

Raise /ɑ/

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Here is some data on a certain vowel from a Southern white dialect of American English -- the vowel used for the pronoun *I* and usually represented in literature as “Ah”. It might be of interest to the UMass community for three reasons:

1. The vowel participates in a phonemic alternation that interacts with flapping. This gives a very nice example of counterbleeding, which I found works well with 201 students as a first encounter with rule ordering. Since it's so similar to Canadian Raising, you can do this problem in class and then assign the CR problem from *Language Files* as reinforcement homework. The acoustic difference between the allophones is *much* more audible than in CR -- students actually laugh out loud.
2. There are intriguing peculiarities about the vowel itself, about the phonemic alternation, and about the diachronics, especially of the interaction with flapping. Both /ɑ/ and flapping seem to be surprisingly recent developments.
3. If you're going to imitate my accent, you might as well do it right.

Hope yall find this useful. Feel free to use the data for any purpose at all. Comments and suggestions are welcome.¹

1. Speaker

Everything here comes from my own speech unless otherwise noted. I was born in 1968 and raised since the age of 1 in Oxford, Mississippi, in a middle-class household. Both of my parents are also from Mississippi; my mother is from a middle-class family in Jackson, and my father is from a working-class family on the Gulf Coast. All of us are white. I attended racially integrated schools (about 50/50) until coming North for college.

2. Phonetics

The vowel in question is a low vowel, back of [Q] but considerably forwards of [A] (Figure 1). It is very close to, but slightly forwards of, the [a] of Boston *car* (Figure 2). The prescribed IPA for it would probably be [a1], but for convenience I'll write [ɑ]². The vowel [ɑ] forms the first part of the front rising diphthong [ɑI]. This is shown in Figure 3, which illustrates the minimal pair *biter* and *bider*.

3. Phonology

The notable facts are: 1. Allophony between [ɑ] and [ɑI], 2. Opaque interaction with flapping (counterbleeding).

3.1. Distribution

In underived monosyllables, [ɑ] and [ɑI] are in complementary distribution, with [ɑI] before voiceless segments and [ɑ] elsewhere, as shown in (1). We can therefore take /ɑ/ to be the underlying representation,

¹ Thanks are due to Roger Higgins, John Kingston, Jen Smith, and Adam Werle for their contributions to this memo.

² This usage was suggested to me by R. L. Moreton, who used it in transcribing her own speech in grad school at Yale back in the early '60s.

and the [αI] allophone to be derived by the diphthongization rule in (2). The [α] allophone must be phonologically tense, since it occurs in open syllables.

(1) *Distribution in underived monosyllables*

<i>With</i> [αI]	<i>With</i> [α]
gripe, pipe, slype, cripes	I, shy, thigh, sigh, why
light, rite, site	bribe, tribe
tyke, spike, shriek	slide, tide, Ides
knife, wife, rife	Steig ³
Reith	hive, shrive, thrive
price, vise, rice, Christ, heist	tithe, writhe, lithe
	prize, guise
	Nige (dim. of Nigel), (oblíge)
	rhyme, lime, Syme, Grimes
	Rhine, line, sign, blind, mind
	file, mile, style, aisle, child,
	wild, Miles, Giles
	fire, mire, byre, ours ⁴

(2) *Raise Alpha (first try)*

/α/ → [αI] / ____ [-voice]

In the first syllable of underived disyllables, the allophone of /α/ is affected not only by the following segment, but also by the stress pattern of the word: Raise Alpha only applies before an unstressed syllable. I have unclear judgments on some forms.

(3) *Distribution in underived disyllables*

<i>With</i> [αI]	<i>With</i> [α]	<i>With either</i>
víper, Dnéiper	Tǎ ipíng	díaper
stípend	stípě nd	
cípher		
síphon	Hǎ iphóng, Háiphǒ ng	
rífle, trífle		
Tý phon	tý phó on	
pý thon	pý thǒ n	
Títan, píton		
bíson, Méissen	Mý sǒ re	Dý son
crísis		Ísis
kéister, méister	nǚ stágmus, Eistéddfǒ dd	
Tý cho	táikǒ , tǚ có on	
cý cle	Báikǎ l	cý clóne
Víking	ícǒ n, íchǒ r	
	Zíó n, Zíon	
	ríot	
	bíó(logy)	
	cýǎ n	
	Sí ám	

³ There don't appear to be any ordinary words ending in [α]/[αI] followed by [g], [θ], or [ʃ]. [ʃ] is known not to follow tense vowels or diphthongs, but the other two are a bit of a surprise.

⁴ *Our* and *ours* are pronounced [αI] and [αIz]. *Hour* and *hours* are [aʊI] and [aʊIz].

This generalizes to produce alternations when stress-shifting suffixes are added. Again, judgments are unstable on some forms.

(4) *Effect of stress shift on Raise Alpha*

<i>With</i> [αI]	<i>With</i> [α]	<i>With either</i>
Títan	tǐ tánic	
Trítan	Trǐ tónian	
psý chic	psý chótic	
mícroscǒpe		mǐ cróscopy
cýcle		cýclícity
ísobár	ǐ sóchrony	
ǐ conícity	ícǒn, ǐ cónic	
ǐ sométric	ǐ sómetry	
lícense	ǐ céntious	
cíte	cǐ tátion	
pípe		pǐ pétte
psý chológical	psý chólogy	
tý pográphical	tý pógraphy	

Adding a suffix which shifts main words stress, but leaves secondary stress alone, does not affect Raise Alpha:

(5) *Shift of main word stress alone does not effect RA*

<i>With</i> [αI]	<i>With</i> [α]
pýthon	Pýthonésque
Títan	(Tǐtanétte) ⁵
psýcho	psýchológical
mícroscǒpe	mǐcroscópic
	psýchótic
	ícǒn
	(Trǐtónianétte)
	psýchóticality
	ǐcónic

In derived forms, RA is blocked by an intervening # boundary, irrespective of stress. Prefixes and initial members of compounds do not diphthongize even when the stress is right:

(6) *Blocking of RA by #.*

a. *Prefixes. All forms have* [α].

tricoló n, dísyllábic, bícenténial, díchromátic, ántǐsemític, (múltǐprotéctive)

b. *Compounds. All forms have* [α].

flýcolléction, NýeCommíteetee, (frýthermǒmeter)

c. *Some near-minimal pairs*

(supplý#contáiner) [α] *but* Píke#Authórity [αI]

(ský#telémety) [α] *but* flíght#atténdant [αI] (flapped *t* is underlined)

éye#protéctor [α] *but* týpe#redúction [αI]

Nýe#Commíteetee [α] *but* psých#instrúctor [αI]

The stress and # facts amount to saying that Diphthongization doesn't happen unless the voiceless consonant is in the same syllable as the /α/:

⁵ Examples in parentheses are words I just made up.

(7) *Raise Alpha (final version)*

/α/ → [αI] / ____ [-voice] ...]syll

This explains the unstable judgments on *microscopy* and *cyclicality* in (4) above -- the [k] can be syllabified two ways. As expected, *cyclone* also has both pronunciations.⁶

The very specific environment of this rule confirms that /α/ is the underlying form. To state the rule the other way around would be too awkward.

3.2. Productivity

This alternation is productive; proper names, foreign loanwords, etc. with surface [aI] get lexicalized with underlying /α/, which then undergoes Raise Alpha in the relevant contexts. Examples:

(8) *Productivity of the alternation*

- a. *With* [α]: Shanghai, Hokkaido, Faisal [ˈfɑzəl], Kai, Karl May, Frankfurt am Main, *Mein Kampf*, antennae [ænˈtɪnə], daikon, kaiten
- b. *With* [αI]: Aisch, Reich, Meissen, *aes alienum*, Reissner's membrane, Reith Lectures, balalaika

When English speakers living in a foreign country get together, their conversation is often sprinkled with nonce loanwords. Sometimes these are used for things with no English equivalent, like local street names, foods, government offices, or cultural practices. Sometimes they are used just because the local word comes quicker to mind. I lived for two years in Germany in my early 20s, and spoke the language on a daily basis. I had no trouble pronouncing [aI] in any context *in German*, but in English, all of the German [aI]s became either [α] or [αI], as dictated by Diphthongization -- *Eisenbahn* came out [αzɪnbən] (with the typically Southern-white neutralization of the [ɪ ɛ] contrast before [n]), while *Eislauf* became [aɪslɑʊf]. The process was automatic and difficult to consciously block. I have since had the same experience with Japanese, which I barely even speak.

3.3. Exceptions and doubtful cases**3.3.1. Alternate syllabifications**

The largest set of doubtful cases, in which either vowel is possible, consists of words for which two syllabifications are possible: the syllable containing /α/ can either be open, or closed with a voiceless consonant.

⁶ Unexpectedly, *Reischauer* can only have [αI], even though this means the [ʃ] has to be syllabified as a coda. English is generally supposed to forbid [ʃ] in the coda of a long vowel (Ladefoged 1975:###), but this may be a historical artifact -- inherited [ʃ] goes back to [sk], which being a cluster could not have followed a long vowel (Sweet 1891: §§ 745, 791 820). The present-day scarcity of [V:ʃ], is unsystematic and may not be due to a constraint at all; we certainly have no trouble with borrowings like *quiche*, *gauche*, and *tarboosh*.

(9) *Alternate syllabifications*

- a. both possible: Dý son, I sis, I SO-9000, Dréyfus, tý phoid
- b. both possible: Cý clö ps, cý clö ne, cý clícity, micróscopy ([ó]=[α])
- c. both possible: pí' pétte
- d. both possible: díaper [dɔ̃pr]/[daɪpr]

Closely akin to these cases are those of *python* and *stipend*, in which the second syllable can have secondary stress or be stressless (and undergo reduction). When the second syllable is stressed, only [α] is possible; when it is reduced, only [αI].

There are also the apparent exceptions shown in (10), where an unusual syllabification is required if Raise Alpha is to fit the facts.

(10) *Anomalous syllabifications*

- a. only [αI]: mícrö , nítrö
- b. only [αI]: Réischauer

These are really exceptions to the theory of syllabification, rather than to that of the [α]/[αI] alternation.

3.3.2. Voiced consonants that act like they are voiceless

In (11) below are shown outright counterexamples to Raise Alpha. These cannot be blamed on anomalous syllabification; the syllable containing /α/ must be either open, or closed with a voiced consonant. The theory therefore predicts the elsewhere allophone [α], but Raise Alpha overapplies to produce [αI].

(11) *Overapplication*

- a. both possible: tídy
- b. only [αI]: pint, ninth, ninetéen/nineteen(-th)
- c. only [αI]: tíger, tígress, Tígris, tígroid
- d. both possible: táíga

Case (11 a) is only an apparent counterexample. The orthographic <d> represents a flap [R], which could come from underlying /t/ as well as /d/. If *tídy* is underlyingly /tɔ̃ti/, then the observed pronunciation is the expected one.

The syllable codas /αnt/ and /αnθ/ are very rare in English. The list in (11 b) is very nearly exhaustive; the OED can add only *heintzite*, *nineted*, and *rynt*. In fact, aside from proper names, these are the only words which have /α/ plus nasal plus voiceless consonant at all. The exception appears to be productive; foreign loans like *Heinz* and *Mainz* sound more natural with [αI] (German orthographic <z> is [ts]).

The explanation seems to be that in words like *pint*, the [n] is realized, not as a separate consonant like in *pine*, but as nasalization on the nuclear vowel: [paĩ̃t]. The consonant immediately following the vowel is therefore actually voiceless.

Cases (11 cd) are genuinely exceptional. The pattern is not productive -- *Géiger*, *Néiger*, *Kutrígur*, *Éigles*, *mígrant*, all have the expected [α]⁷. Some peculiarity of /tɔ̃gr/ allows the /α/ to surface as [αI]. More precisely the /g/ is, for some reason, treated as voiceless: when the stress pattern of the word does not allow the /g/ to be syllabified with the /α/, we get the allophone we expect in an open syllable. Thus *tigrólýsis* has [α].

⁷ I have to make it a young lady from Goa who went for a ride on a boa. It's just as well -- they don't have tigers in Africa anyway, except in zoos.

3.4. OT account of Raise Alpha

Under Richness of the Base, we have to explain not only why /α/ becomes [αI] in ___ [-voice]]_σ, but also why /αI/ becomes [α] everywhere else. Here are the constraints:

(12) *Constraint set for allophony*

- a. IDENT-V -- A faithfulness constraint that gives one mark to each output vowel with a different quality from its input correspondent.
- b. *[α/___[-VOICE]]_σ -- A markedness constraint against [α] before a voiceless segment in the same syllable.
- c. *[αI] -- A markedness constraint against [αI] everywhere
- d. MAX-V -- A faithfulness constraint that gives one mark whenever a vowel is deleted.

IDENT-V, *[α/___[-VOICE]]_σ are unviolated, hence undominated. *[αI] is violated to satisfy *[α/___[-VOICE]]_σ since that's the repair, so *[α/___[-VOICE]]_σ >> *[αI]. Finally, *[αI] >> MAX-V because the [I] gets deleted from underlying /αI/ in the elsewhere environment.

(13) *Constraint ranking for allophony*

IDENT-V, *[α/___[-VOICE]]_σ >> *[αI] >> MAX-V

The allophonic processes is illustrated in (14):

(14) [α]~[αI] *allophony, including RA*

/UR/ → [SR]	IDENT-V	*[α/___[-VOICE]] _σ	*[αI]	MAX-V
1. /αt/				
1a. [αt]		*!		
→ 1b. [αIt]			*	
(1c. [æ̃t], etc.)	*!			
2. /αd/				
→ 2a. [αd]				
2b. [αId]			*!	
3. /αIt/				
→ 3a. [αIt]			*	
3b. [αt]		*!		*
4. /αId/				
4a. [αId]			*!	
→ 4b. [αd]				*

The constraints responsible for syllabification have been omitted, since they are unviolated and hence don't interact with the constraints in (13).

In OT, unmarkedness does not always mean grammaticality. Surface forms ending in [...αɪd] and [...αɪt] are equally marked in this analysis -- both violate only *[αɪ]. But only [...αɪd] is ungrammatical, because no underlying representation can possibly surface that way. The prohibition is an emergent phenomenon of the whole grammar, which conspires to prevent [...αɪd]. On the other hand, [...αɪt] is forbidden not only

by the grammar as a whole, but by a specific markedness constraint against it, * $[\alpha]/____[-\text{VOICE}]]_{\sigma}$. Intuitively, both ungrammatical sequences [...αɪd] and [...αɪt] feel about equally bad, despite the extra markedness constraint against one of them.

3.5. Interaction with voicing alternations

RA interacts transparently with the usual English morphological voicing alternations (most of these examples from Chambers (1973)):

(15) Raise Alpha and voicing alternations

With [αɪ]	With [α]
knife	knives
wife	wives
life	lives
live	live (adj.)
advice	advise
device	devise
die	dice
incisive	incise
strife	strive

3.6. Interaction with flapping

English has two rules neutralizing the contrast between [t] and [d] to [ɾ] between vowels⁸. One, shown in (16) with examples in (17), is obligatory. The other, shown in (18) with examples in (19), is optional.

(16) Internal flapping (obligatory)

$[t, d] \rightarrow [\text{ɾ}] / V____V[-\text{stress}]$

(17) *Internal flapping examples. Neither [t] nor [d] is possible in the underlined position; only [ɾ].*

a. Underived words.

látter/látter, médal/métal, páddy/pátty
cáttapult, Átticus, Sátterthwaite, wátter

b. Derived words.

sit~sítter, fat~fátter, rat~rátted
art~ártist⁹, Údmurt~Údmurtist (coda [ɪ] doesn't seem to count)
bid~bítter, sad~sátter
hard~hárdest

(18) External flapping (optional)

$[t, d] \rightarrow [\text{ɾ}] / V____\#V$

⁸ Of course they are probably only one rule, but I don't at the moment see how to unify them.

⁹ Coda [ɪ] doesn't seem to count as a consonant, thus *artist*. Coda [l], though, does count: **Baltic*.

(19) *External flapping examples*

Flappable	Unflappable
meɛ̃t Ábner	see Tábitha
meɛ̃t Eléna	see Telémachus
meɛ̃t [ə]léxis	see T[ə]rónto
pil[ə̃]t áirplanes	folll[ə̃] Tábitha ¹⁰
pil[ə̃]t Onássis's ships	folll[ə̃] Telémachus
pil[ə̃]t [ə̃]lúminum boats	folll[ə̃] T[ə̃]rónto
ar̃t ópens	that car totalled mine
ar̃t exists	that car terrifies cyclists
ar̃t [ə̃]ppálls	this car t[ə̃]pólogizes

RA interacts opaquely with both kinds of flapping. The observed allophone is determined by the underlying, rather than the surface, [voice] value of the following stop as shown in (20) and (21). The rule-ordering explanation would be that RA precedes Flapping in a counterbleeding relation (22).

(20) *Interaction of Raise Alpha and Internal Flapping*

With [αd]	With [αr]	With [αɪt]	With [αɪr]
ride	rider	write	writer
confide	confider	incite	inciter
homicide	homicidal	saprophyte	saprophytal
tide	tidal	recite	recital
snide	snider	bright	brighter
wide	widest	tight	tightest
glide	glided	slight	slighted
deride	derided	ignite	ignited
Clyde	(Clydist)	right	rightist
wide	widish	slight	slightish
		flight	flighty
		might	mighty
		night	nightie

(21) *Interaction of Raise Alpha and External Flapping*

With [αd]	With [αd] or [αr]	With [αɪt]	With [αɪt] or [αɪr]
ride	ride Ernie	write	write Ernie
inside	inside Ernie's house	incite	incite Ernie's tenants
wide	wide elephant	white	white elephant
glide	glide or crash	right	right or wrong
cyanide	some cyanide escaped	Amorite	an Amorite escaped

¹⁰ *Follow, hallow, yellow, borrow*, etc. are pronounced with a final schwa in my dialect. I couldn't think of any verbs ending in schwa in Standard English, except perhaps *mamma*. John McCarthy suggests *subpoena*.

(22) *Flapping counterbleeds Raise Alpha*

	<i>ride</i>	<i>rider</i>	<i>write</i>	<i>writer</i>
UR	/ɪad/	/ɪadəɪ/	/ɪat/	/ɪatəɪ/
Diphth.	----	----	ɪaɪt	ɪaɪtəɪ
Flapping	----	ɪaɾəɪ	----	ɪaɪɾəɪ
SR	[ɪad]	[ɪaɾəɪ]	[ɪaɪt]	[ɪaɪɾəɪ]

Thus we can derive surface pairs like *vital~vitality*, where the first has [αɪ] before a voiced consonant and the second has [α] before a voiceless one!

In OT terms, the surface form of *writer* is inexplicably unfaithful to the underlying vowel. A Sympathy account would say that it is faithful to the defeated candidate [ɪaɪtəɪ], which cannot surface because it violates the markedness constraint which causes flapping. [ɪaɪtəɪ] is the sympathetic candidate because it satisfies IDENT-C, i.e., it is faithful to the underlying [t].

4. Historical development of Raise Alpha and Flapping

4.1. Flapping

Given the wide distribution of flapping in American English dialects, and on up into Canada, one would think it to be of some antiquity. Einar Haugen (1937) agrees: “The writer has seen no discussion of the origin of ‘voiced T’ in American English.... Its wide distribution in American English does not point to a very recent origin.” And yet:

The use of a ‘tapped’ realisation of /t/ (and /d/) in certain phonological contexts in GenAm. appears to be a twentieth-century innovation. Haldeman (1860) makes no reference to it, not even in his lengthy transcriptions of American pronunciations (1860:127-9); nor does Whitney (1874:244, 249). Similarly, Ellis (1874:1218-19), in his transcriptions of two American speakers, does not refer to it, but he does transcribe a Californian pronunciation of PARTNER with a /d/ (1874:1230). Grandgent (1895:456) simply states that the word ATOM contains a /t/. (MacMahon 1998:##)

There is an astonishing amount of evidence for this surprising claim. The style sheet for Volume I of *Dialect Notes*, covering the early 1890s, says that

Doubled consonants are not to be used unless the consonant is really long or produces the effect of two consonants on the ear; as *siti* (*city*), *sit'* (*sitter*), *Auttçk* (*outtalk*).... A secondary accent may be marked, when it seems desirable to mark it, by a : (colon) before the vowel, as *Aks:esib-iliti* (*accessibility*).

In a study of the dialect of “the common people of Ithaca, New York” (who are, it seems, “people little influenced by the schools”), Emerson (1896) found that “[t]he dentals *t*, *d* occur in all positions and in words from all sources. They are for the most part stable, but certain peculiarities have been noticed... *t* becomes *d* regularly in [the individual lexical item] *pardnrr* < *partner*”. He does not mention flapping, and provides several examples of unflapped [t] in a flapping context: *kyuti* < *Cayuta*, *byuti* < *beauty*, *kQllated* < *calculated*, *tetiz* < *potatoes*.

The orthoepists Soule & Wheeler (1877) do not mention flapping, not even as an error to guard against.

Grandgent (189?) gives specimens of the speech of seven phoneticians reading aloud a paragraph from Sweet’s *Elementarbuch des gesprochenen Englisch*. Nine or ten contexts occur which today would be potential flapping contexts -- *matter*, *sorry to hear*, *but it*, *hot in*, *but I don’t*, *what’ll*, *water*, *that’ll*, and *it’ll*. Only two of the speakers flap at all -- one only *what’ll* and *water*, the other those two plus *what’ll*, *that’ll*, and *it’ll*. The lack of external flapping proves nothing, since external flapping is an optional process, but both speakers pronounced a [t] in *matter* and a flap in *water*, meaning that they are inconsistent about internal flapping too.

Interestingly, the two flappers are from Maryland and Kentucky, while the other speakers are from Maine, Boston, New York City, Philadelphia, and northern Missouri. Of the 32 speakers (16 of each race) transcribed by Lowman (in Dorrill 1986), 30 of them had a voiced realization of the *t* in *thirty*. These speakers were born between 1842 and 1874. It appears that flapping may have come earlier to the South than to other parts of the country.

Flapping, it seems, was a curiosity in 1890, but was widespread enough fifty years later that linguists took it for granted (e.g., Haugen 1937, Trager 1942, Oswald 1943, Bloch 1941). Haugen (1937) does state that the then-new 6th edition of Kenyon's *American Pronunciation* for the first time recognized "the sound commonly known as 'voiced T'" -- but not only did the sound have time to sweep the country, it also had time to gain a name, which had time to become commonly known!¹¹

4.2. Raise Alpha

To have Raise Alpha, a dialect has to have /α/ and raise it. There are dialects which have /α/ but don't raise it, and there are dialects that have raising without /α/. The raising seems to be very old; Southern speakers of both races had a form of diphthong raising as early as the 1840s. The vowel /α/ first appears in speakers born after 1890.

Historically, /α/ developed from a non-alternating /aI/. Before a voiceless consonant, the diphthong was retained and in some cases its nucleus slightly raised. Elsewhere, it sank to [α]. How this happened can be inferred from Dorrill's description of thirty-two speakers (half of them black, half white) born between 1842 and 1874:

The initial element [of the diphthong] may be relatively long with a brief offglide; this is called a "slow" diphthong. Conversely, the first element may be relatively short and the upglide swift and prominent; this is called a "fast" diphthong. "Slow" diphthongs tend to have upglides of relatively little distance from the initial element, as [ε>], or inglides, as [ə<]. "Fast" diphthongs tend to have the [i] upglide (1986:85).

Vowels generally are shorter in the voiceless context and longer elsewhere (John Kingston, class lectures, 1995). The length of a diphthong (any diphthong) is ordinarily varied by changing the length of its nucleus (REF??). Hence the "fast" diphthongs of the voiceless contexts keep the upglide, while the "slow" diphthongs elsewhere have the nucleus lengthened and its offset lowered. In North Mississippi, the process has gone so far as to eliminate the offset entirely, turning the "slow" diphthong into a monophthong and creating the seeming paradox of an efficient monophthong in a lengthening environment and a cumbersome diphthong in a shortening environment.

The evidence seems to show that before about 1870, the raising existed but /α/ did not. Dorrill's speakers (from Guy Lowman's field notes for the Linguistic Atlas of the Middle and South Atlantic States) all have diphthongs of some sort in both environments. Many of the "fast" diphthongs have raised nuclei, like in Canadian Raising. In many cases both nucleus and offset are raised. Bailey (1997) and Bailey & Thomas (1998) made spectrograms of the recorded speech of black and white Southern speakers. Speakers of both races from Texas and Virginia, born in the 1840s, had only a diphthong, which came in two versions with a noticeably higher offset before voiceless consonants than before voiced ones.

¹¹ There are authorities who, to this day, do not recognize the existence of flapping in American English. The most recent edition of the *Random House Dictionary of the English Language* (Flexner & Hauck, 1987) says that *water* is pronounced *wô't'r* or *wot'r*, and the Pronunciation Key in the front endpapers explains the symbol *t* thusly:

t ten, matter, bit

So there is slight possibility that the difference existed but that the sources did not explicitly record it, or did not record it consistently.

The reduction of the elsewhere diphthong to [α] seems to have set in towards the end of the 19th Century. Both black and white Texans born in the 1890s had [aI] before voiceless consonants and a nearly pure [a] before voiced ones (Bailey & Thomas 1998). Many born later in the 20th Century reduced the remaining [aI] to [a] as well, losing the alternation entirely. Wheatley & Stanley (1959) reported that white East Texas speakers born in the 1880s had only [aI] in all environments, while some of those born in the 1920s and later had [a] instead. Stanley (1936ab) found adult white East Texas speakers had [aI] (“the second element is usually quite as definite as anywhere in the English-speaking world”), but often changed it to [a] “when the word is not especially emphatic”. This change took place in all segmental environments (e.g., both *bite* and *mind*).

4.3. Which came first?

It seems that flapping and Raise Alpha are almost contemporaries, dating from the early 20th century. Evidence is sketchy, but what there is of it seems to show that the sequence of events was roughly like this:

(23) Chronology

Speakers born	Raising	[α]	Flapping
Before 1840	No information.	Unattested.	Some evidence of internal flapping in southwestern England (Brooks 1935:53-54, Haugen 1937).
1840-1870	Whole-diphthong raising found by Lowman (in Dorrill 1986), Bailey & Thomas (1998).	Unattested.	Some internal flapping found by Lowman (Dorrill 1986) and by Grandgent (189?); some external flapping (Grandgent 189?). Not found outside of the South (Emerson 1896, Grandgent 189?).
1870 - 1900	Monophthong-to-diphthong raising found by Bailey & Thomas (1998).	First appearance of [α] (Bailey & Thomas 1998).	Consistent internal (and possibly external) flapping found by Wheatley & Stanley (1959).
1900-1930		[α] becomes widespread in the South (Wheatley & Stanley 1959, Zimmerman 1939).	Internal flapping widespread in “General American” (Haugen 1937, Bloch 1941).
1930-	Some white Texas speakers lose [αI] completely (Bailey & Thomas 1998).		

Flapping is certainly older than [α], but it is unclear whether it is older than the diphthong-raising process that became Raise Alpha. There is some indication that it is: There are speakers who have flapping without raising, but none, so far as I can find, who have raising without flapping. Nine Southern speakers (two black, the rest white) are transcribed in Zimmerman (1939). Both black speakers and two white speakers had some form of contextually conditioned raising; all of these speakers also had flapping (Nos. 53, 55, 67, and 70)¹². Conversely, the two speakers who completely lacked flapping also lacked raising (Nos. 54 and 61). There were also two speakers who had flapping but not raising (Nos. 27 (Huey Long) and 68).

¹² One other white speaker (No. 66) had flapping, but it was not possible, given his choice of words, to tell whether he also had raising.

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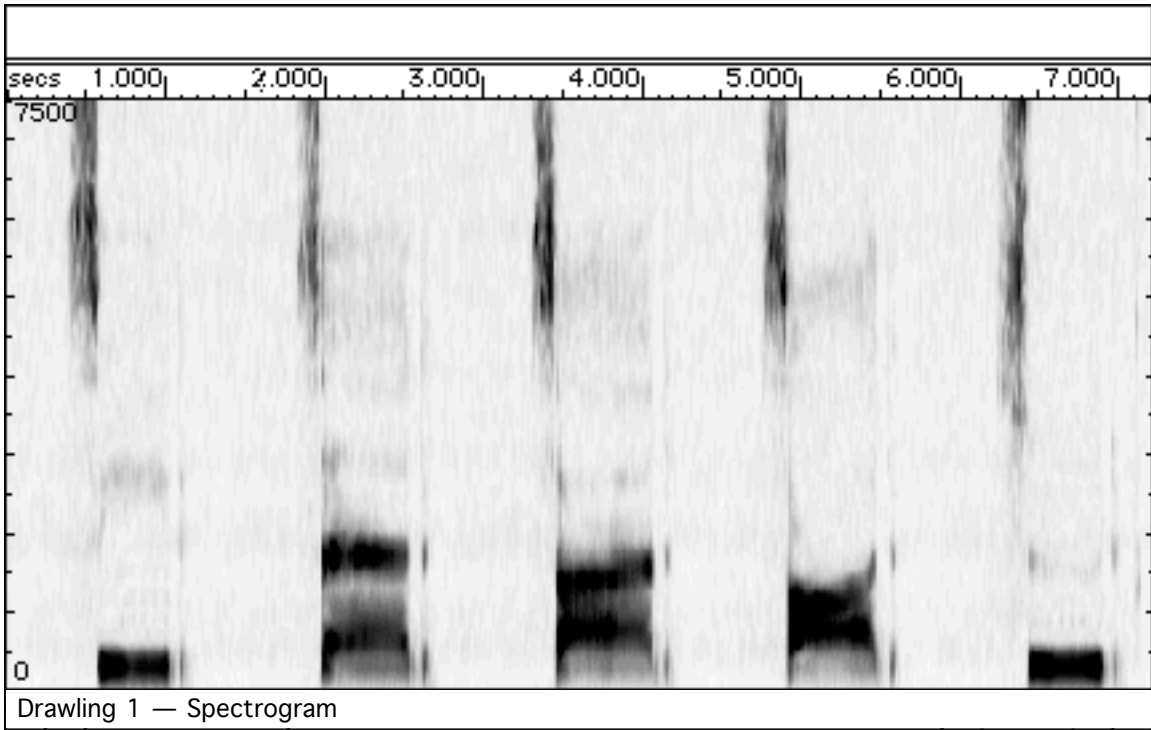


Figure 1. The words *seed*, *sad*, *side*, *sod*, *sued*, pronounced by the author. The [ɑ] is in *side*.

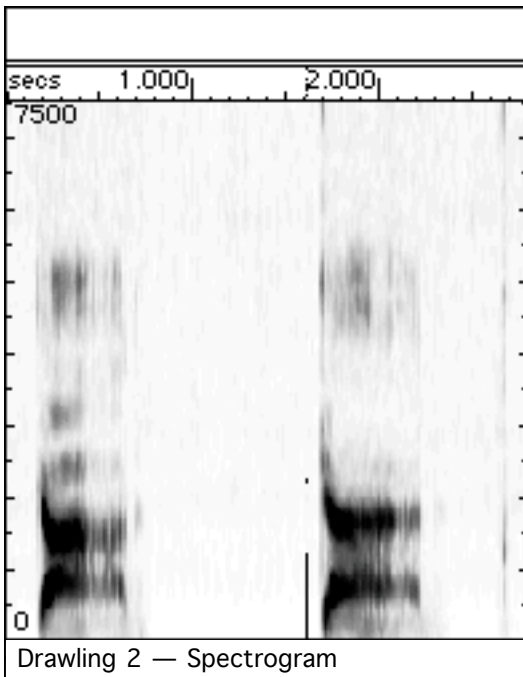


Figure 2. Author's imitation of Boston pronunciation of *guard*, and native pronunciation of *guide*.

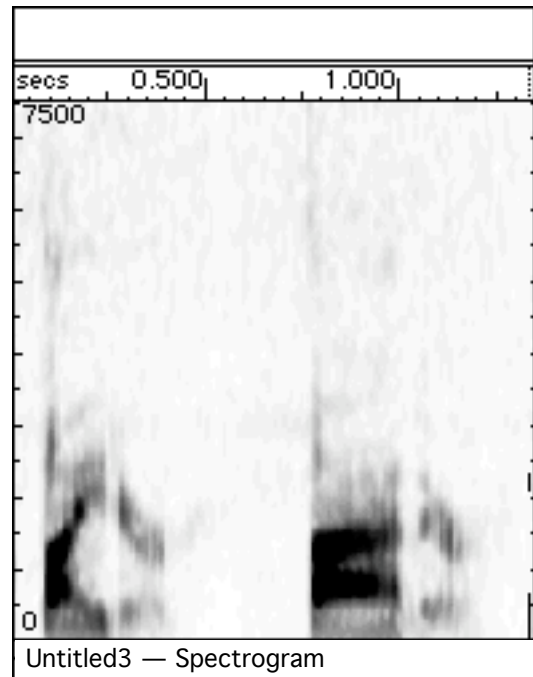


Figure 3. The minimal pair *biter/bider*, showing that [ɑ] is the first element of the front rising diphthong.