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Iconization and the Timing of Southern Vowels: A Case Study of /æ/

Christian Koops
ckoops@unm.edu

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Abstract
With reference to Irvine and Gal's (2000) model of how language ideologies are constructed, this study examines the linguistic basis for the iconization of Southern American English vowels. The specific focus is on the spectral and temporal properties of the low front vowel /ae/ (TRAP). The paper proposes a unified analysis of this vowel's seemingly inconsistent behavior as part of the Southern Vowel Shift and as part of the Southern drawl. In the proposed model, the latter is an extension of the former. The link is an internal timing feature, a delayed initial vowel target. This case study of /ae/ serves as the basis for a broader re-consideration of Southern Anglo vowel phonetics.

Iconization and the Timing of Southern Vowels: A Case Study of /æ/

Christian Koops

1 Introduction

In their analysis of different processes whereby language ideologies are constructed, Irvine and Gal (2000) discuss the process of *iconization*. Through iconization, the arbitrary link that exists between the structure of languages and dialects on the one hand and their speakers on the other hand is construed as a motivated or even a necessary one. From this perspective, "[l]inguistic features that index social groups or activities appear to be iconic representations of them, as if a linguistic feature somehow depicted or displayed a social group's *inherent nature or essence*" (Irvine and Gal 2000:37, emphasis added). Irvine and Gal's specific example involves the ideologies pertaining to the clicks of the Nguni languages of southern Africa. In the context of language variation in North America, forms of iconization are readily found in the discourses surrounding Southern American English. For example, in a recent ethnographic study of this variety, Hayes (2013) documents alternative forms of iconizing certain of its features. In one part of the study, residents of Albuquerque, New Mexico (non-Southerners) were asked about speech in the South.

> Multiple participants cited the "difficulty Southerners have with vowels" as further evidence of their lack of education. Participants also expressed that these features of Southern American English were a reflection of general unintelligence. The two features most often mentioned were a slower rate of speech and "drawled vowels". As one participant put it, "It takes some of them so long to get their thoughts out, so sometimes you wonder if they have trouble keeping up with you." That is, mental processing is thought to correspond to the rate of language production. (Hayes 2013:55)

Such comments are, of course, reflective of broader cultural stereotypes held toward Southerners, specifically white rural Southerners, at the national level (e.g., Preston 1997). Hayes' second group of participants, white natives of eastern Middle Tennessee, when asked about their local dialect, gave their own explanation for why someone might "take longer" to express their thoughts.

> The clearest association with the Southern accent and the first mentioned by all Southern participants when asked when they were most likely to use a Southern accent was for "politeness." One participant provided the following scenario to demonstrate the concept: "Can you imagine like a waitress coming up to you and saying 'What do you want?' … No, she's gonna say 'What can I get for you, sweetie?' … As the participant added directly following the quote, "and she would be willing to stick around and talk." At a cultural pragmatic level, willingness to converse is regarded as a desirable personality trait. … The inverse of this, refusing someone one's time, implies that the person is not important enough to merit it, which … is regarded as arrogant, that is, impolite. (Hayes 2013:34, 35)

This illustrates Irvine and Gal's point that iconization involves not only general attributes of a social group but also characteristic, socially meaningful activities. Overall, the two examples reveal alternative, opposed modes of naturalizing a particular way of speaking, specifically forms of temporal variation perceived to typify Southern American English: a slow, drawn-out delivery and, in particular, increased vowel duration. The focus on vowels comes out more clearly in the first excerpt where the Southern drawl (Feagin 1987, 2008) is implicitly referenced. However, as Hayes points out in his discussion of the quote in the second excerpt, the speaker who voices the polite waitress does so with emphasized Southern phonological features that exceed that interviewee's own vernacular, including features of the Southern Vowel Shift (Labov, Ash and Boberg 2006) like the raising and diphthongization of the front lax vowel /ɛ/ in *get*. This suggests that not only a general slowness in speaking, but also specifically the properties of Southern vowels are the subject of iconization in both ideologies.

This paper is not primarily concerned with the conceptual side of these language ideologies, which is analyzed in detail in Hayes' study. Rather, I focus on the linguistic side of the iconization process. The data examined here suggest that the phonetic acuteness involved in recognizing Southern vowels as "taking long" may well be greater than previously believed. Observers who construct or subscribe to the ideologies illustrated above may be cueing into fine phonetic detail that even sociophoneticians have not fully documented yet. The specific focus here is on the spectral and temporal properties of the vowel /æ/ in the South. I propose a unified analysis of /æ/'s seemingly inconsistent behavior as part of the Southern Vowel Shift and as part of the Southern drawl. The proposed link is an internal timing feature I call a *delayed initial vowel target.* This case study of /æ/ then serves as the basis for a broader re-consideration of Southern vowel phonetics. As I argue, the proposed feature is a common denominator of a larger set of Southern features. The nature of this timing feature and its ubiquity make it just the kind of structural property that is likely to become the subject of iconization.

2 The Intrinsic Duration of Southern Vowels

Recent cross-dialectal phonetic studies have found that vowel durations in Southern American English are indeed longer than in non-Southern varieties (Jacewicz, Fox and Salmons 2007), at least in the case of lax vowels (Clopper, Pisoni and de Jong 2005). The perceived slowness discussed above may then simply reflect a difference in intrinsic length. Compared with vowels in non-Southern dialects, Southern vowels may appear unexpectedly stretched out, in a linear fashion, so that what "takes long" is for the speaker to reach the end of the vowel. However, this simple analysis of the iconization process fails to address two questions: First, how is the increased duration related to other highly recognizable features of the lax vowels in the South, such as the raising, fronting and diphthongization of /ɛ/ and /ɪ/ to [eːᵊ] and [iːᵊ], respectively (Labov 1991), and especially the triphthongization of /æ/ to forms like [æˈə] (Feagin 1987)? Or do these aspects play no part in the iconization process? Second, given that the difference in duration appears clearest for the lax vowels, why should this set of vowels, out of the whole set of 15-odd English vowels, be responsible for the general impression of slowness? Wouldn't it be more plausible if this percept rested on a more global timing feature that is observable in many vowels?

3 The Vowel /æ/

The vowel /æ/ is of particular interest in this context. Out of the subset of American English vowels that are considered lax on phonological grounds, /æ/ is by far the longest. In fact, in terms of duration it is on a par with or exceeds most of the tense vowels (Peterson and Lehiste 1960). If greater duration is related to more complex articulator movement, as the correlation of these features in the South suggests, this makes /æ/ a perfect test case to investigate the nature of this relationship. In fact, a propensity for /æ/ to become a diphthong is evident also in its behavior in non-Southern dialects. Diphthongization is a regular concomitant of /æ/-raising (Labov, Yeager and Steiner 1972), as in New York City English, the Northern Cities dialect, or any of the many varieties that display Labov et al.'s (2006) "nasal system" of /æ/-raising, such as California Anglo English, where *man* in phonetically [meᵊn] (Eckert 2008:34).

In the literature on Southern American English, /æ/ has received particular attention because of its strong association with the "Southern drawl." This unique phonetic pattern has been investigated in detail in Feagin's (1987, 1996, 2008) work with speakers in a rural Alabama community (see also Thomas 2003:156–162, Allbritten 2011). Feagin describes vowel drawling as a cluster of features. Apart from extreme lengthening, perhaps the most well-known is triphthongization, as in *that* [ðæˈəʔ] (Feagin 1987:148). Another feature is the splitting apart of the vowel's amplitude contour into two individual amplitude pulses, which gives the vowel the impression of spanning two syllables, as indicated in Feagin's (1987:138) transcriptions of *ask*, [æⁱ yəsk]. A fourth feature, a characteristic pitch pattern, is not as well understood. In this paper, I treat the first three features as the defining qualities of the Southern drawl, and I focus specifically on the triphthongal trajectory as a diagnostic of whether /æ/ counts as drawled or not.

Labov et al. (2006:178–180) analyze the Southern drawled /æ/'s trajectory in detail. "Southern breaking of /æ/ usually begins with a nucleus in low front position, with the auditory impression of [æʲə]." In the case of the Alabama speaker whose tokens they use for illustration, "various realizations of the vowel start in different positions and reach different points of inflection and endpoints." Their examples of /æ/'s full trajectory plotted in F1-by-F2 space (in their Figure 13.17) show the initial quality generally in the low front area. These examples also suggest that the medial glide often reaches only a mid front position, not the perceived high front position. Regarding the timing of the three gestures, Labov et al. note only that the duration of the final backglide is short. Indeed, the example in their first spectrogram (their Figure 13.15, which they describe as characteristic) has the bulk of the vowel taken up by the middle gesture, with little time allocated to the backglide. In this example, the initial component is also quite short, in fact shorter than the final glide. In their second example (Figure 13.16, a case of extreme lengthening to 411 ms), the initial part matches the final glide in length, creating a notable symmetry. It appears, then, that the variation in the location of the starting point that they point out goes along with variation in the duration of the initial gesture. I will return to these details in the analysis below.

Somewhat counter-intuitively, the literature shows /æ/ to be only weakly associated with the Southern Vowel Shift (SVS). What happens to /æ/ in this shift is something of a mystery. This may be partially because definitions of the SVS have tended to restrict it to the monophthongization of /aɪ/ (stage 1) and the "rotation" of the two tense-lax pairs /eɪ, ɛ/ (stage 2) and /i, ɪ/ (stage 3). Labov et al.'s (2006:244) updated definition of this shift clearly states that /æ/ shifts one step up, in a series with /ɛ/ and /ɪ/. Based on their account, /æ/'s nucleus should be realized at least as high as in [ɛːᵊ] in an SVS system. Nevertheless, Feagin's and Allbritten's descriptions of /æ/ in Alabama, a core Southern state, show the initial quality to be basically [æ]. Why, then, does /æ/ not follow suit? Of course, Feagin and Allbritten show /æ/ to be strongly affected by the Southern drawl. How, then, is the Southern Vowel Shift related to the Southern drawl? Are these categorically distinct phenomena, or can we find a motivated link between them that explains why /æ/ appears to resist raising in the deep South, just where we would most expect it to show the SVS? I approach this question here using data from a more peripheral Southern location, at least as far as the dialect of Anglos goes: Houston, Texas.

4 The Southern Vowel Shift in Houston, TX

Houston is historically a Southern city, but the results of recent sociolinguistic fieldwork in the metropolitan area (Gentry 2006, Pantos 2006) show young Anglo Houstonians to be at the forefront of the linguistic de-Southernization of the urban South. This trend is also known from other large Southern cities such as Atlanta or Dallas (Tillery and Bailey 2004) and the North Carolina metro areas of Raleigh and Charlotte (Dodsworth and Kohn 2012). As in these locations, the post-WW2 influx of migrants from outside the South, accelerated since the 1970s by the Sunbelt migration (Thomas 1997), has fundamentally affected Houston's dialect. Large numbers of non-Southerners have moved to Houston in response to sustained economic growth, especially in the energy sector and subsidiary industries. This resulted in dialect leveling, which defined the speech of later generations of native Anglos. Today, teenage Anglo Houstonians rarely show any Southern features at all, even reversing the merger of pre-nasal /ɪ/ and /ɛ/ (Koops, Gentry and Pantos 2008). At the same time, the relative recentness of this trend means that older Houstonians still preserve the city's linguistically Southern roots. Gentry (2006) found monophthongization of /aɪ/ and the /eɪ/-/ɛ/ "rotation" in Anglos above the age of 40, indicating stage 2 of the SVS.

The data I discuss here are taken from a corpus of recordings of 42 native Anglo Houstonians who were between 15 and 65 years of age at the time of recording (2006 to 2008). Aspects of their vowel systems were previously analyzed for some of the papers cited above. To illustrate the long-term trend away from Southern phonology in Houston, an SVS index was constructed that combines into a single score, in equal parts, Labov et al.'s (2006) six SVS variables: monophthongization of /aɪ/, lowering of /eɪ, i/, and raising of /æ, ɛ, ɪ/. In Figure 1 all 42 speakers' SVS scores are plotted. A regression line is superimposed on the left panel to show the apparent-time trend.

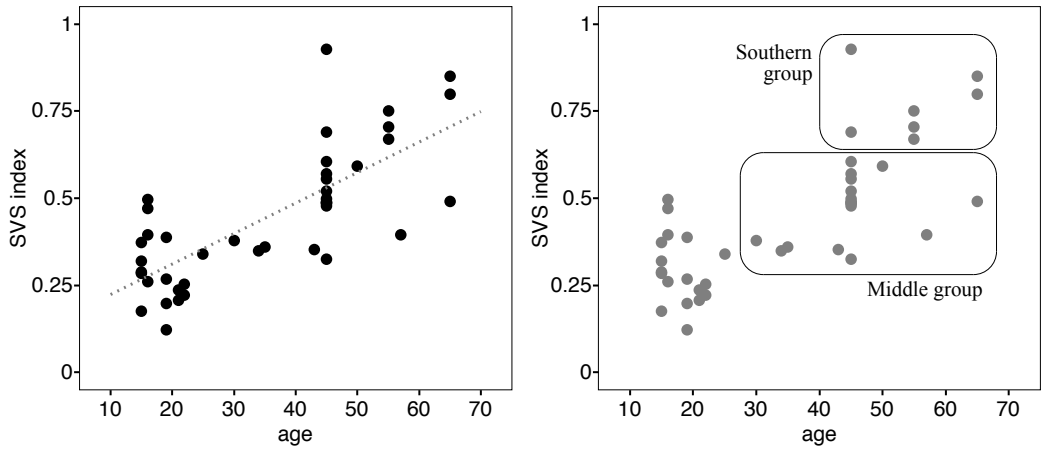

Figure 1: SVS participation of 42 Anglo Houstonians based on a composite SVS index.

In a previous summary presentation of this dataset (Brunner, Koops, Niedzielski and Pantos 2010), we divided these 42 speakers into three groups that reflect their age but, primarily, their degree of participation in the SVS: (i) an older group comprising the speakers with the fullest Southern features; (ii) a mostly middle-aged group whose vowels sometimes show subtle Southern features but generally have a "Standard" American English quality (reflecting the dialect leveling discussed above); and (iii) a group of speakers in their teens and twenties who have practically no Southern features but instead often show more recent sound changes such as the /ɑ-ɔ/ merger and /æ/-retraction. In the following, I will compare the first two of these groups, which I will call the *Southern group* (n=7; 4 male, 3 female) and the *Middle group* (n=17; 11 male, 6 female), respectively. The right panel of Figure 1 shows their place in the age and SVS spectrum.

Turning now to the question how the SVS affects the front lax vowels in Houston, and specifically the open question of /æ/'s role in this shift, consider Figure 2. The two panels of Figure 2 compare the two groups' formant frequencies of /æ/, /ɛ/ and /ɪ/ occurring in pre-obstruent position (i.e., excluding pre-nasal /æ/, which is consistently raised for all of these speakers).

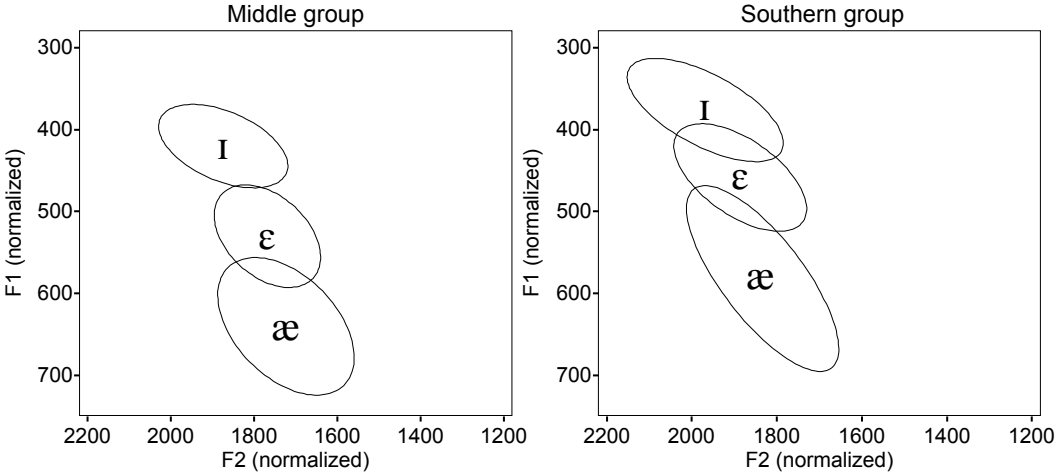

Figure 2: F1 and F2 of /æ/, /ɛ/, and /ɪ/ before obstruents for two groups of Houston Anglos.

The ellipses in Figure 2 indicate two standard deviations around the mean. The F1 and F2 measurements were taken at the nucleus of /æ/, /ɛ/, and /ɪ/ in monosyllabic words produced in their citation form in a word list. The nucleus was defined following Labov et al.'s (2006) technique as, in the simplest case, the point at which F1 peaks. In the case of diphthongization, i.e., where the vowel shows a clear forward gesture before the F1 peak, the nucleus was defined as the point of

the F2 peak. The raw frequency values were normalized using Lobanov's method, and the resulting values were scaled to a male vowel space to give a better sense of the absolute differences.

Figure 2 shows a clear contrast between the two groups. For the speakers in the Southern group, all three vowels appear raised and fronted relative to their more canonical position for the speakers in the Middle group. The raised /æ/ covers a wide frequency range that reaches well into the mid front area. There is a striking unity in how the SVS affects /æ/, /ɛ/, and /ɪ/. They appear to shift in parallel. As Labov et al.'s (2006) account predicts, for these Houstonians the answer to the question whether /æ/ participates in the SVS is a clear "yes."

Before moving on to the formant dynamics of the raised /æ/, I want to mention that there is also a statistically significant difference between the two groups in the duration of the front lax vowels. As one might expect, the speakers in the Southern group produce them with a longer duration. Given that these speakers are also older on average, and that greater age is correlated with a reduced articulation rate, this result is difficult to interpret. But it is consistent with the finding that Southern vowels, especially the lax vowels, have a longer duration, relatively speaking.

5 Formant Trajectories of the SVS raised /æ/

We now zoom in further and focus on the internal structure of the raised and fronted /æ/ by inspecting its formant trajectories. For this analysis, the F1-F3 contours of each speaker's /æ/ in the word *bad* were extracted and the values normalized and averaged for each group. See Figure 3.

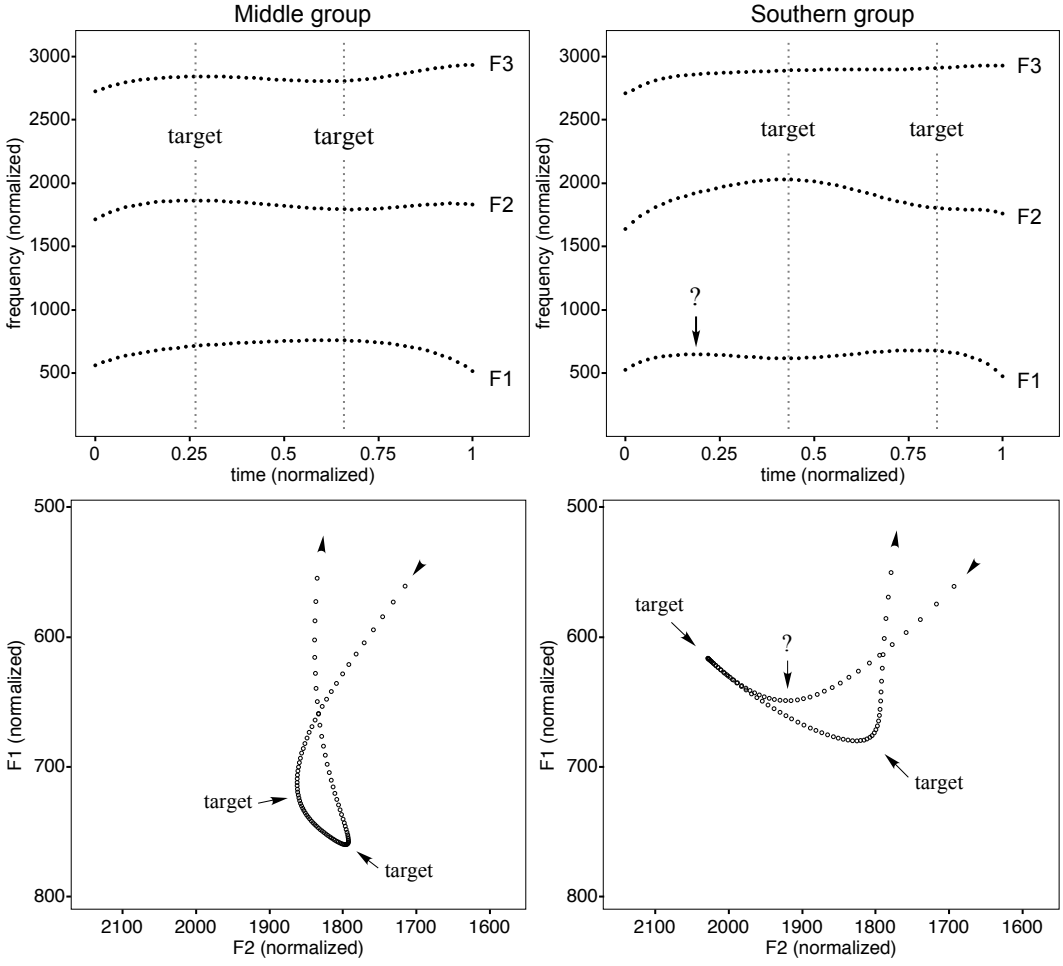

Figure 3: Averaged, normalized formant trajectories of /æ/ in the word *bad* for the two groups.

The word *bad* was chosen for this comparison because the relatively long duration of /æ/ before the voiced coda consonant brings out the relevant contrasts in formant movement. Also, the absence of voicelessness and aspiration in the /b_d/ context facilitates formant tracking. Using Praat, F1-F3 were sampled at 100 equidistant points from the vowel onset to its offset, which time-normalized the trajectories. The raw F1-F3 values were then frequency-normalized using the Nearey-1 method, which was chosen here over the commonly preferred Lobanov method because it preserves the general location of formants on the frequency scale, and thereby also the general spacing of F1, F2, and F3. This makes the trajectories in the top row of Figure 3 similar in appearance to the familiar view in a spectrogram.

The top two panels of Figure 3 show this spectrogram-like view of each group's averaged, normalized formants plotted over time. All turning points in the F1 and F2 contours have been marked. In the following, I will refer to these turning points as *targets*. In the corresponding panels at the bottom of Figure 3, the changes in the first two formant frequencies are shown again with F1 plotted against F2. Note that the two F1-by-F2 plots are drawn to the same scale. This brings out again the fronting and raising of /æ/ for the Southern group. More importantly, it reveals the shape of the acoustic "gestures," i.e., the path traversed for each /æ/ variant in F1-by-F2 space. The direction of movement is indicated by arrows at the beginning and end of the trajectories. These plots reveal the position of the gestural targets very vividly. I have marked the targets here as well. Also, because the open dots are drawn at equal time intervals, it is possible to observe the changing speed of the gestures, especially the marked slowing down at some of the turning points, which indicates steady states.

Although quite different in detail, the two trajectories share one general pattern: a forward movement is followed by a downward movement. The forward gesture is seen in the F2 peak, and the subsequent downward gesture is seen in the F1 peak following the F2 peak. In the case of the Middle group's /æ/, this diphthongization is very subtle. The vowel has only one major target, the point at about two-thirds of its duration where F1 peaks and F2 simultaneously reaches a minimum. This turning point is seen clearly in the bottom representation of Figure 3. Compared to this gesture, the F2 excursion with its peak near the 25% mark is small in magnitude. It is also not accompanied by an F1 steady state. The gestural representation shows this /æ/ variant nearing and tracing the front edge of the acoustic vowel space on its downward path, but without stopping. The overriding push is for the low target. Indeed, the auditory impression when listening to speakers who produce this variant is that of a monophthongal, canonical [æ].

The Southern group's /æ/ variant displays much stronger diphthongization with two clearly defined gestures. The first gesture is seen in the long F2 excursion that peaks just before the center of the vowel. It is synchronized with a parallel dip in F1. In the gestural representation, the trajectory juts out, up and forward, and reaches the primary target simultaneously in F1 and F2. Note that this gesture takes up the bulk of the vowel's duration. The secondary target, the backglide, occurs only in the last quarter of the vowel. But it, too, is well-defined, with a simultaneous peak in F1 and leveling off of F2. The auditory quality of this raised /æ/ is that of a clear diphthong. It does not sound like a drawled /æ/, however. In fact, one does not get the impression of the Southern drawl from any of the Southern group's /æ/ tokens, regardless of the degree of raising.

One might leave it at this and simply note the striking parallels between /æ/'s internal structure and that seen for /ɛ/ and /ɪ/ in the South, underscoring the unity of the SVS raising pattern. But this is not the end of the story. Consider two additional differences. The first comes out when we compare the time points at which the two targets, the F2 peak and the subsequent F1 peak, are reached. The second target trails the first by about the same amount of time in both variants. But their absolute timing is quite different. In the Southern variant, both targets appear "pushed back" relative to their occurrence in the Middle group's variant. Also, note how gradually F2 rises for the Southern group. This is not what one would expect from a stop transition if the forward gesture were anchored to the start of the vowel. The F2 peak appears specifically delayed.

The second additional point of difference is the F1 excursion near the onset of the Southern group's raised /æ/. It is easy to overlook this detail, but the F1-by-F2 plot shows clearly that the vowel moves down before moving up. This unexpected gesture is marked and labeled with a question mark in both representations. There is no counterpart to it in the Middle group's /æ/ trajectory.

One might say that the space created by delaying the nucleus is filled by another, new gesture. Note that the additional F1 peak makes this vowel into an incipient triphthong, even though, to be clear, the auditory impression one gets from listening to this variant is that of a diphthong. It's difficult to perceptually isolate the early F1 peak and hear it as a separate component.

6 Connecting SVS /æ/-Raising and the Southern Drawl

Are these subtle differences relevant to the questions asked in this paper? Two facts suggest that they are. First, the Southern group's /æ/ trajectory, while not sounding drawled, has a recognizably Southern flavor. To test whether it contains information that lends it a social meaning beyond that of "just" a raised, diphthongized /æ/, I conducted an informal perception experiment in which the trajectories seen in Figure 3 were played through a formant synthesizer, with duration and amplitude shape held constant. Especially someone familiar with another /æ/-raising variety can distinguish the Southern /æ/ from, say, a Northern Cities raised /æ/.[1]

The other reason for taking these features seriously is theoretical. They provide the link to the complex trajectory associated with the Southern drawled /æ/ (recall the phonetic details discussed in Section 3). I have already pointed out two parallels. In both patterns, the forward and upward gesture occurs late, spanning the middle of vowel. And in both there is an initial downward gesture creating a triphthongal trajectory. One drawl feature still missing in the Southern group's variant in Figure 3 is for the initial gesture to reach [æ]. Another incomplete aspect is the short duration of that gesture. As discussed earlier, these features actually seem to also vary in speakers who use the drawl. But in fact, they can be observed in the production of individual, older speakers in our sample. The composite nature of Figure 3 washes them out, but if we focus on the speakers at the high end of the SVS spectrum, we find /æ/ variants like those in Figure 4 and Figure 5.

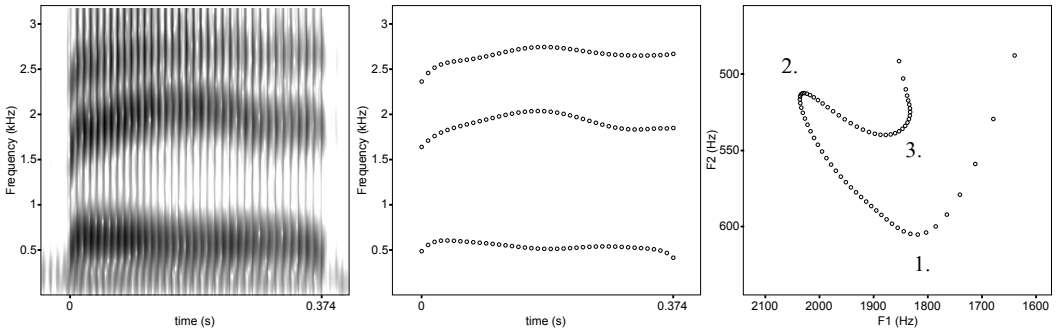

Figure 4: /æ/ in *bad* produced in isolation by a 65-year-old male Houston Anglo speaker.

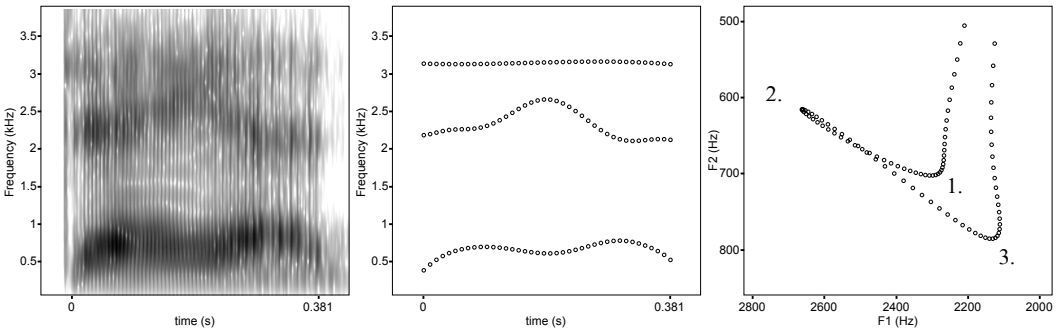

Figure 5: /æ/ in *dad* produced in isolation by a 65-year-old female Houston Anglo speaker.

In Figures 4 and 5, the first panel shows a spectrogram of the speakers' production, the second

[1]I thank Nancy Niedzielski for this insight.

panel repeats the F1, F2, and F3 contours, and the third panel shows the F1-by-F2 gesture, with the order in which the targets are reached indicated by the numbers 1, 2, and 3. Note first of all how long these tokens are: 374 ms and 381 ms. Given the correlation of extreme lengthening and triphthongization in the Southern drawl, we should expect to find the most complex trajectories just in such cases (recall that Labov et al.'s paradigm example is 411 ms long). The example in Figure 4 has almost the expected initial [æ] quality. The gestural representation shows that here, unlike in Figure 3, the first target is lower than the final glide target. This creates the characteristic upward-oriented elbow-shaped trajectory that drawled vowels are known for. The example in Figure 5 shows the characteristic symmetry of the initial and final gestures. The initial gesture is of substantial length and clearly defined here. Note how F2 is initially steady. It doesn't begin to rise until well into the vowel, which shows clearly that there is an earlier articulatory target.

Table 1 summarizes the proposed link between the SVS and the Southern drawl for /æ/. In this scenario, vowel drawling is an extension of the SVS pattern. The phonetic symbols in each row should be understood as forming one vowel. The three vowel slots show the component gestures and their development. The gesture that is generally considered the vowel nucleus at a given stage is shown in gray. Not indicated in Table 1 is that, as we proceed from one stage to the next, there is a steady increase in total duration, the essential ingredient of the Southern drawl.

Stage 1: monophthong		æ	
Stage 2: diphthong		ɛ	ə
Stage 3: incipient triphthong	ɛ ~ æ	ẹ	ə
Stage 4: triphthong	æ	j	ə

Table 1: Proposed model of /æ/'s development through the SVS to the Southern drawl.

Stage 2 creates the Southern-shifted, diphthongal [ɛːᵊ]. The more moderately shifted /æ/ tokens in our data are of this basic type. It's only for the more advanced SVS speakers that we find clear examples of stage 3, which links the SVS to the Southern drawl. At stage 3, an opening gesture appears at the beginning of the vowel, resulting in the incipient triphthong discussed above. Judging by our speakers' variants, when this additional gesture first appears it is short and often doesn't reach [æ]. The stage 3 variants have a somewhat erratic quality, [ᵋẹːᵊ] ~ [ᵆẹːᵊ]. Even where the initial quality is as low as [æ], an analyst might disregard this feature because of its lack of perceptual salience and instead continue to analyze the much more prominent forward and upward gesture as defining the vowel nucleus (Figure 2 reflects this measurement approach). Finally, at stage 4 the Southern drawl is complete as the new first target becomes conventionalized in low front position. The shift has now come full circle, back to a nucleus with the quality [æ]. This explains why /æ/ appears to resist the SVS just where we'd expect it to show it the most, in the deep South. What was the vowel nucleus at the earlier stages is now reinterpreted as a secondary target, a glide. This development is probably impossible without the third feature of the drawl, which appears at this stage: the breaking apart of /æ/'s amplitude contour into two pulses. We have no definitive evidence of this feature in the Houston data, but if the two pulses align with the first and last vowel target, this lends emphasis to the initial [æ] and facilitates its reanalysis as the vowel nucleus. At the same time, since the amplitude drop aligns with the mid component, this part is deprived of its prosodic salience, resulting in the percept of a front glide, as in [æʲə]. Recall that in a fully drawled /æ/, the second target may have a mid front location but be heard as [j].[2] Importantly, then, the medial [j] glide cannot really be called "intrusive" because it's been part of the vowel all along, in a different form. What might be called intrusive is the initial [æ].

The phonetic account presented above addresses the first question posed in Section 2. There is, indeed, an inherent relationship between the parameters of duration and movement in the Southern /æ/. In general, this relationship is such that the greater the duration is, the more movement there is. But we can now be more specific about the nature and motivation of this movement. As Thomas

[2]An analogous case is vowel hiatus resolution in Spanish words like *linea* [ˈli.ne.a] > [ˈli.nja].

(2003:161) argues in a similar discussion, "[e]ven if the Southern drawl provides the opportunity for gliding by increasing the duration, movement of articulators … has to have some source." What articulatory strategy, then, leads speakers of Southern Anglo American English to add these particular gestures given additional duration? It doesn't go without saying that they should do so, or, for that matter, that new gestures should be added at all.[3]

7 Conclusion: The Phonetic Feature 'Delayed Initial Target'

The unique Southern Anglo vowel trajectories are the outcome of a particular way of utilizing the extra time provided by lengthening. Instead of stretching the vowel uniformly, or perhaps adding a gesture at the end, the initial gesture is delayed, "pushed back" into the vowel. The gained time at the beginning, if sufficient, may be used to carry out an additional gesture. I call this articulatory strategy a *delayed initial target*. Coming back to the premise of this paper, then, the iconization of Southern vowels as reflections of either cultural or cognitive slowness may work as follows. Observers are aware, whether consciously or not, that it actually does take longer, relatively speaking, for Southern speakers to produce the vowel quality associated with the initial gestural target, even if the delay is on the order of milliseconds. An anticipated linguistic event happens routinely later than expected, and this counts as a display of "taking time."

This form of iconicity is somewhat different from other examples analyzed previously in the literature, but not fundamentally so. For example, Eckert (1991:229) argues that the jocks' literally open, [æ]-like /ɛ/ may be iconically related to their perpetually upbeat, "open-faced, smiling demeanor". In the Southern example, the phonetic dimension involved is time, not vowel quality. But in the case of the jock smile as in the case of Southern vowels, a socially meaningful non-linguistic behavior, whether it is smiling or laughter, politeness practices, or, as the stereotype has it, mental processing, is seen as directly shaping linguistic structure.

As I argued at the outset of this paper, the iconization account would be strengthened if the crucial feature 'delayed initial target' could be identified in vowels other than /æ/. I will briefly sketch the argument for a few other vowels. The case of the other front lax vowels is analogous to /æ/. Consider Feagin's (1987:141) examples of /ɛ/ and /ɪ/, *head* [hɛ^{i} yəd] and *him* [hɪ^{i} yəm]. We can analyze the [i]-offglides here as former nuclei that were raised in the SVS, and which, as with /æ/'s raised nucleus, now function as glides. The initial [ɛ] and [ɪ] quality in these examples can then be analyzed as a newly added gesture that, just as for /æ/, approximates each vowel's former nucleus quality. The reason why this pattern, the most well known form of the drawl, is better attested for /æ/ than for /ɛ/ and /ɪ/ now becomes clear: /æ/'s long intrinsic duration can more readily host an additional gesture. With a view to other lax vowels, Feagin's analogous example of /ʊ/, *poor* [p^{h}ʊ^{u} wə], suggests that the delay pattern proposed here indeed transcends the SVS.

For the front tense vowels /eɪ/ and /i/, which undergo lowering in the SVS, the case of /i/ is straightforward. In a 'delay' scenario, the target [i] is pushed back and the added downward gesture inserted before it is the lowered nucleus, i.e. the initial part of [ɪi] ~ [ɛi]. A parallel account of /eɪ/ runs into the complication that the initial gesture of this vowel already is an opening gesture. The lowering of /eɪ/'s nucleus to [ɛɪ] ~ [æɪ] in the SVS is consistent with the pattern described for /æ/, whose new initial target also lowers between stages 3 and 4. But the lowered /eɪ/ nucleus should also be delayed. That is, in fact, what an earlier comparison of Houston Anglo and African American English lowered /eɪ/ found (Koops 2010). Both dialects lower /eɪ/ to [ɛɪ], but the Anglo speakers' lowered nucleus has a significantly longer duration.

Finally, consider the case of /aɪ/, which undergoes monophthongization to [aː] in the SVS. The nucleus of /aɪ/ is already low, so we should not expect to see an additional or increased opening gesture here. Rather, /aɪ/'s initial target should be delayed. In the 'delay' analysis of /aɪ/-monophthongization, what is generally described as glide weakening would then be the further and further delay of the nucleus, eventually ousting the offglide and leading to [aː].

[3]For example, Houston African American English also has relatively long and peripheral lax vowels but very little diphthongization and no triphthongization. Stressed /ɛ/ is a long monophthong [eː] (Koops 2010).

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University of New Mexico
Department of Linguistics
1 University of New Mexico
Albuquerque, NM 87131
ckoops@unm.edu