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# Contact and coherence: Dialectal leveling and structural convergence in NYC Spanish

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## Abstract

The sustained and intense interaction of massive groups of English and Spanish speakers in the U.S. has the potential to deepen our understanding of continuity and innovation in linguistic systems under heavy contact. The current study focuses on Spanish as it is spoken in the largest urban center of the United States: New York City. It examines a range of variable phenomena in the most extensive collection of Spanish in New York to date: the *Otheguy Zentella Corpus of Spanish in NYC (OZC)*. The data represent original research by the first author as well as the efforts of several other scholars who have examined aspects of the OZC in detail. When synthesized, results reveal two broad patterns in the Spanish of long-time NYC residents: diminished regional differentiation and structural convergence with English. These trends emerge across numerous levels of linguistic structure, manifesting in patterns of syntactic, morphological, and phonological variation.

The coherence of these phenomena is consistent with the view that contact-induced change is tightly constrained, both socially and structurally, and that it is unlikely to manifest as haphazard bricolage. This is because, while the intensity of linguistic innovations and the time required for their onset and implementation may vary from feature to feature, such changes derive ultimately from a single source; namely, the set of linguistic and social factors that characterize the contact situation. As such, we can expect contact-induced changes to be restricted and of a kind, imbued with the character of the whole to which they belong.

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## 1. Introduction

The current study examines patterns of apparent time language change in several features of Spanish as it is spoken in New York City (NYC). Data come from the largest existing corpus of spoken Spanish in NYC, the *Otheguy Zentella Corpus of Spanish in New York City* (henceforth OZC). Collected between 2000 and 2004, the OZC consists of 140 sociolinguistic interviews with speakers whose origins are in one of six Latin American countries. In addition to variability in regional and national origin, speakers in the corpus vary across a range of other parameters, including age, sex, and socioeconomic status, as well as age of arrival to and time spent living in NYC. The OZC was originally created for a study of the variable use of subject pronouns, results of which are reported in [Otheguy and Zentella \(2012\)](#). It has since been used to investigate a variety of other features, several of which are discussed here.

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The current paper takes as its starting point the widest generalization to emerge from the study of pronouns in the OZC: while in most respects Spanish in NYC bears a strong resemblance to that of Latin America, there is evidence of developing discontinuity, such that Spanish speakers born and raised in NYC use subject pronouns differently than their recently arrived Latin American counterparts (Otheguy and Zentella, 2012:216–18). Native New Yorkers and the recently arrived differ not only with respect to their overall rates of pronoun use, but also in terms of their sensitivity to a range of linguistic factors that guide pronominal behavior.

The central claim of the present paper is that the trends studied in Otheguy and Zentella (2012) are not particular to subject pronouns. Instead shifts in pronoun use are a specific case of a more general pattern. A series of recent studies leaves little doubt that intergenerational differences are abundant in the OZC data: Bookhammer (2013) illustrates generational reduction in the use of Spanish subjunctive verbal morphology; both Raña Risso (2013) and Barrera-Tobón (2013) highlight reductions in word order variability in the Spanish of the second generation; and Erker (2012) observes significantly attenuated regional differentiation in the variable production of coda /s/. We propose that these results are connected by two forces shaping Spanish in NYC as a whole, namely dialectal leveling and linguistic convergence. Furthermore, we suggest that the influence of these two forces is modulated by principles of cognitive economy as well as variation in the relative social salience of different linguistic features: Spanish variable features that are low in social salience are more likely to undergo structural convergence with English, potentially reducing bilinguals' cognitive load at little social cost. Features that are higher in social salience are less predictable intergenerationally, as their social signaling potential may require renegotiation in the contact environment.

### 1.1. The terms leveling and convergence

In this paper, *dialectal leveling* is understood as the intergenerational reduction of regionally differentiated linguistic behavior, and *linguistic convergence* refers to 'the enhancement of inherent structural similarities found between two linguistic systems' (Bullock and Toribio, 2004:91). Latinos in NYC have experience with a wide range of linguistic behaviors and settings. These include: (1) the use of Spanish by Latinos whose origins are in some cases different and in other cases similar to their own, (2) the use of English by the general populace of NYC, and (3) the use of English in their own bilingual speech and that of their own bilingual communities in NYC. The pressures that thus lead to leveling and convergence have the potential to interact, to either amplifying or diminishing effect. Still, it is helpful for the sake of rhetorical clarity to distinguish between these pressures. In the discussion below, *dialectal leveling* and *dialectal contact* will be used in reference to changes taking place in the Spanish of Latinos in New York due to the influence of other Latinos' Spanish, while *linguistic convergence* and *linguistic contact* will be reserved for changes due to the influence of their own and other people's English.

### 1.2. Spanish in New York City

According to the American Community Survey (US Census Bureau, 2010), the 1.9 million speakers of Spanish in NYC are more than double the number of speakers of the next four largest NYC languages other than English combined (Chinese, Haitian, Italian, and Russian). Certainly, the massive numbers of Spanish speakers in NYC is related to the fact that NYC has had a large Hispanic population for over a hundred years (Remeseira, 2010). Relevant to our work here is the fact that this population has undergone two important changes in recent decades, namely notable growth in size and remarkable increase in regional diversity. Details are in Tables 1a and 1b.

Table 1a  
NYC population by mutually exclusive race and Hispanic origin.

Total population of New York City	1990		2000		2010	
	N	%	N	%	N	%
	7,322,564	100	8,008,278	100	8,175,133	100
White non-Hispanic	3,163,125	43.2	2,801,267	35	2,722,904	33.3
African American	1,847,049	25.2	1,962,154	24.5	1,861,295	22.8
Asian/Pacific Islander	489,851	6.7	783,058	9.8	1,030,914	12.6
American Indian	17,871	.2	17,321	.2	17,427	.2
Some other race	21,157	.3	58,775	.7	57,841	.7
Two or more races	No data	–	225,149	2.8	148,676	1.8
Hispanic origin	1,783,511	24.4	2,160,554	27	2,336,076	28.6

Table 1b  
NYC population increase by decade, total and Hispanic origin.

Total population of NYC	Increase 1990–2000		Increase 2000–2010	
	<i>N</i>	%	<i>N</i>	%
	685,714	9.4	166,855 <sup>a</sup>	2.1
Hispanic origin	377,043	21.1	177,522	8.1

<sup>a</sup> This figure is smaller than the increase in the Hispanic population due to a decrease in the number of Whites and African Americans in NYC from 2000 to 2010.

Table 2  
Six national Hispanic groups in New York City, 2010.

Region	Country	<i>N</i>
Caribbean	Puerto Rico	723,621
	Dominican Republic	576,701
	Cuba	40,840
Latin American Mainland	Mexico	319,263
	Ecuador	167,209
	Colombia	94,723
Six-country total		1,922,357

The tables show that as of 2010, over one in four New Yorkers was of Hispanic origin. In addition, these figures illustrate that since 1990, the growth of NYC's Hispanic population has outpaced that of the city's total population.

A second noteworthy demographic trend is that while NYC's Hispanic population has historically consisted of a large Caribbean majority, recent decades have witnessed substantial immigration from other regions of Latin America (Bergad, 2009). As of 2010, 82% of all Hispanic New Yorkers had origins in one of six countries: three located in the Caribbean (Cuba, Dominican Republic, Puerto Rico) and three in mainland Latin America (Colombia, Ecuador, Mexico) (Table 2).

Assuming that the Hispanic population of NYC represents the bulk of its Spanish speakers, the demographic figures presented above make plain the following: Spanish is spoken in NYC by a continuously growing group of people who increasingly represent a greater range of Latin American locales. The increasing size and regional diversity of this group, alongside its location in the largest urban center in the U.S., presents linguists with a range of questions. Chief among them are those related to the possibility of language change prompted by dialectal and linguistic contact.

### 1.3. Organization of the paper

We address the issue of contact-induced change here by first using the OZC for a combined study of the variable realization of coda /s/ and the variable use of subject pronouns (Sections 2 and 3), moving on then to a comparison of these results with other OZC-based studies of subjunctive mood and word-order. The combined study of pronouns and coda /s/ is in Sections 4–4.3. Section 5 surveys cases of intergenerational innovation in other features. Discussion and concluding sections follow.

## 2. Speaker sample for the study of /s/ and pronouns

Because our study includes a phonetic phenomenon along with a morphological one, we have based our investigation on the 20 recordings in the OZC that contain the best interviews in terms of acoustic properties. Our 20 informants are divided into two regional groups; 10 of them are from the Caribbean and 10 from the Latin American Mainland, with equal numbers of men and women in each regional group. Included in the Caribbean group are one Cuban, four Dominicans, and five Puerto Ricans. The Mainland<sup>1</sup> group includes one Colombian, four Ecuadorians, and five Mexicans. The justification for our partition of the corpus into groups of Caribbeans and Mainlanders is that, with respect to the two

<sup>1</sup> While the OZC includes a number of speakers from the coastal regions of Mexico, Colombia, and Ecuador – whose speakers are known to produce /s/ similarly to speakers in the Caribbean – all *Mainland* speakers in the current study originate from the interiors of these countries.

Table 3  
Exposure groups in the current study.

	Average age of arrival	Average years in NYC	N	Region
Newcomers	26	3	5	Caribbean
			4	Mainland
Longtime residents	12	22	5	Caribbean
			6	Mainland

features under study, speakers of Spanish from these two regions have been established as two distinct groups not only in the dialectological literature but also in our own variationist analyses. That is, among newcomers to NYC (and we assume among speakers in the home countries as well), Caribbeans and Mainlanders have been identified as using pronouns differently and also as showing different treatments of coda /s/ (Erker, 2012). It is this difference between Caribbeans and Mainlanders that we use as the baseline for our analysis of dialectal leveling and linguistic convergence. While differences in social factors such as sex and socioeconomic class are relevant to variation within these regions, such factors cannot be considered here due to space limitations.

The 20 informants of the study are divided into *newcomers* and *long-time residents*. We have nine newcomers and 11 long-time residents. Newcomers arrived in New York after their 17th birthday and had spent less than five years in the city at the time of their interview. The average newcomer in this study arrived at age 26 and had spent less than 3 years in NYC before being interviewed. Long-time residents came to the city before their 17th birthday and had spent more than five years in NYC at the time of the interview. The average longtime resident in the current study arrived in NYC at age 12 and has spent 22 years living in the city. These data, along with the regional distribution within each exposure group, are summarized in Table 3 below.

### 3. Variable use of subject personal pronouns

The following sections present a study of coda /s/ variability in NYC, preceded by a brief analysis of the variable use of subject personal pronouns. Since our purpose is to show the parallel between patterns of change in morphosyntactic and phonological features in Spanish in NYC, we include here an analysis of the variable use of subject personal pronouns in the same 20 OZC interviews that we use below for a coda /s/ study. Pronoun data were taken directly from the larger study of Otheguy and Zentella (2012), which provides extensive review of previous literature as well as detailed description of the data collection protocol. As in the larger pronoun study, we use the term *pronoun rate* to refer to the proportion of all finite verbs within the envelope of variation that are found with a subject pronoun.

In terms of pronoun rates, a significant regional difference is observed among newcomers: Caribbean newcomers have significantly higher rates of pronoun use ( $M = 37\%$ ) than Mainland newcomers ( $M = 18\%$ ),  $t = 3.82$ ,  $p < .007$ . Among longtime residents, Caribbean speakers continue to have higher rates of pronoun use ( $M = 33\%$ ) than Mainland speakers ( $M = 24\%$ ). However, this difference is no longer significant,  $t = 1.3$ ,  $p < .227$ . While a statistically significant interaction between exposure and region fails to emerge, results nonetheless reflect an intergenerational attenuation in regional differences.

These results, illustrated in Fig. 1 below, provide the first element of comparison necessary to address our research question of whether morphosyntactic, morphological, and phonological elements show parallel patterns of generational discontinuity. Whatever the cause of the difference in pronominal behavior between newcomers and longtime residents in the current study – language contact, dialectal contact, or some combination of the two – the difference exists. Moreover, it straightforwardly illustrates, among longtime residents, diminished differences between speakers of Caribbean and Mainland origin. Put another way, one might say that the predictive power of a particular social factor has been reduced: *Region of origin* significantly predicts patterns of pronoun use among newcomers, but does not for longtime residents of NYC. As will be shown below, the same pattern emerges for coda /s/.

### 4. Variable realization of coda /s/

The variable phonetic implementation of coda /s/ has interested scholars of Spanish for hundreds of years (Lapesa, 1980), and has received increasing attention in the last several decades (Hochberg, 1986; Penny, 2004; Erker, 2010, *inter alia*). In these and other studies, coda /s/ regularly demonstrates patterns of variation that are structured and constrained by linguistic and social factors.

In the research on coda /s/ there are at least two distinct, yet complementary descriptive methodologies. Many studies describe variability in the production of syllable-final /s/ in terms of perceptually coded segmental variants: /s/ is produced

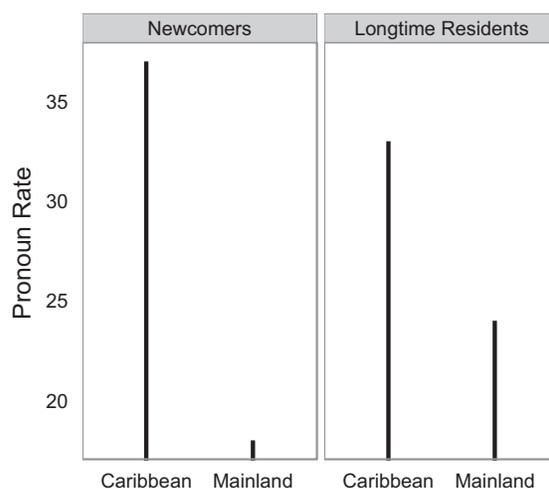


Fig. 1. Pronoun rates by region and exposure group.

as either [s] or [h], or it is *deleted*. That is, the /s/ of *mismo* ‘same’, for example, is articulated as a voiceless alveolar or glottal fricative, or it is not produced at all. A more recent trend in the literature is to consider variation in coda /s/ along a spectrotemporal continuum (Minnick Fox, 2006; Erker, 2010; File-Muriel and Brown, 2012). From this perspective, the /s/ of *mismo* is either deleted, or it is produced as a fricative characterized by two continuously variable parameters, duration and spectral center of gravity, each of which is calculated instrumentally in such studies (this methodology is detailed in Section 4.1). While these two approaches – the *perceptual/segmental* and *instrumental/acoustic* – do not tell identical stories about coda /s/ (Erker, 2012), they do tend to be similar.

When research on coda /s/ is viewed through the general lens of *phonetic reduction* – defined as the systematic minimization of time and effort invested in the articulation of any part of a given utterance relative to its lexically specified form (Barry and Andreeva, 2001:51) – a unified picture comes into focus. When one considers as *reduced* all deleted tokens, as well as all [h] tokens in segmental analyses, and all relatively short and spectrally diminished tokens in acoustic analyses, and when one considers linguistic factors related to this reduction, then three generalizations emerge: reduction is conditioned by features of the phonetic context in which /s/ occurs, by speech rate and prosodic factors, and by lexical frequency and morphemic considerations.

Regarding phonetic context, /s/ is more likely to be reduced when it precedes another consonant, either within the same word, i.e. *mismo* ‘same’, or across word boundaries, *tienes que...* ‘you have to...’ than when it is followed by a vowel or pause (Ma and Herasimchuk, 1975; File-Muriel, 2007, *i.a.*). Fast speech and high lexical frequency also tend to favor reduction (File-Muriel, 2009). So does the occurrence of /s/ in unstressed syllables as well as its presence in the middle, rather than near the boundary of a prosodic phrase (Poplack, 1981; Brown and Cacoulios, 2003). While there is ongoing debate regarding the effect of morphological factors, a small majority of research supports that notion that /s/ is more likely to be reduced when it does not play a morphemic role (Hochberg, 1986; Erker, 2010). That is, /s/ is more likely to be reduced in *entonces*, where it is part of a monomorpheme, than in *casas* or *tienes*, where /s/ itself is a nominal number marker or a verbal person/number marker, respectively.

Though reduction of coda /s/ is widespread throughout the Spanish-speaking world (Lipski, 1994), it tends to be viewed, generally speaking, as non-normative speech behavior (with deletion likely to be the most stigmatized of variants). Reduction of /s/ is not only the frequent target of explicit prescriptive instruction in Spanish-language educational settings, its use also has clear folk-linguistic associations in the broader Spanish speaking world: The humorous phrase *hablar fisno* ‘speaking finely or elegantly’ gently mocks hyper-correction in /s/ production with a superfluous /s/ inserted into the word ‘fino’. This and other phrases, such as the prohibition against *comerse las eses* ‘swallowing one’s S’s’ illustrate the high social salience of this feature, as does the sociolinguistic literature on the topic, which routinely shows /s/ variation to be strongly affected by social factors. These include speaker sex, age, and socioeconomic background, as well as discourse style. In general, /s/ is more likely to be reduced by men than women (Fontanella de Weinberg, 1974; Cepeda, 1995, *i.a.*), by younger rather than older speakers (Poplack, 1979; Guillén Sutil, 1992), and by working class speakers (Alba, 1990; Cepeda, 1995). Furthermore, informal speech is characterized by higher rates of reduction than formal speech (Alba, 2004; File-Muriel, 2009).

The present analysis focuses on the relationship between patterns of /s/ variation and a single extralinguistic factor, namely, region of origin. This factor is the obvious entry point into an intergenerational comparison. Extending across

studies of coda /s/ is the generalization that, for the countries of origin studied here, rates of /s/ reduction are higher in coastal and Caribbean communities than in those located in the interior regions of the mainland (Lipski, 1994, *i.a.*). On its own, this distinction presents a straightforward research question regarding shifting behavior among Spanish speakers in New York: Do the regional differences in /s/ production that have been observed in Latin America persist in the speech of longtime residents of NYC?

#### 4.1. Acoustic data collection

For our study of coda /s/, data was collected from each speaker at two different points. The first point was ten minutes into the interview and the second was at twenty minutes in. The first 100 tokens of coda /s/ that occurred after each of those points were identified, producing a total data set of 4000 tokens (200 for each speaker). All tokens were then subjected to acoustic analysis in *Praat*.

The presence of fricative moments was established on the basis of characteristic cues in spectrographic and waveform representations of speech. These include random noise located in the upper limits of the spectrogram and aperiodic waveforms in the mid-high frequency range (Ladefoged, 2003). Cases in which evidence of frication was absent from the speech stream were coded as *frication absent*, i.e. deletion. All cases illustrating acoustic moments typical of frication were coded as *frication present*. In addition, all fricative moments were measured in terms of their duration in milliseconds and their mean center of gravity in Hertz. This process is illustrated in Fig. 2 below, which shows a spectrogram for the utterance *tres hermanos* ‘three siblings’.

In the first row below the spectrogram, *tres* and *hermanos* have each been segmented in a *Praat textgrid*. Below this row, two intervals of frication have been bounded off and labeled *fricative*. Acoustic differences between these two fricatives are clearly visible. First, the interval of frication on the left, under *tres*, is much shorter than that on the right, at the end of *hermanos*. Additionally, an examination of the spectrogram within each interval shows that the fricative noise present at the end of *tres* is distributed throughout the frequency spectrum, i.e. the cloudy gray impressions dispersed across this interval of the spectrogram indicate the presence of sonic energy at both the lower and higher frequencies. This contrasts with the turbulent noise at the end of *hermanos*, which, as indicated by the dark band running across the upper half of the spectrogram, is concentrated almost exclusively in the higher frequencies.

The temporal difference between these two fricative intervals can be captured by reporting duration in milliseconds (ms). The spectral differences between these tokens, and in particular the distribution and amplitude of turbulent noise, can be characterized with the parameter *center of gravity* (COG). COG is a weighted average calculated with the equation  $COG = \frac{\sum fI}{\sum I}$  where  $I$  is the amplitude in decibels and  $f$  the frequency in Hertz of the spectral components. In the current study, COG was measured three times for each fricative: at the one-quarter, one-half, and three-quarters points of each interval. These three values were averaged, giving a mean COG for the token. Using these two measures, the two fricatives shown in Fig. 2 above have, respectively, durations of 104 and 206 ms and a mean COG of 2098 and 4821 Hz.

#### 4.2. Deletion rates across exposure groups

Spectrographic and waveform evidence indicate the presence of speech-generated frication in 2912 tokens, or 72.8% of the data, making the *deletion rate* of the entire sample 27.2%. Among non-deleted tokens, mean frication duration and COG is 83 ms and 2410 Hz, respectively. Recall that a common theme in the literature is that rates of /s/ deletion are typically higher in the Caribbean than in Mainland Latin America. This is true of the current study’s speakers as well, for both newcomers and longtime residents. However, the intensity of the regional difference is considerably diminished in latter group. Consider Fig. 3.

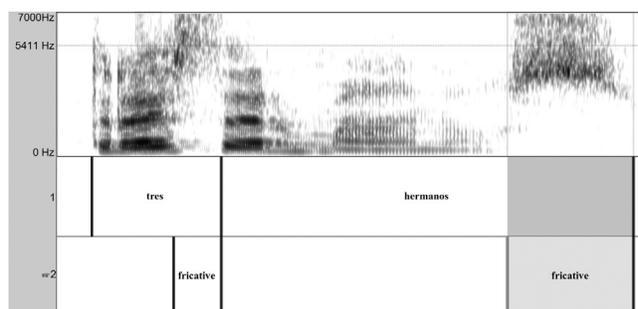


Fig. 2. Spectrogram for *tres hermanos*.

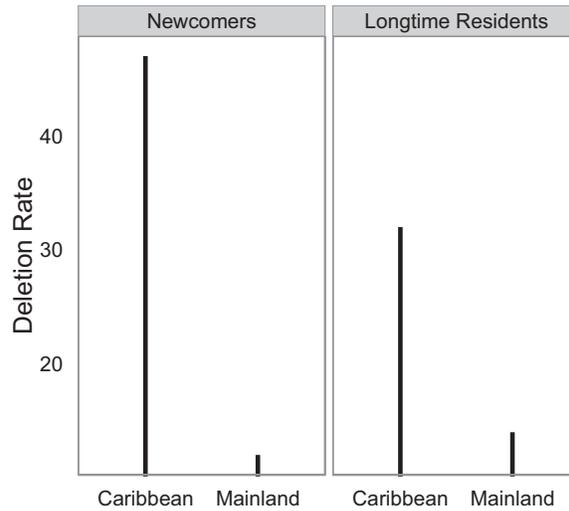


Fig. 3. Deletion rates by region and exposure group.

On average, Caribbean newcomers delete /s/ nearly four times more often than Mainlanders: 47% of the time (470 of 1000 of cases) compared to 12% (96/800) (recall that Mainlanders were not equally distributed across exposure groups, e.g. 4 are newcomers and 6 are longtime residents, thus the difference in total number of tokens). This robust difference is statistically significant:  $t = 10.7$ ,  $p < .001$ . While a sizable regional difference in mean deletion rate persists among longtime residents – 32% (320/1000) deletion among Caribbean speakers compared to 14% (168/1200) for Mainlanders – this difference is no longer significant:  $t = 1.64$ ,  $p < .14$ . The non-significant result is due, in great measure, to considerably greater within-group variation among longtime residents. That is, among newcomers, most Caribbean speakers have similarly high deletion rates while most Mainlanders demonstrate deletion rates that are comparably low. This is substantially less true for longtime residents, whose deletion rates vary widely within regional groups. This dispersal of deletion rates is well captured by the standard deviation associated with the mean for each exposure group (Table 4).

#### 4.3. Acoustic parameters: duration and COG across exposure groups

A similar pattern of attenuation in the predictive power of regional origin emerges for the study's acoustic parameters.

In the figure, duration is plotted on the x-axis and COG on the y-axis. Each dot in the plot represents one of the study's twenty speakers. Speaker region of origin is indicated by color, and each exposure group is presented separately. Each dot represents the mean duration and COG of coda /s/, as produced by the individual speakers in the study. Deleted tokens were included in the calculation of mean duration such that each was assigned a duration of 0 ms. Given that calculating COG depends on the presence of frication, mean COG of /s/ for each speaker was calculated on the basis of non-deleted tokens only.

In the figure, regional differentiation is clear among newcomers such that Caribbean speakers are clustered toward the lower left corner of the plot, indicating that for them /s/ is typically shorter in duration and lower in COG than it is in the speech of Mainland newcomers, who mostly populate the right side of the plot. By comparison, longtime residents demonstrate considerable overlap in their production of /s/. Statistical analysis confirms what the visual data suggest: When compared simultaneously in terms of duration and COG through multiple analysis of variance (MANOVA), a significant regional difference emerges among newcomers,  $F = 40.79$ ,  $p < .001$ . However, region of origin fails to

Table 4  
Mean deletion rates and standard deviation across exposure groups.

Region	Newcomers		Longtime residents	
	Mean	SD	Mean	SD
Caribbean	47	4.8	32	19.2
Mainland	12	3.7	14	17.2

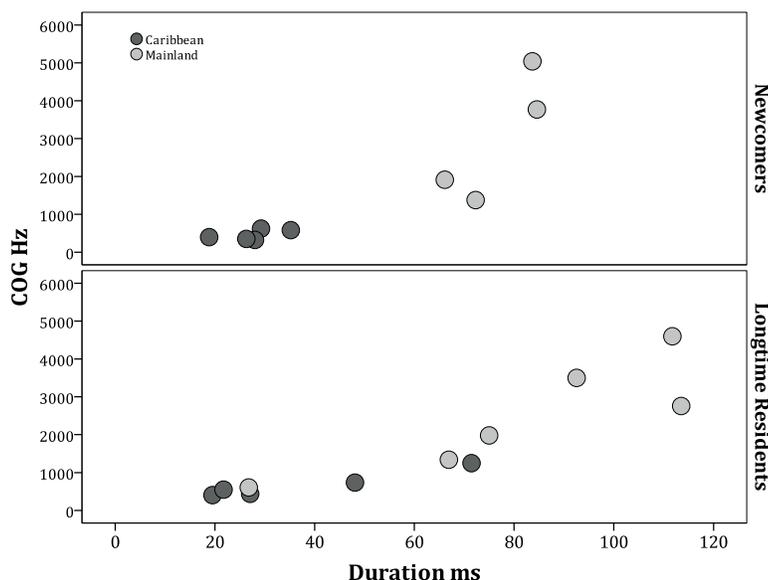


Fig. 4. Mean duration and COG of /s/ by speaker, region, and exposure group.

significantly predict differences in the speech of longtime residents,  $F = 2.94$ ,  $p < .11$ . Taken together, the results for deletion and the spectrotemporal properties of /s/ reveal an intergenerational pattern of attenuation in regionally distinctive behavior.

#### 4.4. Coda /s/ and subject pronouns in MANOVA

It is possible to add another dimension to the MANOVA analysis discussed above by including the pronoun rates of participants. Consider Fig. 5, which, like Fig. 4 contains twenty data points, each of which represent a single participant in the study. Again region of origin is indicated by color, and duration is plotted on the x-axis while COG is plotted on the y-axis. The pronoun rate of each speaker, plotted on a third axis, is also included in the figure. The pattern that emerges is as follows: Among newcomers, speakers of Caribbean origin tend to have higher rates of pronoun use *and* tend to produce /s/ with a shorter duration and lower COG than do Mainlanders. Among longtime residents, this pattern becomes less sharply defined.

Quantitatively speaking, the MANOVA represents a significance test of the effect of *region of origin* when participants are compared simultaneously along on all three dependent variables. Unsurprisingly, there is a significant main effect for region among the newcomers, who, in the left frame of Fig. 5 are grouped in two, non-overlapping clusters:  $F = 27.93$ ,  $p < .002$ . Among longtime residents, we still observe a grouping along regional lines. That is, in general, Mainlanders and Caribbean speakers tend to cluster together. However, region of origin fails to significantly differentiate the behavior of this group:  $F = 2.7$ ,  $p < .13$ . This is consistent with the looser regional clustering observed here, e.g. there are some Mainlanders with relatively high rates of pronoun use, shorter /s/ duration, and lower /s/ COG, there are also some Caribbean longtime residents with relatively lower rates of pronoun use as well as longer duration and higher COG for /s/.

#### 4.5. Linguistic constraints on /s/ deletion

We now shift from rates to an analysis of conditioning factors. The suggestion has been advanced by Otheguy and Zentella (2012) that shifts in pronoun rates across exposure groups are due in part to reconfiguration of conditioning factors constraining pronoun use. While a full accounting of the linguistic and social factors that constrain /s/ variation in these data is beyond the scope of the current paper, a brief inspection of linguistic factors that condition deletion (setting aside variation in duration and COG) similarly reveals a pattern of cross-group reconfiguration. Results also show reduced sensitivity among longtime residents to the influence of a number of constraining factors that robustly affect the behavior of newcomers.

When the sample is considered as a whole, seven linguistic factors emerge as significant predictors of /s/ deletion in logistic regression analysis. In decreasing order of strength, they are as follows:

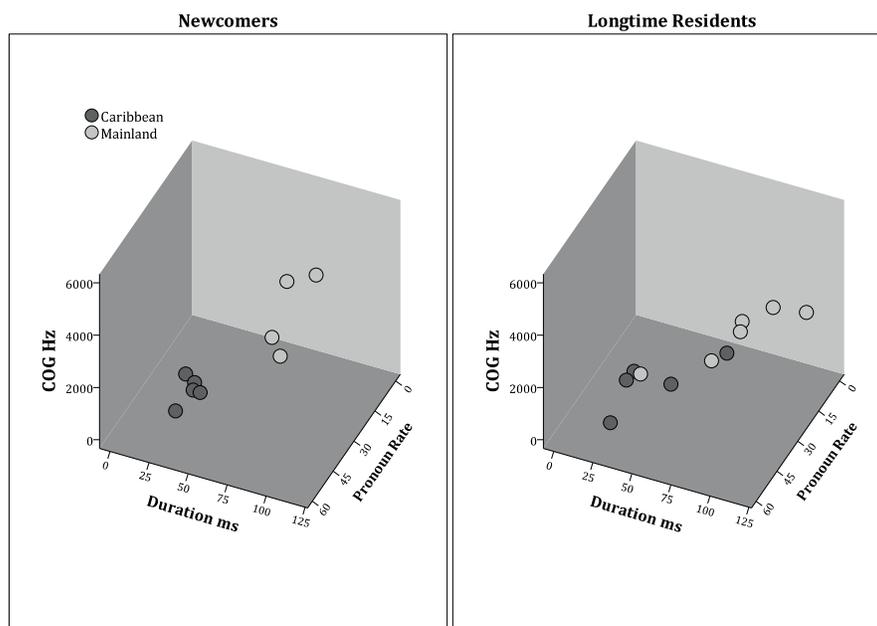


Fig. 5. Mean duration and COG of /s/ by speaker, region, and exposure group.

- Lexical frequency of the host word
- Speech rate in the host word in milliseconds per syllable
- Morphemic status of /s/
- Stress (whether the /s/ occurs in stress-bearing syllable)
- Following segment (by natural class, e.g. stops, fricatives, nasals, etc.)
- F2 of the preceding vowel (in Hz measured at vocalic midpoint)
- F1 of the preceding vowel (in Hz measured at vocalic midpoint)

When speakers are grouped according to region and exposure group, and when an identical set of potentially significant linguistic constraints is included in each analysis, numerous differences emerge. Table 5 lists in descending order of strength the set of factors that significantly condition /s/ deletion in each of the four subgroups.

While no two groups share the same constraint hierarchy, regional differences among the newcomers are largely restricted to the relative strength of constraints. Only one factor, F2 of the preceding vowel, fails to appear in both newcomer hierarchies. With respect to order, newcomers differ most obviously in regards to the strength of lexical frequency and following segment. The former is the strongest constraint on deletion for Caribbean newcomers while the latter is the highest ranked constraint for Mainland newcomers. The two groups have identical rankings for speech rate and morphemic status, which are ranked 2nd and 3rd, respectively, and they have similar rankings for stress. In other words, the same constraints (with one exception) guide the production of /s/ for these two groups. These shared constraints, however, differ in how sensitively they are attended to.

The picture that emerges for the longtime residents is more complex, though several findings are consistent with trends of reconfiguration and diminished sensitivity. Some factors cease to significantly condition /s/ deletion among the longtime residents entirely: Both lexical frequency and stress have disappeared from the hierarchies. Caribbean longtime residents, who appear particularly different from their newcomer counterparts, have also lost the guiding force of following segment. Additionally, they demonstrate sensitivity to the F1 of preceding vowels, a factor whose influence is unique to that subgroup. While the Mainland exposure groups are comparatively more alike, longtime residents do demonstrate sensitivity to the F2 of preceding vowel, a factor that both Caribbean groups have in common but which Mainland newcomers lack.

Overall, the shifts observed here amount to a reduction in the power of these factors to account for the behavior of both groups of longtime residents. This point is made quantitatively by the respective  $R^2$  coefficients associated with each constraint hierarchy. This coefficient reflects the amount of variance in the model that is accounted for by the independent variables. It is derived from  $R$ , which here reflects the strength of the linear relationship between the linguistic factors and

Table 5  
Linguistic conditioning factors on deletion by region and generation.

Caribbean	Mainland
<i>Newcomers</i>	
1. Lexical frequency**	1. Following segment**
2. Speech rate**	2. Speech rate**
3. Morphemic status**	3. Morphemic status**
4. Stress**	4. Lexical frequency*
5. Following segment*	5. Stress*
6. F2 preceding vowel*	
<i>N</i> (1200) $R^2 = .18$	<i>N</i> (800) $R^2 = .36$
<i>Longtime residents</i>	
1. Morphemic status**	1. Following segment**
2. F1 preceding vowel**	2. Speech rate**
3. Speech rate**	3. F2 preceding vowel**
4. F2 preceding vowel*	4. Morphemic status*
<i>N</i> (800) $R^2 = .11$	<i>N</i> (800) $R^2 = .22$

\*  $p < .05$ .

\*\*  $p < .01$ .

/s/ deletion in the data for each of the four subgroups examined above. A larger  $R^2$  indicates a stronger relationship between the dependent and independent variables. While none of the  $R^2$  coefficients in these analyses is particularly high, they decrease as exposure to NYC increases. In sum, linguistic factors guiding the newcomers' production of /s/ have become reconfigured and diminished in predictive power among longtime residents.

## 5. Evidence of dialectal leveling and linguistic convergence in other features

Several recent analyses of the OZC complement and enrich the dimensionality of the picture presented above (Bookhammer, 2013; Raña Riso, 2013; Barrera-Tobón, 2013). Because they represent independent research projects (each is a Ph.D. dissertation) with their own methods and data samples, it is not possible to directly examine simultaneously the phenomena they cover in a single set of speakers, as was done with coda /s/ and pronouns above. Nonetheless, in many cases the speakers under analysis are indeed the same across the studies, and when they are not, results remain unified by the basic framework of the analyses – each is built upon a comparison of speakers who have been drawn from the same corpus and who vary in terms of their degree of exposure to the NYC linguistic environment.

### 5.1. Subjunctive verbal morphology

In non-contact varieties of Spanish, subjunctive mood has explicit and systematic morphological expression that formally contrasts it with the indicative, e.g. *Mario viene mañana* 'Mario comes tomorrow' vs. *Espero que Mario venga mañana* 'I hope that Mario comes tomorrow'. Bookhammer (2013) examines the use of the subjunctive in the speech of 52 individuals in the OZC. He divides his informants into two groups, using criteria that are parallel, but not identical to, the ones used above. Half of his speakers are called newcomers, though Bookhammer's definition of a newcomer is slightly different from ours; his newcomers arrived after age 18 and had spent less than six years in NYC at the time of the interview. The other half of Bookhammer's speakers is called *New York raised* (NYR); they were born in NYC or had arrived before their third birthdays.

Bookhammer finds significant differences between the newcomers and the NYR such that, in similar linguistic contexts, the latter produce significantly fewer subjunctives and more indicatives than the former (Tables 6 and 7).

On the basis of these results, Bookhammer argues that while speakers raised in New York do maintain general command and productive use of Spanish mood morphology, their behavior reveals a pattern of morphological simplification, one that is driven by an expansion of the range of contexts in which indicative morphology is used.

### 5.2. Word order flexibility

Subjects of Spanish occur both pre- and post-verbally, e.g. *Llega Juan*, *Juan llega* both 'Juan arrived'. Rocio Raña's dissertation focuses on rates of post-posed pronominal subjects in the speech of 139 speakers in the OZC. She has the

Table 6  
Use of subjunctive in obligatory contexts.

Generation	<i>N</i> speakers	Rate of subjunctive use
Newcomers	26	98.2
New York raised	26	86

Reproduced from Bookhammer (2013:54).  
 $F = 13.7, p < .001$ .

Table 7  
Use of subjunctive in optional contexts.

Generation	<i>N</i> speakers	Rate of subjunctive use
Newcomers	26	66.3
New York raised	26	46.9

Reproduced from Bookhammer (2013:54).  
 $F = 13.75, p < .001$ .

same New York raised (NYR) group as Bookhammer, and compares these informants to all others in the corpus, whom she calls the *Latin American raised*. In the corpus as a whole, postposed pronominal subjects tend to be very infrequent. That is, the vast majority of pronoun subjects are preposed. Of the 21,193 verbs that occur with a subject pronoun in the OZC, 20,269 (95.5%) appear with a preposed pronoun. Thus the pronominal *post-posing rate* of the corpus as a whole is 4.5%. Still, Raña is able to establish that post-posing rates of speakers raised in New York are significantly lower than those of the rest of the sample (Table 8).

Raña's analysis of the linguistic factors that constrain pronoun placement also reveal differences across exposure groups. For the constraint analyses, Raña divides her speakers into three groups: Immigrant newcomers, established immigrants, and NYR. Two factors significantly constrain pronoun placement among newcomers: (1) the identity of the pronoun, e.g. *ustedes* 'you (plural)' favors post-posing more than any other pronoun, and (2) the declarative/non-declarative status of the phrase in which the verb occurs; postposing is more likely in contexts that are non-declarative, e.g. imperative, interrogative. Among established immigrants, Raña observes both continuity and change: While Identity of the Pronoun remains the most robust predictor of post-posing for this group, the factor Phrase fails to make a significant contribution to the model. A different factor, Clause Type (main vs. subordinate vs. coordinate) has taken its place. When she turns her attention to the NYRs, Raña does not find any significant constraints on postposing behavior. In other words, the NYRs demonstrate a loss of sensitivity to factors that constrain the behavior of their more recently arrived counterparts.

Raña summarizes her results as follows: 'The study demonstrates that linguistic variables constraining pronoun placement in the speech of newcomers begin to change in significance and hierarchy in the first generation with more exposure to the city [here she is referring to established immigrants], and become insignificant for the second generation of speakers [the NYR].' (2013:v)

Carolina Barrera-Tobón also examines constituent order in the OZC, subdividing her informants in essentially the same manner as Bookhammer and Raña. Her analysis focuses on word order in copular constructions, e.g. *Nicolás es feliz* vs. *Feliz es Nicolás*, *Es Nicolás feliz*, and *Es feliz Nicolás*, all 'Nicolas is happy'. Barrera-Tobón divides these orders into two categories, a *canonical* word order (i.e., subject-copula-adjective) and *marked* orders, which include the other three orders exemplified above. Results showed that marked orders are substantially less frequent in the speech of the NYR, whose copular constructions demonstrate a marked order 14% of the time compared to 34% for newcomers.

Table 8  
Post-verbal rate by generation.

Generation	<i>N</i> speakers	Percent pronouns postposed
Latin American raised	114	6
New York raised	25	3

Reproduced from Raña Risso (2013:46).  
 $F = 4.94, p < .02$ .

Table 9  
Linguistic constraints on copular construction word order.

Newcomers	NYR
1. Type of subject NP**	1. Type of subject NP**
2. Pragmatic function**	2. Pragmatic function**
$R^2 = .523$	$R^2 = .166$

Reproduced from Barrera-Tobón (2013).

\*\*  $p < .01$ .

Beyond rates, Barrera-Tobón's analysis, like that of others above, reveals a reduction in the predictive power of a set of conditioning factors. Logistic regression analyses of linguistic factors that constrain word order in copular constructions returned two significant results: Type of Subject NP and Pragmatic function (highlighted adjective vs. subject-topic-contrast vs. contrary-to-expectation). Together, these factors accounted for a remarkable 60% of the variance in the model. When this analysis is run separately for newcomers and NYRs, these two linguistic factors continue to make significant contributions to each model. However, their explanatory power is diminished by a factor of three among the NYR, as indicated by the  $R^2$  coefficients in their respective analyses (Table 9).

## 6. Discussion

In each analysis presented above we find evidence of linguistic differences between two groups of Spanish speakers: those who are relative newcomers to NYC and those who have lived substantial portions of their lives in the city. These differences manifest as both changes in rates of use of particular features as well as changes in the order, significance, and explanatory power of sets of factors that condition them. Table 10 summarizes the results.

The central question of the current paper is this: Do these findings represent a disparate list of independent results, or, are they dots that can be connected to reveal a bigger picture? We argue in favor of the latter scenario, and propose that each result in Table 10 can be interpreted as a linguistic change induced by contact between groups of speakers in NYC. Specifically, each can be understood as the outcome of contact between (1) Spanish speakers and English speakers, referred to here as *linguistic contact*, (2) Spanish speakers of different regional origin, which we have called *dialectal contact*, or (3) some combination of (1) and (2). Together, *linguistic* and *dialectal contact* have induced two trends: *linguistic convergence*, in this case the enhancement of inherent structural similarities between Spanish and English, and *dialectal leveling*, the reduction of regionally differentiated linguistic behavior. Thus, the widest generalization that the results permit is that contact has led to convergence and leveling, such that speakers with more experience in NYC use Spanish in ways that are both more English-like and, from a pan-Hispanic perspective, less regionally distinct.

At the same, the picture of contact-induced change that emerges from these results is asymmetrical. That is, they suggest that in NYC, English has a bigger influence on how Spanish is used than does the interaction of speakers of different Spanishes. Of the five features studied here, four demonstrate patterns consistent with a convergence

Table 10  
Summary of exposure group differences in the OZC.

Feature	Speakers with more exposure to NYC demonstrate:
Pronoun use	<ul style="list-style-type: none"> <li>• Overall increase in rates of use</li> <li>• Reconfiguration of linguistic constraining factors</li> <li>• Diminished regional differentiation in constraining factors</li> </ul>
Coda /s/	<ul style="list-style-type: none"> <li>• Diminished regional differentiation in rates of deletion as well as in continuous acoustic properties</li> <li>• Decreased sensitivity to linguistic constraining factors</li> </ul>
Subjunctive morphology	<ul style="list-style-type: none"> <li>• Decreased rates of use, especially in optional contexts</li> <li>• Expansion of indicative morphology to subjunctive domains</li> </ul>
Pronoun placement	<ul style="list-style-type: none"> <li>• Decreased rates of post-posed subjects</li> <li>• Decreased sensitivity to linguistic conditioning factors</li> </ul>
Word order	<ul style="list-style-type: none"> <li>• Decreased flexibility in copular constructions</li> <li>• Decreased sensitivity to linguistic constraining factors</li> </ul>

interpretation: more pronouns and fewer post-verbal subjects, a stronger preference for SVO word order, and a disinclination to use subjunctive mood morphology. These behaviors align the Spanish of longtime residents more closely with structural properties of English, which is generally characterized by very high rates of subject pronoun use, very low frequency of post-verbal subjects, a preference for SVO word order, and highly restricted subjunctive morphology.

In contrast, only two features clearly demonstrate diminished regional differentiation: pronoun use and coda /s/. In the present study, which examined both of these features in a 20-speaker subset of the OZC, an increase in rates of pronoun use was observed among Mainlander longtime residents alongside a decrease among their Caribbean counterparts. This trend does not generalize to the entire OZC, however, and we highlight as more compelling evidence of leveling the increased similarity between Mainlander and Caribbean pronoun constraint hierarchies that Otheguy and Zentella observed (2012:147). With respect to /s/, the present study revealed diminished regional differences in rates of deletion, in the duration and COG of /s/, and also in constraint hierarchies. While differences did not disappear entirely, the net result of these shifts was that region of origin ceased to statistically differentiate the /s/ production of longtime residents.

What might account for the asymmetry in the changes we observe? That is, why is the evidence for convergence more abundant than that for leveling? We propose that it is largely due to the interaction of three things: the variable nature of the features under investigation, differences in their social salience, and differences in their potential for increasing the cognitive economy of bilinguals. In short, variable features that represent a cross-linguistic difference between Spanish and English and that are also low in social salience are prime targets for convergence. Variables that are high in social salience, and in particular those that feature prominently in ideologies of Spanish language use inherited from non-contact settings, have a different status in the those settings. They are unlikely to undergo convergence, and whether leveling occurs depends on how the social meaning of such features is locally (re)defined.

### 6.1. Variation and social salience

All of the features studied here are variable in nature, but they are not equivalently socially salient. That is, some of these features are more likely to ‘fly under the sociolinguistic radar’ of speakers than others. Lowest in social salience are pronoun use, pronoun placement, and word order flexibility. By saying this, we do not mean to suggest that there is no relationship whatsoever between variation in these features and social factors. Rather, we note that it would be difficult to describe their variants in terms of ‘standard’ and ‘nonstandard’ forms. In addition, their variants – the presence or absence of a pronoun, whether a pronoun occurs after or before a verb, and whether a subject precedes its verb or vice versa – do not obviously vary in terms of either overt or covert linguistic prestige. These observations are consistent with the fact that variation in these features is very unlikely to merit explicit comment among Spanish speakers, much less socially motivated rebuke or praise of any kind. In contrast, coda /s/ is highly socially salient. Indeed, it is the rare speaker who is *not* aware of variation in /s/ production in Spanish (see Section 4).

Assessing the social salience of subjunctive mood morphology is somewhat less straightforward. While the salience of variation in subjunctive mood morphology is probably somewhat higher than that of pronoun use, pronoun placement, and word order, it likely remains relatively low. Recall Bookhammer’s finding that NYRs demonstrate high rates of subjunctive morphology in what he calls ‘obligatory contexts’. In such contexts, they use subjunctive morphology 86% of the time. Where these speakers demonstrate a marked reduction in the use of subjunctive forms is in what Bookhammer defines as ‘optional contexts’. Subjunctive forms occur in 46% of such contexts among NYRs compared to 66% for newcomers. In other words, while the non-use of subjunctive forms in obligatory contexts might be conspicuous to speakers, NYRs rarely fail to produce subjunctive morphology in these contexts. Indeed, the evidence that NYRs have generalized the use of indicative forms at the expense of subjunctive forms is largely restricted to optional contexts, a site of variation that we consider to be substantially less salient.

### 6.2. Cognitive economy and convergence

The different sociolinguistic status of these five variables has implications for how they have been shaped by the contact situation. The clearest pattern emerges for those that are low in social salience: They all converge. Why? Experimental research on the linguistic performance of bilinguals suggests that bilingualism represents something of a ‘cognitive paradox’ (Sorace, 2011). That is, bilingualism appears to confer both cognitive advantages and disadvantages throughout life. Bilinguals are better than monolinguals at suppressing irrelevant information and other executive function tasks, and bilingualism likely serves as a defense against age-related cognitive decline. Yet, monolinguals outperform bilinguals in online linguistic performance in experimentally observable ways: ‘Bilinguals are slower and commit more errors in picture naming even in their dominant language, obtain lower scores on verbal-fluency tasks, experience more tip-of-the-tongue states, and demonstrate more interference in lexical decision

making' (Bialystok and Craik, 2010). The poorer performance of bilinguals on such tasks is frequently attributed to potential incompatibilities that arise between the representational systems of the languages that they know. Sites where these systems make competing demands create conflict that can result in the disruption of linguistic performance. One possible account for the convergence phenomena that we observe in the present study is that modulating the use of these features in the direction of analogous structures in English amounts to, if not a resolution of such conflict, an easing of tensions.

By converging – that is, by using more pronouns, fewer post-verbal subjects, more SVO word order, and less subjunctive morphology – bilinguals are able to generalize patterns across their linguistic systems more broadly. And because these features are also low in social salience, the increase in parity between their linguistic systems is acquired at little to no social cost. From this perspective, language contact may be seen to promote a coherent series of changes mediated by principles of cognitive economy and social salience: linguistic system A is likely to converge with B especially where (1) variation present in A allows it to be retuned so that it is more similar to B, and (2) the features and structures in question are of low social salience.

In addition to accounting for shifts in pronoun use, pronoun placement, word order, and subjunctive morphology, this interpretation also helps explain why we fail to find evidence for convergence in /s/. A convergence hypothesis for /s/ predicts a decrease in /s/ reduction across the board in the NYC environment. That is, for variation in Spanish /s/ production to be reconfigured in the direction of English, in which the production of that speech sound is comparably stable, all longtime residents of NYC should delete it with less frequency and produce it with a longer duration and higher COG. This is not what we observe. Rather, we find a pattern of mutual accommodation such that some Caribbeans have approximated Mainlander norms and vice versa. Similar patterns emerge at the level of constraint hierarchies. One way to interpret these findings is that the high social salience of this feature shields it from the pull of convergence. That is, the potential cognitive benefits of converging on a crosslinguistically similar production of /s/ are trumped by the high social stakes associated with variation in this feature in Spanish.

### 6.3. *Passive and active leveling*

While it is true that all of the low salience features under investigation here reveal patterns of convergence, one of them also permits a leveling interpretation: subject pronoun use. That is, in addition to evidence of convergence with English, the pronoun use of longtime residents also shows reduction in regional differentiation, making it similar to /s/ in this regard. However, the comparatively low salience of pronouns, together with fact that the results for /s/ are resistant to a convergence interpretation, suggests that the leveling observed in these two features has arisen by different mechanisms. Specifically, it invites the speculation that leveling in pronouns arises passively as a byproduct of convergence whereas leveling in /s/ arises actively through the local reconfiguration of the social meaning of patterns of variation.

From this perspective, the same characteristics that make pronoun use a prime target for convergence – the low social value associated with it variability and its potential for straightforward reconfiguration in the direction of English – makes it also a prime target for eventual leveling. As speakers exposed to the NYC environment come to converge on more crosslinguistically generalized patterns of pronominal behavior, they may simultaneously become less attentive to the guiding influence of linguistic factors to which recently arrived monolinguals from Latin America attend and from which regional differences partly emerge. Thus, over time, dialectal differences in such features may gradually, passively fade away.

Diminished regional differentiation in /s/ production is unlikely to have arisen this way. Region of origin ceases to statistically differentiate the behavior of longtime residents in our study because of a trend of mutual accommodation: some Mainlanders have approximated Caribbean norms and vice versa. One way to understand this trend is to consider how the social meanings of patterns of /s/ production may be reconfigured in the NYC environment. Recall, for instance, two generalizations that emerge from the research literature: first, across communities throughout the Spanish-speaking world women tend to demonstrate lower rates of /s/ reduction than men. Second, Caribbean communities tend to show higher rates of reduction than those in the Mainland. Now consider a hypothetical scenario: a female speaker of Caribbean origin may, upon her arrival to NYC, produce patterns of /s/ reduction that are locally not only less overtly prestigious than that of Mainland women with whom she may now come into contact, but that of Mainlander men as well. Especially in light of the high social salience of this feature, it is not difficult to imagine that such a speaker may have a strong motivation to reconfigure her behavior.

Leveling in this feature may then be the net result of numbers of speakers reacting to the NYC environment, adjusting their /s/ production so that it aligns more consistently with local norms of overt and/or covert prestige. In other words, under this scenario leveling emerges not as an epiphenomenon of convergence, but rather as a direct result of dialectal contact.

## 7. Conclusion

This study presented evidence of broad-ranging differences in the variable linguistic behavior of individuals included in the *Otheguy Zentella Corpus of Spanish in New York City*. Established New Yorkers and recent arrivals demonstrate significantly different behavior not only with respect to subject pronoun use, but also in terms of coda /s/, subjunctive verbal morphology, subject pronoun placement, and word order flexibility in copular constructions. Furthermore, these differences are uniform in nature, representing either cases of leveling of regional differences, structural convergence with English, or a combination of both. Together these results reveal patterns of change that are tightly constrained by the forces of language and dialectal contact, the effects of which are mediated by social salience of specific features as well as principles of cognitive economy. To better understand the relationship between convergence, leveling, social salience, and bilingualism in this and other contact situations like it, it will be crucial to examine a broader range of linguistic features than is examined here. Of particular value will be variables that show clear regional differentiation in Latin America, that are high in social salience, and that in principle could be realigned so as to converge toward aspects of English. Finally, it would be ideal to complement the present study and others similar to it with longitudinal data capable of assessing contact induced change across the lifetime of speakers.

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## References

- Alba, O., 1990. *Variación fonética y diversidad social en el español de Santiago*. Pontificia Universidad Católica, Santiago.
- Alba, O., 2004. *Cómo hablamos los dominicanos: Un enfoque sociolingüístico*. Grupo León Jimenes, Santo Domingo.
- Barrera-Tobón, C., 2013. *Contact-induced changes in word order and into nation in the Spanish of New York City bilinguals* (Ph.D. dissertation). The Graduate Center of the City University of New York.
- Barry, W., Andreeva, B., 2001. Cross-linguistic similarities and differences in spontaneous speech patterns. *J. Int. Phon. Assoc.* 31, 51–67.
- Bergad, L.W., 2009. *The Latino Population of New York City*. Center For Lat in American, Caribbean and Latino Studies. Graduate Center City University of New York. <http://web.gc.cuny.edu/lastudies>
- Bialystok, E., Craik, F.I.M., 2010. Cognitive and linguistic processing in the bilingual mind. *Curr. Dir. Psychol. Sci.* 19 (1), 19–23.
- Bookhammer, K., 2013. *The variable grammar of the Spanish subjunctive in second-generation bilinguals in New York City* (Ph.D. dissertation). The Graduate Center of the City University of New York.
- Brown, E.L., Cacoullos, R.T., 2003. ¿Qué le vamos a hacer? Taking the syllable out of Spanish /s/ reduction. *University of Pennsylvania Working Papers in Linguistics (PWPL)* 8.3, pp. 17–31. Papers from NWAV 30.
- Bullock, B.E., Toribio, A.J., 2004. Introduction: convergence as an emergent property of bilingual speech. *Bilingualism: Lang. Cogn.* 7 (2), 91–93.
- Cepeda, G., 1995. Retention and deletion of word-final /s/ in Valdivian Spanish (Chile). *Hisp. Linguist.* 6–7, 329–353.
- Erker, D., 2010. *A subsegmental approach to coda /s/ weakening in Dominican Spanish*. *Int. J. Sociol. Lang.* 20 (3), 9–26.
- Erker, D., 2012. *An acoustically based sociolinguistic analysis of variable coda /s/ production in the Spanish of New York City* (Ph.D. dissertation). New York University.
- File-Muriel, R., 2007. *A study of lenition: the role of lexical frequency and phonetic context in the weakening of lexical /s/ in the Spanish of Barranquilla* (Ph.D. dissertation). Indiana University.
- File-Muriel, R., 2009. The role of lexical frequency in the weakening of syllable final lexical /s/ in the Spanish of Barranquilla, Colombia. *Hispania* 92 (2), 348–360.
- File-Muriel, R., Brown, E., 2012. The Gradient Nature of s-Lenition in Caleño Spanish, vol. 16.2. *University of Pennsylvania Working Papers in Linguistics* pp. 2010.
- Fontanella de Weinberg, M.B., 1974. Aspectos sociolingüísticos del uso de -s en el español bonaerense. *Orbis* 23, 85–98.
- Guillén Sutil, R., 1992. Una cuestión de fonosintaxis: Realización en andaluz de la /s/ final de palabra seguida de vocal. *Anu. Estud. Filol.* 15, 135–153.
- Hochberg, J., 1986. Functional compensation for /s/ deletion in Puerto Rican Spanish. *Language* 62, 609–621.
- Ladefoged, P., 2003. *Phonetic Data Analysis: An Introduction to Fieldwork and Instrumental Techniques*. Blackwell, Malden, MA.
- Lapesa, R., 1980. *Historia de la lengua española*. Gredos, Madrid.
- Lipski, J., 1994. *Latin American Spanish*. Longman Publishers, London.
- Ma, R., Herasimchuk, E., 1975. The linguistic dimensions of a bilingual neighborhood. In: Fishman, J. (Ed.), *Bilingualism in the Barrio*. Indiana University Press, Bloomington, pp. 347–479.
- Minnick Fox, M.A., 2006. *Usage-based effects in Latin American Spanish Syllable-final /s/ Lenition* (Ph.D. dissertation).

- Otheguy, R., Zentella, A.C., 2012. *Spanish in New York: Language Contact, Dialect Leveling and Structural Continuity*. Oxford University Press, Oxford.
- Penny, R., 2004. *Variation and Change in Spanish*. Cambridge University Press, Cambridge.
- Poplack, S., 1979. *Function and process in a variable phonology* (Ph.D. dissertation). University of Pennsylvania.
- Poplack, S., 1981. Mortal phonemes as plural morphemes. In: Sankoff, D., Cedergren, H. (Eds.), *Variation Omnibus*. Linguistic Research, Edmonton, Alberta, pp. 59–71.
- Raña Riso, R., 2013. *A corpus-based sociolinguistic study of subject pronoun placement* (Ph.D. dissertation). The Graduate Center of the City University of New York.
- Remeseira, C., 2010. *Hispanic New York: A Sourcebook*. Columbia University Press.
- Sorace, A., 2011. Is there a bilingual paradox? Cognitive advantages in bilingualism: is there a “bilingual paradox”? In: Valore, P. (Ed.), *Multilingualism. Language, Power, and Knowledge*. Edistudio, Pisa, pp. 335–358.
- US Census Bureau, 2010. American Community Survey. <http://quickfacts.census.gov/qfd/states/36/3651000.html>