

LINGUISTIC AND SOCIAL FACTORS FAVORING ACQUISITION OF CONTRAST IN A NEW DIALECT

Jennifer Nycz

Georgetown University
jennifer.nycz@georgetown.edu

ABSTRACT

This study describes linguistic and social factors favoring acquisition of a low back vowel contrast by native speakers of Canadian English living in New York City (NYC). Previous literature has found that new phonemic distinctions seem difficult to acquire, both in L2 and D2 (second dialect) learning contexts. In contrast, this analysis shows that Canadian expats who have been exposed to NYC English due to mobility show small but significant distinctions between the COT and CAUGHT classes. Intriguingly, the social factor most strongly influencing the magnitude of this new contrast is not total years spent in NYC or even identification as a New Yorker, but choice of partner: Canadians married to New Yorkers show greater COT/CAUGHT contrast. These findings suggest that long term, consistent input from a regular and important interlocutor may facilitate the acquisition of new contrasts in a second dialect.

Keywords: dialect acquisition, long-term accommodation, phonemic splits, sociophonetics

1. INTRODUCTION

When a person grows up in one region and later moves to another, they may change aspects of their accent to become more similar to that of their new community. Many developmental, linguistic, and social factors play a role in this process, usually termed *second dialect acquisition* (SDA) [20, 13]. Age of arrival in a new region is a key predictor: children are more likely to adopt new forms than adults and younger children use more second dialect (D2) forms than older children [16, 4, 11, 21]. Social and attitudinal factors also play a role, with both the composition of a speaker's social network [8, 6] and their attitudes towards their home and adopted regions [19, 23] affecting the overall extent to which speakers adopt D2 forms. The impact of such extralinguistic factors has been most clearly demonstrated in studies focusing on the most commonly observed (and arguably, most straightfor-

wardly learnable) dialect changes; that is, those that involve a shift in a single phonemic or allophonic category shared by both D1 and D2, or the addition (or suppression) of a simple phonological rule. Changes involving the acquisition of new phonemic contrasts, however, seem to be less frequent (or at least, less frequently attested) [16, 4, 11, 7], and accordingly less is known about the potential explanatory roles of age, exposure, attitude, and other factors in these changes. Yet understanding how these variables impact new contrast acquisition in a D2 can shed light on the mechanisms of dialect learning and the levels of representation that are manipulated during the learning process [12].

The analysis presented here investigates factors affecting acquisition of the COT/CAUGHT distinction by native speakers of Toronto English who are now living in New York City. Toronto English, like most varieties of Canadian English, is characterized by a historical (and complete) merger of the LOT, CLOTH, and THOUGHT lexical sets [2]; for life-long residents of Toronto, words like *cot* and *caught* are produced with the same vowel sound. New York City, meanwhile, maintains a distinction between LOT and CLOTH/THOUGHT; *cot* and *caught* are produced with different vowels ([kat] and [kɔt], respectively). While some work has suggested that this contrast is unlikely to be acquired after about age 12 [4], other research [12] has found that native speakers of Canadian English do show evidence of acquiring a small COT/CAUGHT contrast after having moved to the NYC region in adulthood. These previous studies could not robustly examine the effect of extralinguistic factors such as Age of Arrival, Years of Exposure, or Speaker Identity given their speaker samples. Post hoc examination of speaker patterns in [12]'s data, however, did suggest a potential predictor that is not typically the focus of SDA research: the native dialect of the speaker's spouse or partner. The current study analyses a new and larger speaker dataset, with the goal of determining a) whether these speakers also show evidence of a COT/CAUGHT distinction and b) whether the magnitude of the distinction is mediated by quality of exposure (Age of Arrival, Years in NYC), social-

attitudinal factors (Gender, NYC orientation), or Native Dialect of Partner.

2. METHOD

2.1. Participants

Data from 29 participants (15 female, 14 male) were included in this analysis. Participants were recruited as part of a larger SDA study; all are natives of Toronto, Ontario (Canada) or nearby towns who lived in the Toronto metro area until at least age 18. All participants had been living in New York City for at least 5 years at the time that data was collected. Participants varied in their age of arrival in NYC and in number of years spent there (Fig. 1), as well as other demographic characteristics such as ethnicity, which will not be examined here. 10 participants reported having a spouse or partner who is native to the NYC region, while the other 19 reported partners from outside of this region.

Figure 1: Study participants (Women = circles; men = triangles, here and in all figures)



2.2. Data collection

Participants took part in sociolinguistic interviews consisting of conversation, word list readings, and minimal pair readings and judgments. The conversational portion of the interview included questions probing the participant’s childhood and life growing up in Toronto, their experience moving to New York, and their impressions of similarities and differences between both Canada and the U.S. and Toronto and New York City. Interview activities took place in either a quiet meeting room in the New York Public Library or a quiet room convenient to the participant (such as their home or office), and were recorded to 44.1kHz 16 bit wav files using a Zoom H4N PRO digital recorder and an Audio-Technica AT831R condenser lavalier microphone.

2.3. Data processing and acoustic analysis

Only speech from the conversational portions of interviews is analyzed here. All interviews were transcribed by student RAs using ELAN [5]. Transcripts and wav files were submitted to FAVE-Align python scripts [18] to generate time-aligned Praat textgrids with word- and phoneme-level segmentation. Textgrid alignments were spot-checked for accuracy and manually corrected when needed. FAVE-Extract scripts were then used to extract Lobanov-normalized formant measurements (rescaled to Hz) from all stressed vowels longer than 50 msec. The FAVE-Extract output also included coding for a number of linguistic context variables, including preceding and following segment. Default configuration settings for FAVE-Extract were used, with maximum formant set automatically according to gender of the speaker. Word class codes assigned by the CMU dictionary were hand-checked and corrected as needed. All non-pre-rhotic tokens of the COT and CAUGHT word classes (3587 COT, 1591 CAUGHT) were extracted from the larger dataframe for the statistical analysis described below.

Each speaker was also assigned a NYC Orientation Score (Fig. 2) based on the content of their interview; these scores are meant to capture and make more comparable each individual’s orientation towards and sense of identification with New York City (see [23]’s ‘integration’ scores and [3]’s orientation scores; the system I use draws on relevant aspects of both of these systems).

Figure 2: Orientation score worksheet for NYC

NYC Orientation	Pts	Description
Identification as New Yorker	+2	Identifies enthusiastically as a New Yorker
	+1	Qualified identification (“I guess”)
	0	No data (question not answered, e.g.)
	-1	qualified non-identification (“I guess”)
	-2	Identifies enthusiastically as not a New Yorker
Desire to move to NYC	+1	Always wanted to move to NYC
	0	Thought about moving there but wasn’t sure
	-1	Never wanted to move to NYC
Owns property in NYC region	+1	Yes
	-1	No
Currently has job in NYC region	+1	Yes
	-1	No
Has children schooled or raised in NYC	+1	Yes
	-1	No
Has NYC community	+1	Yes
	-1	No
Total		

2.4. Statistical analysis

In the first phase of statistical analysis, a MANOVA was run for each speaker to determine the extent to which that speaker phonetically distinguished words

in the COT and CAUGHT classes. The outcome variables in each model were F1 and F2, and the predictor variables included following place, following manner, vowel duration, and word class (COT or CAUGHT, in the NYC dialect). The Pillai score associated with word class in the MANOVA output indicates the degree to which the two word class distributions are distinct while controlling for phonetic context effects, with higher values indicating greater distinction [10, 15]; the p value associated with this statistic indicates whether the difference between distributions is significant.

In the second phase of analysis, a fixed-effects linear regression model was built to determine whether socio-attitudinal and time-based factors predict speaker's degree of COT/CAUGHT distinction. The dependent variable in the analysis was Pillai score (as in [9]). Predictors tested included Age-of-Arrival, Years in New York City, Gender (Male or Female), New York City Orientation score, and whether the speaker had a partner who is a native of New York City (Yes or No).

3. RESULTS

3.1. COT/CAUGHT distinction across speakers

Individual Pillai scores are plotted according to Years in NYC and Age Moved to NYC in Figs. 3 and 4. Word class emerged as a significant predictor of vowel quality for nineteen of the twenty-nine speakers (Pillai scores for these nineteen speakers are plotted in black in these two figures). At the same time, both the mean Pillai value (0.06) and the overall range of values (0 to 0.21) are quite low, indicating that all speakers continue to produce the two word classes with a high degree of overlap in conversational speech.

Figure 3: Pillai scores vs. Years in NYC

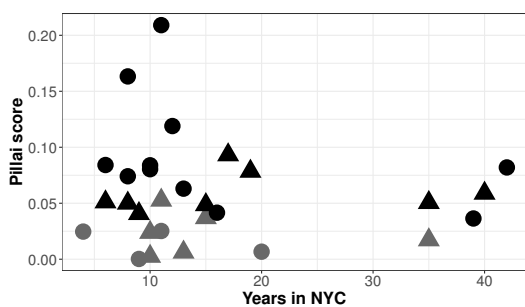
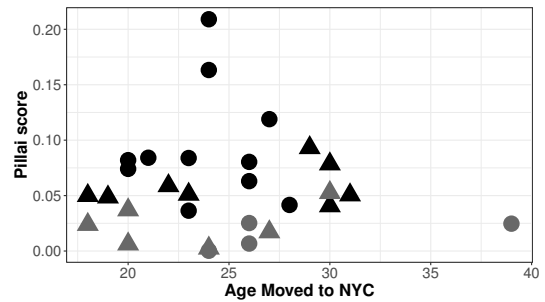


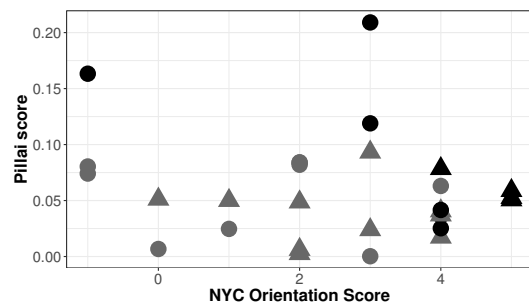
Figure 4: Pillai scores vs. Age of Arrival in NYC



3.2. Exposure and social factors

The distribution of Pillais in Fig. 3 and 4 suggests that Age of Arrival and Amount of Time spent in the new dialect region do not clearly correlate with degree of COT/CAUGHT distinction. Social/attitudinal factors also do not show an obvious relationship with Pillai values under graphical inspection (Fig. 5) While the mean Pillai among the female speakers is greater than that of the male participants in this sample (0.07 vs 0.04), this seems to be driven by the three highest scores, all held by women; otherwise, men and women are evenly distributed along the range of scores. NYC orientation score similarly shows no apparent relationship with Pillais; those with the strongest orientation towards NYC do not have the largest distinctions. However, Fig. 5 suggests possible interactions with the Partner factor: Men who are partnered with a New Yorker have higher NYC orientation scores, if not higher Pillais, while women with NYC partners seem to have higher Pillais, though not higher NYC orientation.

Figure 5: Pillai scores vs. NYC Orientation. Participants with a NYC partner are plotted in Black; those with no NYC partner are plotted in Grey



To verify these observations, a linear fixed-effects regression model was built manually using a step-down procedure in R [22]. All five social and experiential variables were included in the first model of

Pillai score. Non-significant variables were then removed one at a time, starting with the variable showing the smallest effect (Years in NYC), until only significant factors remained. The final model explained 25% of the variance in Pillai (Adjusted $R^2=0.25$, $F(2, 26)=5.65$, $p=0.01$) and included Partner and NYC orientation score. Partner had the greatest predictive value for Pillai as a main effect ($B= 0.06$, $SE=0.02$, $t=3.19$, $p<0.001$); having a native New Yorker as a partner is associated with a 0.06 higher Pillai score, compared to not having such a partner. NYC orientation score also had a significant effect ($B=-0.01$, $SE=.00$, $t=-2.36$, $p=0.02$); counter-intuitively, each 1 point increase in NYC orientation was associated with a slight decrease in Pillai score of 0.01. Age of Arrival, Years in NYC, or Gender did not significantly improve the model, nor did adding any interactions among the five predictors.

4. GENERAL DISCUSSION

The analysis presented here was carried out to address two questions: to what extent do native speakers of a COT/CAUGHT-merging dialect show evidence of a COT/CAUGHT distinction after long-term exposure to new dialect input, and do exposure and/or socio-attitudinal factors affect the magnitude of this distinction? The answer to the first question is complex. On the one hand, a majority of speakers show evidence of having acquired a phonetic distinction between the COT and CAUGHT word classes, as shown by the MANOVA outputs. On the other hand, the distinction is very small; the categories show high amounts of overlap, suggesting that the difference is not likely to be noticeable by speakers nor strongly relied upon by listeners to identify lexical items. The subtle, gradient nature of this change may reflect the manner in which speakers learn this contrast in a new dialect region; because the native and new dialects are mutually intelligible, speakers have no need to explicitly learn new lexical items or their component phonemic categories, and are largely unaware of the COT/CAUGHT distinction *per se*.

The role of extralinguistic factors in predicting the extent of distinction is also not straightforward. Age of arrival and years spent in NYC do not predict Pillai scores, contrary to what we might expect given the importance of these findings in previous SDA research as well as the second language learning literature [1]. Orientation towards the new dialect region weakly predicts degree of distinction, while the dialect background of one's partner has the strongest predictive value in this dataset. These

findings should be taken as suggestive rather than definitive, given the size of the speaker sample relative to the variation within it. However, it is not surprising that having a partner from the new dialect region – a factor that arguably encompasses aspects of both exposure and orientation/identity – would favor dialect shift: not only does the expat Canadian presumably receive many consistently realized tokens of relevant vowels from their partner, but the positive attitude they are likely to have towards their partner (and the associated high motivation to seek approval and/or solidarity) will favor accommodation in the short term, and dialect shift in the long term. These findings suggest that long term, consistent input from a regular and important interlocutor may facilitate the acquisition of new contrasts in a second dialect. Future research adding more speakers to the dataset will enable us to determine whether trends in the data which did not reach significance in the current models reflect reality (for example, the apparent interaction between partner and gender, where it seems to be women with local partners who are driving the partner effect on Pillai scores).

The findings presented here are consistent with elaborated theories of phonological representation such as Exemplar Theory [17], in which listener-speakers dynamically update phonetically detailed, existing lexical representations with new dialect input. In these cases, as individual items belonging to the COT and CAUGHT word classes gradually shift their representations as a result of contact with NYC English, a more general phonetic difference between word classes emerges. Importantly, this seems to occur without the creation of new abstract categories, as speakers are themselves unaware of the contrast, and judge relevant minimal pairs to sound the same (see [14]). An interesting question for future research is whether such 'distinctions-without-a-contrast' are common in contact situations, whether the new variety is a D2 or an L2.

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