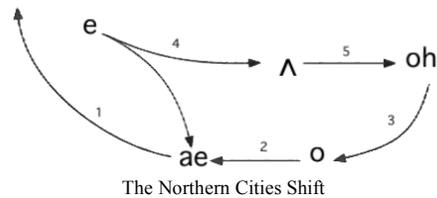


Nasal Short-a Systems vs. the Northern Cities Shift

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ANAE (Labov et al. 2006) identifies several /æ/ systems in American English, including:

- **Nasal** system: prenasal /æ/ occupies a distinct higher region of phonetic space¹.
- **Continuous** system: prenasal /æ/ is still higher than non-prenasal /æ/, but all tokens are still within a single cluster in phonetic space.
- **Raised** system: entire phoneme /æ/ raised as a unit out of low position², as part of **Northern Cities Shift**.



NCS score measures speaker's **degree of participation** in NCS on 5-point scale (Dinkin 2009, based on Labov 2007).

Current data: new interviews with 119 Upstate New York speakers (see Dinkin 2009 for details), plus 10 Upstate NY interviews from *ANAE*.

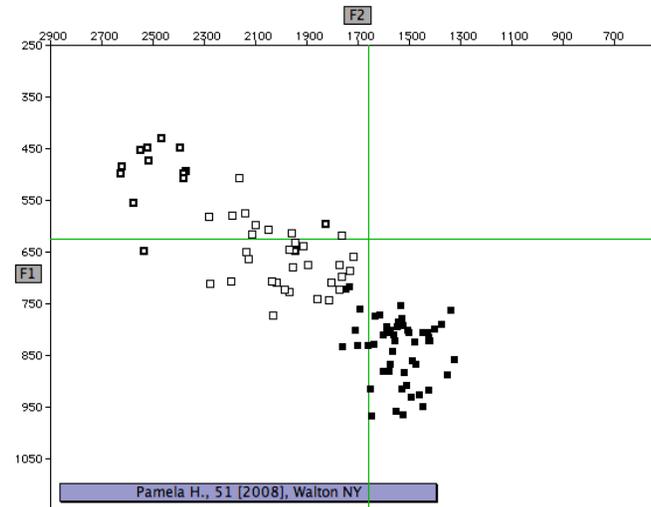
Dialect regions of Upstate NY (Dinkin 2009):

- **Inland North core:** nearly all speakers subject to NCS; scores 4–5
 - over 50% of speakers have raised system as described by *ANAE*
- **Inland North fringe:** some but not most speakers subject to NCS; scores 2–4
 - under 50% of speakers have raised system, but still some
- **Hudson Valley:** much less participation in NCS; scores 0–2
- **North Country:** little participation in NCS; low back merger; scores 0–1
 - no raised system

By *ANAE*'s definition, raised system is **subtype of continuous system**; but in fact sharp nasal allophony can coexist with raised /æ/.

¹ In this paper, a speaker is judged as meeting this description if all prenasal tokens of /æ/ but at most one are higher and/or fronter than pre-oral tokens, or if a wide gap between allophones exists in phonetic space with at most three exceptional tokens not before /r/ or /ŋ/.

² Speakers are judged as meeting this criterion if they have at most one token of /æ/ lower than mean /o/, or mean /æ/ two standard deviations or more higher than mean /o/.



Raised nasal /æ/ system of Pamela H. from Walton: non-prenasal /æ/ (white) raised in comparison to /o/ (black); prenasal /æ/ (bold outline) is a separate phonetic cluster.

Therefore we can think of **continuous vs. nasal** and **raised vs. low** as two independent features that can combine in four ways.

Continuous /æ/ patterns more associated with more Inland North-like areas and features:

- **Raised continuous** system most concentrated in Inland North core; correlated with high rate of NCS features: mean NCS score 4.2; mean /e~/o/ F2 distance 133 Hz
- **Raised nasal** system most frequent in Inland North fringe; correlated with moderate rate of NCS features: mean NCS score 2.8; mean /e~/o/ F2 distance 288 Hz

Continuous patterns (raised or low) very rare in Hudson Valley & North Country.

	raised	low
nasal	20	56
continuous	20	19

Continuous system is relatively more common for raised than low distributions

low distributions only	continuous	nasal
Inland North (core or fringe)	11	13
elsewhere	8	43

Even among non-raised speakers, continuous system is more common in Inland North

So continuous /æ/ and raised /æ/ are **both** characteristic features of Inland North.

Majority of Hudson Valley speakers have **NCS score of 2**: clearly distinct from Inland North, but NCS features are not completely absent.

vowel means	ANAE Inland North (n = 61)	Hudson Valley (n = 33)	North Country (n = 19)	ANAE elsewhere (n = 385)
/o/ F2	1498 Hz	1421 Hz	1334 Hz	1310 Hz
/e/ F2	1740 Hz	1724 Hz	1708 Hz	1847 Hz
/ʌ/ F2	1353 Hz	1324 Hz	1343 Hz	1470 Hz
/æ/ F1	653 Hz	766 Hz	792 Hz	767 Hz

The Hudson Valley:

- **resembles or exceeds the Inland North** as a whole in backing of /e/ and /ʌ/,
- is **midway between the Inland North and elsewhere** in fronting of /o/, and
- **resembles non-Inland North regions** in height of /æ/.³

North Country is similar except in /o/ (due to *caught-cot* merger).

If most features of NCS can **spread beyond Inland North**, why doesn't /æ/-raising?

Life cycle of phonological change (Bermúdez-Otero 2007):

- **Phase I:** A rule for phonetic implementation of phonological features
- **Phase II:** An allophonic rule acting discretely **on** phonological features

Prenasal /æ/ tokens are higher than non-prenasal tokens in both nasal and continuous systems, but by **Phase I** rule in **continuous systems** and **Phase II** in **nasal systems**.

Chain shifting is a Phase I operation:

- Therefore the basic unit of chain shifts is the **output** of Phase II rules.
- So prenasal and non-prenasal /æ/ **act independently** in a nasal system.
- Per Labov (2007), **diffusion** shouldn't change this.
- In the nasal system, the phonologically distinct prenasal allophone **blocks** nonprenasal /æ/ from raising into its phonetic space.
- Thus nasal system in Hudson Valley and North Country prevents diffusion of /æ/ from Inland North, while other NCS changes are not blocked.

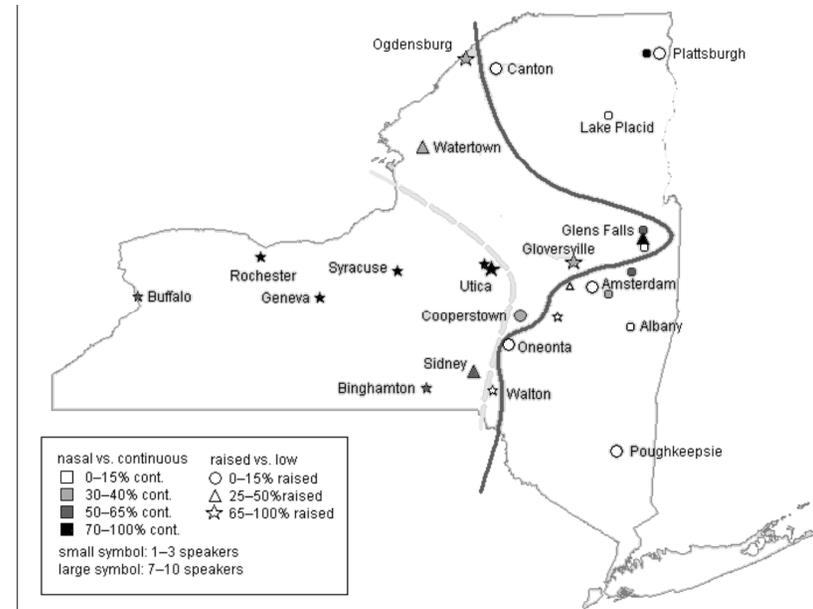
Why should an **allophone** block another allophone of the same phoneme from diffusing into its phonetic space, but a **distinct phoneme** doesn't do so?

In diffusion of merger, unmerged speakers "suspend" the distinction (Labov 1994).

But in discrete allophony, distinction is productive and can't be "suspended".

How is **raised nasal system** consistent with this picture? Communities in which it exists presumably developed raising before Phase II nasal system; in Inland North Fringe communities, distance between prenasal and non-prenasal /æ/ increasing in apparent time.

³ The New York State component of the Inland North is more advanced in backing of /e/ and /ʌ/ than the remainder of the Inland North; the Hudson Valley and North Country fall in between the two components of the Inland North with respect to these vowels. The mean /o/ F2 for non-Inland North communities becomes 1339 Hz when regions with the *caught-cot* merger are excluded.



Appendix: Data set

- 91 in-person interviews with upstate NY natives, conducted 2006–08; including Short Sociolinguistic Encounters (Ash 2002) and scheduled interviews:
 - Amsterdam (5), Canton (7), Cooperstown (5), Glens Falls (7), Gloversville (7), Morrisonville (1), Ogdensburg (7), Oneonta (9), Plattsburgh (7), Poughkeepsie (7), Queensbury (2), Sidney (6), South Glens Falls (3), Utica (7), Watertown (10), Yorkville (1)
 - 28 telephone interviews with upstate NY natives, conducted 2006–08, ANAE methodology:
 - Amsterdam, Canton, Cobleskill, Fonda, Geneva, Gloversville, Lake Placid, Ogdensburg, Saratoga Springs, Schenectady, Sidney, Walton (2 each); Cooperstown (4)
- Vowel formants measured in Praat, log-mean normalized in Plotnik using methodology of ANAE. Speakers' F1/F2 means for phonemes are computed disregarding tokens before nasals and liquids.

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