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Abstract
This paper reports on the current status of the short-a system in New York City English (NYCE), traditionally characterized as a phonemic split conditioned by the following phonological environment and a complex set of additional constraints (Labov 2007, Labov, Ash, and Boberg 2006). We provide apparent-time evidence from twelve white native New Yorkers of three age groups that the complex short-a split is changing over time, such that the system is losing its complex conditioning among our young white speakers. These results raise questions concerning the continuing characterization of NYCE short-a as phonemic. Additionally, we demonstrate that young native New Yorkers of ethnic minority backgrounds (Chinese, Puerto Rican, and African American) who speak English natively do not produce the traditional NYCE split, but instead produce a nasal tensing system (Labov 2007). In addition to providing current results suggesting change in white NYCE, this study contributes to the growing literature in sociolinguistics regarding ethnic minority speakers and their production of regional dialect features.

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The Short-*a* System of New York City English: An Update

Kara Becker* and Amy Wing-mei Wong

1 Introduction

The short-*a* system of New York City English (NYCE) is traditionally characterized as a phonemic split conditioned by the environment, with tensing of /æ/ before voiceless fricatives (*half*), voiced stops (*bag*), and front nasals (*ham, hand*), and lax /æ/ elsewhere (*halve, back, hang*) (Cohen 1970, Labov 1966, 2007, Labov, Ash, and Boberg 2006, Labov, Yaeger, and Steiner 1972):[1]

p		t	č	k
b		d	ǰ	g
m		n		ŋ
f	θ	s	š	
v	ð	z	ž	
		l	r	

Figure 1: Codas inside the box condition tense /æ/ in New York City, from Labov 2007.

It should follow from this phonological conditioning that NYCE short-*a* is an allophonic split into tense and lax sets; however, many scholars have noted a complex list of exceptions to the following environment conditioning. For instance, /æ/ word-initially (*absent*), in open syllables (*planet*), in function words (*can*), and in abbreviations (*math*) are generally lax in environments that would otherwise produce tensing. There are also lexical exceptions, which either do not follow the following environment condition (tense *avenue*), or are exceptions to exceptions (*after* and *ask* are word-initial yet tense; *can't* is a function word yet tense). These complex constraints have led some linguists to characterize the split as phonemic (Labov, Yaeger, and Steiner 1972, Trager 1940), a position maintained in recent work (Labov 2007, Labov, Ash, and Boberg 2006). However, Becker and Coggshall (2008) found evidence that young white and African American New Yorkers[2] were not producing the complex split described above, but instead what appeared to be a simpler system that would not require a phonemic characterization.

This study provides data from white New Yorkers to establish the current state of NYCE short-*a*, a dialect marked by change in other features (cf. Labov 1966 for rhoticity in NYCE as a change in progress). We add to a growing body of literature that includes minority speakers in dialectological investigation (*inter alia* Becker and Coggshall 2008, Fought 1999, Hall-Lew 2008,

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[1]We follow the convention first laid out in Labov, Yaeger, and Steiner 1972 in using the labels *tense* and *lax* to refer to the two phonemic classes of short-*a*. The use of these labels implies the presence of a combination of articulatory features to produce the distinction, such as pharyngeal width, tongue shape, and muscle use. Acoustically, the tense and lax classes can be distinguished in terms of differences in formant position. The tense class should have significantly lower F1 and higher F2 values (which translates to peripherality in the vowel space) than the lax class. In this paper, we follow common sociolinguistic practice in identifying tense and lax sets in relation to each other through differences in formant values.

[2]A note on ethnic terms: we use the term *white* to refer to speakers of European descent, following Fought (2006) and others who acknowledge white as an ethnic category that many European Americans (including those in our sample) identify with. We use *African American* to refer specifically to New Yorkers who are U.S. slave descendents, following Baugh (1999). The terms *Puerto Rican* and *Chinese* are used to acknowledge that our sample is limited to these two particular groups, and may not represent the larger Latino or Asian communities in NYC.

Henderson 1996, Hoffman 2008, Preston 2003, Wong 2007), and investigate the use of NYCE short-*a* by young native New Yorkers who are members of ethnic minorities. Our research questions map directly onto Labov's (2007) distinction between *transmission* and *diffusion*. First, are older generations of white New Yorkers transmitting the complex phonemic split of NYCE short-*a* to their children? We look at white New Yorkers from three age groups for signs of either change in progress or maintenance of the system. Second, does the system diffuse to non-white native-born New Yorkers? There is a large body of work concerning the complicated short-*a* systems of the Mid-Atlantic states and the difficulty of their diffusion, whether geographically or ethnically (Friesner and Dinkin 2006, Henderson 1996, Labov 2007, Payne 1980, Wong 2007). Labov (2007) argues that NYCE short-*a* only partially diffused to other cities which historically interacted with New York City, so that only some parts of the system were preserved. Additionally, there is evidence that minority speakers do not produce Mid-Atlantic short-*a* patterns, as Labov (1966) found for African Americans and Wong (2007) for Chinese Americans in New York City, and Henderson (1996) and Labov (1994) for Philadelphian African Americans.

In the following sections, we will present evidence which suggests that NYCE short-*a* is losing its complex conditioning over time among our young white speakers. This leveling suggests a change in progress in apparent time, and raises questions as to the successful transmission of NYCE short-*a* to younger generations of white New Yorkers. In addition, our results show that none of the ethnic minority groups we investigate produces the NYCE split as laid out by Labov and others. Our findings call into question the continuing characterization of the NYCE short-*a* as phonemic. Further, they suggest a need for more work to confirm whether the traditional short-*a* system in New York City is indeed continuing to be produced by both white speakers as well as speakers of ethnic minorities.

Speaker	Born	Ethnicity	Gender	Occupation	Education
Frank	1927	White	Male	Garment worker	Some college
Mae	1928	White	Female	Lab supervisor	College
Anne	1932	White	Female	Homemaker	Elementary
Michael	1933	White	Male	Pastor	Graduate
Martin	1959	White	Male	Craftsman	High School
Kathy	1960	White	Female	Waitress	College
Janet	1965	White	Female	Law Clerk	High School
Jerry	1968	White	Female	Police Officer	College
Jane	1977	White	Female	Office Administrator	College
Elaine	1980	White	Female	Salesperson	College
Gary	1980	White	Male	Teacher	Graduate
Seamus	1984	White	Male	Substitute Teacher	Some College
Mary	1977	AA	Female	Unemployed	High School
Lisa	1980	AA	Female	Community Organizer	College
Marcus	1985	AA	Male	Student	Some College
Matthew	1986	AA	Male	Student	Some College
Doris	1977	Chinese	Female	Business Consultant	Graduate
Candace	1988	Chinese	Female	Student	Some College
Beatrice	1985	Chinese	Female	Accountant	College
Alice	1984	Chinese	Female	Real Estate Agent	High School
Anthony	1976	PR	Male	Public Health Worker	College
Jasmin	1979	PR	Female	Community Organizer	College
Christy	1982	PR	Male	Receptionist	College
Ashley	1992	PR	Female	Student	High School

Table 1: List of speakers.[3]

[3]All our speakers qualified as either upper working- or lower middle-class with regard to level of education and occupation, two objective characteristics of socioeconomic class (Guy 1988:42).

2 The Study

2.1 The Sample

In order to determine if white NYCE is changing over time, we built a sample of twelve white New Yorkers split into three age groups (old, middle, and young). To further investigate the current status of short-*a* produced by young New Yorkers, we also utilized data from speakers who represent three of the largest ethnic minority groups in New York City: African Americans (AA), Chinese, and Puerto Ricans (PR). All the speakers in the sample are native speakers of English. Our young white speakers are at least third generation New Yorkers, while the sample of minority speakers ranges from second to third generation. Their short-*a* tokens come from the interview speech of twenty-four interviews conducted by a wide range of interviewers. Demographic information on the full sample of twenty-four speakers is shown in Table 1.

2.2 Measurements and Analysis

Acoustic measurements of about 100 short-*a* tokens were taken for each speaker (Total N=2355). Formant information (F0, F1, F2, F3) was extracted at two points for each vowel (onset at 35ms or the point of inflection; offset at 35 ms from the end of the vowel), and duration was measured. We analyzed the F1 and F2 onset values in this study, and did not analyze duration. We normalized formant measurements to the Telsur G of Labov, Ash, and Boberg 2006.

3 Results

3.1 Vowel Plots

We coded all our speakers' short-*a* tokens according to the classic Labovian phonemic split. It was immediately clear from the vowel plots generated in Plotnik that not all speakers were splitting their short-*a* tokens in the expected way.[4] Older white speakers, like Mae in Figure 2, show the classic short-*a* split, with a clear division between tense and lax words (represented as yellow triangles and red squares, respectively). Mae also obeys the many exceptions to the following phonological environment that condition the split, with tense *can't* and *avenue*, lax /æ/ in function words like *had*, in open syllables like *traffic*, and before velar nasals like *thank*.

The vowel plots of our middle-aged white speakers do not show the clean tense/lax split that Mae has. Particularly, individual speakers' /æ/ tokens followed by velar nasals are highly variable. Our young white New Yorkers' short-*a* tokens show even more overlap between the Labovian tense and lax sets than their middle-aged counterparts. Seamus (Figure 3), born in 1984, shows variation when /æ/ is followed by a voiceless fricative, for instance, with lax *half* and *last* but tense *fast* and *trash*. Most importantly, his /æ/ followed by a velar nasal is extremely tense, which will be shown in Section 3.2 to be a crucial difference between young speakers like Seamus and older white speakers who adhere to the traditional system.

3.2 Quantitative Analysis

Based on the vowel plots, showing younger speakers of all ethnicities producing tense /æ/ in nasal environments, we hypothesized that the following nasal environment might be a source of difference between our older and younger speakers' short-*a* systems. To confirm this hypothesis, we ran one-way ANOVAs on each speaker group to determine whether the following four groups of /æ/ tokens were significantly different in height and frontness from each other: 1) /æ/ followed by tautosyllabic front nasals (*ham, band*); 2) /æ/ followed by tautosyllabic velar nasals (*hang*); 3) /æ/ in all other tensing environments in the classic Labovian system (*half, past, bad, can't, avenue, after, planning,* etc.); and 4), /æ/ in all remaining environments that the Labovian system considers lax (*halve, back, has, bat, average, planet,* etc.). We discuss only the F1 results in this paper.

[4]For full vowel plots for each of the twenty-four speakers, please contact the authors.

Figure 2: Mae, old white female, born 1928.

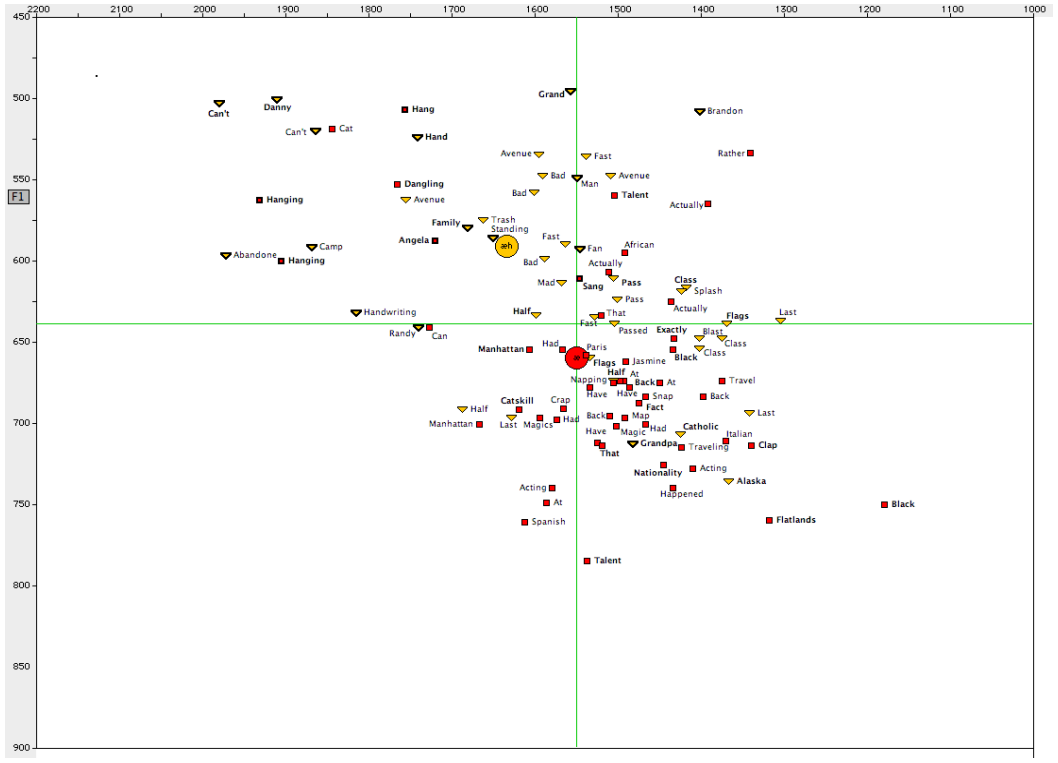

Figure 3: Seamus, young white male, born 1984.

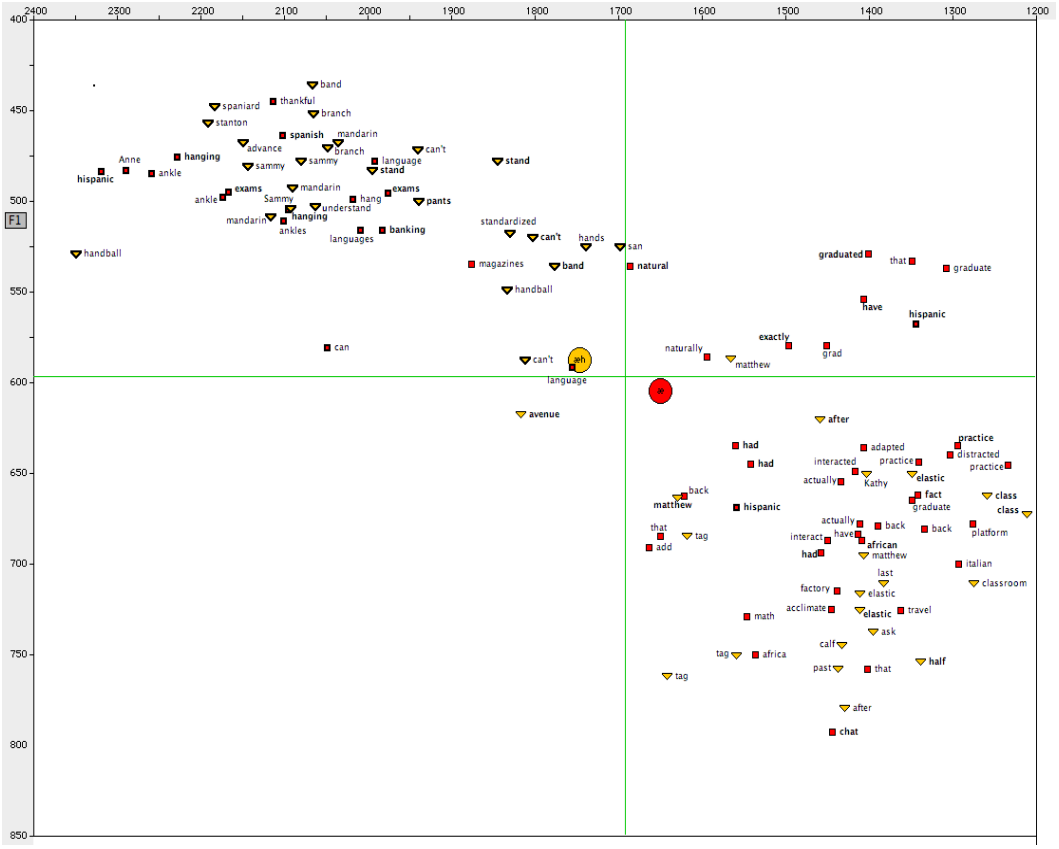

Figure 4: Doris, young Chinese female, born 1977.

3.2.1 White New Yorkers

One-way ANOVAs were performed for each white age group, showing a significant main effect of the four coding environments on the F1 means of /æ/ for all three age groups. (F1: Young $F(3, 412)=79.48$, $MSE=5{,}211$, $p<.0001$; Middle $F(3, 394)=110.75$, $MSE=3613$, $p<.0001$; Old $F(3, 364)=101.13$, $MSE=7{,}181$, $p<.0001$). Post-hoc Bonferroni tests were performed to determine which groups of /æ/ tokens are significantly different from each other. Figure 5 shows the mean F1 values of /æ/ in the four coding environments for our white speakers. We circle those groups whose F1 means are *not* significantly different in post-hoc tests.

Older speakers maintain the classic split: /æ/ within the Labovian tensing environments is not significantly different in F1 from /æ/ followed by front nasals; /æ/ followed by velar nasals is not significantly different in F1 from /æ/ in the Labovian lax environments. Middle-aged speakers also show no significant difference between /æ/ in the Labovian tensing environments and /æ/ followed by front nasals. However, their /æ/ followed by the velar nasal is significantly different (with a lower F1 value) than /æ/ in the Labovian lax environment. Our younger speakers show an even more dramatic change: /æ/ followed by velar nasal is *not* significantly different in F1 from /æ/ in the Labovian tensing environments, which has lowered and is now significantly different from /æ/ followed by front nasals. This points towards an apparent change over time with respect to the conditioning of NYCE short-*a* by following phonological environment among white New Yorkers.

3.2.2 Ethnic Minorities

Similar one-way ANOVAs and post-hoc tests were performed for each individual ethnic minority group: African American, Puerto Rican, and Chinese. Results show significant main effects of the four following environments on the F1 means of /æ/ for all three ethnic groups (African Americ-

ans: $F(3, 401)=63.42$, $MSE=5299$, $p<.0001$; Puerto Rican: $F(3, 365)=17.064$, $MSE=5347$, $p<.0001$; Chinese: $F(3, 395)=80.24$, $MSE=6268$, $p<.0001$.) Figure 6 presents the F1 means for our four groups of young New Yorkers, with the young white speakers repeated for comparison. F1 means that are not significantly-different in the post-hoc tests are again circled.

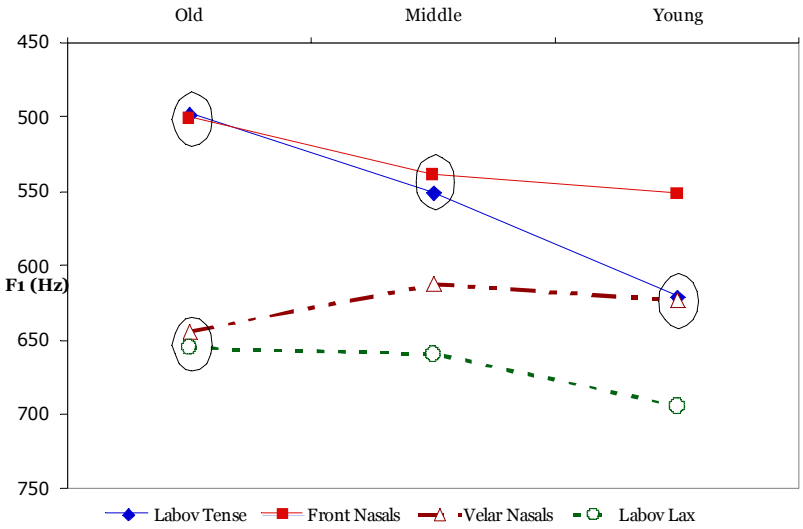

Figure 5: Mean F1 (height) of /æ/ for white New Yorkers.

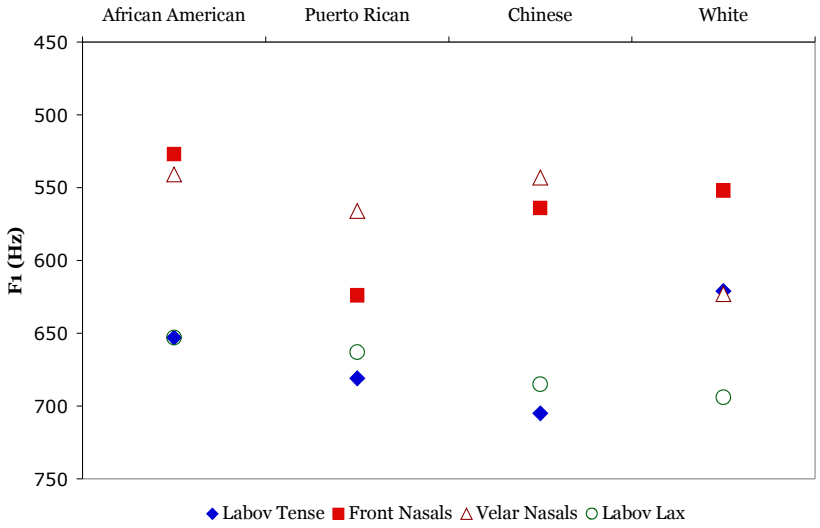

Figure 6**:** Mean F1 (height) of /æ/ for young New Yorkers.

All three ethnic minority groups show no significant differences in F1 means between /æ/ in the following front and velar nasal environments; further, their mean F1 of /æ/ in the Labovian tensing environments is not significantly different from that of the Labovian lax environments. This is strong evidence that these young ethnic minority speakers are not producing the NYCE phonemic short-*a* split. With their mean F1 values of /æ/ before tautosyllabic nasals lower than that before other oral consonants, our young ethnic minority speakers appear to produce a nasal

system, defined by Labov (2007:353) as one in which "short-*a* before nasal consonants is tense (*man, manage, span, Spanish*) and lax elsewhere." This system is often considered the default short-*a* system in American English (Thomas 2001), and has been found in other minority communities, as for African Americans in Gary, Indiana (Gordon 2000). Young white New Yorkers, in contrast, continue to show significant differences in F1 means of /æ/ between the Labovian tense and lax sets, as discussed in Section 3.2.1. However, with /æ/ before velar nasals raising to join those before front nasals, while the rest of the NYCE tensing environments lax, the movement of their systems could point towards a change to a nasal system as well.

To summarize, two important findings follow from the ANOVA results. First, there is apparent-time evidence of change for white New Yorkers. The classic split is maintained by older white speakers, but is weakening as speakers get younger. Crucially, for the younger white speakers, the movement of /æ/ followed by a velar nasal to join /æ/ in other Labovian tensing environments (which itself is lowering) is indicative of change, potentially towards a nasal system. Second, in line with previous findings on the incomplete diffusion of complex short-*a* across different regions and ethnic groups, we found no evidence that young speakers of ethnic minorities in NYC were producing the NYCE short-*a* split system. They instead produce what appears to be a nasal system, with their highest /æ/ tokens before the two nasal following environments.

3.3 Further Questions

While our ANOVA results provide evidence that younger New Yorkers are not producing the classic split according to the following phonological environment condition, further questions remain as to whether or not our speakers observe the many exceptional constraints as laid out in Labov 2007. A linear regression analysis in Rbrul (Johnson 2008) was conducted to determine which constraints are being observed by each of our speaker groups. An Rbrul multiple regression analysis allows us to treat the dependent variables, in this case F1 and F2 values, as continuous. The independent variables include the following Labovian constraints: 1) Following Phonological Environment; 2) Syllable Structure (open or closed); 3) Function Word (lexical or function); 4) Word Initial (word initial or non-initial); and 5) Exceptions (tokens which are exceptions to constraints (3) and (4), like *ask, after, aunt,* and *can't*).[5]

Table 2 summarizes the significant constraints that were selected in our Rbrul analysis for each speaker group. All of the Labovian constraints were found to be significant in accounting for the realization of /æ/ by the older white New Yorkers; all but one constraint significantly accounted for the pattern of middle-aged white speakers. This is further confirmation that middle-aged and older white speakers follow the Labovian system. In contrast, only the following environment constraint and the syllable structure constraint are selected as factors for the young speaker groups that significantly account for the realization of /æ/ (with the exception of the Puerto Ricans, who do not select syllable structure). Beyond that, no additional constraints were selected as significant for the young New Yorkers, including the white group.

Table 2: Significant factors on F1 of /æ/ and their *p*-values.

It is important to point out that even though the following environment condition is selected

[5]We acknowledge the limitations of running regression analyses on independent factor groups that interact, as these do, which has the potential to dilute the effects of the groups.

as significant for all speaker groups, speaker groups differ in the exact ways in which each following environment conditions the realization of /æ/. Table 3 presents the mean F1 values of /æ/ in different following phonological environments across different speaker groups. The F1 mean values are sorted in ascending order for each speaker group. The shaded and plain cells indicate, respectively, the laxing and tensing environments under the traditional Labovian system.

	White Old	White Middle	White Young	African American	Puerto Rican	Chinese
Highest /æ/	Vl. Fricative (*507hz*)	Front Nasal (*562 Hz*)	Front Nasal (*574 Hz*)	Front Nasal (*531 Hz*)	Velar Nasal (*566 Hz*)	Velar Nasal (*543 Hz*)
	Front Nasal (*527 Hz*)	Vl. Fricative (*569 Hz*)	Velar Nasal (*623 Hz*)	Velar Nasal (*541 Hz*)	Front Nasal (*627 Hz*)	Front Nasal (*568 Hz*)
	Vd. Stop (*561 Hz)*	Vd. Stop (*598 Hz*)	Vl. Fricative (*634 Hz*)	Vd. Stop (*643 Hz*)	Liquids (*649 Hz*)	Vd. Fricative (*662 Hz*)
	Liquids (*643 Hz*)	Velar Nasal (*612 Hz*)	Vd. Stop (*648 Hz*)	Vl. Stop (651 Hz)	Vl. Stop (*656 Hz*)	Vd. Stop (*679 Hz*)
	Velar Nasal (*644 Hz*)	Vd. Fricative (*632 Hz*)	Vd. Fricative (*660 Hz*)	Liquids (*681 Hz*)	Vd. Stop (*672 Hz*)	Liquids (*700 Hz*)
Lowest /æ/	Vl. Stop (*677 Hz*)	Vl. Stop (*668 Hz*)	Vl. Stop (*695 Hz*)	Vl. Fricative (*669 Hz*)	Vd. Fricative (*689 Hz*)	Vl. Stop (*706 Hz*)
	Vd. Fricative (*686 Hz*)	Liquids (*688 Hz*)	Liquids (*731 Hz*)	Vd. Fricative (*700 Hz*)	Vl. Fricative (*691 Hz*)	Vl. Fricative (*714 Hz*)

Table 3: Mean F1 values of /æ/ in different following phonological environments, arranged in ascending order for each speaker group.

Table 3 shows a clear difference between the middle-aged and older white groups and the young groups, corroborating our earlier ANOVA results. Both middle-aged and older whites maintain a clear separation between the tense and lax classes according to the Labovian following environments, with a considerable jump in mean F1 values from the first three tense groups to the remaining four lax groups. We do, however, begin to see the raising of /æ/ (i.e., lowering of F1 values) before velar nasals for the middle-aged group. For younger speakers, not only are the two sets muddled, but importantly, *all* young groups show /æ/ followed by front nasals and velar nasals to have the highest mean values. This is further confirmation that young New Yorkers' short-*a* systems are not the same as older white New Yorkers'.

4 Conclusions

The results of our study reveal change, and raise questions about an allophonic versus a phonemic characterization of NYCE short-*a*. The old system, with its complex conditioning, has been a puzzle that phonologists and others have attempted to tackle for some time, and some have argued for an allophonic description even of that system (Setzer 1998). We do not comment on the puzzle of the old system here, except to state that sociolinguists have continued to describe NYCE short-*a* as phonemic due to its complex conditioning, which we indeed confirm for our older white speakers. Our younger speakers, though, have far more simplified systems, with few exceptional constraints. In fact, if younger white speakers are moving away from the complex conditioning constraints that motivated Labov and others to characterize the NYCE short-*a* split as phonemic, then an allophonic description of the new system may be appropriate. Further study will confirm whether there is indeed change, and if so, whether that change has leveled NYCE short-*a* to an allophonic system.

Further, our ethnic minority groups are not producing NYCE short-*a.* This might seem at first to corroborate other reports that minority speakers do not produce regional dialect features; for instance, Henderson (1996) and Labov (1994) both argue that African Americans in Philadelphia do not produce that local short-*a* split, similar to NYCE short-*a* in its complexity. Yet juxtaposing the

results from our ethnic minority speakers with the results from our white speakers caution us against jumping to such a conclusion. How can we conclude that these ethnic minority speakers have failed to produce a split that their white peers are also not producing? Friesner and Dinkin (2006) raised a similar question when they found that Russian immigrants in Philadelphia were not producing the Philadelphian short-*a* split, while at the same time young white Philadelphians were not producing it either. Our results suggest that further work is needed to identify the leaders who are driving this trend towards a nasal system in New York City. Is the NYCE split simply being lost over time internally, limiting young non-white New Yorkers' exposure to the system, or are young white New Yorkers being influenced by their ethnic peers? This study is only a first step in understanding the current state of NYCE features like short-*a*, and we hope that more qualitative, ethnographic work can be done in combination with quantitative analysis to investigate both *why* young white New Yorkers are changing, as well as *who* the models are for young New Yorkers' systems, crucially, both white and non-white.

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