

The PIN~PEN Vowel Merger in Southern Illinois English

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General Information

- This study looks at the merger of the /ɪ/ and /ɛ/ vowels before nasals.
- This is commonly called the PIN~PEN merger (Bailey 1997, Labov 1996).
- The presence of this merger is considered a hallmark of Southern speech (Bailey 1997, Pederson 1983).

General Information

- In the PIN~PEN merger, the high and mid lax front vowels merge before nasals, but remain distinct before oral stops.
 - bin [bɪn] ben [bɪn]
 - bid [bɪd] bed [bɛd]
- Likewise, it has been noted (Labov 1994, Thomas 2001) that pre-nasal /æ/ will often be raised. . .
- ...and when raised often shows something like merger with either /ɪ/ or /ɛ/ (Clarke 1995, Thomas 2001, etc.).
- Yet the ramifications of /æ/-raising have never been explicitly linked to the PIN~PEN merger.

General PIN~PEN

Background

- Brown (1990, 1991) is the only study to look at the PIN~PEN merger specifically.
 - These are historical accounts of the merger in Tennessee and North Carolina.
 - Brown used orthographic evidence and impressionistic transcriptions from Dialect Atlas projects.

General PIN~PEN Background

- Brown found that:
 - The PIN~PEN merger began around 1875 and could be considered “complete” by around 1930.
 - Neither sex nor education nor class plays a role in the merger after its completion.
 - This is not a particularly stigmatized feature, at least not in the South.

Phonetic Background

- Nasalization of vowels has the general effect of lowering a high F1 and raising a low F1 (Stevens 1999).
 - F1 is inversely related to vowel height (see Ladefoged 2000).
 - Nasalized /æ/ will sound “higher”; nasalized /i/ will sound “lower”.
- So, the vowel space of nasalized vowels is generally more contracted than the vowel space for oral vowels.

Phonetic Background

- Beddor (1993, etc.): this contraction of the vowel space is likely due to the combination of the nasal formant trough with a vowel's F1.
 - This interaction causes a shift in the vowel's "center of gravity".
- However, Beddor also found that recoverable CONTEXTUAL nasalization had no effect on perceived vowel height.
 - [bæ̃nd] ~ [bæ̃n] ~ [bæ̃d]
 - [bænd] ~ [bæn] ~ [bɛd]

General PIN~PEN

Background

- No dedicated *acoustical* study of the PIN~PEN merger has been published.
- When mentioned in existing acoustical studies, the PIN~PEN merger is not the focus.
 - For example, while Thomas's 2001 study of vowel variation was acoustically-based, when it came to the PIN~PEN merger, he chose to conduct an impressionistic analysis.

Phonetic Background of the PIN~PEN Merger

- So far, Thomas (2001) has been one of the only acoustic explanations of the PIN~PEN merger.
 - /ε/, being higher in the South, is more susceptible to the influence from the nasal formant trough...
 - ...which allows /ε/ to undergo categorical raising in pre-nasal contexts.

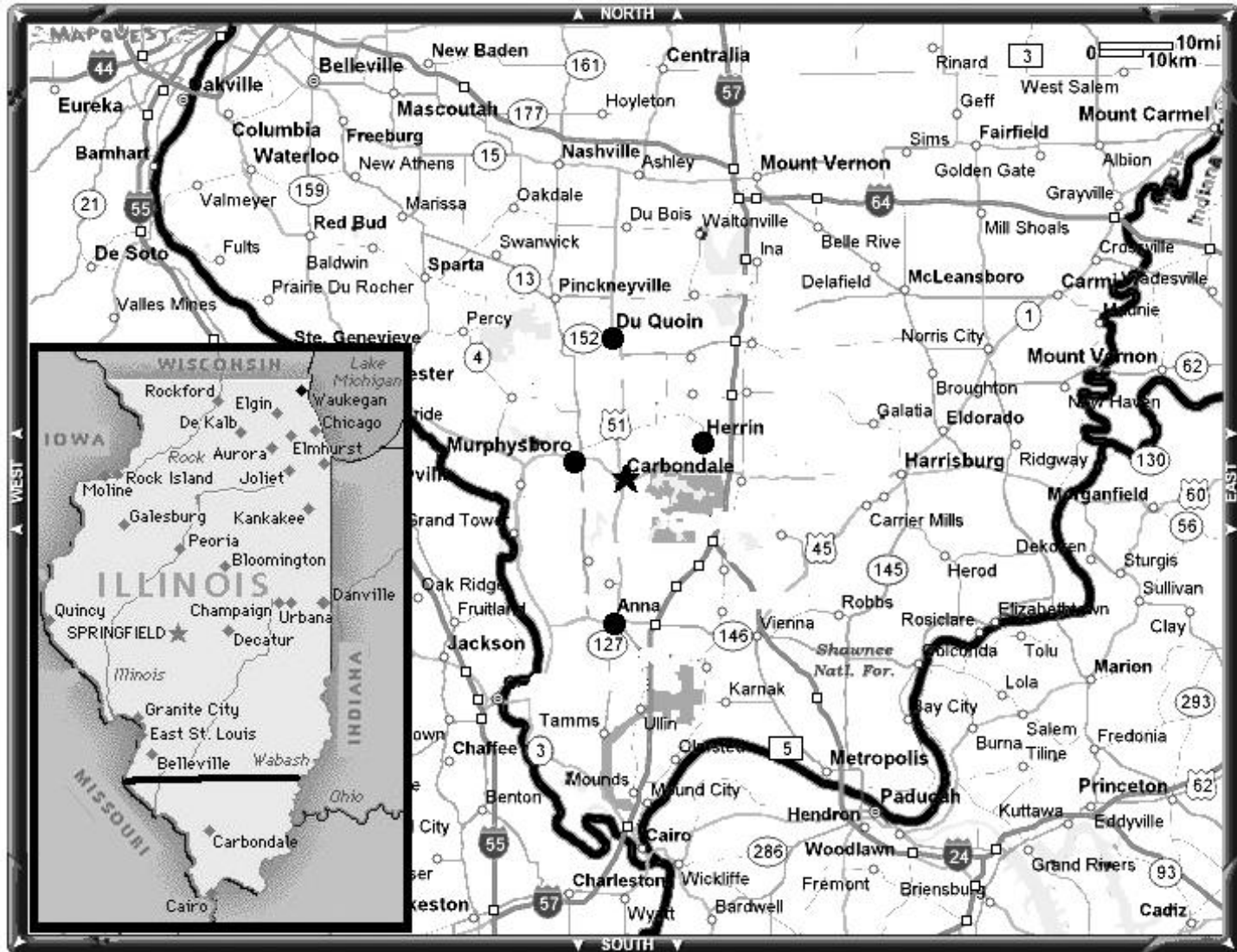
Primary Research Goals

- What is the phonetic picture for the PIN~PEN merger?
 - Beddor's work predicts that pre-nasal /ɪ/ should lower.
 - Thomas's account predicts that pre-nasal /ɛ/ should raise.
 - Problem One: Thomas's account goes against Beddor's findings.
 - Problem Two: Beddor's findings regarding *contextual* nasalization predict no effect of perceived vowel height.

Southern Illinois (SoIL)

- Lower-most 16 counties of Illinois (“Egypt” in Frazer, 1987)
 - Part of The Ohio River Valley (Dakin, 1966)
- An understudied dialect
- Labov’s TELSUR/Phonological Atlas of N. America project included SoIL in the “merger in perception & production” side of the $ɪn \sim \varepsilon n$ merger map.
 - But no speakers from Southern Illinois appear to have been sampled.
- A Rural Transition Zone
 - Roughly equidistant from NCS and SS urban anchors
 - NCS = St. Louis / SS = Memphis
- Speakers in SoIL have real and frequent access to both fully merged and fully distinct dialects.

Southern Illinois



Secondary Research Goals

- How does the PIN~PEN merger fit into a larger account of Southern Illinois English?
- Can the particulars of the PIN~PEN merger in Southern Illinois tell us anything about dialect attitudes and the outcomes of dialect contact?

Methods - Speakers

- All speakers were native Southern Illinoisans
- All speakers were raised working class
- Primary Analysis (Speaker Group A):
 - 20 Speakers
 - 11 males, 9 females
 - Age range: 15 – 65 years old
- Secondary Analysis (Speaker Group B):
 - 15 Speakers
 - 6 males, 7 females
 - Age: 18 (high school seniors)
 - Used as a comparison group only.

Methods: Recording

- Recordings were made in subjects' homes and/or quite local diners; there was no attempt to control microphone distance.
- Recordings were made on a Sony Minidisc MZ-707 recorder, with a Sony ECM-ms907 microphone.
- Minidisc ATRAC files were then recorded into Macquiner as *.wav files for analysis.

Methods – Data Collection: Group A

- 6 tokens, of 3 vowels, in 2 environments, in 2 tasks were measured for 20 speakers.
 - This yields 1440 tokens total; actual number = 1324
 - All tokens were monosyllabic
 - The vowels measured were /æ/, /ɛ/, and /ɪ/
 - Following environments were either oral (/b/ and /d/) or nasal (/m/ and /n/)
 - Initial context was not kept constant.
 - Equal number of labials and alveolars were used in final position

Methods – Data Collection: Group A

- Tokens were samples from two different reading tasks.
- Task One: Embedded List
 - Reading list where token words were jumbled in a larger list of words NOT of the phonological type under consideration.
 - EXAMPLE: . . .tiny, get, cram, chick, **hen**, farm, plough, hog, **ham**, **head**, body, now, laid, sat, **did**, Dawn, Shawn, **Ted**, thin, **ban**, mad. . .
- Task Two: Minimal Triplets
 - Reading list where tokens words were presented in minimal triplets only.
 - EXAMPLE: *...din* *Dan* *den* *did* *dad*
 dead *Ken* can *kin...*

Methods – Data Collection: Group A

- Reading lists allowed for a large sample of controlled data.
- It was thought that these two List Types would represent both a lower and a higher "attention to speech" level.
- Subjects read List One (Embedded), then two short stories, and finally read List Two (Minimal Triplets).

Methods – Data Collection: Group B

- Group B is a comparison group.
- 75 speakers (in progress... ~40 done so far)
- 8 tokens each of /æ/, /ɛ/, and /ɪ/ in pre-oral environments
- 3 tokens each of /æ/, /ɛ/, and /ɪ/ in pre-nasal environments
- Word list reading task (Embedded List)
- 360 pre-oral tokens, 135 pre-nasal tokens
- All tokens were monosyllabic

Methods: Measurements

- F1 was the primary consideration for this analysis.
- Measurement at midpoint of the F1 steady state.

Methods: Measurement & Analysis

- Measurement of F1 and F2 was taken at the midpoint of the F1 steady state.
- F1 was the primary consideration for this analysis.
 - F1 is generally accepted to represent vowel height (Ladefoged 2000).
 - The PIN~PEN merger is generally considered a merger of height (Thomas 2001, etc.)
- F2 was not considered.

Results: Overview

- Group A Speakers show a variety of different patterns of merger.
- Most older speakers show a PIN~PEN merger in their speech.
 - The phonetics of the merger show two distinct patterns for older speakers
- Younger speakers show more variability.
 - Phonetic merger seems to be adding to and conflicting with a learned neutralization / dialect feature
- Group B confirm the patterns found in younger Group A speakers.

Results: Non-merging

- Following is a graph of a speaker whose system is without merger.
- This speaker is a 16-year-old male.
- Note that both the pre-oral and pre-nasal vowels are distinct, at three different heights, but the nasality has caused a “contraction” of the vowel space.
- Notice also that Task type does not have a great influence on the vowels.

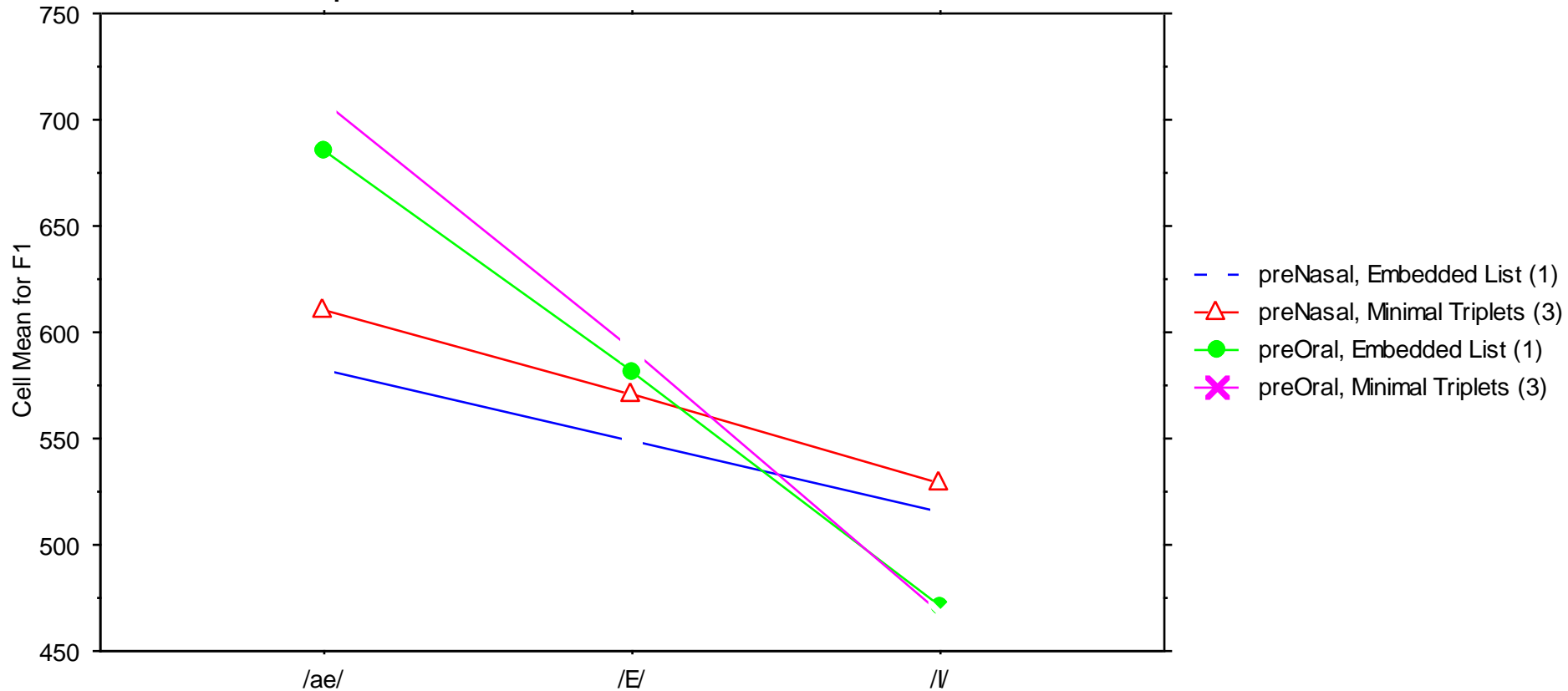
Speaker P, male, 16 years, no merger

Cell Line Chart

Grouping Variable(s): Vowel

Split By: Context, Task Type

Inclusion criteria: Speaker P from MA_3set_9-16c.svd



Results: Merging: Older Speakers

- Generally, the pre-nasal merger of /ɪ/ and /ɛ/ occurs for older speakers.
 - Task type, while it shows an effect, does not usually affect degree or direction of merger in older speakers.

Results: Canonical Merging: Older Speakers

- Following is a graph that shows the canonical PIN~PEN merger.
- See how, in pre-oral environments, all three vowels are distinct and match what we would expect of the traditional (inverted) vowel triangle.
- In pre-nasal environments, however, we see that /ɪ/ and /ɛ/ have merged; that is, they are at the same height on the Y-axis.
- Task Type does not have an effect on the merger of Speaker 3, i.e. the merger pattern is the same for both tasks.

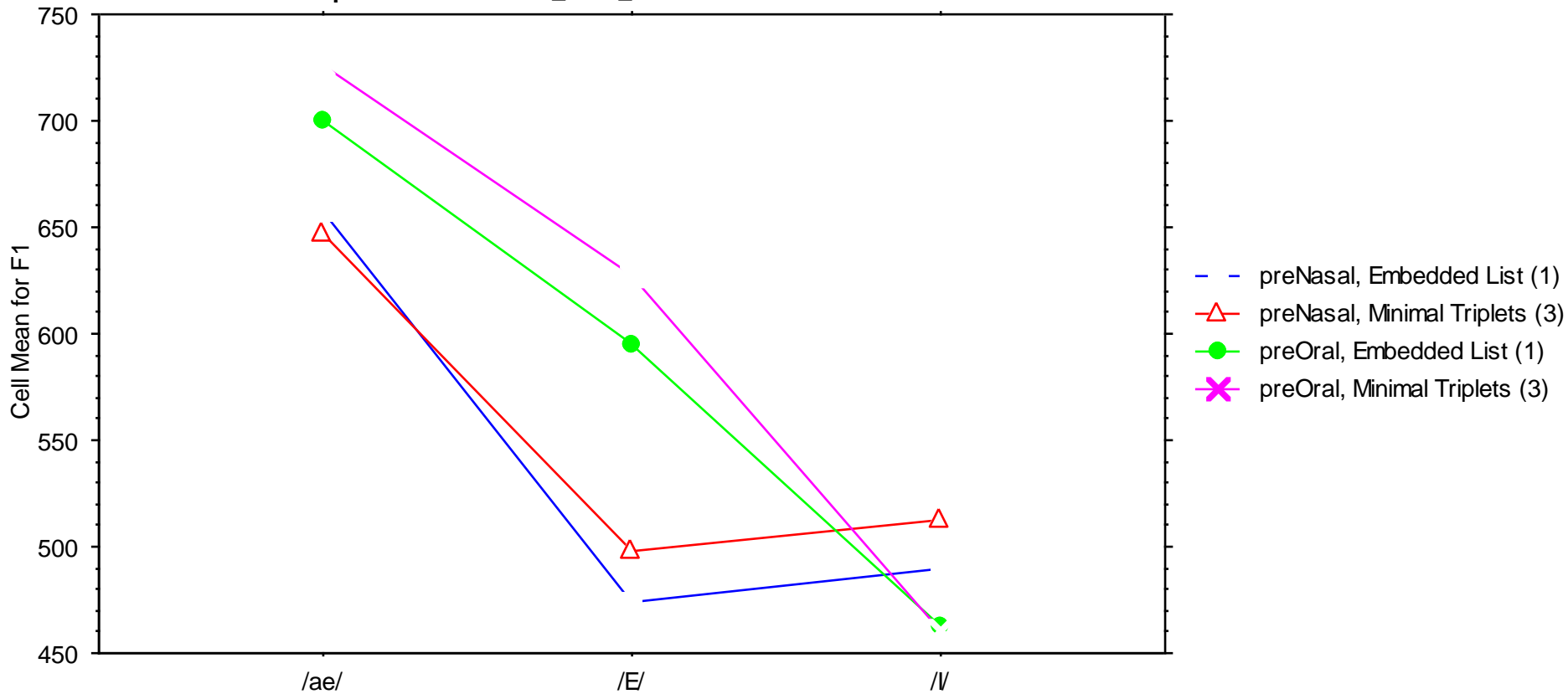
Speaker 3, female, 55 years

Cell Line Chart

Grouping Variable(s): Vowel

Split By: Context, Task Type

Inclusion criteria: Speaker 3 from MA_3set_9-16c.svd



Results: Phonetic Merging: Older Speakers

- However, this pattern of "canonical" /ɪ/~/ɛ/ merger is not what we find for the majority of our older speakers.
- Instead, we find the kinds of examples that, when based on impressionistic data, might be misleading.
- In the majority of cases for older speakers, we see that it is the /ɪ/ which has lowered to meet the /ɛ/, and not /ɛ/ raising.
 - This follows the phonetic effects of nasalization predicted in Beddor's work.

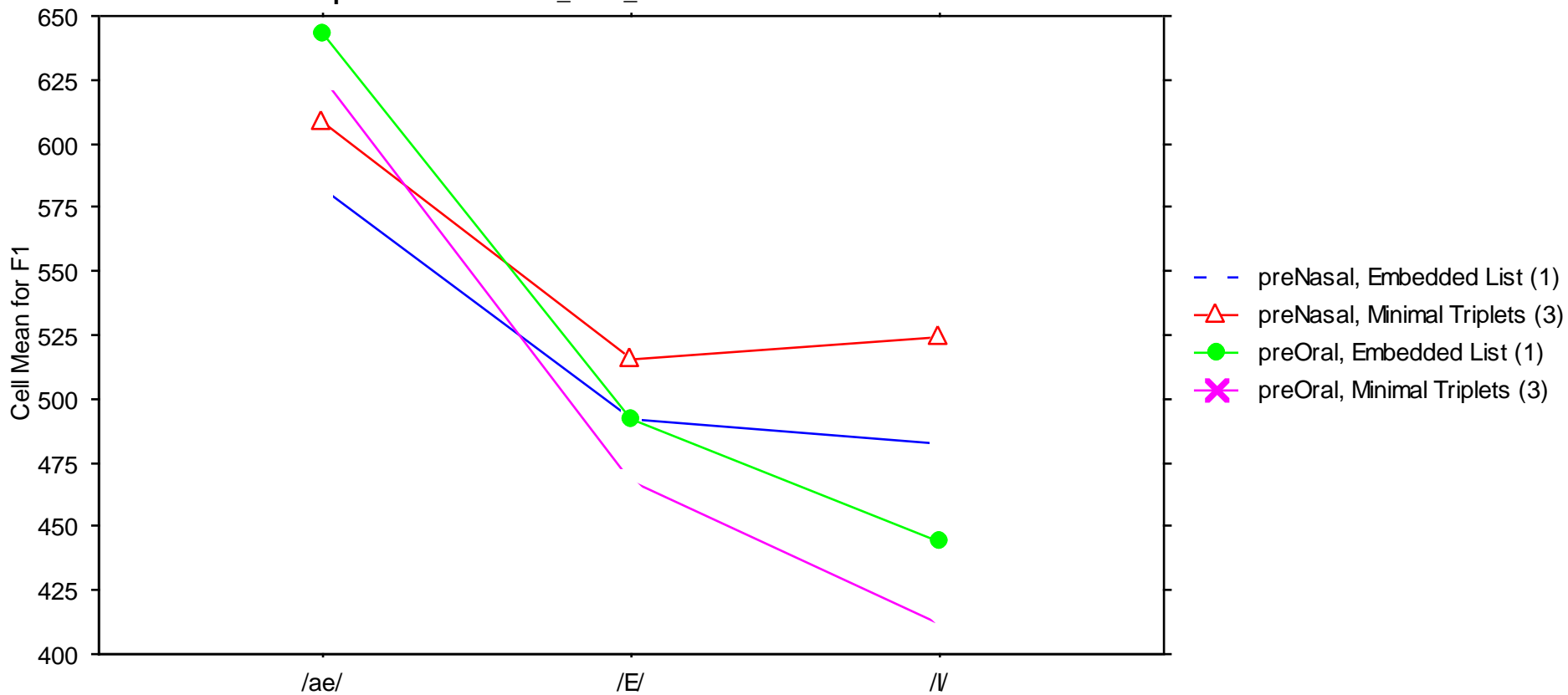
Speaker A, male, 62 years

Cell Line Chart

Grouping Variable(s): Vowel

Split By: Context, Task Type

Inclusion criteria: Speaker A from MA_3set_9-16c.svd



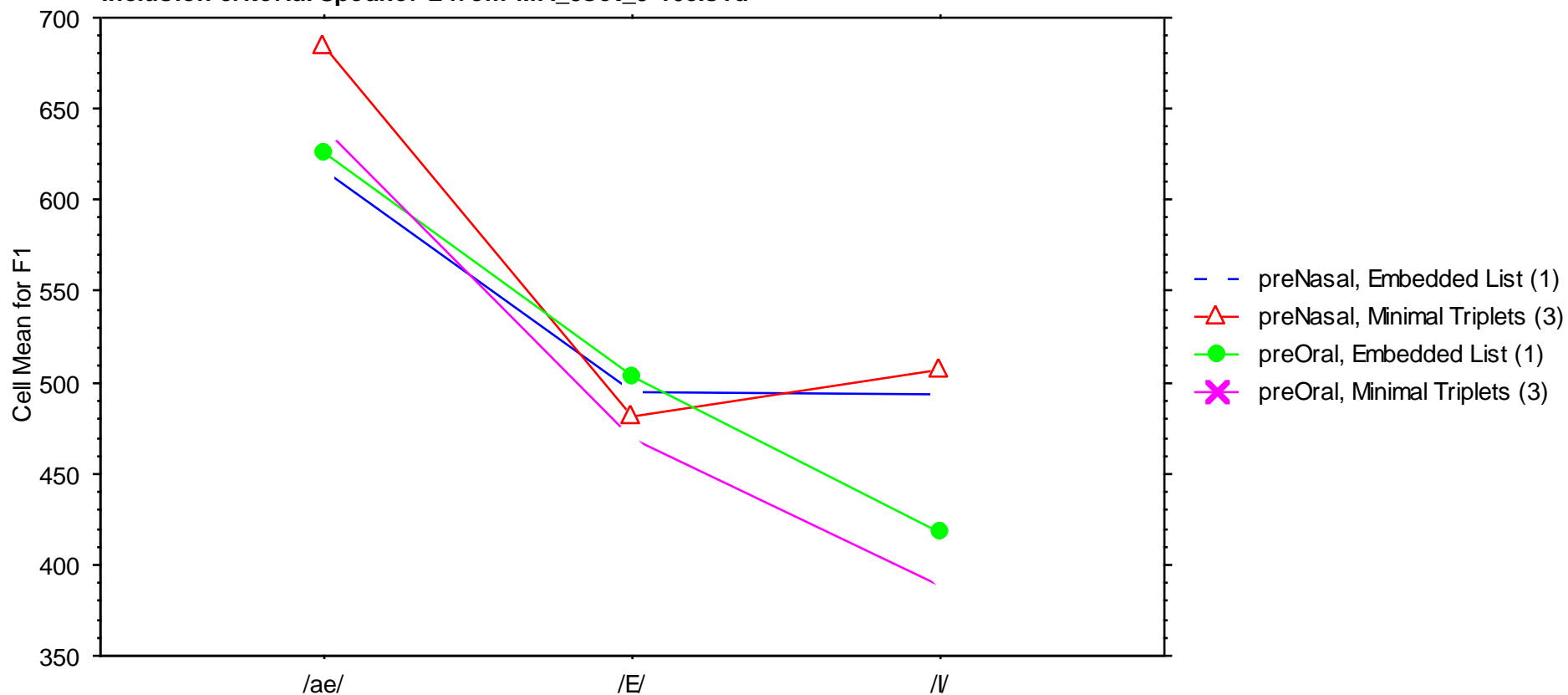
Speaker L, male, 56 years

Cell Line Chart

Grouping Variable(s): Vowel

Split By: Context, Task Type

Inclusion criteria: Speaker L from MA_3set_9-16c.svd



Results: Phonetic Merging: Older Speakers

- In the two previous examples, we still see PIN~PEN merger, but it is in the opposite direction from what the dialect literature would predict.
 - Pre-nasal /ɛ/ has remained, more or less, at the same F1 height as its pre-oral counterpart.
 - Pre-nasal /ɪ/, however, has shifted down in F1.
- This is, however, the direction of merger we would expect from the phonetics literature!
- Again, Task Type, while it has an effect on the vowels, is not affecting the pattern of merger.

Results: Merging: Younger Speakers

- If this merger is complete in SoIL, we could expect to find the same pattern in our younger speakers (see also Thomas 1996).
- Younger speakers, however, show much more variable vowel patterns.

Younger Speaker Vowels

- When List Type is also considered, there is even less consistency among younger speakers.
- Pre-oral vowels continue to behave as expected-- without much change from speaker to speaker or generation to generation.
- Pre-nasal vowels are more complicated.
- There are, however, four basic patterns for pre-nasal vowels among younger speakers

Results: Merging: Pattern A

- Complete pre-nasal neutralization
- All three pre-nasal vowels have merged
- All three pre-oral vowels remain distinct
- Context plays no role in merger
- This pattern appears to be most common for males.

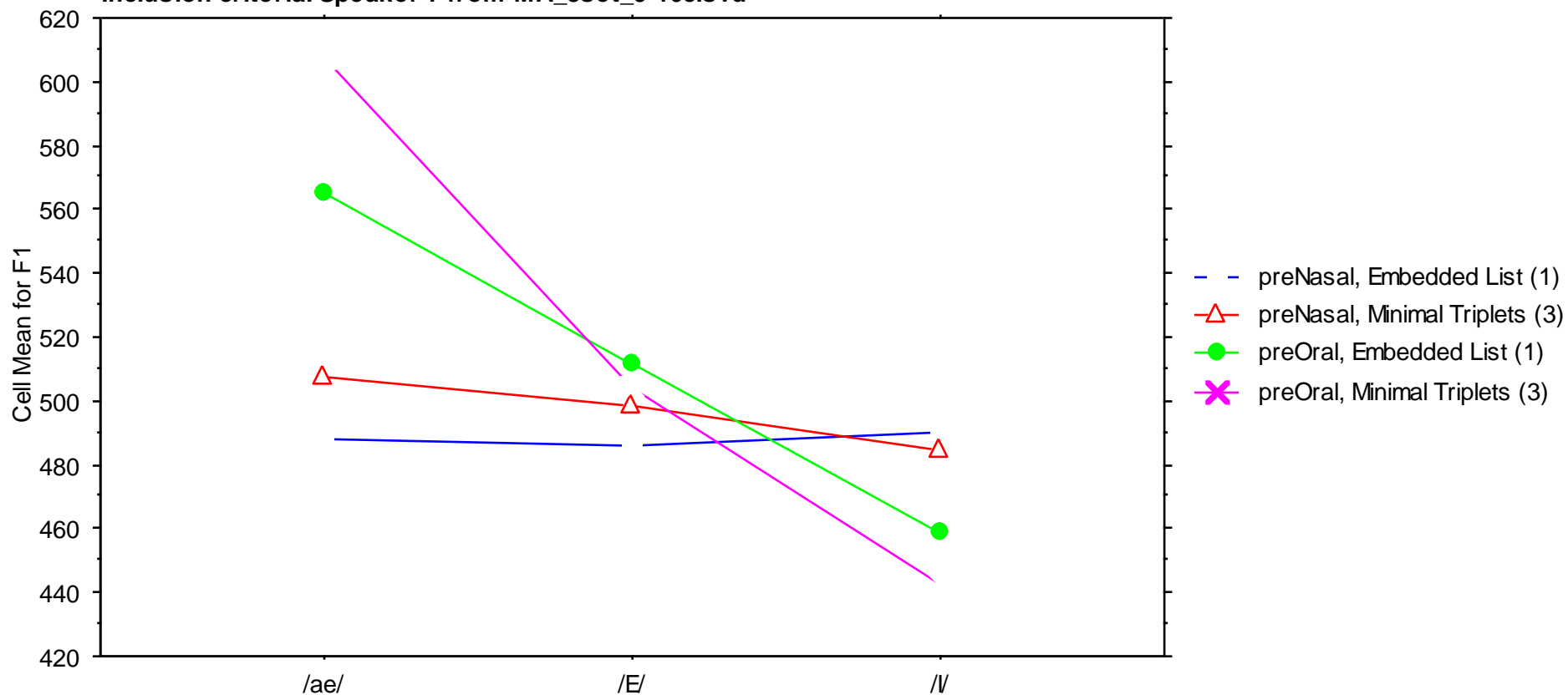
Speaker 7, male, 26 years

Cell Line Chart

Grouping Variable(s): Vowel

Split By: Context, Task Type

Inclusion criteria: Speaker 7 from MA_3set_9-16c.svd



Results: Merging: Pattern B

- a PEN~PAN merger...
- /ɛ/ and /æ/ have merged, while /ɪ/ is distinct
- This is seen both in cases where /ɛ/ lowers and in cases where /æ/ raises.
- With regard to Task Type, this pattern is highly variable, and therefore, Task Type is not considered here.

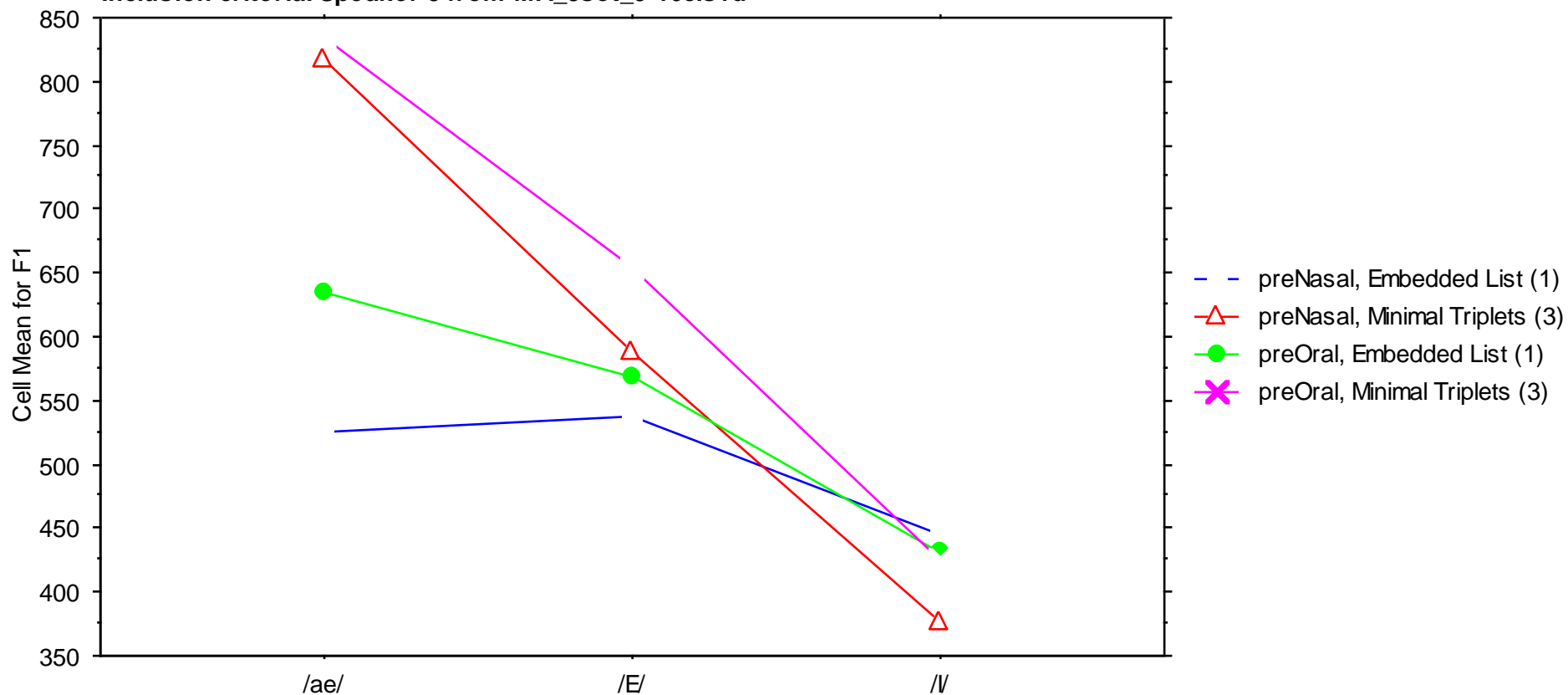
Speaker 5, female, 24 years

Cell Line Chart

Grouping Variable(s): Vowel

Split By: Context, Task Type

Inclusion criteria: Speaker 5 from MA_3set_9-16c.svd



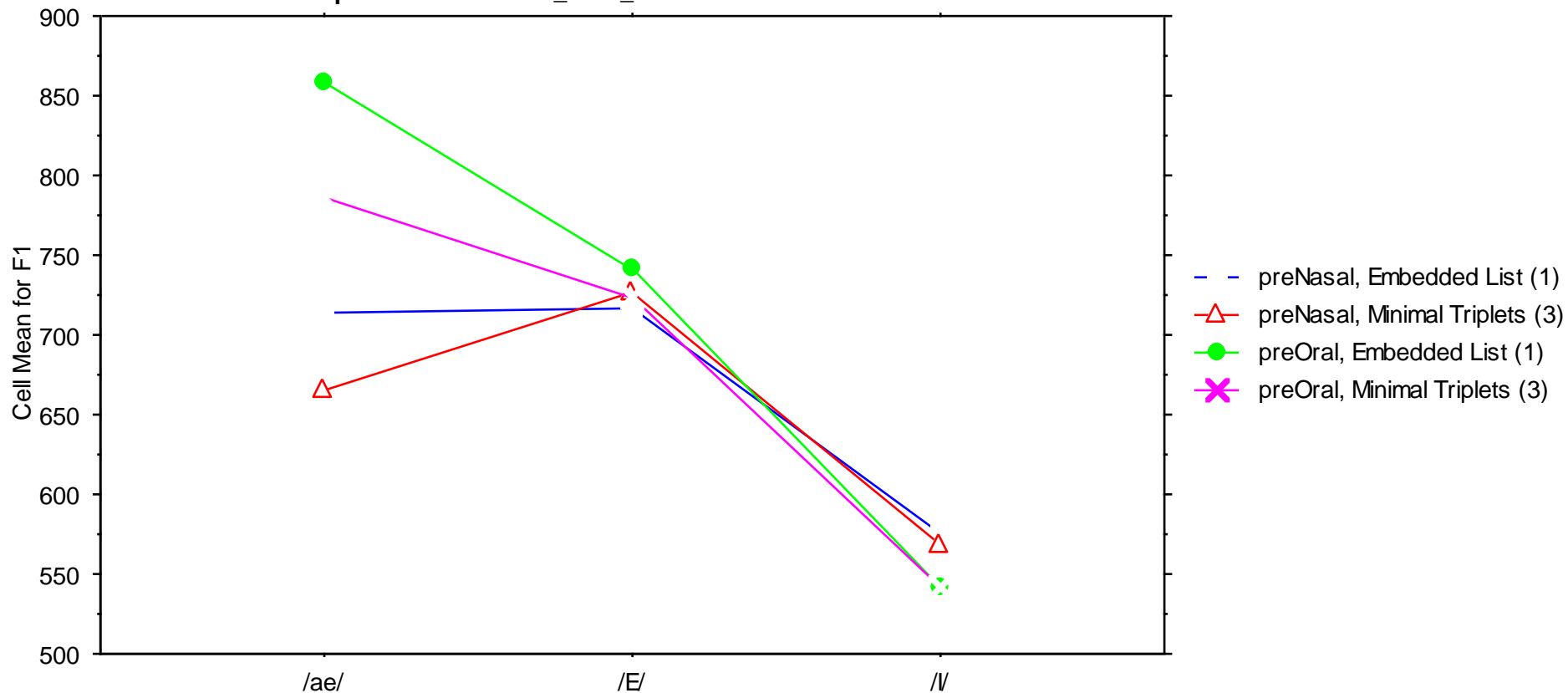
Speaker E, female, 24 years

Cell Line Chart

Grouping Variable(s): Vowel

Split By: Context, Task Type

Inclusion criteria: Speaker E from MA_3set_9-16c.svd



Results: Merging: Pattern C

- Task-dependant merger
- Pre-nasal vowels show different patterns of merger depending on Task Type.
- In the Embedded List Task, we see either /ɪ/~ /ɛ/ merger or no merger.
- In the Minimal Triplets Task, we see either full merger or /æ/~ /ɛ/ merger.

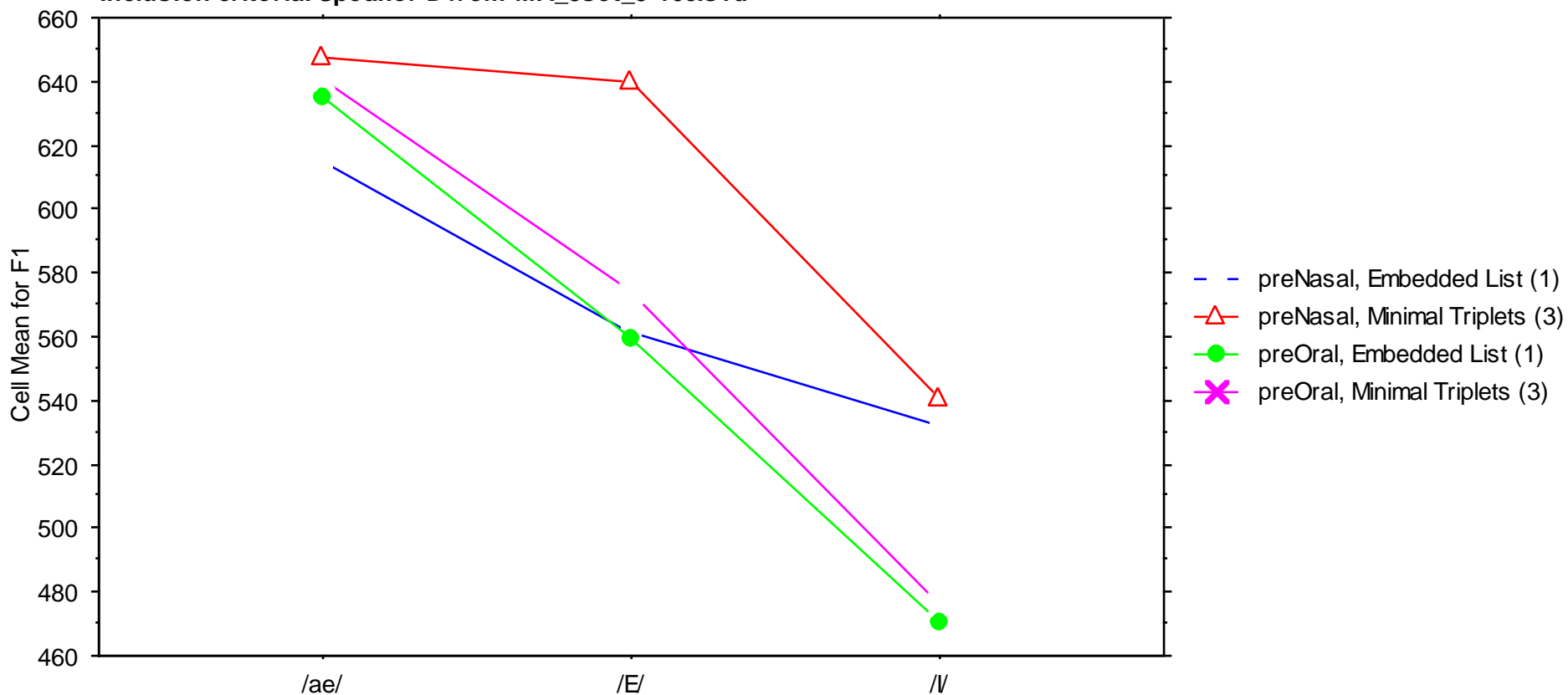
Speaker D, male, 20 years

Cell Line Chart

Grouping Variable(s): Vowel

Split By: Context, Task Type

Inclusion criteria: Speaker D from MA_3set_9-16c.svd



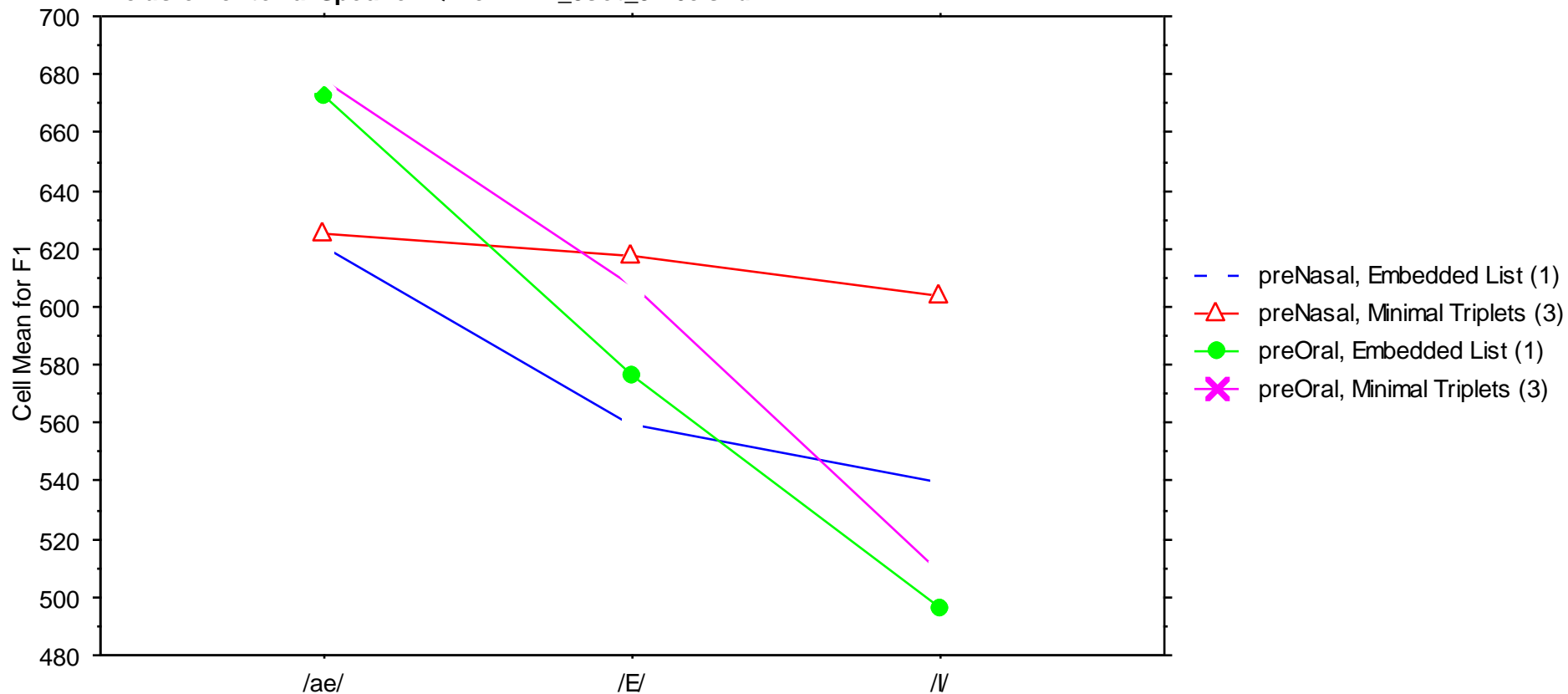
Speaker Q, male, 15 years

Cell Line Chart

Grouping Variable(s): Vowel

Split By: Context, Task Type

Inclusion criteria: Speaker Q from MA_3set_9-16c.svd



Results: Merging: Pattern D

- /æ/-Raising (a PIN~PAN merger?)
- /ɪ/ and /æ/ have merged in pre-nasal contexts.
- Again, this pattern is highly variable by list type.
- This is the only pattern found among both younger and older speakers.
- This resembles the /æ/-raising characteristic of Northern Cities Speech...

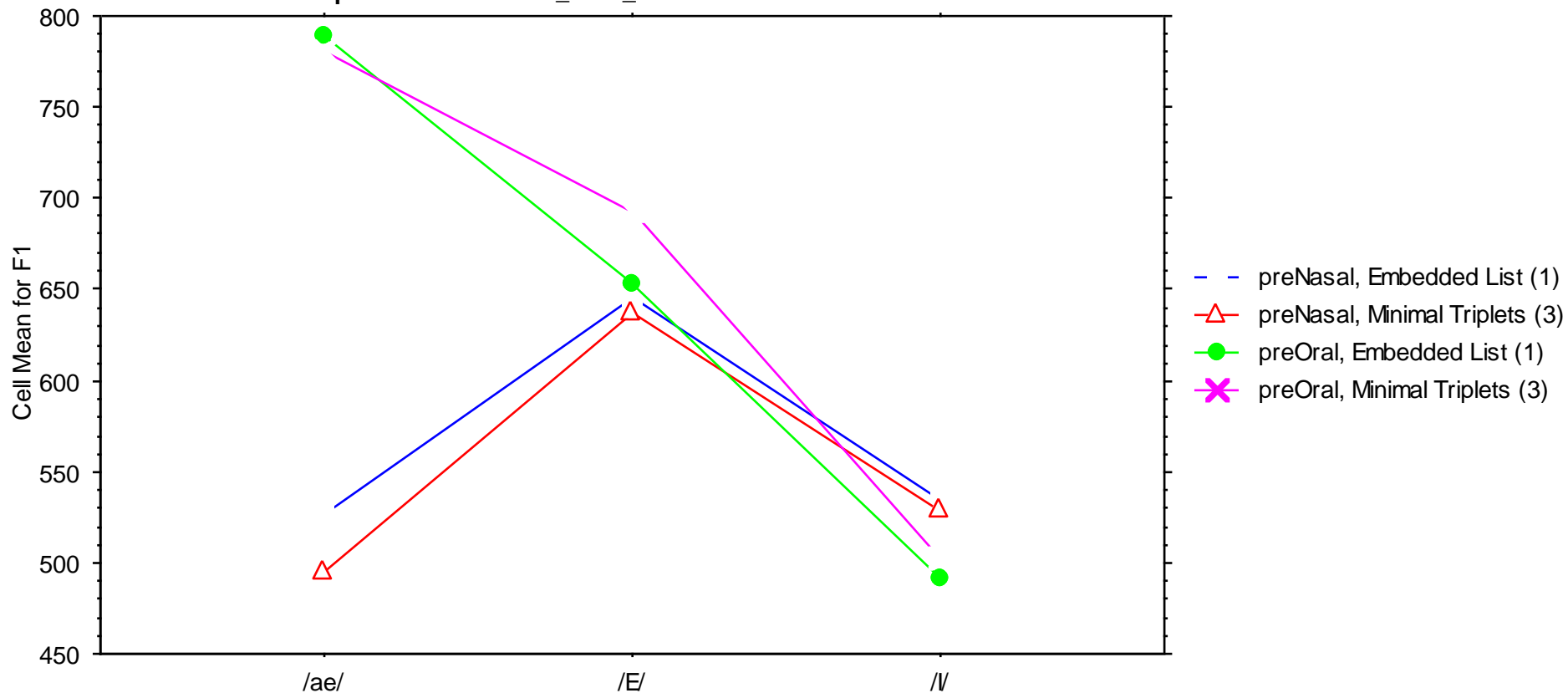
Speaker H, female, 51 years

Cell Line Chart

Grouping Variable(s): Vowel

Split By: Context, Task Type

Inclusion criteria: Speaker H from MA_3set_9-16c.svd



Conclusions: Primary Goals

- Is the PIN~PEN Merger present in Southern Illinois English?
- Yes... mostly.
 - My data indicate that the PIN~PEN merger in SoIL appears to have been a stable phenomenon, but has since become variable.
 - This apparent-time change could be either real change in progress or age-graded, we cannot know until future studies are done in Southern Illinois.

Conclusions: Primary Goals

- What is the phonetic picture for the PIN~PEN merger?
- Nearly all reports of the PIN~PEN merger have considered it an /ε/-raising phenomenon.
- My data, however, show that /ɪ/ lowering is actually more common than /ε/ raising
 - Acoustically, this lowering of /ɪ/ is exactly what we would expect based on the work by Beddor.
- Since all previous reports have focused on impressionistic rather than acoustic data the difference between /ε/ raising and /ɪ/ lowering could have been elusive.

Conclusions: Primary Goals

- The /ε/~ /æ/ merger: Hypercorrection
- I had noticed that when speakers of this region were forced to make a phonetic distinction between *ink PIN* and *stick PEN*, the second would sound much closer to *PAN* than a standard English *PEN*.
- The data occasionally show exactly this. We saw this in Speaker D, for example, who would lower his /ε/ down to the F1 value of his pre-nasal /æ/ in the minimal triplet list.

Conclusions: Secondary Goals

- Can the particulars of the PIN~PEN merger in Southern Illinois tell us anything about dialect attitudes and the outcomes of dialect contact?
- Two patterns were found in older speakers
 - Phonetics-based merger (/ɪ/ lowering)
 - Dialect-based merger (/ɛ/ raising)
- Which pattern is true of the speech of the South-South?
- Is the phonetics-based pattern characteristic of South Midland (or Midland, etc.) pronunciation only?
 - i.e., Is this the result of Southern Illinois's status as a Dialect Transition Zone?

Conclusions: Secondary Goals

- Younger speakers show more variability
- Younger speakers also have greater access to speakers from outside their “native” dialect region
- It appears that contact destabilizes the traditional merger pattern
- More frequent out-of-area contact leads to a wider range of variation
 - More work is needed in this area...

Conclusions: Secondary Goals

- How does the PIN~PEN merger fit into a larger account of Southern Illinois English?
- I'm currently working on this...
- Data from Group B are being taken into account.

Additional Data: Group B

- Data from Group B speakers (and then some) show three distinct dialect patterns.
 - A “native” Southern Illinois pattern
 - A Northern Cities Shift influenced pattern
 - A Southern Shift influenced pattern
- Do these different overall vowel patterns correspond to different patterns of merger?
 - Yes, more or less.

Group B:

Patterns & Correspondences

- “Native” Southern Illinois Dialect pattern
 - Merger pattern C
 - Either PIN~PEN merger or none at all
- NCS-influence pattern
 - /æ/-raising
 - Merger patterns B & D (depends on degree of /æ/-raising)
 - PEN~PAN merger
 - PIN~PAN merger
- SS-influenced pattern:
 - Merger pattern A
 - Complete pre-nasal neutralization

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