Pockets of Change: Salience and Sound Change in Istanbul Greek

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Abstract

Istanbul Greek (IG) is an endangered Greek dialect historically in contact with Turkish, French, and other languages. While differences from Standard Modern Greek (SMG) occur at all structural levels of IG, speakers recognize lateral velarization as a defining characteristic of IG not present in SMG. A less salient difference between IG and SMG is the production of the affricate /ts/ as [ʧ] in IG. This study uses SMG speakers as a control group in comparing these dialectal features in two different IG communities: those remaining in Istanbul (IGs) and those who have moved to Athens (Gen1s). As high degrees of salience have led velarized laterals to index IG identity, IGs maintain this feature more than Gen1s who have shifted from this stigmatized production. While SMG does not participate in lateral velarization, this study shows some SMG speakers do produce [ʧ] before [u] and [o]. Subsequently, Gen1s have not shifted to [ts] as they have with laterals, due to the affricate being less divergent from SMG than the lateral. IGs, meanwhile, have not maintained [ʧ] as they have velarized laterals, as this lesser degree of salience has prevented the feature from becoming an index of IG identity. These results show that the salience of a dialectal phonetic feature relates to how it will be maintained in contact situations.

Keywords: dialect contact, Istanbul Greek, salience, variationist linguistics

1.   Introduction

Traditional variationist studies (e.g., Labov, 1972; Park, 2012) aim to locate the directionality and motivations of a changing feature. Research in dialect contact, such as that of Trudgill (1986), suggests that speakers of stigmatized varieties tend to shift their production of salient features to the unmarked forms found in the standard variety. This paper compares two phonetic features of the Istanbul Greek (IG) dialect in two different IG communities, examining the role of salience as a motivation for shift and maintenance in dialect contact.

2.　　 Greek in Istanbul

The IGs are an indigenous minority that in the early 20th century numbered around 300,000 individuals (then 35% of Istanbul's population). With currently 2,000 members, IGs now make up around .01% of Istanbul's population of 20,000,000 (Alexandris, 1983). Having historically constituted a major part of the city's cosmopolitan nature from prior to the Byzantine and throughout the Ottoman eras, IGs served in noteworthy commercial, cultural, and political roles (Örs, 2006, 2017). The "deportations" of tens of thousands of IGs holding Greek passports in 1964 marked the pivotal moment where the Greek presence in Istanbul diminished and led to a growing diaspora in Greece.

　　IG therefore is an endangered dialect of Greek that has resulted from long-term intimate contact with Turks, Franco-Levantines, and others, while maintaining contact with Standard Modern Greek (SMG). Greeks and Turks have been in contact for centuries and the standard varieties of both languages have experienced some degree of convergence at all structural levels (Horrocks, 2014; Joseph, 2000). However, IG has had more direct contact with Turkish than SMG, and IG exhibits more Turkish influence as a result of that more intimate contact (Papadopulos, 1975; Zahariadis, 2014). Contact with multiple dialects of Greek and Romance languages, as well as the shifting demographic population of Greeks and Turks in Istanbul, have had an impact on the IG dialect. This historic linguistic fluidity is prominent in the extensive borrowings which have subsequently led to further structural changes in IG (Zahariadis, 2014). For example, the increased contact with Turkish, French and Italian has led to IG having adopted postalveolar fricatives in loanwords from these languages, whereas such loanwords in SMG are adapted to SMG phonology.

　　In addition to contact-induced change, IG maintains archaisms lost in other Greek dialects and demonstrates internal changes. While not exhibiting all of the features present in what Newton (1972) and Trudgill (2003) classify as Northern Greek (NG), IG does exhibit some features also found in NG varieties, most notably the production of velarized laterals [ɫ] before back vowels [o, u, a]. A feature specific to IG is the realization of /ts/ as [ʧ].[1] These two features will be examined to make claims about language variation in the IG diaspora.

3.　　 Salience and Indexicality

Podesva (2011) discusses salience in terms of a given variable's level of consciousness, asserting that tokens can be salient categorically (based on frequency) or phonetically by exhibiting extreme acoustic values (p. 237). This understanding of salience draws heavily from Trudgill's (1986) four factors of linguistic awareness that relate to overt stigmatization, involvement in current

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[1] Regardless of phonemic status, the affricate is referred to here as /ts/ to differentiate between distinct phonetic realizations.

sound change, radically divergent phonetics, and involvement in maintaining phonological contrast. Whether variation occurs due to internal or external factors, variation of a linguistic form can be described based on degrees of salience. Social elements of salience are seen in Labov's (1972) designation of linguistic variables as either stereotypes, markers, or indicators, and in Johnstone and Kiesling's (2008) and Silverstein's (2003) fruitful applications of indexicality. Indexicality is the process in which salient linguistic productions are embedded with social meaning related to race, gender, sexuality, and other social categories.

This paper asserts that the salience of a given dialectal feature requires divergence from a standard variant. Subsequently, as speakers of a language become aware of differences between dialects, social meaning is assigned to different salient variants within given speech communities. Degree of phonetic divergence is expected to be an integral component for what makes certain features more salient than others. As social meaning of linguistic features depends on high levels of salience, a dialectal form with higher levels of salience can be expected to pattern differently than those with lesser degrees of salience. For example, IG speakers responded in sociolinguistic interviews that a defining characteristic of the dialect is the velarized lateral, whereas fewer referenced the coronal affricate. As the metalinguistic awareness between the two IG dialectal forms are different, then their production may pattern differently, as well.

3.1   Lateral Velarization in Greek

After vocabulary differences, the most overt dialectal difference between SMG and IG is the "dark l."[2] Lateral velarization is a scalar phenomenon cross-linguistically, with variation in how laterals are articulated. Clear laterals are typically produced in a single articulation with the tongue tip touching the alveolar ridge and the tongue root in neutral position, whereas velarized laterals have a second articulation with the tongue tip and blade more dentalized and the tongue root approaching the velum (Recasens, 2012). Acoustically, velarized laterals have lower F2 values than clear laterals, although different languages have different benchmark F2 values (Müller, 2015). SMG does not exhibit lateral velarization, although NG varieties do before back vowels (Arvaniti, 2007; Loukina, 2010). Loukina (2010) demonstrated that before [a], NG /l/ was produced with F2 values of around 1000 - 1400 Hz before /a/ (group mean F2 = 1324), compared to F2s in the same context for Athenian speakers (1400 – 1600 Hz, mean F2 = 1466). IG appears to have even more progressive velarization, with mean F2 values before [a] at 1175 Hz (Hadodo, 2017). Hadodo (2017) found similar mean F2 values before [o] and [u] in IG, and some speakers produce the velarized lateral in coda position. Papadopulos (1975) asserts that extensive contact with Turkish has affected the IG vowel space, prompting lateral

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[2] The velarized lateral in Greek is often referred to as "thick" or "heavy," which is also how some IGs holistically describe their dialect. Other IG descriptors include "Eastern/Anatolian" and "throaty."

velarization before back vowels. The current author has taken mean F1 and F2 measurements of the five vowels from male IGs reciting wordlists to demonstrate that while [a] is significantly further back than the SMG low vowel (based on lower F2 values), [o] and [u] are also slightly further back.

3.2 Coronal Affricates in Greek

SMG and most other varieties have the alveolar affricates [ts] and [dz], whereas IG tends realize them as [ʧ] and [ʤ]. Although Cypriot and other southern dialects do have postalveolar affricates, these are allophones of /k/, and not variants of /ts/.[3] SMG and IG both palatalize /k/ to [c] before front vowels, whereas these are realized as [ʧ] in Cypriot and other Southern varieties of Greek (Newton, 1972; Trudgill, 2003). Arvaniti (2007) classifies sibilants as retracted alveolars, having their placement somewhere in between English alveolar and postalveolar fricatives based on where the frication noise begins: English [s] 3700 Hz, English [ʃ] 2100 Hz, and Greek [s] 3000 Hz. Gordon, Barthmaier, and Sands (2002) have demonstrated that center of gravity (COG) values are a common acoustic cue of place of articulation for fricatives and by extension affricates. COG measurements describe the mean distribution of frication energy within the spectrum, with central distributions of energy at lower Hz values corresponding with a further back articulation than distributions at higher Hz values. For example, Themistocleus (2017) found that SMG [s] has mean COG values at 7000 Hz. There is much variation in the phonetic realization of Greek [s], with the phone "fronted when followed by [t] and in some cases the front vowel [i], while in the [a_a] context it may be so retracted as to be best described as an advanced postalveolar" (Arvaniti, 2007: 12). This coarticulation logically could apply to the affricate, as well. See Figures 1 and 2 for a comparison between IG and SMG /ts/.
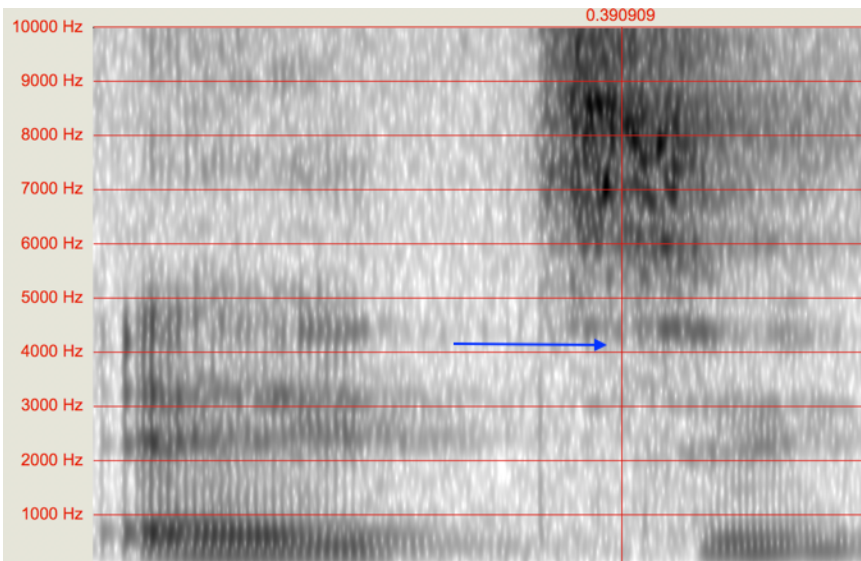
3.3 Hypotheses

Lateral velarization is a highly salient IG feature based on phonetic divergence from the standard variety, which in turn indexes IG identity. This third-order indexicality (Johnstone and Kiesling, 2008) is indicated by reflexive performances of "IGness" made by several IGs. As postalveolar affricates are less phonetically divergent from advanced postalveolars or retracted alveolars than a velarized lateral is to an alveolar lateral (based on articulatory distance and additional articulatory gesture), it logically follows that the [ɫ] variant of /l/ is more salient than [ʧ] for /ts/, under Podesva's (2011) and Trudgill's (1986) assumptions. Subsequently, lateral production is expected to shift to the SMG production more in IGs living in Athens (Gen1s), whereas Gen1s are expected to shift from [ʧ] to [ts] less.

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[3] Cypriot appears to produce [ʧ] for /ts/ in borrowings (see Arvaniti, 1999).
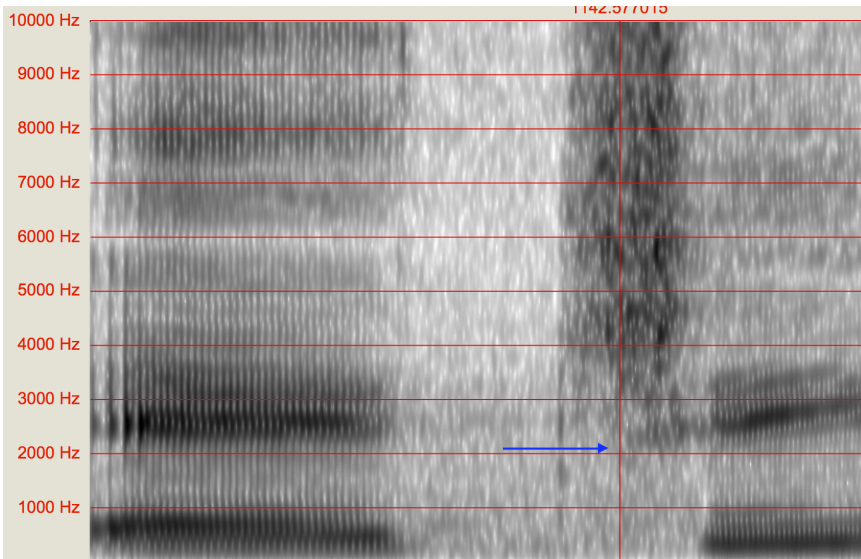
Figure 1*: IG female in her 30s uttering /etsi/ Note that the fricative portion has a COG value of 4618 Hz and the frication noise starts at 21000 Hz signaling postalveolar affricate.

Figure 2: SMG female in her 30s uttering /etsi/ Note that the fricative portion has a COG value of 8106 Hz and the frication noise starts at 4100 Hz, signaling an alveolar affricate.

4. Methods

To test the hypotheses, two IG communities were compared; the IGs remaining in Istanbul and the Gen1s in Athens. Auditory perception was used to compare variation of the laterals and coronal affricates. By comparing these groups with SMG-speakers as a control, patterns of variation could be examined, particularly for the Gen1 group who has been in increased contact with SMG.

4.1 Participants

In Istanbul, 46 interviews (26 males and 20 females) were recorded. In Athens, 23 Gen1 speakers (12 males and 11 females) and a control group of 10 SMG speakers (six males and four females) were recorded.

4.2 IG and Gen1 Data Collection

Ethnographic fieldwork was conducted in Istanbul in 2016. As part of an 11-week-long ethnography in Istanbul, IG participants were recruited using the "friend of a friend" technique (Milroy and Gordon 2008). 45 participants were found based on the researcher's existing and increasing connections in Istanbul. Sociolinguistic interviews were conducted after several weeks following the initial ethnographic observation and included elicitation tasks (picture-based and sentence-based) and word-list recitations. The same techniques were employed in 2017 over 5 weeks in Athens, where 23 Gen1s and 10 SMGs were recruited.

4.3 Social Variables

Gender is among the most observed social variables in variationist research. Labov (1972), Park (2012), and others have found that females tend to lead change from above, which corresponds to more standard-like production. Thus, gender was examined to potentially corroborate findings on change from above. As age was anticipated to be an important factor due to shifting demographics of Istanbul, IG speakers were placed into one of three different age groups based on birth year: 14 born in 1946 or earlier, 19 born between 1947 and 1969 and 11 born in 1970 or after. Due to a lack of diversity with the Gen1 and SMG speakers, age is only being considered for the IG group.

4.4 Linguistic Variables

Two dependent variables were considered in this study: lateral velarization before back vowels and the perceived production of the coronal affricate in each token. Regarding explanatory variables, the phonetic environments of the affricate were considered: word position and vocalic context.

4.4.1   Affricate Measurements

Each speaker read from a list of 66 lexical items, 12 of which contain the affricate in different positions: 6 word-initially, 6 word-medially, and an equal amount before each vowel, except for [i], which received an additional 2 tokens word-initially and word-medially. The 12 words with /ts/ were extracted for each speaker, with the affricate portion isolated to decontextualize the segments from the word. Segmentation was done by finding the beginning of the VOT of the [t] portion of the affricate and the transition of the following vowel after the fricative portion of the affricate. This resulted in 934 tokens. The files were then divided into four blocks to be entered into E-Prime 3.0 software (Psychology Software Tools, Pittsburgh, PA). Each speaker had at least three of their tokens randomly assigned in each block to ensure a balanced representation of tokens by each speaker group (IG, Gen1, and SMG) throughout the experiment. Certain speakers had additional tokens added to different blocks to reach 1,000 total tokens.

Rather than solely using acoustic measurements to determine the /ts/ production of a given speaker, auditory perception rankings were used. In Pittsburgh, 15 linguistically naïve raters were recruited: five Greeks (two natives dominant in Greek both female, three bi/multilingual not dominant in Greek all male) and 10 non-Greeks (six females and four males, all English dominant).The 15 raters listened to isolated clippings of /ts/ in the four blocks and rated each clip as either "ts" or "ch." The E-Prime suite exported responses into a .csv file, which includes individual ratings of each clip as either [ts] or [ʧ]. Each speaker's individual tokens were coded as either [ts] or [ʧ] based on the recorded ratings. For example, if 13 of 15 raters rated a particular token as /ts/, then that specific token of a given speaker was coded as /ts/. The two rater groups were largely in consensus with their rankings of the affricates, which serves as an additional check validating the perception data. Furthermore, acoustic measurements were taken of a random sample of the data, which corroborated rater assessments. Although speakers demonstrated a wide range of COG values, those ranked as having postalveolar productions had lower COGs (2000-5500 Hz) than those ranked as alveolar (5500-9000 Hz), which Gordon, Barthmaier, and Sands (2002) assert as an expected difference. When listeners were more evenly split in their evaluations, this was typically the case in recordings with ambient noise. Retracted alveolar productions were primarily perceived by listeners as alveolar and all were coded as such.

4.4.2   Lateral Measurements

Since auditory perception of laterals with linguistically naïve speakers is difficult to operationalize (i.e., impractical to have raters select between allophones of /l/) and potentially would complicate findings, the author rated each speaker's overall lateral quality based on their recitation of the wordlist. The wordlist contains 22 lexical items with the lateral in diverse vocalic contexts. As he has extensive experience acoustically analyzing laterals, he made a binary choice of the quality for each speaker's lateral production, as either clear or dark. These rankings were

corroborated with visual inspection of the acoustic data to ensure general concord when performing a second check. This method has been used in other studies concerning lateral quality and has been found to be a helpful approach in dealing with complex phones (S. Kiesling, personal communication, February, 2018).

4.4.3   Statistical Analyses

Mixed-effects models in Rbrul (Johnson, 2009) were conducted with the dependent variables from the response data and the independent variables described in Sections 4.3 and 4.4.

5.   Results

5. 1   Laterals

5.1.1   SMG Laterals

As expected, SMG speakers never velarized laterals before back vowels.

5.1.2   IG and Gen1 Laterals

As seen in Table 1, about 80% of IGs velarized laterals before back vowels, which contrasts with the 25% of Gen1s who velarize. Although the majority of both Gen1 males and females have shifted to the standard clear production, males are more likely to velarize than females, which is also the case for IGs. Although gender was a significant predictor for both groups, it was much more significant for the IG speakers.

Figure 3 separates IG speakers by age and shows that the middle-aged and elderly IGs behave near identically, both velarizing about 84% of the time. Although the youngest speakers appear to be shifting to clear laterals more than the oldest speakers, the mixed-effects model did not find age to be a significant predictor in lateral quality.

Table 1: *Percentages and centered factor weights for IG and Gen1 lateral quality before back vowels.*

IG				Gen 1			
Factor	**%**	**Log Odds**	**Factor Weight**	**Factor**	**%**	**Log Odds**	**Factor Weight**
Overall Production				**Overall Production**			
Plain	18.4	-	-	Plain	74.9	-	-
Velarized	81.6	-	-	Velarized	25.1	-	-
Gender (p = 2.68e-24)				**Gender** (p = 8.41e-05)			
Male	95.7	1.231	0.774	Male	32.7	0.758	0.681
Female	62.5	-1.231	0.226	Female	17.4	-0.758	0.319
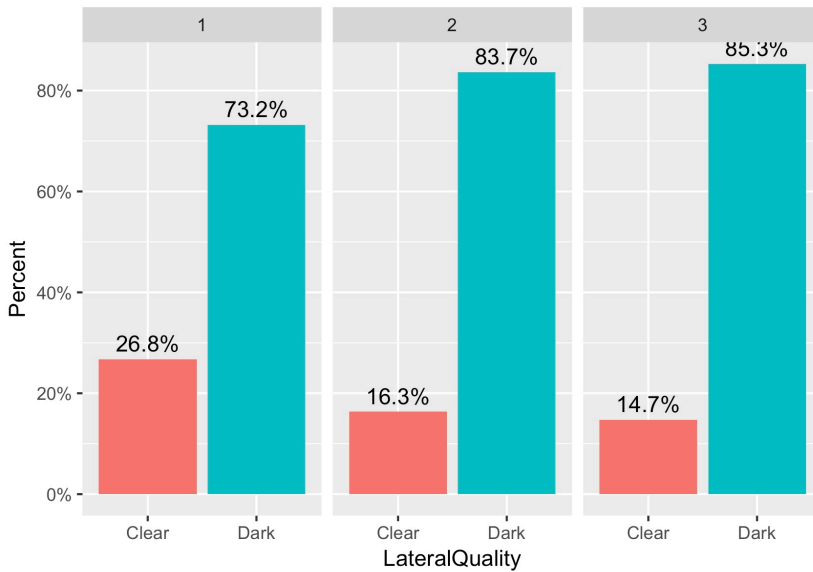
Figure 3: *IG lateral quality before back vowels as a function of age. Group 1 is the youngest (born 1970-1994) and 3 the oldest (born in or before 1946).*

5.2   Affricates

5.2.1   SMG Affricates

When examining overall distributions of the affricates, about 88% of SMG affricate tokens were alveolar and almost 12% were postalveolar, as seen below in Table 2. The mixed-effects model found gender to be a significant predictor of [ʧ] production, with SMG males tending to produce the postalveolar affricate more than females.

In terms of linguistic variables, the mixed-effects model did not find word position to be a significant predictor of affricate production in SMG speakers. As such, [ts] is predominantly produced and [ʧ] was produced in about 10% of tokens word-initially and 13% word-medially. The vocalic context, however, was found to be significant predictor of the affricate's place of articulation. Table 2 shows significant predictors for SMG affricate production, including how [o] and [u] prompt more postalveolar productions in SMG speakers: 28% and 33% of tokens respectively.

Table 2: *Percentages and centered factor weights for SMG [ʧ] production.*

Factor	Token Percentage	Log Odds	Factor Weight
Overall Production			
[ʧ]	11.6	-	-
[ts]	88.4	-	-
Vocalic Context (p = 7.79e-12)			
u	33.3	0.300	> 0.999
o	28.0	0.300	> 0.999
i	2.2	0.025	0.996
a	0.0	0.000	< 0.001
e	0.0	0.000	< 0.001
Gender (p = 0.0024)			
Male	16.5	1.301	0.786
Female	5.1	-1.301	0.3214

5.2.2 IG and Gen1 Affricates

The majority of IGs produce the postalveolar variant, whereas Gen1 affricates were near evenly split between [ts] and [ʧ], as seen in Table 3. Gender is a significant predictor of affricate production for both IGs and Gen1s with mixed-effects models showing males more likely to produce the postalveolar variant.

   Figure 4 shows that the two older age groups of IGs maintain the dialectal form at similar rates, and higher percentages of younger speakers shifting to the standard form [ts]. The mixed-effects model corroborates this, with age being a significant predictor and the oldest IGs most likely to produce [ʧ].

   With respect to linguistic variables, the Rbrul model shows that word position was significant for IGs and Gen1s, unlike SMGs. IGs and Gen1s are more likely to produce [ʧ] word-initially rather than word-medially. Vocalic context was also found to be significant, with IGs and Gen1s producing [ʧ] before [u] and [o] significantly more than before other vowels. Whereas gender and word position are even more significant predictors for postalveolar production for IGs than for Gen1s, vocalic context was more significant for Gen1s than for IGs. Figures 5 and 6 show distinct patterns of affricate production based on vocalic context between IG and Gen1 speakers. Table 3 provides p-values and factor weights for the variables tested.

**Table 3:** *Percentages and centered factor weights for IG and Gen1[ʧ] production.*

IG				Gen 1			
Factor	**%**	**Log Odds**	**Factor Weight**	**Factor**	**%**	**Log Odds**	**Factor Weight**
Overall Production				**Overall Production**			
[ʧ]	65.8	-	-	[ʧ]	49.8	-	-
[ts]	34.2	-	-	[ts]	50.2	-	-
Word Position (*p* = 1.65e-07)				**Word Position** (*p* = 5.02e-05)			
Initial	74.8	0.633	0.653	Initial	61.6	0.629	0.652
Medial	56.7	-0.633	0.347	Medial	37.9	-0.629	0.348
Vocalic Context (*p* = 1.35e-05)				**Vocalic Context** (*p* = 7.79e-12)			
u	77.8	0.924	0.716	u	82.0	1.826	0.861
o	77.7	0.660	0.659	o	76.6	1.314	0.788
i	62.1	-0.286	0.429	e	40.8	-0.830	0.304
a	57.9	-0.614	0.351	i	32.3	-1.124	0.245
e	56.4	-0.684	0.335	a	34.7	-1.185	0.234
Gender (*p* = 4.74e-15)				**Gender** (*p* = 8.41e-05)			
Male	78.4	0.636	0.639	Male	59.9	0.758	0.681
Female	48.8	-0.636	0.361	Female	39.6	-0.758	0.319
Participant Age (*p* = 1.16e-10)							
Oldest	78.5	0.725	0.674				
Middle	71.8	0.443	0.609				
Youngest	39.4	-1.168	0.237				
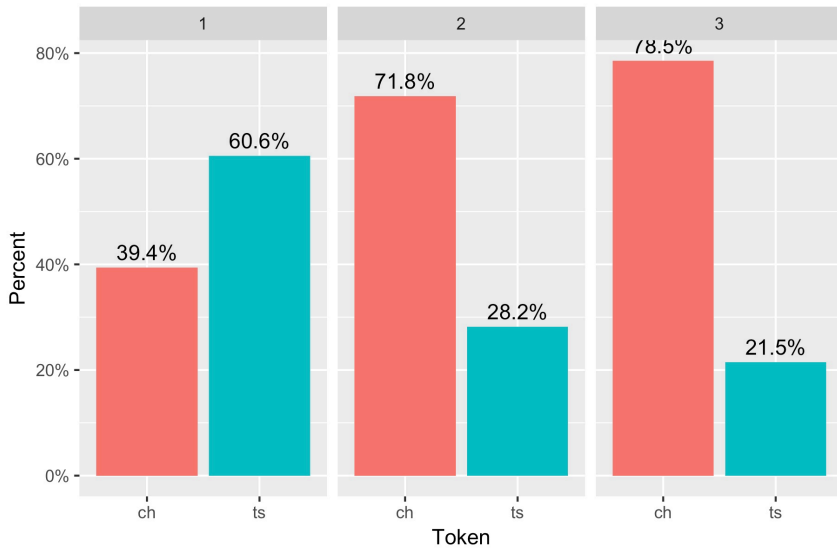
Figure 4: *IG affricate production as a function of Age. 1 is the youngest and 3 the oldest.*
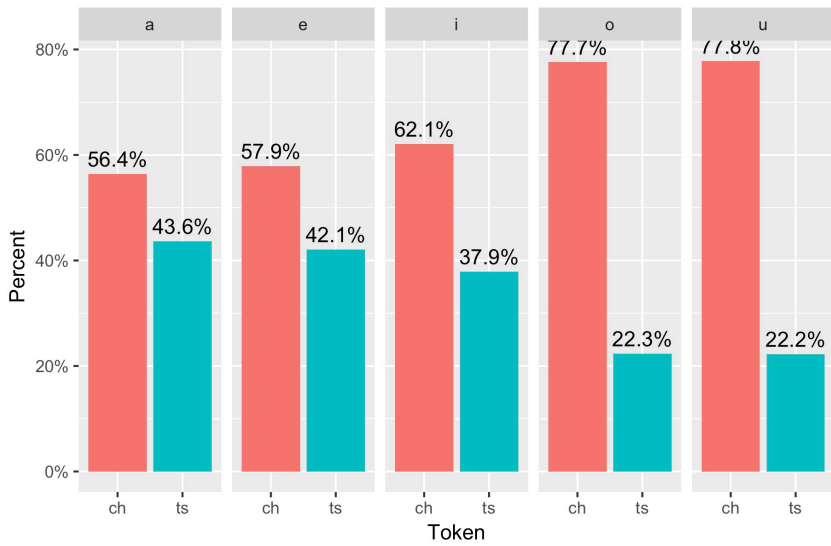
**Figure 5:** *IG affricate production by following vowel.*
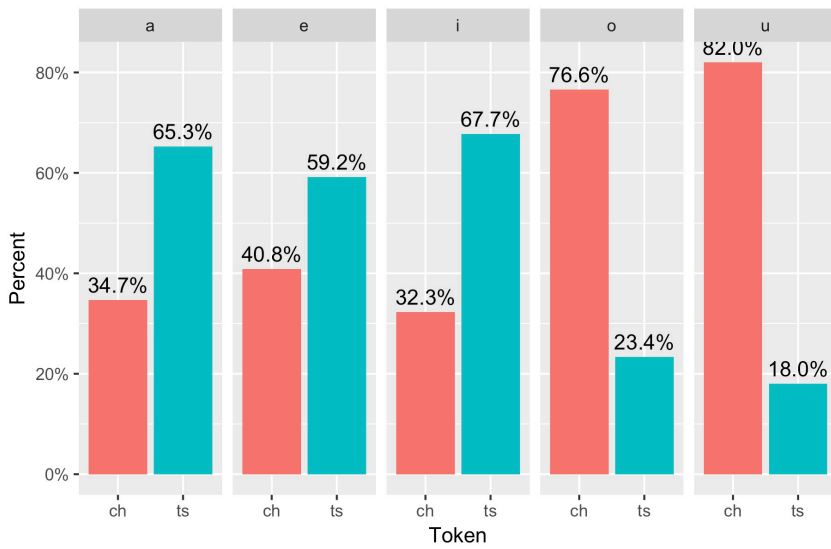
**Figure 6:** *Gen1 affricate production by following vowel.*

5.4 *Pockets* of Change

While few IGs and Gen1s described the affricate as a difference between IG and SMG, everyone referenced lexicon and lateral quality. Several IGs and Gen1s provided reflexive performances of IG and in doing so emphasized velarized laterals, but no such performance included affricates.

In the case of one middle-aged Gen1 female speaker, when asked about dialectal differences between SMG and IG, she expectedly stated vocabulary and the velarized lateral, but did not mention the affricate, instead focusing on Turkish influences on word order that she deems "incorrect." Nevertheless, prior to starting the full interview, she explicitly discussed that upon moving to Greece one of the most difficult challenges for her was to change her pronunciation of the word "pockets" to [tsepes] in SMG. She asserted she only had an issue with this specific word, that she always would want to say and still on occasion produces [dzepes], which she claims is the IG production. This is curious, considering that the word "pockets" in IG tends to be realized as [ʤepes], as the item is a borrowing from Turkish [ʤep] (compare Figures 7 and 8). As a result, IGs maintain both the voicing and placement of the affricate in the loanword, whereas SMGs have adapted the loan into the SMG phonological system. This speaker has retained the dialectal voicing but not the placement. Despite this difference, the Gen1 speaker recounted how she was bullied as a schoolchild newly arrived in Athens for her "dialectal pronunciation" of this specific word. Throughout the interview, she stated that most other Greeks mistake her for a local Athenian, and not for someone who moved from Istanbul. It is not surprising that among all speakers in each of the groups, not only did listeners perceived her affricates categorically as alveolar, but that she also had among the highest COG values (~8000 Hz). This makes sense as she experienced a form of discrimination which heightened her awareness of her production, although she does not recognize what is actually the dialectal difference (in this case, place of articulation). In a sense, she has "hypercorrected" the affricate.
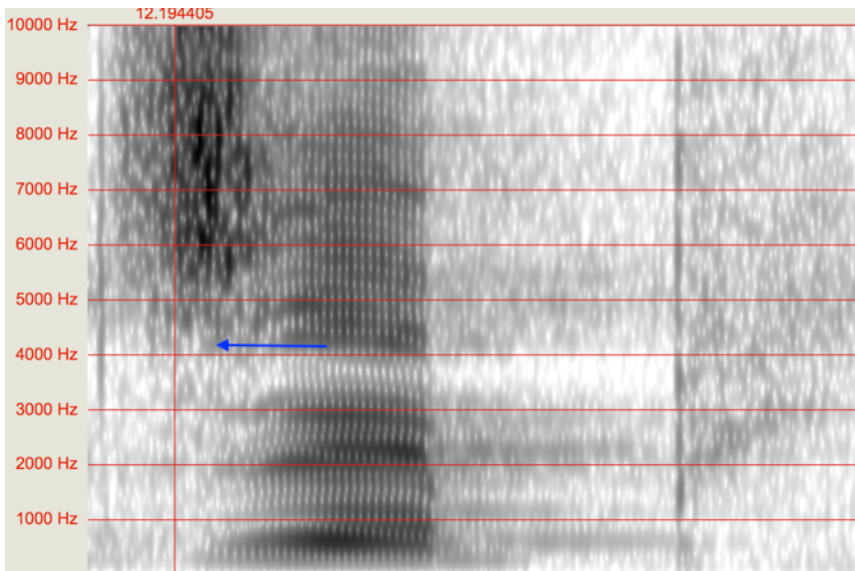
Figure 7: *Gen1 Female uttering /tsepi/ as [dzep]. Note that the fricative portion has a COG value of 7197 Hz with frication energy starts at 4100 Hz, signaling an alveolar affricate.*
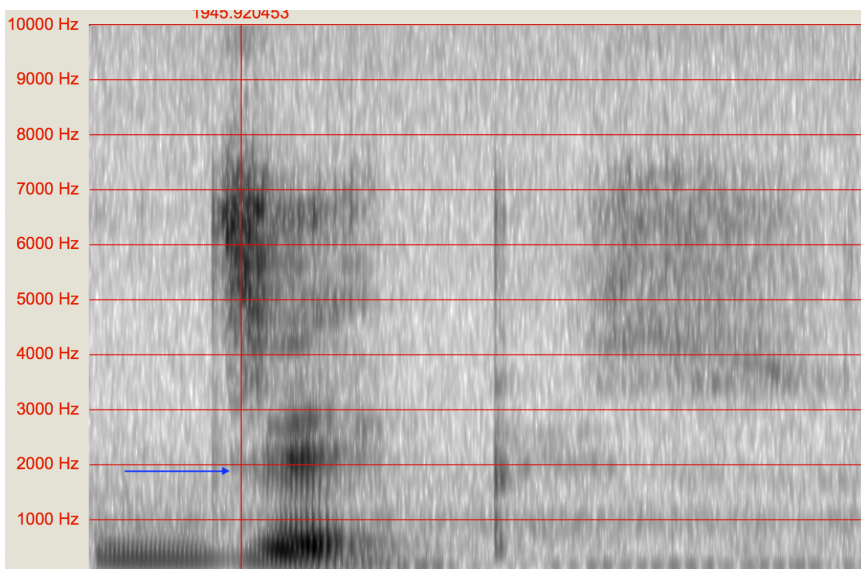
Figure 8: *IG Female uttering /tsepes/ as [dʒepes]. Note that the fricative portion has a COG value of 4019 Hz with frication energy starting at 1900 Hz, signaling a postalveolar affricate.*

6. Discussion

Most IGs velarize laterals before back vowels, particularly males. The 4% of IG males who have shifted to the SMG production of clear laterals starkly contrasts with the 38% of IG females with clear laterals. This pattern typifies change from above with females adopting the more standard production. Gen1s largely have shifted to not velarizing laterals, with the majority of both males and females producing clear [l], although Gen1 males are more likely to velarize than Gen1 females. As expected, the SMGs do not participate in velarization.

Most IGs still produce the postalveolar affricate more often than the alveolar, but not as frequently as the velarized lateral. Examining affricates based on gender reveals that while the majority of IG males still have the postalveolar variant, a larger percentage have shifted to a more SMG-like production than they have with the clear /l/ (22% [ts] versus 4% [l]). IG females, however, are near evenly split with their affricate production, which is an even larger shift to the SMG variant than with the laterals (38% [l] versus 49% [ts]). Whereas the two oldest IG groups produced about 84% of the dialectal lateral, the middle-aged group has shifted a bit more to the standard affricate. Young IGs are much more likely to produce alveolar affricates, despite their laterals still being predominantly dark before back vowels (Figures 3 and 4). Whereas Gen1s have shifted to the SMG lateral, Gen1s resist shifting to the SMG affricate to the same degree. The difference in Gen1 affricates with Gen1 laterals based on gender is that most Gen1 males maintain the postalveolar affricate while shifting to clear laterals. This contrasts with the IGs, in which while more females have shifted to the SMG variant, the majority of both genders still maintain the dialectal form of both variables.

What was unexpected is that some SMG speakers produce [ʧ] even though this has not been documented in the literature before. While only occurring in about 12% of tokens uttered by SMG speakers, a similar pattern to that found in IGs and Gen1s emerges with males producing the postalveolar more often than females. While word position is a significant predictor for IGs and Gen1s, it is not for SMGs. This could be due to the fact that the wordlist was recited in alphabetical order, with all six of the word-initial /ts/ items appearing in a row near the end and the six word-medial items dispersed throughout the first two thirds of the list, or that two of the word-initial items are words of Turkish origin (τσουρέκι, τσομπάνης), both of which are produced with [ʧ] in Turkish. As such, either the more time reciting the words, the succession of the tokens, or knowledge of Turkish prompt the dialectal feature of [ʧ] more, although word position was more significant for IGs than for Gen1s (as seen in Table 3).

Perhaps most interesting is the distribution of affricates based on vocalic context, which is a significant predictor of affricate production for all three groups. SMGs primarily produce [ʧ] before [u] and [o]. While most IGs consistently produce postalveolar affricates regardless of vowel, [u] and [o] see the highest percentages of [ʧ] tokens. The Gen1s largely produce postalveolar affricates before [o] and [u], at rates similar to those of IGs. Although /a/ is a central vowel in SMG, it is further back in IG, and IG speakers produce the

postalveolar before [a] more than Gen1s and SMGs. In this sense, the Gen1s have shifted to more SMG affricates before [a], [e] and [i] (see Figures 5 and 6).

The metapragmatic awareness demonstrated in responses and performances by IGs and Gen1s suggest that lateral velarization is highly salient and subsequently an index of IGness. The lesser awareness of differences in affricate production and its absence in stylistic performances suggest that the affricate is less salient and not an index of IGness. Phonetic properties support these claims of salience, as velarization requires the coariticularion of the lateral with the tongue root approaching the velum, which is physiologically distant from the alveolar ridge where clear laterals are articulated. Postalveolar affricates are much closer articulatorily to alveolar and retracted alveolar affricates.

Furthermore, SMGs do not participate in lateral velarization but do appear to participate in the affricate variation before [o] and [u]. Arvaniti (2007) describes SMG [s] as retracted alveolar becoming advanced postalveolar when between two [a] vowels. Therefore, despite the phonological status of /ts/ in SMG, it logically follows to say that its behavior before [o] and [u] demonstrates a type of allophonic distribution. It is not surprising that IGs have even greater percentages of [ʧ] before [o] and [u], as IG has further back vowels. The backing of this low vowel demonstrates how a contact-induced change has spread what looks like the beginning of an allophonic process in the standard variety.

With respect to gender, females tend to lead change from above. As females in both IG and Gen1 groups were more likely to shift to SMG clear lateral quality, this reinforces the idea that females lead in change that relate to standard notions of prestige. As Trudgill (1971) and others have demonstrated, wordlists tend to elicit the most standard speech productions when compared to short reading passages, careful speech, and casual speech. As a result, the high rates of velarized laterals and postalveolar affricates in IG speakers in the wordlist data analyzed can be expected to increase in more spontaneous speech, which will be examined elsewhere.

Having said that, the findings demonstrate that within a stigmatized dialect, two phonetic variants do not pattern the same way. What makes this an interesting case is that the variation of both the lateral and the affricate is due to phonetic differences in the vowel space of IG and SMG. As the back vowels are further back in IG due to contact with Turkish, this results in a contact-induced change regarding laterals. However, as SMG back vowels are prompting a postalveolar production of the affricate, the further back IG vowels appear to have spread this internal change throughout IG. Since the velarized lateral is highly salient, it is subsequently steadily maintained in the IG community due to indexical relations with the IG identity. This same feature is not maintained within the Gen1s who live in the center of the SMG community, as it is stigmatized in Athens due to that very salience that promotes it in Istanbul. As such, Gen1s are shifting to SMG, which does not velarize. However, this shifting to the standard is not occurring with the same frequency with the Gen1's coronal affricates. As SMG also participates to some degree in this affricate coarticulation, the postalveolar variant is less salient than the velarized lateral and does not index IG identity and therefore is maintained less than the lateral in Istanbul. As the affricate is not stigmatized, there is lesser necessity for Gen1s to shift in response and they

maintain the dialectal affricate more than the lateral, although Gen1s still produce the IG variant less than the IGs do. As a result, the degree of salience of a given dialectal feature not only plays an important role in how it will be maintained, but that salience will be used differently in separate communities of a dialectal group.

7. Conclusions

Istanbul Greek is an endangered dialect historically in contact with Turkish, French, and other languages. Speakers recognize lateral velarization as a defining characteristic of IG not present in SMG, whereas the production of /ts/ as [ʧ] in IG is a less salient difference, and subsequently the production of the two features pattern differently.

As high degrees of salience have led velarized laterals to index IG identity, IGs maintain this feature more than Gen1s who have shifted from this stigmatized production. While SMGs do not velarize laterals, some SMGs do produce [ʧ] before [u] and [o]. Subsequently, Gen1s have not shifted to [ts] as they have with laterals, due to the affricate being less divergent from SMG than the lateral is. IGs, meanwhile, have not maintained [ʧ] as they have velarized laterals, as this lesser degree of salience has prevented the feature from becoming an index of IG identity. These results show that the salience of dialectal features (i.e., the degree of divergence of a feature from the standard) relates to how they are maintained in contact situations. The IGs' and Gen1s' patterns of variation with respect to /l/ and /ts/ demonstrate that change from above does not affect all dialectal features of a given language variety in the same way.

Acknowledgments

References

Alexandris, A. (1983) *The Greek Minority of Istanbul and Greek-Turkish Relations 1918-1974*. Athens: Center for Asia Minor Studies.

Arvaniti, A. (1999). Cypriot Greek. *Journal of the International Phonetic Association*, *29*(02), 173-178.

Arvaniti, A. (2007). Greek Phonetics: The State of the Art. *Journal of Greek Linguistics*, *8*(1), 97-208.

Broersma, P. & Weenink, D. (2017): **Praat**: doing phonetics by computer Version 6.0.30, retrieved from http://www.praat.org/.

Fourakis, M., Botinis, A. & Katsaiti, M. (1999). Acoustic Characteristics of Greek Vowels. *Phonetica, 56*, 28-43.

Gordon, M., Barthmaier, P., & Sands, K. (2002). A cross-linguistic acoustic study of voiceless fricatives. *Journal of the International Phonetic Association, 3*2(2), 141-174.

Hadodo, M.J. (2017, September). *Lateral Velarization in Istanbul Greek: Acoustic Evidence of Phonological Diffusion.* Paper presented at ICGL (International Conference of Greek Linguistics) 13, London, England.

Horrocks, G. (2014). *Greek: A History of the Language and its Speakers* (2nd ed.). London, New York: Longmans.

Johnson, D.E. (2009). Getting off the GoldVarb Standard: Introducing Rbrul for Mixed-Effects Variable Rule Analysis. *Language and Linguistics Compass 3*(1), 359-383.

Johnstone, B., & Kiesling, S. F. (2008). Indexicality and Experience: Exploring the Meanings of /aw/-monophthongization in Pittsburgh. *Journal of Sociolinguistics, 12*(1), 5-33.

Joseph, B.D. (2000). Language Contact and the Development of Negation in Greek and the Balkans. In *Greek Linguistics' 99. Proceedings of the 4th International Conference on Greek Linguistics* (pp. 346-353). Nicosia.

Labov, W. (1972). *Sociolinguistic Patterns.* Philadelphia: University of Pennsylvania Press.

Loukina, A. (2010). Towards the Acoustic Analysis of Lateral Consonants in Modern Greek Dialects: A Preliminary Study. In *e-Proceedings of 4TH Modern Greek Dialects and Linguistic Theory* (pp. 124-136). Chios.

Milroy, L. & Gordon, M. (2008). The Concept of Social Network. *Sociolinguistics: Method and Interpretation.* Oxford: John Wiley & Sons. (116-133).

Müller, D. (2015). Cue Weighting in the Perception of Phonemic and Allophonic Laterals Along the Darkness Continuum: Evidence from Greek and Albanian. *Albanohellenica, 6*, 1-15.

Newton, B. (1972). *The Generative Interpretation of Dialect*. Cambridge: Cambridge University Press.

Nicolaidis, K. 2003. Acoustic Variability of Vowels in Greek Spontaneous Speech. Proceedings of the XVth International Congress of Phonetic Sciences, 3221-3224. Universidad Autónoma de Barcelona.

Örs, I.R. (2006). Beyond the Greek and Turkish Dichotomy: The Rum Polites of Istanbul and Athens. *South European Society and Politics, 11*(1), 79-94.

Örs, I. R. (2017). *Diaspora of the City: Stories of Cosmopolitanism from Istanbul and Athens*. Springer.

Papadopulos, A. (1975). *The Phonology of MGK: Athenian Greek and Istanbul Greek* (unpublished master's thesis)*.* Retrieved from Boğaziçi University.

Park, K. (2012). Dialect Choice in Fiji: A variationist approach to language change in the South Pacific. In G. De Vogelaer & G. Seiler (eds.) *The Dialect Laboratory:*

Dialects as a Testing Ground for Theories of Language Change. (Vol. 128). John Benjamins Publishing.

Podesva, R. J. (2011). Salience and the social meaning of declarative contours: Three case studies of gay professionals. Journal of English Linguistics, 39(3), 233-264.

Psychology Software Tools, Inc. [E-Prime 3.0]. (2016). Retrieved from http://www.pstnet.com.

Recasens, D. (2012). A cross-language acoustic study of initial and final allophones of/l. *Speech Communication*, *54*(3), 368-383.

Sfakianaki, A. (2002). Acoustics Characteristics of Greek Vowels Produced by Adults and Children". In Selected Papers on Theoretical and Applied Linguistics from the 14th International Symposium, April 20-22, 2000 ed. by Marianthi Makri-Tsilipakou, 383-394. Thessaloniki: Aristotle University of Thessaloniki.

Silverstein, M. (2003). Indexical order and the dialectics of sociolinguistic life. *Language & Communication*, *23*(3), 193-229.

Themistocleous, C. (2017). Effects of Two Linguistically Proximal Varieties on the Spectral and Coarticulatory Properties of Fricatives: Evidence from Athenian Greek and Cypriot Greek. *Frontiers in Psychology,* 8, 1945 (pp. 1-19).

Trudgill, P. (1971). The Social Differentiation of English in Norwich. Edinburgh University: Unpublished Ph.D. Thesis.

Trudgill, P. (1986). *Dialects in Contact*. Oxford: Blackwell Press.

Trudgill, P. (2003). Modern Greek Dialects: A Preliminary Classification. *Journal of Greek linguistics*, *4*(1), 45-63.

Zahariadis, N. (2014). Λεξικό του Κωνσταντινουπολίτικου Γλωσσικού Ιδιώματος. Athens: Εκδοσεις Γαβριηλιδης.