(ay) Monophthongization in Deer Park Texas

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(ay) Monophthongization

What is (ay) monophthongization?

- Phonological process in which the glide of the diphthong [aɪ] undergoes weakening or is completely lost (Wise 1933, Edgerton 1935)

- Resulting vowel is lengthened ([a:]) and fronted (towards [æ]) (Thomas 2001, Fridland 2003)

- Sensitive to following phonological environment: most frequent in open syllables or before voiced consonants (Evans 1935; Fridland 2003; Labov, Ash, & Boberg 2006)

Compare: ‘rice’ ‘rise’

- A “long established stereotype” of Southern U.S. English (Bailey 1997)

“Did I just say [bra:t]?”

(ay) Monophthongization

How have linguists quantified (ay) monophthongization?

<u>Auditory Analysis</u> (Edwards 1992, 1997; Anderson 1999)

- Variation in level of detail transcribed, but typically broad transcription
- Usually imposes an artificial dichotomy (monophthongal or diphthongal) onto a continuous range of monophthongization
- Difficult to compare *how* groups monophthongize (in addition to *whether* they monophthongize)

Diphthongal ⟶ Weakened glide ⟶ Monophthongal

(ay) Monophthongization

How have linguists quantified (ay) monophthongization?

Acoustic Analysis (Thomas 2001; Fridland 2003; Labov, Ash, & Boberg 2006)

- Measurements traditionally taken at single point ("steady state" or "point of inflection") with variation in measurement points across tokens (DiPaolo, Yaeger-Dror, & Wassink 2011)

- Shift in recent research towards multiple points of measurement
  - Resulting measurements often still dichotomized into "monophthongal" and "diphthongal" ranges
  - Despite research suggesting listeners use duration and rate of change in vowel identification (Nearey & Assman 1986, Strange 1989), sociophonetic studies have typically relied on F1/F2 measurements only

Social Factors

Fridland (2003) (Memphis, TN)

- Gender/voicing interaction: Monophthongization more frequent in pre-voiceless contexts & open syllables in male speakers
- Age: Monophthongization less frequent in younger speakers

Labov, Ash, & Boberg (2006) (Several cities throughout the South)

- Gender: No significant differences
- City type: Monophthongization more frequent in smaller cities
- Age: Monophthongization less frequent in younger speakers

Thomas (1997) (Several cities throughout Texas)

- City type/age interaction: Monophthongization less frequent in younger speakers from large metropolitan areas

Why Deer Park?

Attitudinal motivation

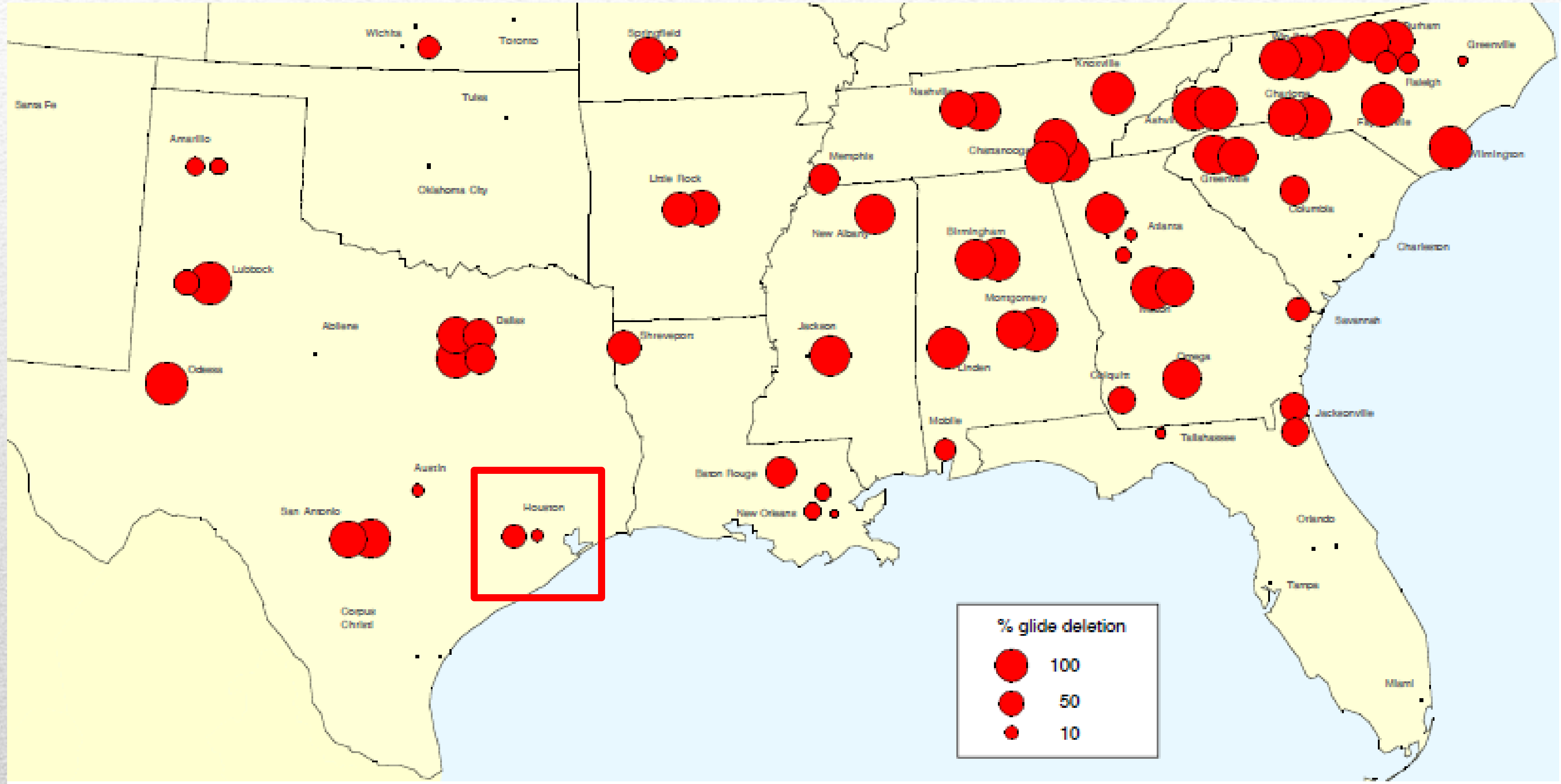
- Deer Park residents characterize Texas as distinct from the South at large, echoing attitudinal research conducted in other parts of the U.S. (Niedzielski & Preston 1999, Johnstone 1999)

Regional motivation

- Several traditional Southern dialect features infrequent in Houston area (Labov, Ash, & Boberg 2006)
- Recent research suggests vowel systems of Houston speakers are neither wholly Southern nor wholly western (Koops 2010, Brunner et al. 2010)

Why Deer Park?

Labov, Ash, & Boberg (2006)



"Do people from Deer Park speak like that? Yes. Do most people in Deer Park? No."

Goals

- Examine the effects of following linguistic environment, task formality, gender, and age on (ay) monophthongization

- Compare Deer Park (suburban) results to results of previous studies (primarily rural or urban)

- Test and compare 3 innovative methods of measuring (ay) monophthongization:
  - Offset F2-F1
  - ΔF1, change in vowel height over time
  - ΔF2, change in vowel backness over time

Methods: Data Collection

Subjects: 30 native English speakers from Deer Park, Texas
Ethnicities: 28 Caucasian speakers, 2 Hispanic speakers

	Youngest Group (18-31)	Middle Group (32-47)	Oldest Group (48-66)	Total
Male	5	3	5	13
Female	6	4	7	17
Total	11	7	12	30

3 Tasks:

- Word List (scripted with target stimuli)
- Map Task (unscripted with target stimuli)
- Interview (unscripted with volunteered stimuli)

Hypotheses

(ay) monophthongization will occur more . . .

Language-internal variables

. . . before voiced consonants than before voiceless consonants

Task formality variables

. . . in the interview task than the map task

. . . in the map task than the word list

Speaker variables

. . . in male speakers than female speakers

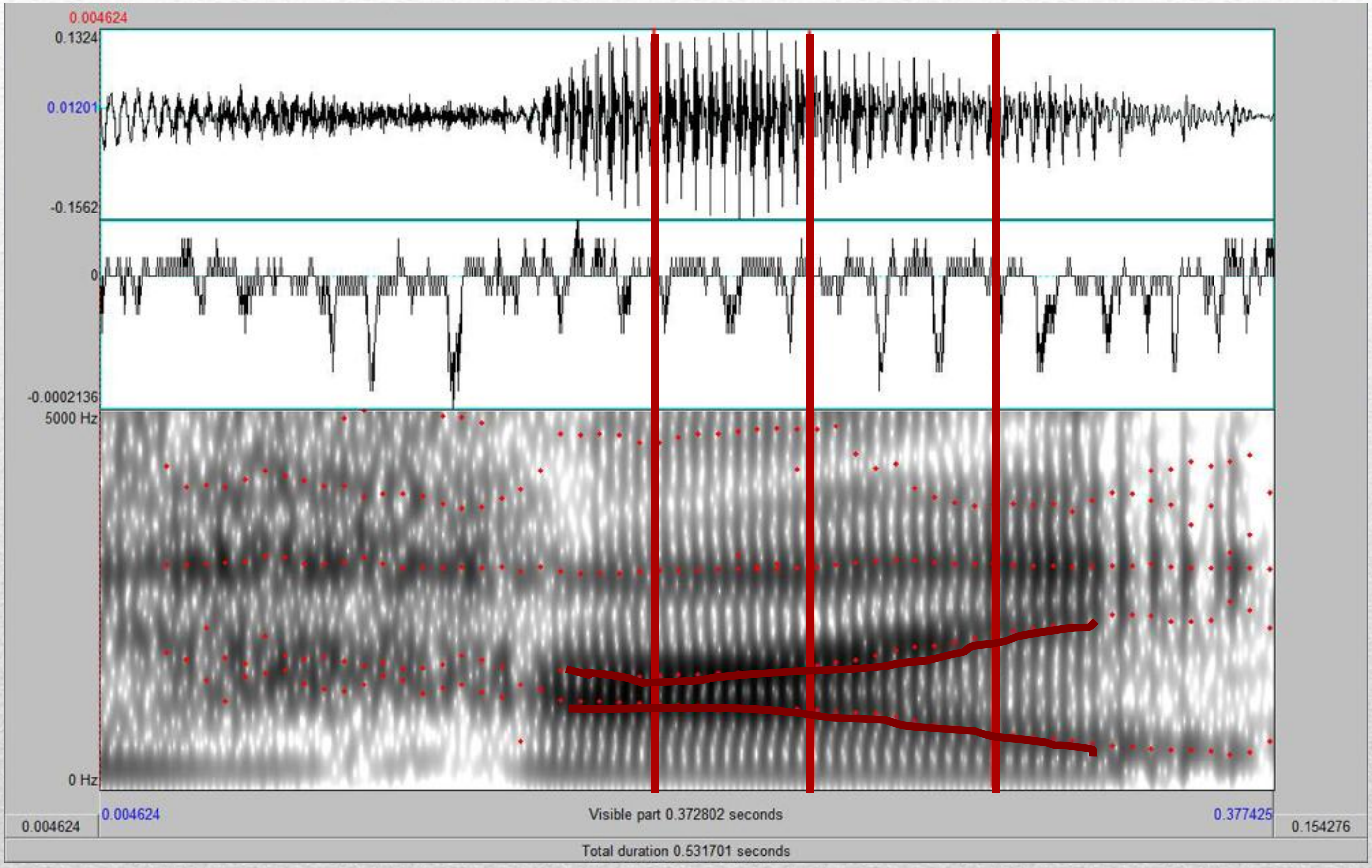
. . . in the middle age group than the youngest age group

. . . in the oldest age group than the middle age group

Methods: Acoustic Analysis

- 3,780 tokens total, ~126 tokens per speaker
- Analyzed in Praat signal analysis software (Boersma & Weenik 2005)
- Collected 7 measurements per vowel using a Praat script:
  - F1, F2 (20%, 50%, 80%)
  - Duration
- To represent spectral change in vowels over time, 2 calculations:
  - $\Delta F1$ = [End F1 (80%) - Beginning F1 (20%)] / Duration (ms)
  - $\Delta F2$ = [End F2 (80%) - Beginning F2 (20%)] / Duration (ms)
- Compared with a 3rd calculation which does **not** incorporate duration:
  - Offset F2-F1 = End F2 (80%) - End F1 (80%)

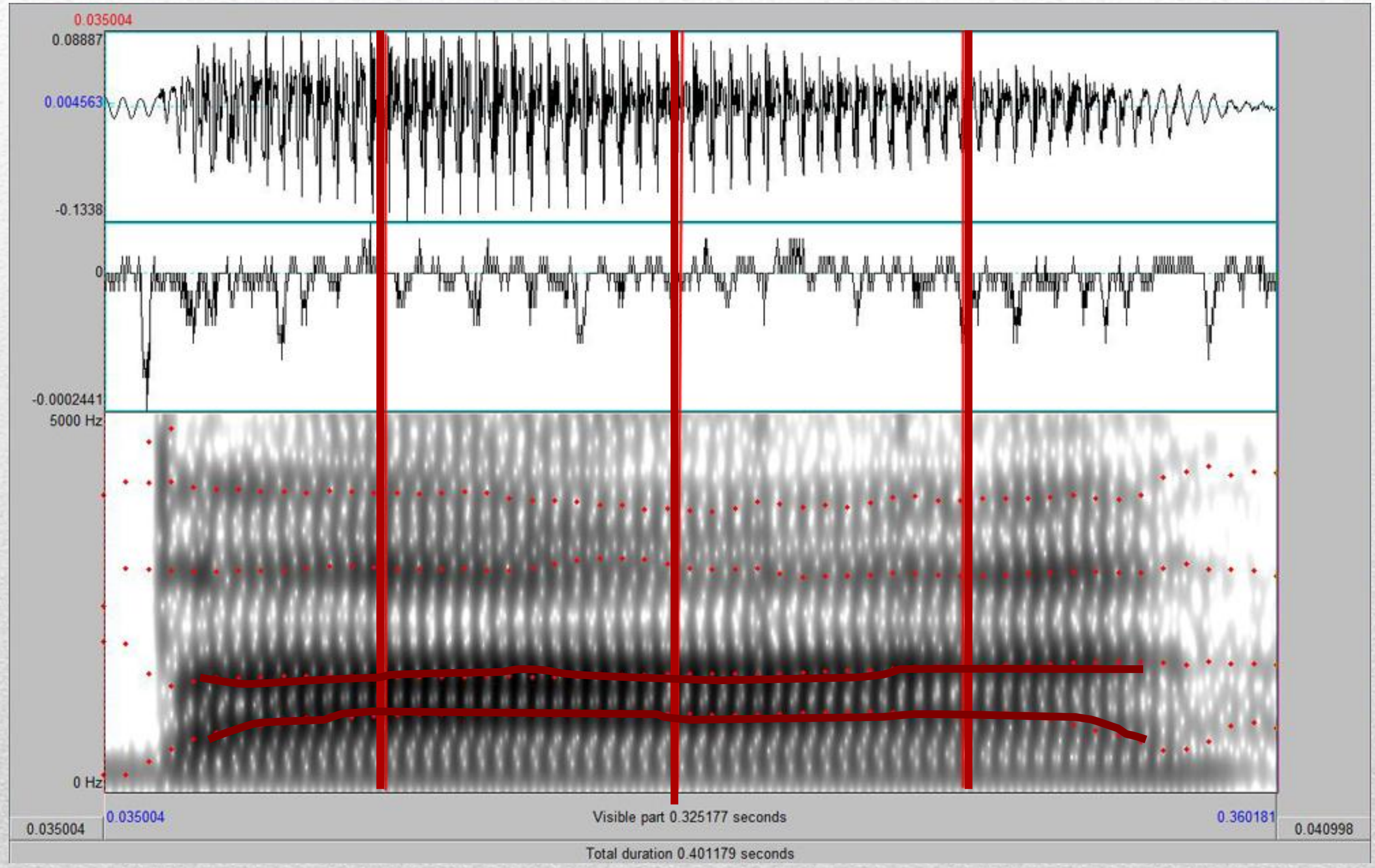
Methods: Acoustic Analysis



‘height’ (diphthongal)

Smaller ΔF1, larger ΔF2, larger Offset F2-F1

Methods: Acoustic Analysis



'bye' (monophthongal)

Larger ΔF1, smaller ΔF2, smaller Offset F2-F1

Methods: Statistical Analysis

Multiple Linear Regression

- Dependent variable: ΔF1, ΔF2, or Offset F2-F1 (3 separate analyses)
- Independent Variables:
  - Language-internal variable
  - Task formality variables
  - Speaker variables

- Sequential regression
  - Added variables in blocks (language-internal, task formality, speaker variables) to assess whether model is significantly improved

- Random effects model
  - Tokens nested in speakers, so individual tokens not necessarily independent of each other – included speaker as a random effect

Overall Results

Language-internal variable:

- **Voicing of following consonant**: ΔF1, ΔF2, and Offset F2-F1 all significant ($p < .05$), with more monophthongization in pre-voiced rather than pre-voiceless environments

Task formality variables:

- **Task formality**: ΔF1, ΔF2, and Offset F2-F1 all significant ($p < .05$), with more monophthongization in the interview than the map task and in the map task than the word list

Overall Results:

Speaker variables:

- **Gender**: ΔF1, ΔF2, and Offset F2-F1 all significant ($p < .05$), with more monophthongization in male speakers than female speakers

- **Age (youngest versus middle age group)**: ΔF1, ΔF2, and Offset F2-F1 all significant ($p < .05$), with more monophthongization in middle age group speakers than youngest age group speakers

- **Age (middle versus oldest age group)**:
  - ΔF1 significant ($p < .05$), with more monophthongization in oldest age group speakers than middle age group speakers
  - ΔF2 and Offset F2-F1 **not** significantly different for these 2 groups

Overall Results: Summary

Statistical Comparison	ΔF1	ΔF2	Offset F2-F1
Voiced versus voiceless following consonant	✓	✓	✓
Interview versus map task	✓	✓	✓
Map task versus interview	✓	✓	✓
Males versus females	✓	✓	✓
Youngest versus middle age group	✓	✓	✓
Middle versus oldest age group	✓	✗	✗

Age in the South

“[(ay) monophthongization] is most advanced among older speakers living in smaller cities. In the perspective of apparent time, the Southern Shift is slowly receding.” (Labov, Ash, & Boberg 2006: 253)

“As glide weakening in (ay) moves through the Southern White community and becomes a strong marker of Southern identity, young speakers may be withdrawing as the change nears completion and becomes a strong southern marker.” (Fridland 2003: 290)

Age in Deer Park

- Younger speakers in Deer Park are monophthongizing less than older speakers, but differences between age groups aren't reflected in frequency of monophthongization alone:
  - Youngest and middle age group differ on all 3 measurements (ΔF1, ΔF2, and Offset F2-F1)
  - Middle and oldest age group do **not** differ in Offset F2-F1 (which doesn't incorporate duration), but **do** differ in ΔF1 (which calculates change in F1 **over time**)

Age in Deer Park

Age Group	Mean ΔF1	Mean ΔF2	Mean Offset F2-F1
Oldest	-0.61 Hz/ms	1.9 Hz/ms	1190 Hz
Middle	-0.86 Hz/ms	1.82 Hz/ms	1095 Hz
Youngest	-1.21 Hz/ms	2.25 Hz/ms	1279 Hz
Age Group Comparison	**p value**		
Oldest vs Middle	.000***	.103	.830
Middle vs Youngest	.000***	.013*	.040*

$^{*} p < .05$, $^{**} p < .01$, $^{***} p < .001$

Conclusions

- Single-point measurement of F1 and F2 gives us part of the picture of variation between speakers, but not the entire picture
- Incorporating dynamic information distinguishes two age groups whose (ay) productions might appear identical in a non-dynamic, single-point approach
- Speakers are capable of displaying systematic variation that is more nuanced than what can be captured in single point approaches or by examining F1 and F2 alone
- Dynamic, multiple-point measurements bring us closer to characterizing the scope of that variation


City of Deer Park
BIRTHPLACE OF TEXAS


WELCOME TO
Deer Park


City of Deer Park
BIRTHPLACE OF TEXAS

Thank you!

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