Please Merge Ahead:
The Vowel Space of Pacific Northwestern English

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The Pacific Northwest

- Typically defined as Oregon and Washington, occasionally includes Idaho and British Columbia
- ~150 years old
- In-migration from around the continent, but chiefly from the US midlands

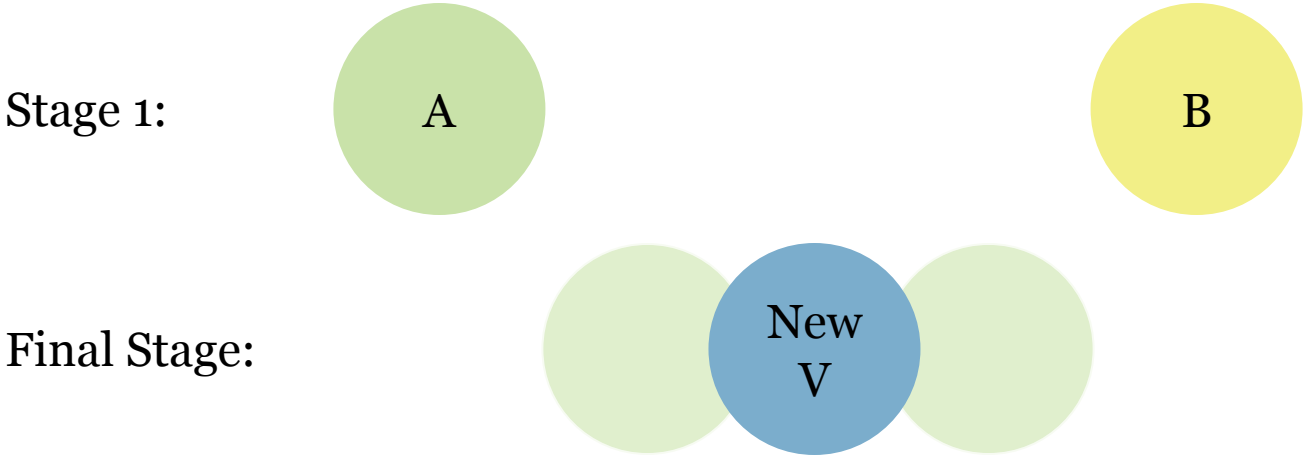
Pacific Northwestern English

- Recent research has come out of the Pacific Northwestern English Project housed at the University of Washington

- Recent Findings
  - Lexical differences (e.g. *filbert*, *spendy*, *rhody*)
  - Centralization of front & back vowels (Ingle et al. 2005; Ward 2003)
  - Reports of creaky voice (Andrus 2011, Ingle et al. 2005; Riebold 2009)
  - The Low Front Pre-Velar Merger (/æ, ɛ, e/ before /g/) (Wassink et al. 2009)
  - The High Back Pre-Lateral Merger (/ʊ, o, ʌ/ before /l/) (Squizzero 2009)

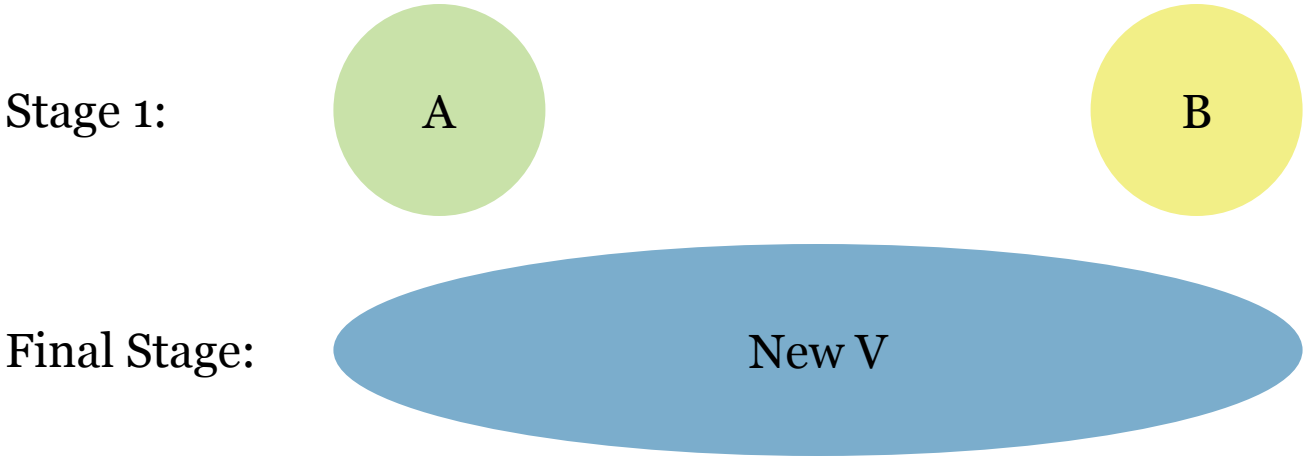
Vowel Mergers

- 3 types: (Labov 1994)
  - Merger by Approximation



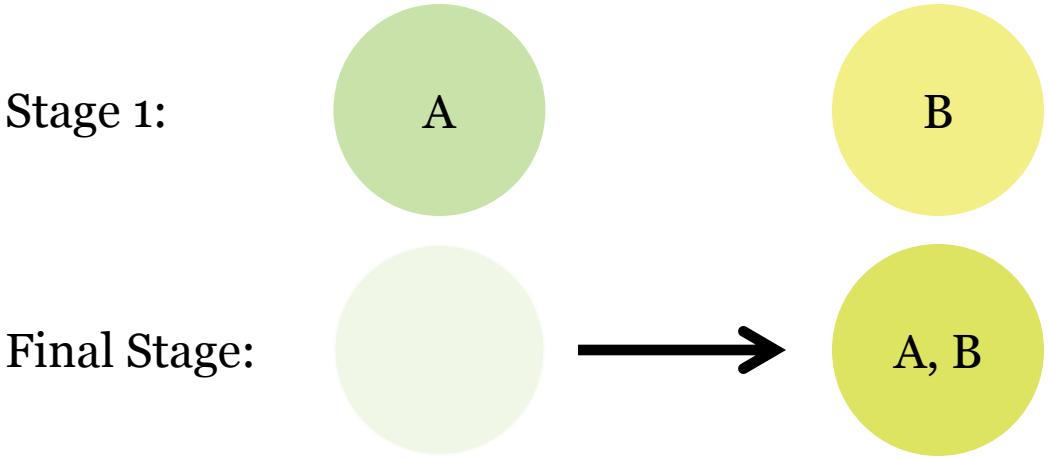
Vowel Mergers

- Merger by Expansion



Vowel Mergers

- Merger by Transfer



The Low Front Pre-Velar Merger

- i.e. the bag-beg-bayg merger

- /æ, ɛ/ raise before /g/*
  - /ɛ/ approaches [e], /æ/ approaches either [ɛ] or [e]
  - Not clear whether /æ/ → [ɛ] represents a midpoint or a separate trajectory

- Some examples:

"the old hag" (/æ/ → [ɛ]) (C32CF3V)

"hang down by her back legs from a peg" (/ɛ/ → [e]) (C31CM3V)

*similar to /æg/-raising in Wisconsin, cf. Benson et. al 2011

The Low Front Pre-Velar Merger

- Wassink, Squizzero, Scanlon, Schirra, & Conn (2009) found near total overlap for pre-/g/ /æ, ɛ, e/
- More casual styles showed higher rates of overlap
- Some speakers merge /æ/ with /ɛ/, other merge /æ/ with /e/
- Possible gender split
  - Females prefer /ɛ/ → [e]
  - Males prefer /æ/ → [ɛ]
- The low front pre-velar merger appears to be a merger by expansion

This Presentation

- Although research into the low front pre-velar merger is still at the early stages, we know less about the rest of the system

- A number of studies have cited the importance of /æ/ in the English vowel system
  - Labov (2007) suggests that /æ/ can be used to study the diffusion of change
  - Boberg & Strassel (2000) have noted its usefulness in establishing typologies of US dialects

- **RQ1:** What's going on with /æ, ɛ, e/ in non-merger contexts?

Methods

- 4 speakers performing 3 tasks
  - Directed interview
  - Reading passage
  - Wordlist (read 3 times)
- Recorded in the UW Linguistic Phonetics Lab recording booth
- Tokens were identified and extracted using Praat TextGrids and a Praat Script
  - Script extracted F1, F2, and F3 at onset, midpoint, and offset, along with duration
- Only data from the wordlist were used, due to the number of tokens and consistency

Methods: VOIS3D

- "Vowel Overlap Indication Software 3D" (Wassink 2006)
- Calculates amount of spectral overlap between two vowels by modeling them as 3D ellipsoids (F1 x F2 x duration)
- Output:

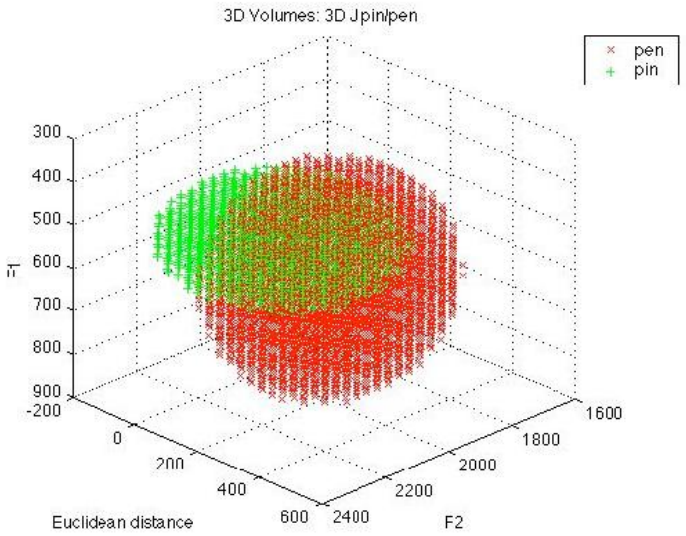


Figure 1: The pin/pen Merger (Wassink & Scanlon 2010)

Speakers

Speaker	Sex	Age	Birthplace
C31CM3V	M	26	Corvallis, OR
C32CF3V	F	24	Corvallis, OR
C33CM3W	M	25	Yakima, WA
C34CF3W	F	26	Corvallis, OR

Table 1: Speaker Demographic Information

All speakers are white, middle class, and college-educated

Tokens

- 33 x 3 tokens/speaker (3 excluded), *n*=394

	Stop	Fricative	Nasal	Liquid	None
/æ/	6	1	3	1	0
/ɛ/	4	3	1	4	0
/e/	5	1	0	1	3

Table 2: Following environment by manner of articulation

	Bilabial	Alveolar	Postalveolar	None
/æ/	1	10	0	0
/ɛ/	0	13	1	0
/e/	0	6	0	3

Table 3: Following environment by place of articulation

Speakers: Merger Status

Speaker	/æg, ɛg/	/ɛg, ek/	/æg, ek/
C31CM3V	0%	36%	0%
C32CF3V	51%	0%	0%
C33CM3W	38%	22%	0%
C34CF3W	0%	0%	0%

Table 5: 3D (F1 x F2 x Duration) Area of Overlap by Vowel Pair

Speaker	/æg, ɛg/	/ɛg, ek/	/æg, ek/
C31CM3V	0%	66%	0%
C32CF3V	89%	73%	0%
C33CM3W	74%	55%	28%
C34CF3W	0%	27%	0%

Table 5: 2D (F1 x F2) Area of Overlap by Vowel Pair

Speakers: Merger Status

	/æg, ɛg/	/ɛg, ek/	/æg, ek/
Females	97%	86%	9%
Males	75%	33%	10%

Table 6: 3D Area of Overlap by Wordlist Vowel Pair from Wassink et. al 2009

Pacific Northwest Vowels

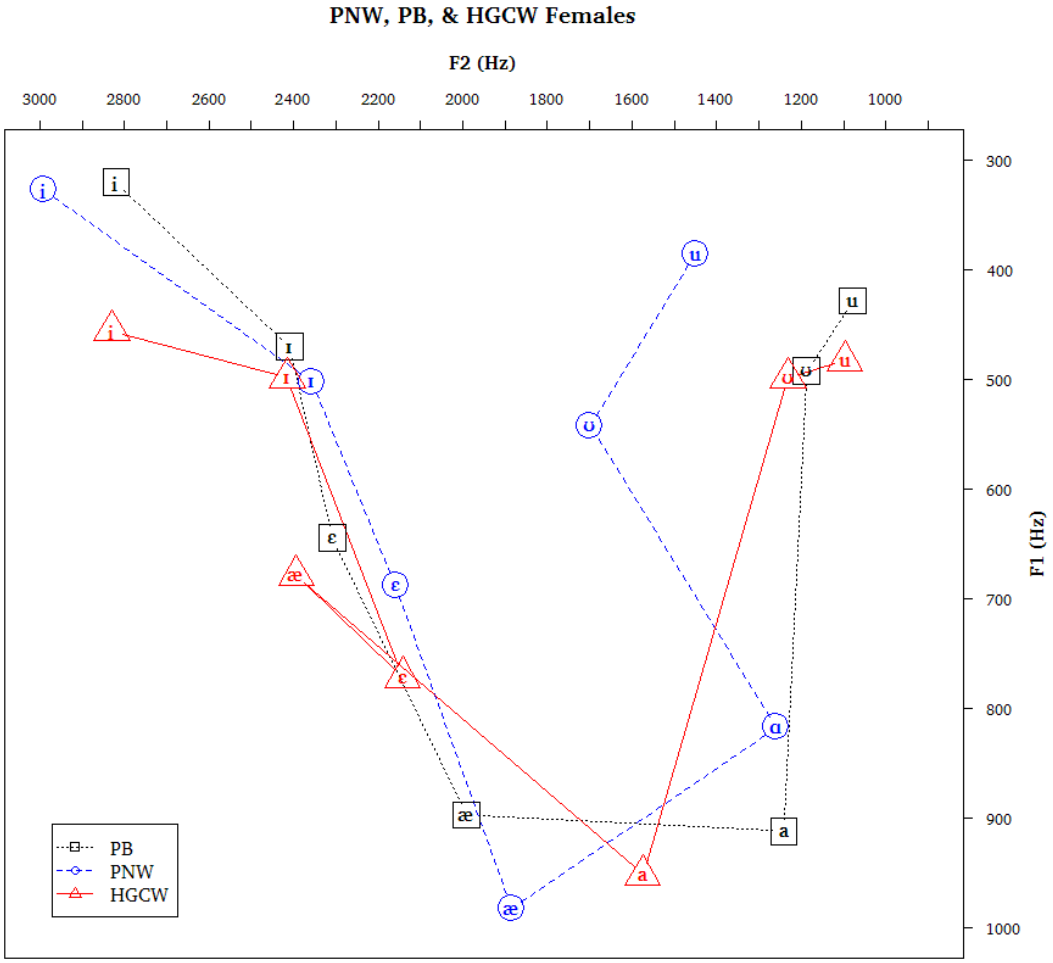


Figure 2: Female PNW, PB, and HGCW Vowels (Wright & Souza 2012)

Pacific Northwest Vowels

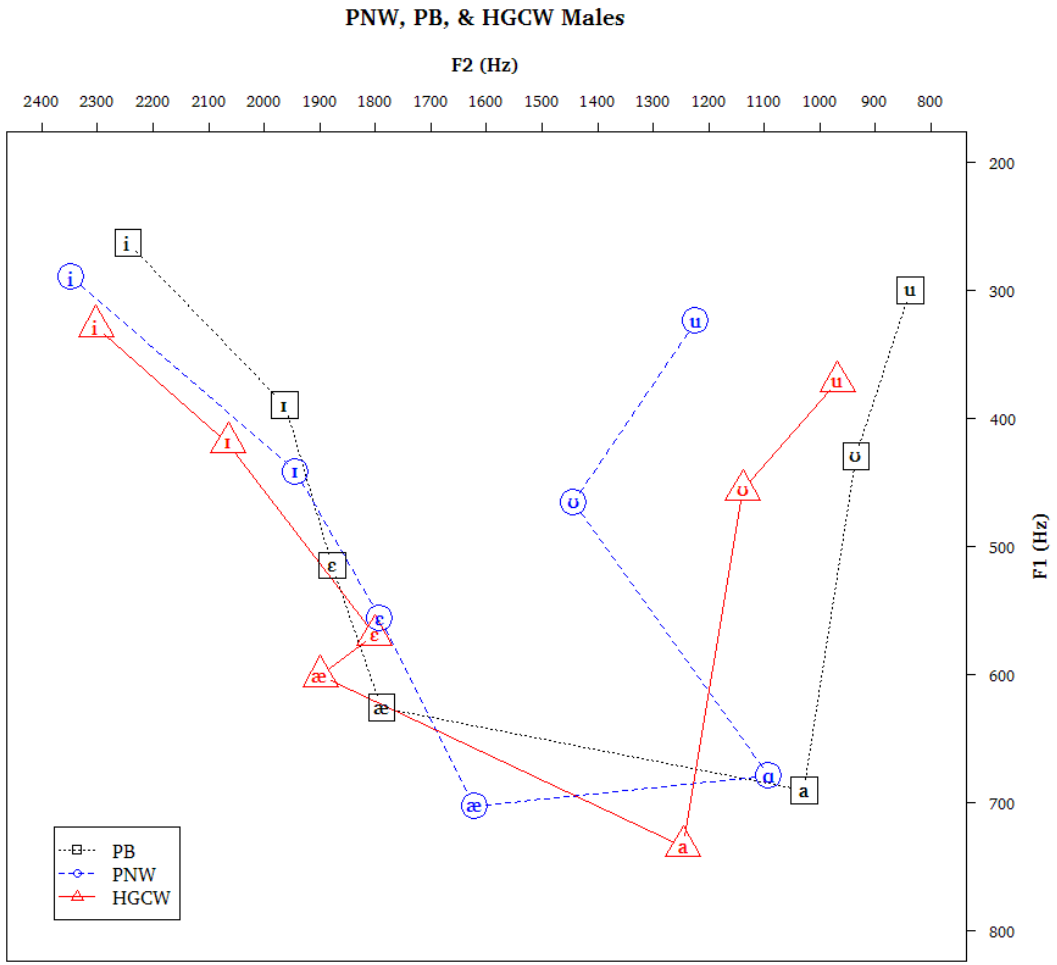
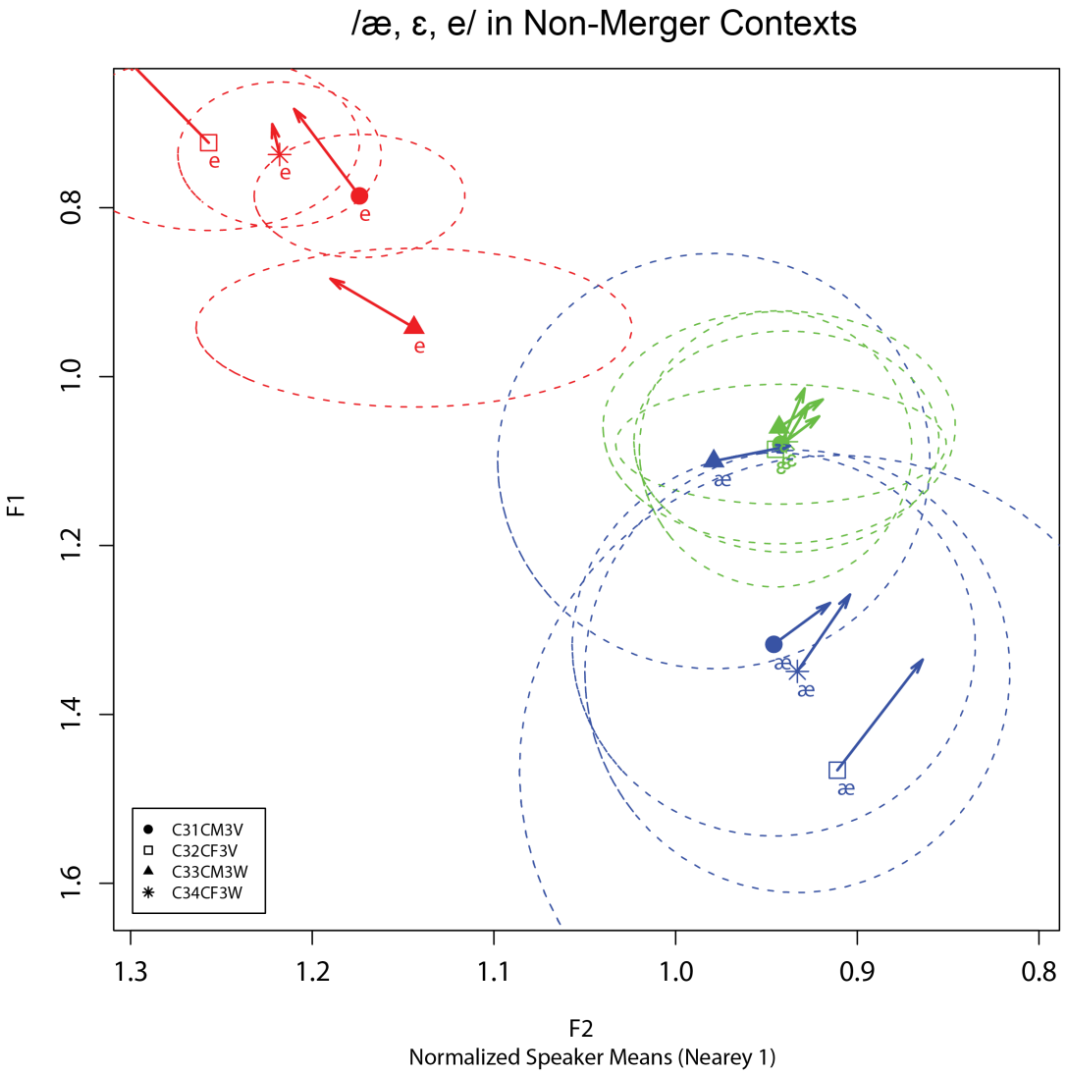


Figure 3: Male PNW, PB, and HGCW Vowels (Wright & Souza 2012)

Results: Non-Merger Environments



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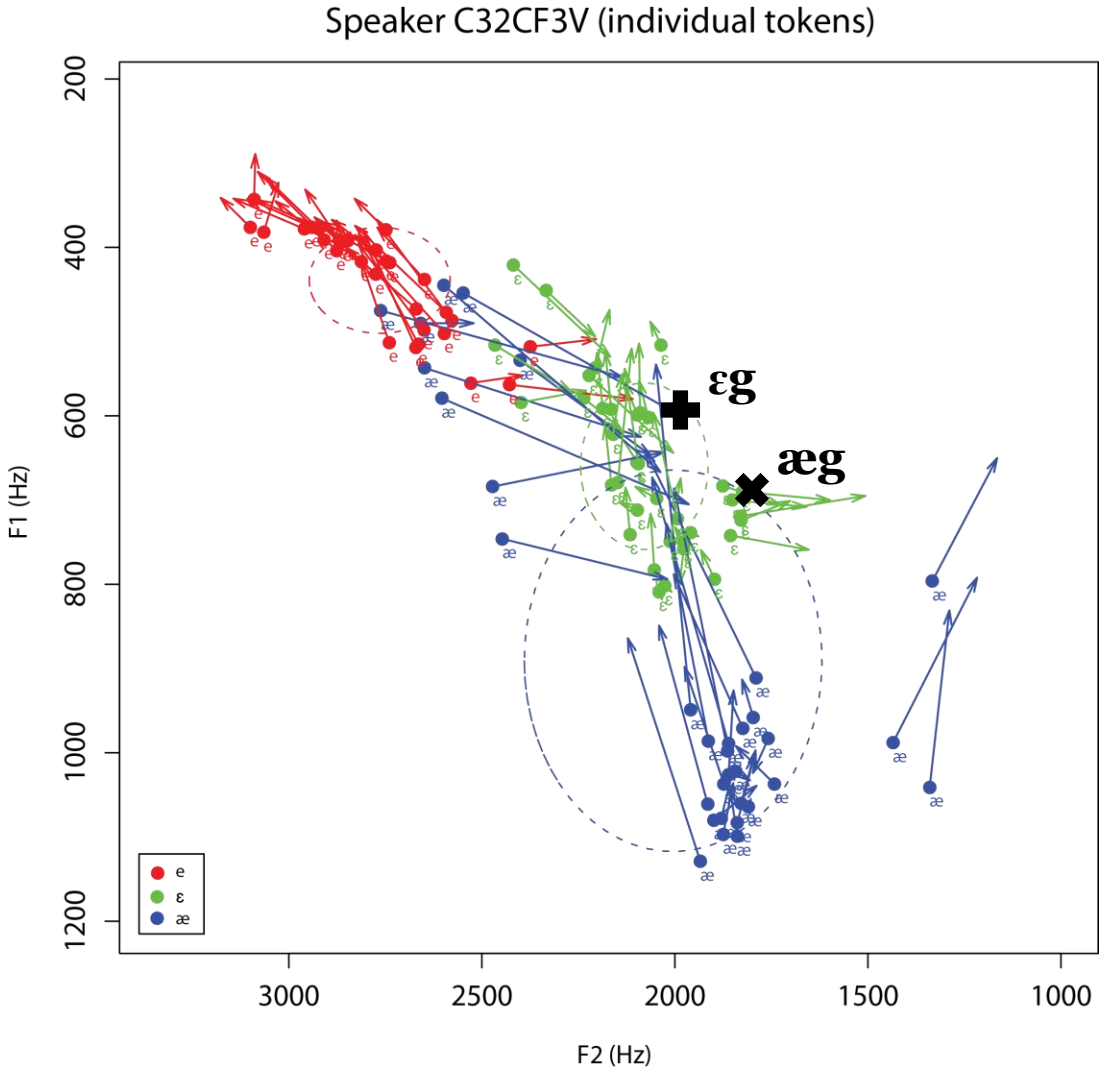

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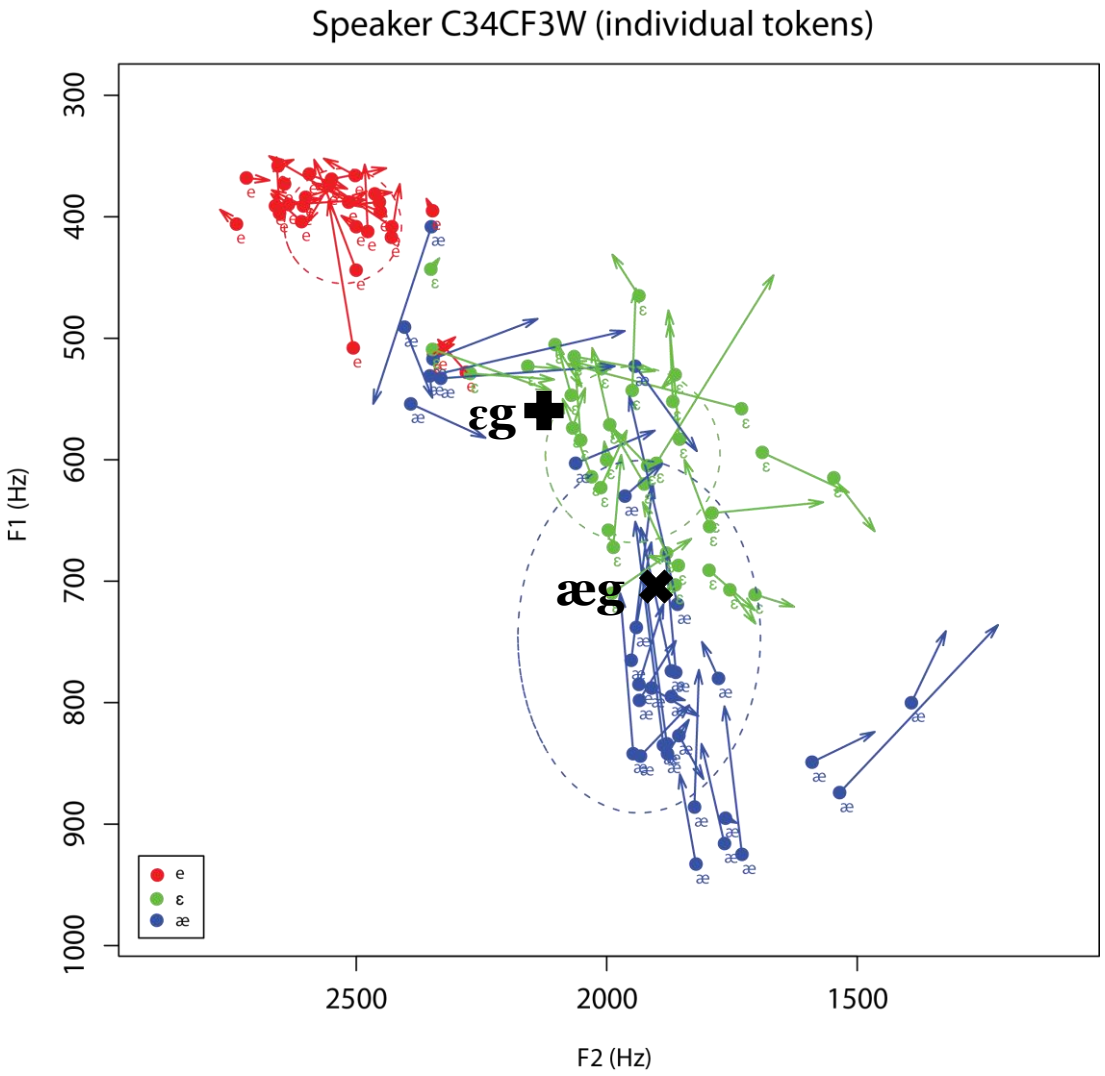

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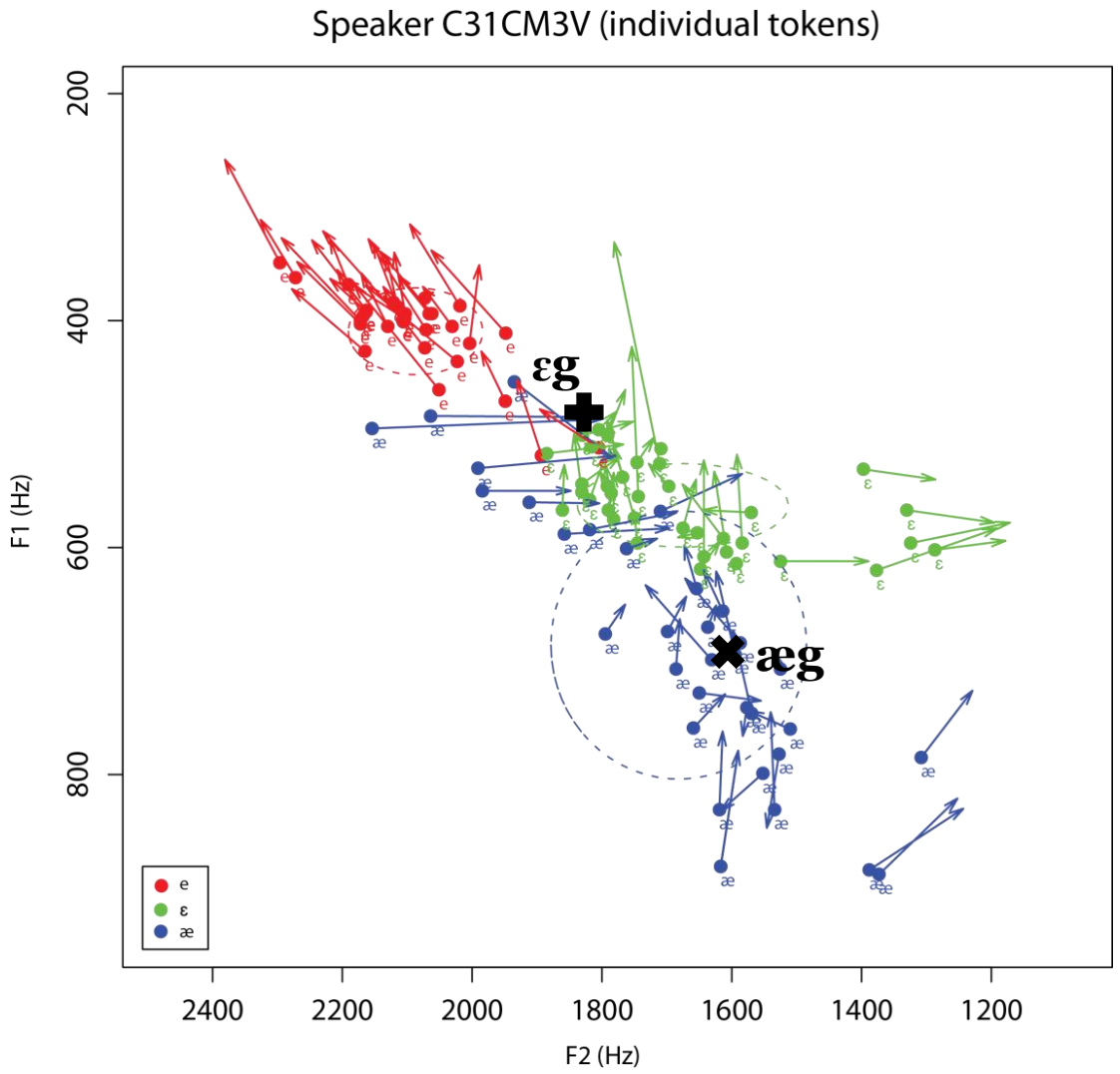

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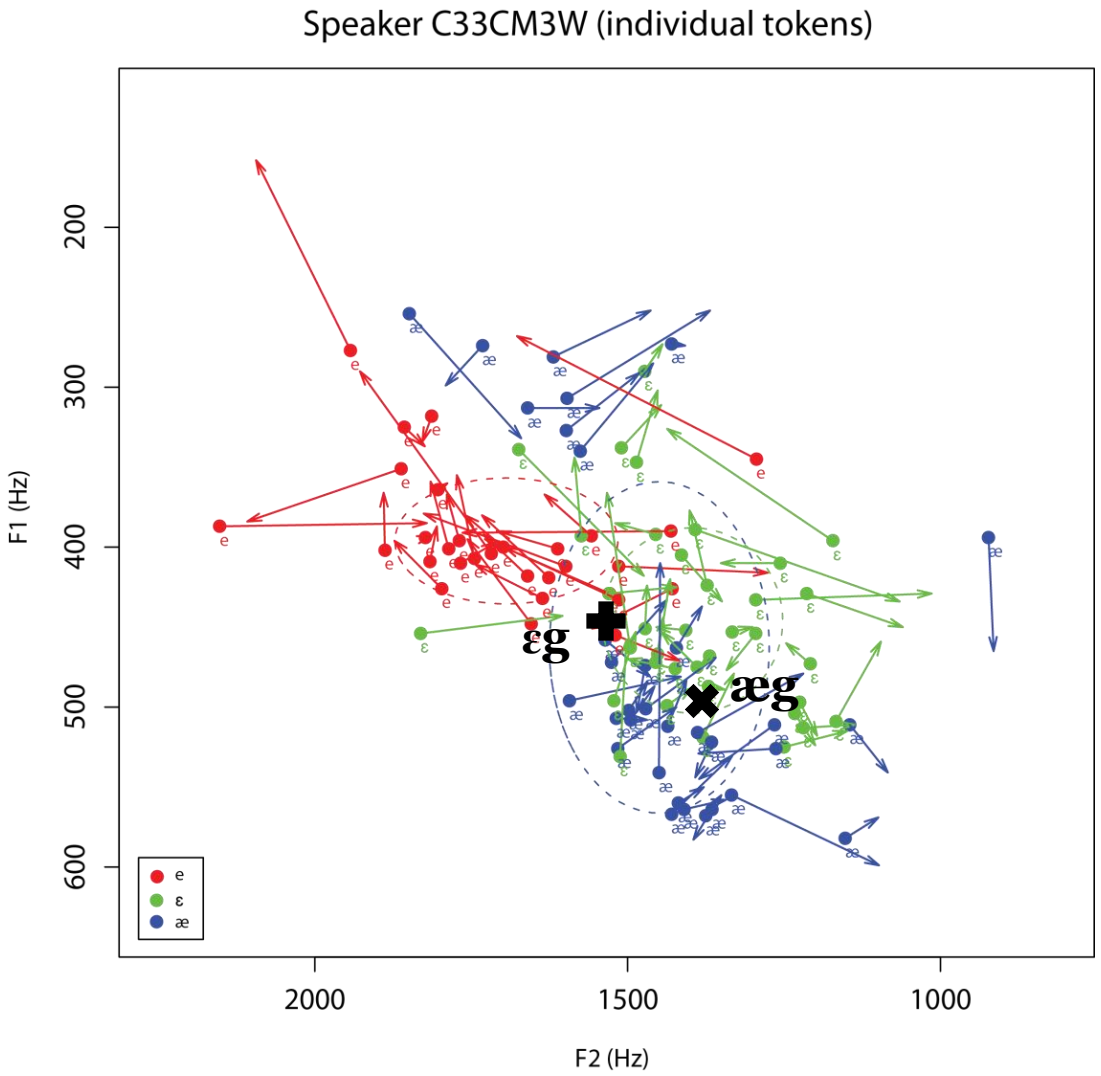
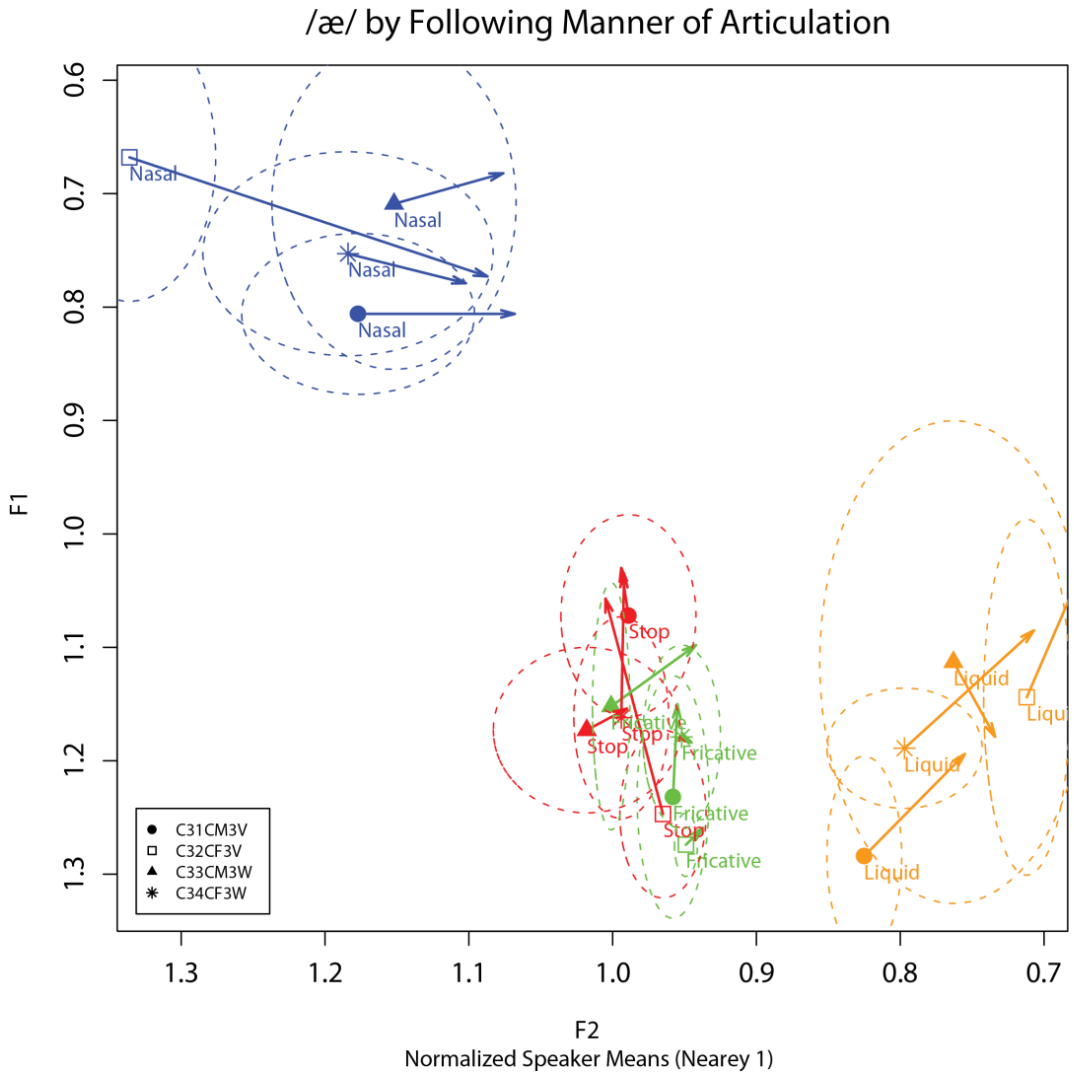


Results: /æ/


/æ/ by Following Manner of Articulation
F1
F2
Normalized Speaker Means (Nearey 1)
0.6
0.7
0.8
0.9
1.0
1.1
1.2
1.3
Nasal
Nasal
Nasal
Nasal
Stop
Stop
Stop
Stop
Fricative
Fricative
Fricative
Fricative
Liquid
Liquid
Liquid
C31CM3V
C32CF3V
C33CM3W
C34CF3W

Discussion

- /æ/ appears to raise before nasals, and back before laterals
  - /æ/-backing may be expected on phonetic grounds
  - /æ/-raising before nasals is common (cf. the 'nasal system' in Wood 2011)
- C33 looks a lot messier, may be more advanced
- Merger and non-merger environments may not be so different after all
  - Speakers C31, C33, and C34's /æg/ and /ɛg/ tokens are in approximately the same location as the non-pre-/g/ tokens
  - This may mean that the merger is spreading to other environments

Discussion

- What can this tell us about the low front pre-velar merger?
  - It looks like a merger by expansion
  - But: potentially on its way to a merger by transfer
- It may be the case that we need a more nuanced typology of mergers
- Future research:
  - More research into the merger itself
  - Comparable data from other dialect areas (e.g. the Upper Midwest, California)

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