Fall 1998

AMERICAN SPEECH

A Quarterly of Linguistic Usage

Editorial Offices at
DUKE UNIVERSITY
Published by
THE UNIVERSITY OF ALABAMA PRESS
for the
AMERICAN DIALECT SOCIETY

MISCELLANY

THE LOW FRONT VOWEL /æ/ IN THE ENGLISH OF NEW YORK CITY: THEORETICAL IMPLICATIONS IN A NONSTANDARD DIALECT

WHEN ALLOPHONIC VARIATION occurs in a language, the phonological rule devised to predict the occurrence of the phoneme alternants is typically sensitive only to the phonetic environment (i.e., neighboring segments, stress, syllabification, etc.). Slightly less common is the case of allophonic variation that appears to be insensitive to phonetic factors. Such a case can be seen in Swahili, where the process of homorganic nasal assimilation may or may not apply, depending on which noun class the nasal represents (Katamba 1989, 112). Hyman (1975, 175) also gives a "classic example" of a phonetic process that must take the morphological environment into account in the "Umlaut in German." In these instances morphological, as well as phonological, knowledge is necessary to accurately predict the forms of the Swahili nasals and the German vowels, respectively.

The dialect of English spoken in New York City and its environs exhibits an alternation of the low front vowel /æ/ which is similar to the case of the Swahili nasals and German umlaut in that morphology plays a role in allophone prediction. In this paper, I will describe the distribution of the allophones of the low front vowel /æ/: the "standard" allophone [æ] and the tenser, higher variant [e̝]. Many people may recognize the latter variant in the stereotypical New Yorker's pronunciation of words such as *cab, bad,* or *gag.*[1] I will also discuss the relevance of this vowel alternation in conjunction with implications for syllabification and suffixation, as well as some implications for phonological rule ordering.

Some of the linguists involved in the study of this dialect, often inaccurately called "Brooklynese" (it's heard not only in Brooklyn, but in at least all five boroughs of New York) have included Babbitt (1896), Hubbell (1950), Bronstein (1962), and Labov (1982). They have given descriptions of this [æ]-[e̝] alternation in various ways, some more complex than others. And unlike Labov (1982), who explained this vowel's patterning and other aspects of the dialect like /r/-deletion (another salient feature) from a sociolinguistic perspective, I describe /æ/ strictly from a viewpoint of theoretical phonology and thus avoid any discussion on the social nature and status of this dialect.

Before discussing the distribution and patterning of the vowel allophones, I would like to briefly present some acoustic evidence to justify using terms like TENSE and HIGH when describing [æ] versus [e̝]. To begin with, I've claimed that in a pair like *cap* and *cab,* the latter will contain a higher, tenser

vowel in comparison to the vowel in the former. A preliminary spectrographic analysis did indeed reveal a greater difference between F1 and F2 for [æ̝] than for [æ]; for [æ̝] F1 and F2 were at approximately 900 Hz and 1900 Hz, respectively, versus 1000 Hz and 1700 Hz for [æ]. This suggests that [æ̝] is indeed higher, and possibly also more front (cf. Olive, Greenwood, and Coleman 1993, 101), than [æ].[2]

It is fairly easy to see the distribution of these variants in monosyllabic data. The raised vowel [æ̝] reliably appears when in a word closed by a voiced stop, as in the aforementioned [kæ̝b], [bæ̝d], [gæ̝g], or when before fricatives, as in *bath* [bæ̝θ], *laugh* [læ̝f], *salve* [sæ̝v], *bass* [bæ̝s], *jazz* [dʒæ̝z], or *cash* [kæ̝ʃ].[3] This is also seen before the liquids /l/, /r/, or the nasals /m/ and /n/, as in *sail* [sæ̝l] (compare this to standard American English [sel]), *bear* [bæ̝r], *clam* [klæ̝m], and the noun *can* [kæ̝n]. The standard vowel [æ] will appear in monosyllabic words closed by the velar nasal [ŋ], as in *bank* [bæŋk], which is understandable given the fact that lax vowels tend to appear before [ŋ] (Ladefoged 1993, 88), and [æ] is certainly laxer than [æ̝]. The only other consonants that do not condition the appearance of [æ̝], but rather demand [æ], are the voiceless stops /p t k/ (e.g., *cap* [kæp], *bat* [bæt], and *sack* [sæk]). At this stage, we can informally assume the following: [æ] appears in a monosyllabic word closed by a voiceless stop. However, the phoneme /æ/ is realized as the [+tense] [æ̝] elsewhere. Since it's customary to use the freer, less restricted allophone to represent the underlying phoneme, it would now actually make more sense to posit the phoneme /æ̝/, rather than /æ/, which then makes it possible to parsimoniously state the distribution so far:

/æ̝/ → [æ]/__ C [–sonorant, –continuant, –voice]

and /æ̝/ → [æ̝] elsewhere.

The situation above is fairly straightforward, and there is really nothing new that has not been described before. The interesting part comes when the apparent "exceptions" to the above rule are examined. It was stated before that the tensed, raised [æ̝] appears regularly before (nonvelar) nasals (among others), but consider *than* [ðæn], *can* [kæn], *an* [æn], and *began* [bəgæn]. All of these words are closed by the alveolar nasal, yet the predicted alternation fails to occur. Also note the lack of the expected vowel raising in *as* [æz], *had* [hæd], and *have* [hæv]. This leads to the problem of minimal pairs contrasting [æ] and [æ̝], as in *have* [hæv] versus *halve* [hæ̝v], *can* (modal) [kæn] versus *can* (noun) [kæ̝n], and *an* (determiner) [æn] versus *Ann* [æ̝n] (this also occurs in the similar environments displayed in *began* [bəgæn] versus *sedan* [sədæ̝n]). Since most of these pairs differ only in their vowels, it is required, under normal circumstances, to

call the vowels allophones of SEPARATE phonemes; the appearance of these two vowels in identical environments causes a change of meaning and is PHONEMIC. Nevertheless, it seems counterintuitive and awkward to posit [æ] and [æ̟] as derived from two different phonemes, namely /æ/ and /æ̟/. This is much simpler to explain when it is seen that the apparent "exceptions" all belong to the class of FUNCTION words. According to Katamba (1993, 41), these do not carry "semantic content," but rather "signal grammatical information or logical relations." Moreover, all the words listed as exceptions to the low-front vowel raising fall under function words or show [æ] in a function morpheme: *than* = conjunction forming comparatives; *can* = modal; *an* = determiner; *have* = auxiliary; and *had* = simple past verb form.[4]

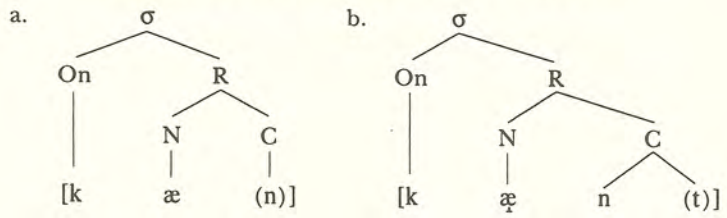
Therefore, similar to the morphologically sensitive nasal assimilation rule of Swahili and the umlaut vowel fronting of German introduced before, the [æ]-[æ̟] alternation in the English of New York City is sensitive to not only the phonetic but also the morphemic environment. Thus, the rule is MORPHOLOGISED; that is, the application of the phonological process is constrained by morphology (Hyman 1975, 175; Katamba 1989, 112). These occurrences of [æ] where [æ̟] is expected are not really exceptions (compare this to what Labov 1982, 34, says about the "exceptional" *can* and *had*) when morphology is taken into account. Furthermore, [æ] and [æ̟] do not need to be analyzed as derived from separate underlying phonemes.

In addition, there appears to be an "exception to the exception" where, in a few examples, the tensed allophone [æ̟] is unexpectedly found in function words. If the modal *can* is negated and in contracted form, we get *can't* [kæ̟nt], which contains the same vowel as the NOUN *can*. This is also seen in the preposition *after* [æ̟ftər] and somewhat unreliably in the conjunction *and* [æ̟nd] (I have heard this last word fluctuate between both vowel variants). What these three examples have in common is that the syllabic nuclei with the vowel in question MUST be analyzed as closed by a coda, and all three codas contain, immediately adjacent to the vowel, a consonant that conditions the appearance of [æ̟]. These data suggest that one possible analysis of the function words is that their final consonants are EXTRAMETRICAL as far as creating the environment necessary for the tenser vowel to appear; that is, the final consonants are "invisible" as far as this process is concerned (see Hayes 1982 for a similar claim involving extrametrical consonants and English stress). And, assuming the FINAL consonants are extrametrical, the above function words still display the conditions necessary for the raised vowel: [kæ̟n(t)], [æ̟n(d)], [æ̟f$tər]; the first two meet the conditions for raising because even if the final consonants in the coda clusters are considered extrametrical, [n] still conditions the raised [æ̟], and the third example shows vowel raising because the

phonotactic constraints of English force [f], a conditioning consonant, to close the syllable containing [æ̱], as [ft] is not a possible onset for the next syllable. By regarding the final coda consonants of function words as extrametrical, we can account for all instantiations of function words as regards this vowel realization. In most cases this will result in an environment that does not allow the tense [æ̱] to appear, but not always; as an example, we can consider the codas of the modals *can* and *can't*. In figure 1a, the final consonant [n] will not trigger the appearance of the tense vowel, even though it normally does, because it is extrametrical in the function word and therefore the phonetic environment that requires the tense vowel is not present. In figure 1b, the final consonant [t] is also extrametrical, but since there is a branching coda of two consonants, the remaining consonant [n] can and does condition the appearance of the tense vowel [æ̱].[5]

Let us now look at some bisyllabic words containing the vowel in question to see how the raised vowel reacts to suffixation. Compare the words *matter* and *madder*. On a phonetic level, these two may be completely homophonous for many speakers of American English, with the medial consonants of both being realized as alveolar flaps: [mærər] (it is possible for speakers to distinguish these by different vowel length, etc.; see Fox and Terbeek 1977). For speakers of the New York City dialect, however, it is very possible to distinguish these words from each other not only by vowel length, but also by vowel quality: *matter* will be realized as [mærər] and *madder* as [mæ̱rər].[6] Interestingly, this contrast is not seen in the otherwise very similar pair *latter* and *ladder*, which are completely homophonous as [lærər]. Since these last two do not contain the raised vowel, but rather [æ], either the flap does not condition the vowel raising or, more consistently, the flap is the onset of the second syllable and, since the syllable containing [æ] is then open, there is no conditioning consonant in the same syllable to demand [æ̱]. What should be done with [mæ̱rər], then, which shows the

FIGURE 1
Syllable Structure of Two Forms of the Modal *can*



raised vowel in an apparently open syllable? By means of another appeal to morphology, it becomes obvious that *madder* is morphologically complex, consisting of the root *mad* plus the comparative *-er*. Since *mad* consistently contains the raised vowel because it is a content (i.e., not a function) word, and is closed by [d], and retains this vowel when the syllable is opened by suffixation, the application of the vowel-raising rule must apply before the addition of the suffix. At this point, let us assume the derivation for the words *matter* and *madder* in table 1. This explains the lack of distinction between *latter* and *ladder*, since neither of these words ever contained the environment for [æ̱], as well as explaining the different vowel qualities in *matter* and *madder*. The ordering of rules in table 1 also correctly predicts the lax [æ] in *batter* 'one who bats', because the root *bat* never had the environment necessary for [æ̱]. (Of course the situation is the same for the monomorphemic *batter* 'mixture used in baking'.) If the order of vowel raising and suffixation is switched, the required vowel distinction in *matter* and *madder* is lost. This is because as soon as *mad* is inflected with *-er*, the intervocalic [d] (or [ɾ]) must be analyzed as the onset for the following syllable, and then there will not be the environment necessary to invoke [æ̱]. So, in table 2, the suffixation and consequent syllable boundary change BLEED the application of the raised vowel rule for *madder*, yielding an unacceptable form in this dialect.

The case of *matter* and *madder* is reminiscent of the minimal pairs seen in the function and content words (recall [kæn] and [kæ̱n]). Once again we have a minimal pair based on [æ] and [æ̱], and by looking at the internal structures of *matter* and *madder* we can see that the tense [æ̱] exists in *madder*

TABLE 1
Deviation of *matter* and *madder*

	matter	*madder*
UR:	/mæ$tər/	/mæd/
1. Raising of [æ]:	N/A	[mæ̱d]
2. Suffixation:	N/A	[mæ̱$d+ər]
3. Flapping:	[mærər]	[mæ̱rər]

TABLE 2
Disordered Deviation of *matter* and *madder*

	matter	*madder*
UR:	/mæ$tər/	/mæd/
2. Suffixation:	N/A	[mæ$d+ər]
1. Raising of [æ]:	N/A	N/A
3. Flapping:	[mærər]	*[mærər]

because the rule can and is applied BEFORE suffixation, when the conditioning environment still exists. And, as with the function and content words, we can avoid positing two different phonemes underlying the allophones [æ] and [æ̝]. There are, of course, other words that must have the same derivation as *madder.* The form *pale* is predictably realized [pæ̝l] and, when suffixed, the vowel remains the same: [pæ̝lər]. So *paler* and *pallor* [pælər] form a pair like *madder* and *matter.* Also of interest is the situation with *man* [mæ̝n], the vowel of which contrasts with the vowel in *manner* [mænər]. It is my observation that a speaker of this dialect will produce a minimal pair if *man* receives the agentive suffix *-er* 'one who mans', as in *to man a station.* The contrasting pair is then *manner* [mænər] and *man-er* [mæ̝nər]; the latter must receive a derivation like the one for *madder* in order to retain the raised vowel allophone, since in both cases the raised vowel appears in an open syllable if we consider the medial consonants to be onsets rather than codas.

A somewhat inconsistent situation exists with the forms *scan* [skæ̝n] and *scanner.* According to the derivation and argument above, we should hear the latter form as [skæ̝nər], but I have heard both [æ] and [æ̝] in *scanner.* Ideally, the two usages would follow the pattern found above: [skæ̝nər] said of 'one who scans' (with more of an agentive *scan* + *-er* meaning) and [skænər] used for the machine (without such a strong agentive interpretation). Unfortunately, this division doesn't appear to be so simple, as either form of *scanner* seems to be possible without much prediction. At least with the word *plan,* we get the expected *planner* [plæ̝nər], which follows the derivation given for *madder.* And as far as *ban* is concerned, there is a more regular trichotomy in that in the suffixed *banner* [bæ̝nər] 'one who bans', we retain the tense [æ̝] as in *mad* and *madder,* but in the monomorphemic *banner* meaning 'type of flag', the lax [æ] appears, since like *matter,* it can be argued that the conditioning environment for [æ̝] never existed.

This rule ordering is certainly not confined to words suffixed with *-er,* as demonstrated by the pair *patting* [pæɾɪŋ] and *padding* [pæ̝ɾɪŋ]. Again we can see that the addition of a suffix, in this case *-ing,* opens the first syllable. And once again the answer to the vowel contrast can be seen in the unsuffixed forms of these two words: [pæt] and [pæ̝d]. As above, to maintain this contrast in the suffixed forms, the rule that chooses the vowel must apply before the suffixation, as the consonants that determine the vowel choice do so only when in the same syllable as the vowel itself.

To summarize, in this paper I have examined the two allophones of the low front vowel (which differ along the lines of height, tenseness, frontness, and length) in the dialect of English spoken in New York, showing that the occurrences of the low front vowel [æ] and the tenser, higher [æ̝] do

consistently and predictably follow a pattern. The lax [æ] is realized when in a syllable closed by the voiceless stops /p t k/ (or the nasal /ŋ/), and the tenser [æ̱] is realized in a syllable closed by anything else. In addition, it must be stipulated whether the vowel occurs in a function or content word, because [æ] does not appear in a function word except in the few instances where a function word must be analyzed as having a closed syllable. Since I posit that final consonants in function words are invisible (i.e., extrametrical) to the rule that chooses [æ̱], a form like *can't* [kæ̱nt] is not an exception because if the final [t] is extrametrical, [n] still closes the syllable and conditions [æ̱]. We have also seen the distribution of [æ] and [æ̱] with regard to monomorphemic bisyllabic words and bisyllabic words created through suffixation and the rule ordering required to produce these pronunciations. Throughout all this I have shown that the two vowel allophones can be derived from one phoneme, even in the circumstances where minimal pairs are found.

Notes

1. See also Warkentyne and Esling (1995, 395), who mention that in "American varieties of English, there is a widespread tendency for the phonetic quality of /æ/ to be raised."

2. These values are for the words *cap* [kæp] and *cab* [kæ̱b], which reliably show an invariable occurrence of these two allophones. The informant was a 31-year-old male native of New York City. The analysis was performed on a Kay Elemetrics Corp. Sona-Graph Model 5500. As this paper does not concentrate on the acoustic qualities of the vowel in question, the data are admittedly limited and are intended only to give the reader a brief look at a sound they may be unfamiliar with. The acoustic aspects of this and other areas of this dialect certainly warrant further investigation.

3. It is convenient here to consider the English affricates as two segments each (i.e., stop + fricative) because this correctly predicts [æ] before the [t] of [tʃ] (e.g., *batch* [bætʃ]) and [æ̱] before the [d] of [dʒ] (e.g., *badge* [bæ̱dʒ]).

4. The past tense forms realized by vowel alternation (ablaut) in *began, swam,* and *ran* appear to pattern like function words, showing the lax pronunciation of [æ], though the following [n] and [m] would predict the raised variant. *Began* and *swam* do not show raising; *ran,* however, is variable, and leans toward the tense allophone. Another influence supporting the lax pronunciation of [æ] in *began, swam,* and sometimes *ran* could be an analogy based on the past tense forms with vowel alternation before a velar nasal (e.g., *drank, sank, thank*), which, like other words containing [æ] before a velar nasal, never show the raised variant of [æ].

5. This contrast exists also in *shall* [ʃæl] and *shan't* [ʃæ̱nt], but this modal is, of course, somewhat unnatural in most American dialects.

6. It may have been tempting, given *cap* and *cab,* to point to [voice] as the culprit that determines [æ] or [æ̱], but the phonetically identical environments in *matter* and *madder* (compare the transcriptions for this pair given in the main text) allow

us to now see that this is not the case, since the two allophones in question are in similar phonetic environments and we still see a height/tenseness distinction; in the former *matter* we get F1 & F2 of 760 Hz and 1720 Hz respectively for [æ], whereas in the latter *madder* F1 and F2 are 620 Hz and 1980 Hz for [æ̝]. Also, since one attribute associated with tense vowels is greater length, it can be seen from the duration of the vowels in *matter* and *madder* that [æ̝] is slightly longer in duration and tenser than [æ]. The vowel in the former showed a length of 142 ms versus the vowel in *madder,* which came to be 173 ms (Fox and Terbeek 1977 found some similar vowel length distinctions before flaps for pairs like *writer* versus *rider*). The informant and acoustic measurement specifications are maintained as in note 2 above.

References

Babbitt, E. H. 1896. "The English of the Lower Classes in New York City and Vicinity." *Dialect Notes* 1: 457–64.

Bronstein, Arthur J. 1962. "Let's Take Another Look at New York City Speech." *American Speech* 37: 13–26.

Fox, Robert A., and Dale Terbeek. 1977. "Dental Flaps, Vowel Duration and Rule Ordering in American English." *Journal of Phonetics* 5: 27–34.

Hayes, Bruce. 1982. "Extrametricality and English Stress." *Linguistic Inquiry* 13: 227–76.

Hubbell, Allan Forbes. 1950. *The Pronunciation of English in New York City: Consonants and Vowels.* New York: King's Crown.

Hyman, Larry M. 1975. *Phonology: Theory and Analysis.* New York: Holt.

Katamba, Francis. 1989. *An Introduction to Phonology.* London: Longman.

———. 1993. *Morphology.* New York: St. Martin's.

Labov, William. 1982. *The Social Stratification of English in New York City.* Washington: Center for Applied Linguistics.

Ladefoged, Peter. 1993. *A Course in Phonetics.* New York: Harcourt.

Olive, Joseph. P., Alice Greenwood, and John Coleman. 1993. *Acoustics of American English Speech: A Dynamic Approach.* New York: Springer.

Warkentyne, Henry J., and John H. Esling. 1995. "The Low Vowels of Vancouver English." *Studies in General and English Phonetics: Essays in Honour of Professor J. D. O'Connor.* Ed. Jack Windsor Lewis. London: Routledge, 395–400.

Kenneth R. Setzer
Florida International University