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Gradience, Allophony, and the Southern Shift Trigger

Aaron J. Dinkin, University of Toronto
Robin Dodsworth, North Carolina State University

The **Southern Shift**:
monophthongization of /ay/ → [a:] led to **lowering**/**backing** of /ey/ and /iy/.
Monophthongization is thus the **triggering event** (Labov 1994) for the chain shift.
Monophthongization is overall **disfavored before voiceless consonants**;
but the specific relationship between pre-voiced (PRIZE) and pre-voiceless (PRICE) differs in different parts of the South (Fridland 2003, Thomas 2001).

A **modular feedforward** architecture of phonology (cf. Bermúdez-Otero 2014, Fruehwald 2013) distinguishes **phonetically** and **phonologically** controlled patterns:
- **Phonological rules** manipulate **discrete, categorical** phonological entities.
- **Outputs** of phonological rules are still represented as **discrete** structural entities.
- **Phonetic implementation rules** map these to concrete physical articulations.
- Phonetic rules operate **gradiently** over **continuous** phonetic space.

A vowel chain shift is a change in **phonetic implementation**;
this means the entities involved **need not be phonemes** per se, but any discrete phonological **segment**, potentially an **allophone** of another phoneme (Dinkin 2011).

This implies…
- **if** the Southern Shift is a pull-chain as described…
- and **if** the modular feedforward account of chain shifts is correct…
- **then** the relationship between PRICE and PRIZE must have **originally** been **gradient**—a continuum from more diphthongal to more monophthongal.

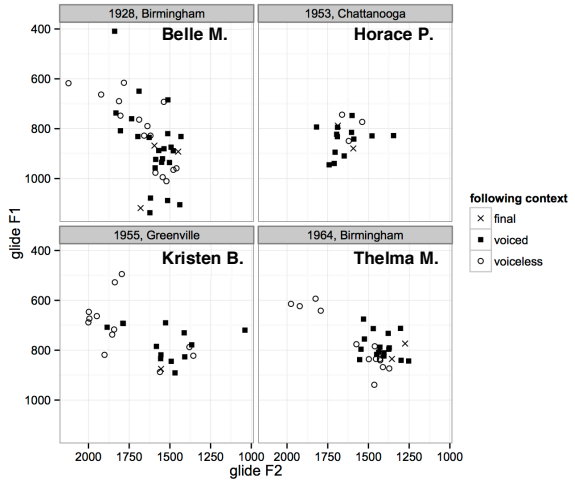
If the shift had **originated** with **distinct** diphthongal and monophthongal **allophones**, the original /ay/ position would still be occupied, not leaving space for /ey/ to lower.

So: **Was Southern /ay/-monophthongization a phonetically gradient process?**

Look at the **Inland South**, where *ANAE* (Labov et al. 2006) suggests the shift originated.
ANAE phonetic data contains **13 speakers** from Inland South cities, interviewed 1995–6:
Birmingham, Ala. (2); Linden, Ala.; Ashland, Ky.; Asheville, N.C. (2); Greenville, S.C. (2); Chattanooga, Tenn. (3); Knoxville, Tenn.; Huntington, W.V.
ANAE reports **high rate of monophthongal PRICE** in Inland South.
This **would not be expected** if PRICE & PRIZE were distinct allophones from the outset—if they were, there'd be no reason for PRICE to "catch up" with PRIZE.

We measure **glide target** of each /ay/ token, at 5/6 of vowel duration.
(Measurements are normalized using log-mean normalization parameter from *ANAE*.)

None of the Inland South speakers has **categorical allophonic distinction**—i.e., one cluster of all PRICE tokens and one of all PRIZE tokens.
Patterns attested in the data:
- **Gradient** single cluster reaching from more diphthongal to less diphthongal
- **All** /ay/ uniformly monophthongal
- 2 discrete diphthongal/monophthonal allophones, but **PRICE varies** between them

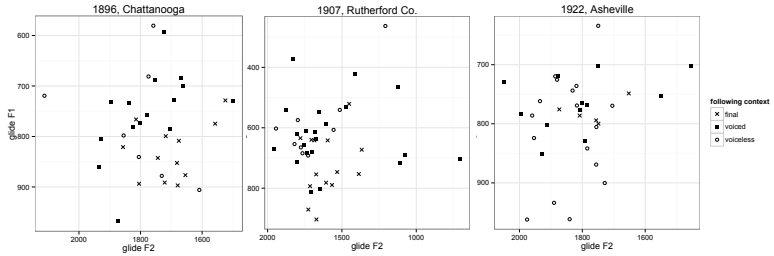


Sample Inland South /ay/ glide targets. Belle shows gradiency, Horace uniform monophthongization, Kristen two robust allophones, Thelma mostly monophthongs with a few isolated diphthongs.

Kristen B. from Greenville, S.C. is the **only** one to **robustly** show two allophones;
a couple others have mostly monophthongs with a **handful** of isolated diphthongs.
If /ay/-monophthongization originated as **variable but discrete,** like Kristen's system, we'd expect to see that pattern in the **oldest speakers in the data**.

But **all three** of the oldest speakers (born 1928–35) have **gradient** distributions.
This indicates that the **earliest stage** of /ay/-monophthongization visible in *ANAE* was a **gradient process** with diphthongs & monophthongs as part of a **single** distribution.
The diphthongal **edge** of that gradient distribution is **still less diphthongal** (i.e., has a **lower glide target**) than a typical non-Southern speaker's /ay/—
i.e., it's **not** the case that diphthongal /ay/ just **stays in place**.
What about the speakers who **do** appear to have two different allophones—e.g., Thelma?
Probably, monophthongization **has gone to completion**, but a diphthongal variant is **re-introduced from above** as a correction to the standard, which is used **occasionally**.
Whether this is the case for Kristen, and she just corrects to the standard **more often**, or whether she just has a different system, is hard to say.

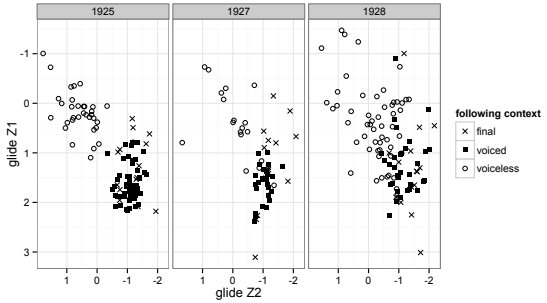
Pushing earlier into the history of the Inland South:
Three speakers born 1896–1922 in western N.C. and eastern Tenn., interviewed 1974 by Ron Butters, show gradient monophthongization with no PRIZE/PRICE differentiation.
(Data retrieved from SLAAP archive—see Kendall 2007—and measured at ¾ of vowel duration.)



Beyond the Inland South:

Raleigh, N.C. is **outside** the Inland South (*ANAE*) / South Midland (Kurath 1949).
Southern Shift has been **retreating** there since 1950s (Dodsworth 2013),
but **oldest speakers** will show early status of /ay/ in a non–Inland South city.
Look at six oldest speakers sampled by Dodsworth (2013), born 1925–1939;
glide target measured at ¾ of vowel duration.

The majority of them have **much more discrete distinction** between diphthong PRICE and monophthong PRIZE than Inland South speakers of similar age.



Sample of oldest Raleigh /ay/ glide targets (excluding *ninth*, *nineteen*, *ninety*). 1925 and 1927 have non-overlapping discrete PRICE/PRIZE; 1928 has possibly gradient pattern.

Use effect of vowel **duration** to approximate phonetic **targets**:
assume vowels of **longer duration** tend to hit **closer** to phonetic targets.
In **Raleigh**, PRICE is **more diphthongal** with increasing duration; PRIZE usually **isn't**.
In **Inland South** older speakers, PRIZE and PRICE **don't differ** in effect of duration.
Therefore, in Raleigh, PRIZE and PRICE are often phonologically **distinct allophones**;
in the Inland South, they're (at least originally) part of a single phonological entity.

Conclusion:
The hypothesis that /ay/ is **one phonological unit** in the early Inland South is supported.

Our data are consistent with a picture wherein:
- /ay/-monophthongization **is the triggering event** for the Southern Shift;
- chain shifts operate as predicted by a **modular feedforward** phonological architecture;
- the Southern Shift **originated in the Inland South** region.

Labov (2007) notes **diffusion** need not maintain structure or chain-shift causality:
In Raleigh, **discrete allophonic alternation** between PRICE and PRIZE is long-standing;
monophthongization may have **diffused** there from Inland South, becoming discrete,
or may have originated there **independently** with a different phonological structure.
The Southern Shift needs monophthongization of PRICE to trigger /ey/-backing;
presumably the chain shift originated in the Inland South,
and then **diffused** to Raleigh and other non–Inland South parts of the South.

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