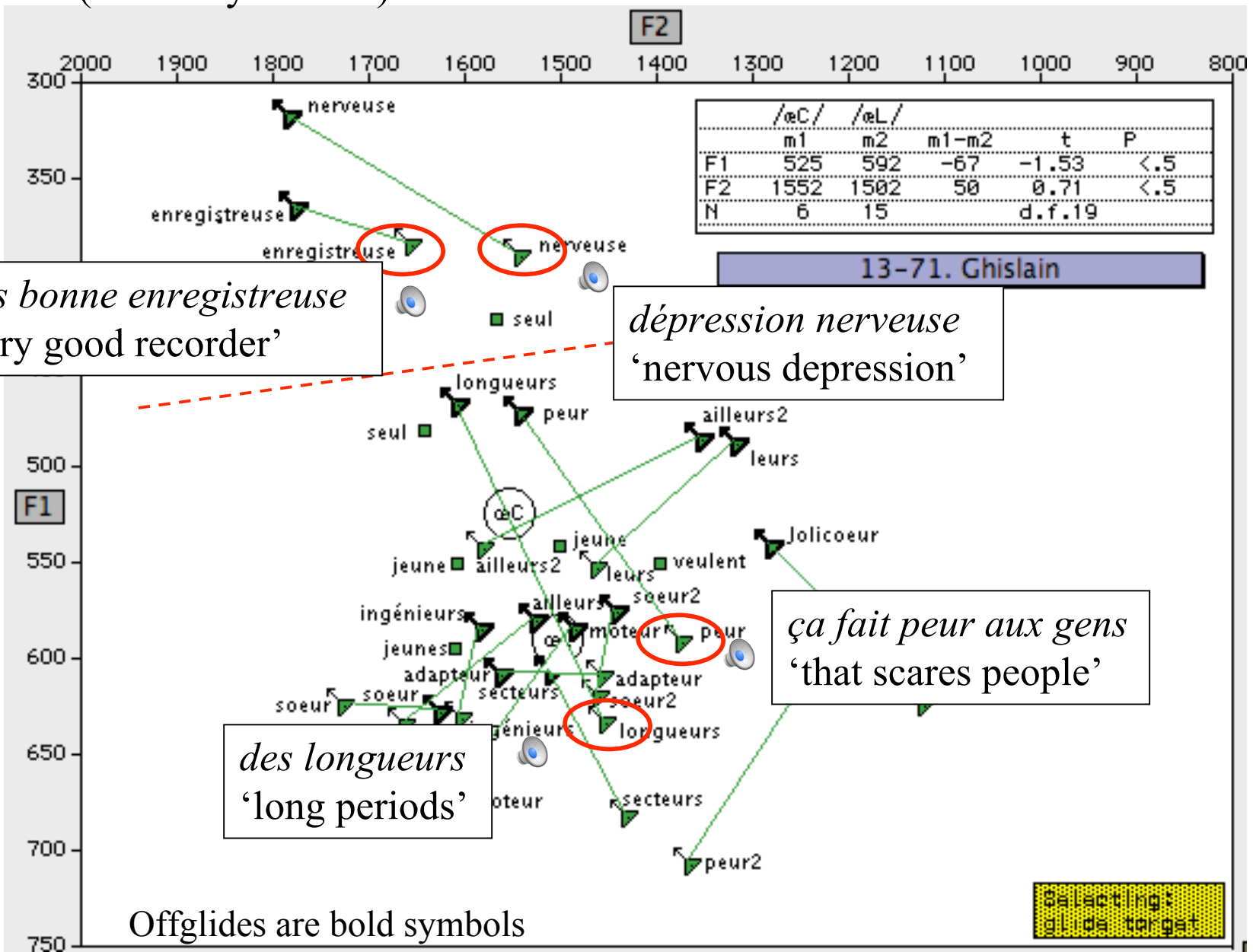
/œ:/ flattening



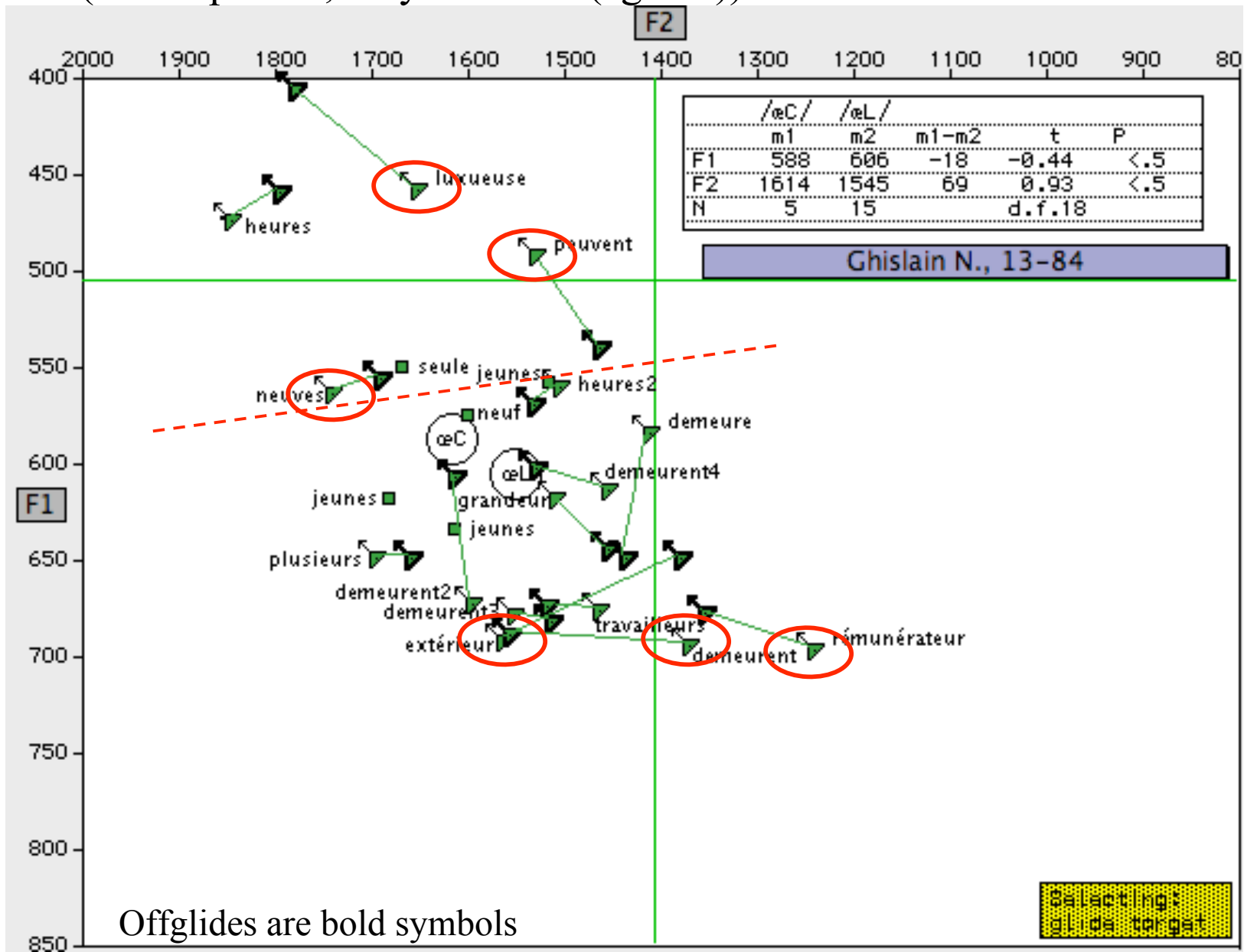
Further research in progress

- /œ:/-lowering may have stabilized, but we think we see a new change of /œ:/ *flattening*.
 - Monophthongization in the lowered position
- **Redefining lengthening environments**

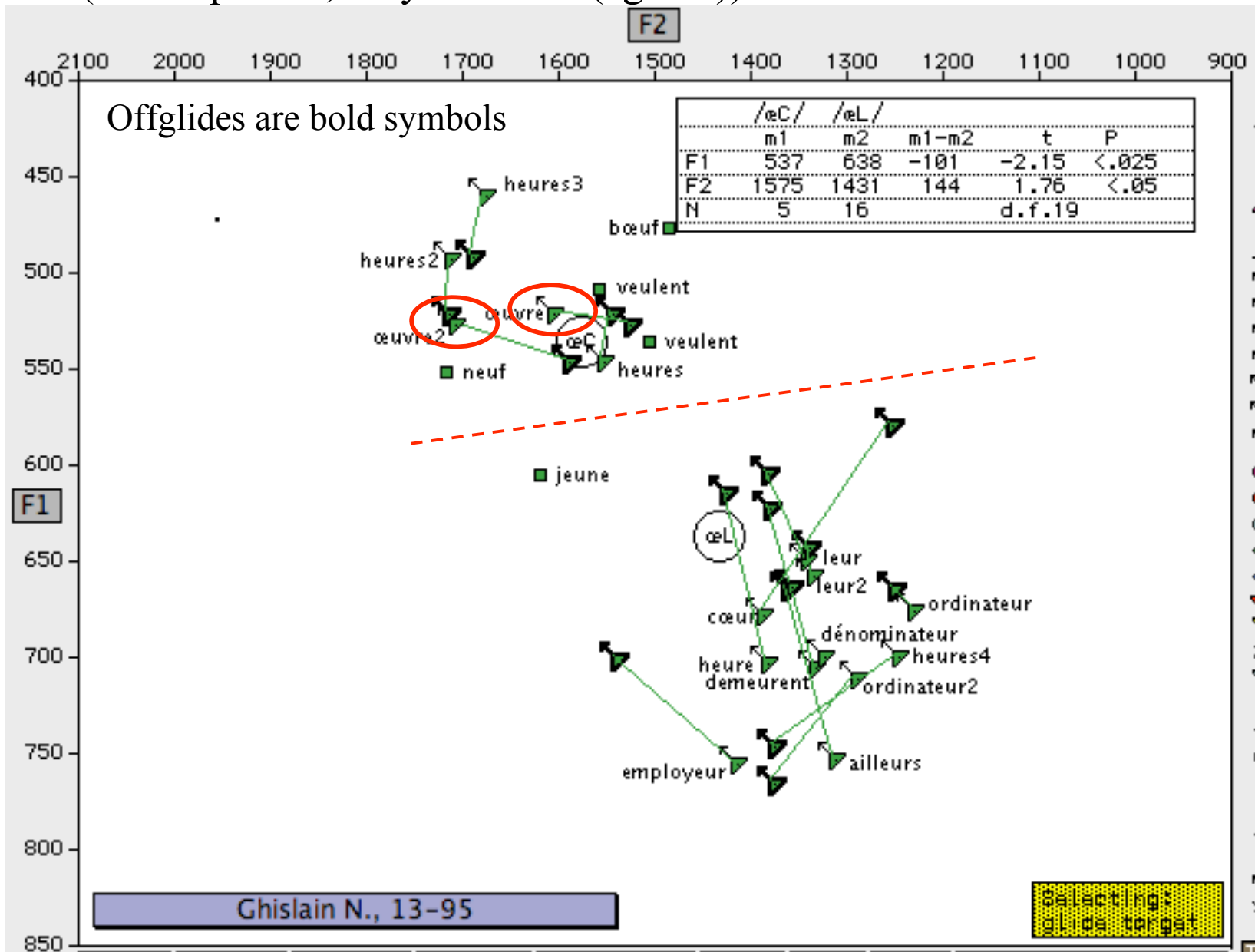
(MC 20-y-o male)



(same speaker, 13 years later (age 33))



(same speaker, 11 years later (age 44))



Further research in progress

- /œ:/-lowering may have stabilized, but we think we see a new change of /œ:/ *flattening*.
- Redefining lengthening environments: less lowering of /œ:/ 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

- /æ:/-lowering may have stabilized, but we think we see a new change of /æ:/ *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

- Cedergren, Henrietta, Jean Clermont, and Francine Côté. Le facteur temps et deux diphtongues du français montréalais. In *Variation Omnibus*, ed. D. Sankoff and H. Cedergren, pp. 169–76. Linguistic Research, Alberta, 1981.
- Dumas, Denis. Structure de la diphtongaison québécoise. *Canadian Journal of Linguistics*, 26(1):1–61, 1981.
- Kemp, William, and Malcah Yaeger-Dror. Changing realizations of A in -*(a)tion* in relation to the front A–back A opposition in Quebec French. In *New Ways of Analyzing Sound Change*, ed. P. Eckert, pp. 127–84. Academic Press, Inc., 1991.
- Sankoff, Gillian, and Hélène Blondeau. Language change across the lifespan: /r/ in Montreal French. *Language*, 83(3):560–88, 2007.
- L. Santerre and J. Millo. Diphthongization in Montreal French. In *Linguistic Variation: Models and Methods*, ed. D. Sankoff, pp. 173–84. Academic Press, New York, 1978.
- Walker, Douglas. *The Pronunciation of Canadian French*. University of Ottawa Press, 1984.

Thank you!

- to the National Science Foundation for grant BCS-0132463, 2002-2005, “Language Change Across the Lifespan” that supported the initial work on diphthongization carried out by Michael Friesner, Damien Hall and Gillian Sankoff
- to Bill Labov for designing the French version of Plotnik (Plotnik v.f.), and for working closely with us in adapting it to the needs of the present analysis.
- to Michael Friesner and Maciej Baranowski for useful discussion and helpful suggestions
- These slides available online at
<http://ling.upenn.edu/~laurel/NWAV37.pdf>