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EFFECTS OF REGIONAL MEDIA, TRAVEL, AND SOCIAL CONTACTS ON THE PERCEPTION OF SPANISH ASPIRATED-/S/

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ABSTRACT. Previous work has found that speakers who move to a new dialect region may come to adopt features of the second dialect. This study investigates whether other types of dialect exposure – those present without ever leaving one's home dialectal region – similarly result in differences in language use. An identification task and a dialect contact questionnaire were administered to two Spanish-speaking dialect groups of young adults (aged 18-24 years old) in Latin America – Bogota, Colombia, and La Rioja, Argentina – to determine the effect of different types of dialect contact on the perceptual categorization of the regionally and socially variable feature of syllable-final /s/-aspiration (e.g., *fresco* [freh.ko], 'fresh'). Short-term travel and exposure to Media from /s/-weakening regions were not found to play a role in identification of aspirated-/s/. However, the regional background of reported social contacts (i.e., the social network) was a significant factor in how the regional variant was identified. Findings highlight the importance of live social interaction in language contact and change.

Keywords. dialect contact; sociophonetic perception; /s/-weakening; social networks; Media

RESUMEN**.** Se ha encontrado en investigaciones previas que los inmigrantes a una nueva región dialectal pueden adquirir nuevos rasgos del segundo dialecto. La presente investigación explora si otras formas de contacto dialectal – sin salir de la comunidad local – también resultan en cambios en el sistema lingüístico del hablante. Se logró la participación de adultos jóvenes (entre las edades de 18 a 24 años) de dos dialectos regionales del español latinoamericano – Bogotá, Colombia, y La Rioja, Argentina – en un experimento de percepción y un cuestionario de contacto dialectal para determinar los efectos de diferentes tipos de contacto dialectal en la categorización perceptual de la aspiración de la /s/ final de sílaba (e.g., *fresco* [freh.ko]), una variable regional y social del español. Las experiencias previas de viajes de corto tiempo y exposición a los medios de comunicación de regiones de debilitamiento de la /s/ no tuvieron ningún efecto en cómo los participantes identificaron la /s/ aspirada. Sin embargo, la región de origen de los contactos sociales (i.e., la red social) fue un factor significativo en su identificación. Los resultados señalan la importancia de la interacción social en el contacto dialectal y el cambio lingüístico.

Palabras clave. contacto dialectal; percepción de variación sociofonética; debilitamiento de la /s/; redes sociales; medios de comunicación

1. Introduction

The objective of the current study is to investigate how different forms of dialect contact or dialect exposure that may be commonplace in metropolitan areas of Latin America – in this case, Bogota, Colombia – may influence the perception of dialectal sounds. Bogota, the capital and by far most populous city of Colombia, with approximately 8.3 million inhabitants (CIA World Factbook), is the political and economic center of the country. *Bogotanos* may have multiple opportunities for exposure to nonlocal dialects of Spanish, as a result of internal migration to the city as well as the importation of business, Media, entertainment, etc., from other Spanish-

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speaking regions and countries. The study, as such, seeks to determine if and how different forms of dialect contact may affect perception[1] of a nonlocal dialectal variant, weakened-/s/, a wide-spread sociolinguistic feature found throughout Latin America and Spain, but not characteristic of the local variety spoken by residents of this capital city. The study finds that changes in perceptual norms of dialectal sounds may occur even in the absence of an intense immersion experience (i.e., moving to a second dialect region); however, not all forms of dialect contact contribute to influence speech perception.

2. Adoption of features of a second dialect

Just as speakers can acquire a second language, they can also acquire features of a *second dialect* of their native language. Although it is commonly accepted that there is a critical or sensitive age after which *full* native-like acquisition of that second language (e.g., Lenneberg 1967; Johnson & Newport 1989; Long 1990; Krashen 2006) or second dialect (e.g., Labov 1970; Krashen & Seliger 1975; Chambers 1992) is uncommon, one's language system is not static but changes throughout one's lifespan.

Moving to a new dialect region can lead to the incorporation of new dialect features in one's speech. There is evidence, for example, of the adoption of second dialect features by children who have moved to a new dialect area (Payne 1980; Chambers 1988, 1992; Tagliamonte & Molfenter 2007; Stanford 2008). The children in these studies did come to produce at least some of the phonetic and phonological features of the new dialect, although initial age of immersion and complexity (variability) of the new features seem to play a role in whether the features are fully acquired or not (Payne 1980; Chambers 1988, 1992; Tagliamonte & Molfenter 2007). And while age certainly appears to be an important factor in adoption of second dialect features, there is also evidence that *adult* speakers may likewise make changes in production after living a period of time in a new dialect region (e.g., Wells 1973; Munro, Derwing & Flege 1999). This was the case, for example, for adult Canadians who had moved to Alabama (Munro et al. 1999) and speakers of northern British English who had been exposed to Standard Southern British English (SSBE) at university (Evans & Iverson 2007).

In addition to modifications in production after immersion in new speech communities, perceptual norms may also change after an experience of living in a new dialect region (Scott & Cutler 1984; Bowie 2000; Evans & Iverson 2004) or for individuals in contact with speakers of other social varieties that make up part of the same geographic space (Sumner & Samuel 2009). For example, speakers from the north of England who had lived in London for at least one year, with an average of 8.6 years, made adjustments to exemplar locations for vowels heard in SSBE carrier phrases (Evans & Iverson 2004), while northerners who lived exclusively in the north did not normalize for the SSBE dialect. Likewise, British speakers living in the United States for an average of 4.5 years made use of American flapping cue to identify phrase boundaries to a greater degree than British speakers in Britain (Scott & Cutler 1984).

Exposure to new dialectal forms through residency in that dialect region does not automatically lead to or guarantee incorporation of those forms in production or in perception, however. Certainly linguistic (Trudgill 1986; Chambers 1992), but also

[1] The notion of perception employed in the current study is that of the interpretation and categorization of speech sounds to established phonetic categories.

social factors (Zentella 1990; Kerswill & Williams 2000; Ghosh Johnson 2005) may contribute to the degree to which new forms are adopted. Zentella (1990) found, for example, that group attitudes toward different social groups played a role in the adoption by Spanish speakers living in New York City of lexical items from four regional varieties of Spanish widely spoken in the city. The British speakers living in Chicago in Scott and Cutler's study (1984) practically never produced the flap – a distinctive feature of American speech – in a reading task, even after an average of 4.5 years living in the United States. Moreover, while Evans and Iverson's (2004) northern speakers living in London made adjustments in perception of vowels in *bud* and *cud* when heard in SSBE carrier phrases, they continued to use northern vowel exemplar locations in the perception of the *bath* vowel, a vowel that seems to especially carry social and regional meaning for British speakers.

Nonetheless, while new dialectal forms are not always fully adopted in contexts of intense dialect exposure, it still remains that speakers – even at ages past the supposed *critical period* of language learning – are capable of making changes in how some sounds are produced and perceived after living a period of time in a new dialect context. We stress that the majority of these studies conducted to date, however, have considered only those effects of dialect exposure through a residential experience in a new dialectal regional or through a multidialectal context. In this type of "immersion" experience, speakers have intense contact with speakers of the new dialect, and social factors may be especially at play (e.g., desire to assimilate or "fit in" within the new social context).

Migration to a new dialect community is certainly not the only medium of contact with or exposure to dialectal speech, however. Due to modern technologies facilitating travel and communication with speakers from other geographic regions (e.g., Media and entertainment, the internet, telephone), it may be quite *unlikely*, in fact, that an individual is never exposed to speakers outside of his or her local speech community. It is not clear, however, if these other types of exposure to dialectal speech likewise influence language use, nor is it known *how much* exposure is necessary to induce changes, nor if those changes are temporary or long-lasting. Thus, the objective of the current study is to begin to test effects of additional types of dialect exposure, exposure types that much more commonly make up language users' regular life experiences, including exposure to nonlocal dialectal features through the Media, short-term travel experiences, and social contacts, on the adoption of dialectal forms in perceptual norms. Furthermore, with the exception of the work conducted on regional Spanish dialects in contact in different areas in the United States (e.g., Zentella 1990; Amastae & Satcher 1993; Ghosh Johnson 2005; Otheguy & Zentella 2007; Potowski 2008; Hernández 2009), previous research has primarily focused on effects of dialect contact for speakers of English; it is less clear how contact with non-local varieties of Spanish may influence language use by Spanish speakers in diverse sociolinguistic contexts throughout other areas of the Spanish-speaking world.

In order to achieve these objectives, the current study investigates the perception of a non-local dialectal form, Spanish aspirated-/s/ (e.g., *fiesta* [fi̯eh.ta] 'party'), by full-/s/ speakers living in their home dialect region who vary in degree and type of exposure to speakers from weakened-/s/ varieties. Spanish /s/-weakening was chosen as the targeted dialectal form as this feature is characteristic of multiple varieties of Spanish, thus increasing the likelihood that Spanish speakers are exposed to the feature. In addition, /s/-weakening is a highly studied phenomenon in the Hispanic sociolinguistic literature, providing a large base of supporting literature on the

characteristics and variable use of the feature. The following section provides a description of Spanish /s/-weakening.

3. Spanish /s/-weakening

Spanish syllable- and word-final /s/ may be lenited from its full sibilant frication form [s] to a period of glottal frication, or aspiration [h], to total deletion[2], resulting in variable realizations of words and phrases, such as in the following variable productions of *listo* /listo/ ('smart'):

(1) a. ['lis.to] full sibilant form
b. ['lih.to] aspirated form
c. ['li.to] elided form

When realized as a full sibilant, as in example (a), the phone is articulated as an alveolar fricative with high-frequency sibilant energy (Quilis 1999). The aspirated form, example (b), may be described as a gestural reduction resulting from an absence of the lingual gesture and a shorter duration and reduced magnitude of the glottal gesture (Romero 1994-1995), leaving only "the puff of laryngeal air that gives the impression of a German or English [h]" (Quilis 1999: 277-278; author's translation).

Weakened-/s/ is a wide-spread regional and social feature, present in up to 50% of the varieties of the Spanish-speaking world (Hammond 2001), including southern Spain, the Caribbean, and the Pacific coast of South America, while it is not typical of those varieties spoken in the highlands of Mexico and Central America and in the Andean regions of South America (Hualde 2005). Furthermore, within the "weakening" dialectal regions, the frequency of occurrence of the aspirated and deleted forms of /s/ are subject to social factors (e.g., Cedegren 1973; Samper Padilla 1990; Calles & Bentivoglio 1986), in addition to stylistic and linguistic ones (e.g., Poplack 1980; Terrell 1978; Brown 2005; File-Muriel 2009). Overall, the more advanced stages of /s/-weakening in a particular dialect are typically observed to a greater extent in the speech of males and speakers from lower socioeconomic levels, while females and speakers from higher socioeconomic levels tend to favor less-advanced stages or full sibilant variants (e.g., Dohotaru 2004; Ruiz-Sanchez 2004). Moreover, retention of /s/ tends to be associated with more formal or prestigious speech than the weakened forms (Lafford 1986; Terrell 1981), although sociolinguistic values associated with the different variants of /s/ may vary across speech communities.

Weakening of syllable- and word-final /s/ may be a perceptually salient and socially indexed variant for Spanish speakers. Boomershine (2006) found, for example, that Spanish speakers made use of the variable pronunciation of Spanish syllable-final /s/ to identify speaker origin in a dialect identification task. Furthermore, retention of /s/ may be perceived as effeminate speech (Zentella 2003), and correlated with perceptions of sexual orientation (Mack 2010, 2011). Social and regional indexes, and, furthermore, explicit linguistic awareness of /s/-weakening, is also explored in the current study, through explicit measures of sociolinguistic perceptions of dialectal sounds in the dialect contact questionnaire, discussed further in Section 5.3.

[2] While traditional accounts of Spanish /s/-weakening tend to assign variants to these three categories, /s/-lenition, in fact, appears to be gradient in nature (see File-Muriel & Brown 2011).

4. Predictions

The variety of Spanish spoken in Bogota and the surrounding highland cities, the target community for the current study, is considered a conservative variety, "textbook-perfect in terms of pronunciation" (Lipski 1994: 204). Syllable- and word-final /s/ is maintained in this variety and is realized in its full sibilant form (Lipski 1994: 209) (e.g., *fresco* [fres.ko], 'fresh'). It is noted, however, that while final /s/ is retained in the highland regions of Colombia, weakening of /s/ occurs in other dialectal regions within the country, with aspiration and deletion found along the Caribbean and Pacific coasts (Lipski 1994)[3].

Regional variation in patterns of speech perception correlating with production is well documented in the literature (e.g., Willis 1972; Fox 1974; Janson & Schulman 1983; Olson Flanigan 2008; Kendall & Fridland 2010). Regional differences in how sounds are perceived can be attributed to the *legitimacy* of the variation in a specific speech variety (see, for example, Sumner & Samuel 2005). As such, we predict that Spanish speakers from dialects where /s/ is weakened would categorize aspirated-/s/ as a legitimate form of the /s/ category, while Spanish speakers from dialects where only the full sibilant form is produced would not accept aspirated-/s/ as a legitimate variant of /s/, if they do not have prior linguistic experience with the lenited variants. However, we predict that those *Bogotanos* who have been exposed to external /s/-weakening varieties – through the Media, short-term travel, and/or social contacts – will pattern similarly to speakers from /s/-weakening dialects and will accept the aspirated variant as a legitimate form of Spanish /s/, categorizing syllable-final [h] as /s/.

5. Methodology

5.1 Participants

To test the effects of different types of dialect exposure – here, Media, travel, and social contacts – on perception of the regional feature of Spanish /s/-weakening, a perception experiment coupled with a dialect contact questionnaire was conducted in Bogota, Colombia. The same experimental tasks were also administered to a second group of Spanish speakers from a /s/-weakening variety, La Rioja, Argentina, who served as a control.

Participants from both dialect groups were university students recruited on their home campuses, either in Bogota or La Rioja. University students were specifically targeted as (1) the researcher had access to this population of informants, and (2) as a means to control the social background of the participants including factors such as age, socioeconomic background, and level of education. The majority of the participants were between the ages of 18 to 24; the mean age for the Colombian group was 20.0 years (SD = 2.72) and 21.5 years (SD = 4.19) for the Argentine group. All 27 Colombian participants (17 female, 10 male) had lived exclusively in Bogota or lived part of their childhood in another /s/-maintaining region of Colombia; none had ever resided in an /s/-weakening region. The 20 Argentine participants (12 female, 8 male) had lived exclusively in La Rioja province or a neighboring /s/-weakening northwestern Argentine province, or had spent part of their childhood in weakening Buenos Aires.

[3] In addition, central highland Colombian Spanish is unique in that although /s/ is retained syllable-finally, one may find aspiration of /s/ in syllable-initial position (Lipski 1994).

5.2 Identification task

The identification task was designed to test how Spanish speakers categorize syllable-final aspirated-/s/ (e.g., *baspe* [bah.pe], nonce item). If aspirated-/s/ is perceptually equivalent to the full sibilant-/s/, then listeners should identify the [h] stimuli as Spanish <s>. However, if [h] is not a legitimate variant of the /s/ category, then listeners should categorize [h] as another phone or as not belonging to any Spanish phonemic category. Only word-internal position was targeted as previous study found Miami Cuban and Puerto Rican /s/-weakening speakers to successfully identify weakened variants as /s/ in word-internal but not word-final position (Hammond 1978; Figueroa 2000).

A total of 158 nonword disyllabic stimuli were included in the task. The 28 target stimuli consisted of items with word-internal, syllable-final aspirated-/s/ ([h]) or the full sibilant ([s]) (N=14 of each). Participants identified the targeted aspirated variant [h] or the sibilant variant [s] as one of six Spanish phonemic categories, /s/, /f/, /ɾ/, /l/, /n/, or Ø (no coda consonant), or as <none of the above>, all represented with standard Spanish orthography. For example, they heard [loh.ta] and categorized it as one of seven options presented on the computer screen: <losta>, <lofta>, <lorta>, <lolta>, <lonta>, <lota>, or <ninguna> (<none of the above>). The variants of word-internal /s/ were always followed by a voiceless stop /p, t, k/, in order to control the phonetic context and to reflect the most frequent phonotactic patterns in Spanish (see File-Muriel, 2007). No single nonce carrier was repeated for any of the target and control stimuli, and all nonce word stimuli reflected viable Spanish phonotactic patterns and sounds. The auditory stimuli were produced by two university-educated, middle-aged speakers from aspirating varieties of Spanish – a male from Caracas, Venezuela, and a female from Buenos Aires, Argentina – who were capable of producing both variants of /s/, [h] and [s].

Fifty control items were included to test identification of other Spanish sounds in the same (word-internal, syllable-final) position to ensure any difficulties in identification of syllable-final [h] were due to acoustic characteristics of the aspirated variant and not to general difficulties in perception of sounds in this position. The controls included 10 tokens each of syllable-final [f], [ɾ], [l], [n], and no coda [V] (e.g., [lof.ta], [doɾ.te], [nil.to], [tan.de], [da.pe]). Listeners from both groups scored high on identification of all control items (*M*=93% to 100%), thus verifying that these Spanish speakers do not have general difficulties in identifying phones in this phonetic context. Finally, 80 distractor stimuli targeted other positions within the disyllabic word and other sounds in order to draw attention away from the targeted word-internal coda position and to conceal the focus of the experiment. See the Appendix for examples of the target, control, and distractor stimuli included in the task. A complete list of the task stimuli is reported in Schmidt (2011).

The task was administered with Praat software (Boersma & Weenink 2010) and was completed at individual computer stations with Sony MDF-V150 headphones. The auditory stimuli were presented one at a time, and participants could chose to listen to each stimulus a second time if desired. After hearing an individual stimulus, participants selected one of the six possible nonce word identification responses (or <none of the above>) provided on the computer screen and which differed only in one grapheme representing the targeted sound. As with the auditory stimuli, all written response options were also nonce words, presented in standard Spanish orthography. The order of presentation of the stimuli was randomized by the computer program.

Participants completed a short training exercise without feedback before beginning the task in order to become familiar with the task instructions and format. While the

same speakers were heard, none of the experimental stimuli were included in the practice session. The perception task took on average 30 minutes to complete but ranged from 25 minutes up to 1 hour, as there was no time limit.

5.3 Dialect contact questionnaire

Following the perception task, participants completed a written language background and dialect contact questionnaire that targeted extralinguistic social information (age, sex, profession), linguistic experience (languages spoken and levels of proficiency), and types and degrees of exposure to Spanish speakers from other dialectal regions. The exposure questions included: timeline of places lived, native language and city of origin of parents, location and duration of travel over two weeks, origin of Spanish speakers (outside of the home region) with whom have had frequent contact in the last five years, and a four-point scale of degree-of-exposure to speakers from other Spanish-speaking countries in (a) TV programs, (b) movies, (c) music, and (d) conversation. The scale ranged from never, to rarely (1-2 times per month), sometimes (3-5 times per month), or frequently (more than 5 times per month). These scalar questions also asked participants to identify the countries of origin represented through the Media (TV, movies, music) or with whom they converse. Finally, two questions were included in the questionnaire to test participants' explicit knowledge of /s/-weakening and reactions to the sounds presented in the task: participants were asked (1) to describe any dialectal pronunciations of Spanish and (2) to report and "funny" or dialectal pronunciations heard in the experiment. These questions are important in that they allow a preliminary exploration of the degree to which these listeners are consciously aware of /s/-weakening and if they associate it with regional variation in Spanish. The questionnaire took on average 20 minutes to complete.

Based on the responses from the questionnaire, binary values (0, 1) were assigned to the /s/-maintaining participants (Bogota) for three measures of dialect exposure: short-term travel, Media, and social contacts. For the travel variable, those with a travel experience of two weeks or longer in a /s/-weakening region were coded as having *travel exposure*. The average duration of travel in a weakening dialect region was one month, although travel time ranged from two weeks to two months. The coding criteria minimum was set at two weeks, as this was a common minimum duration of time that participants from this data pool spent vacationing in other regions[4]. The most frequented /s/-weakening travel destination was to Colombia's Caribbean region (Santa Marta, Cartagena, Barranquilla, N=10); two individuals also reported short-term travel to a neighboring /s/-weakening country (Panama, Venezuela) and one to Miami, which has a large population of /s/-weakening Caribbean speakers.

The Media variable was defined according to the responses from three of the four-point degree-of-exposure scalar questions. Only those participants who reported frequently (more than 5 times per month) watching films, television programs, and/or listening to music from /s/-weakening regions were coded as having *Media exposure*. Initially the three forms of Media were coded separately, but as there were few participants who reported frequent exposure within each category, these were later collapsed into one encompassing Media group. The binary cut-off was set at the most frequent (more than 5 times per month) exposure level (as for the social network variable), as if we would expect to observe an effect anywhere, it would be for those

[4] Furthermore, in a post-hoc comparison of those participants with the longest durations spent traveling in /s/-weakening regions (4-8 weeks) compared to those with the minimal time (2 weeks), no significant differences were found in identification of weakened-/s/.

participants with the greatest degree of exposure to Media from /s/-weakening regions. By far, exposure to music from /s/-weakening countries (Argentina, Chile, Venezuela, Cuba, Puerto Rico) was the most frequently reported type of Media exposure (reported by 11 of the 27 participants). Only 3 participants reported frequently watching movies from weakening regions (Argentina, Chile), and 2 reported frequently viewing television programs from weakening regions (Argentina, Puerto Rico).

Participants were assigned to the *social network exposure* group if they had a parent from a weakening region, reported frequently conversing (more than 5 times per month) with Spanish speaker(s) from /s/-weakening regions (scalar question #4), and/or identified friends, family, or colleagues from /s/-weakening regions with whom have had extensive contact in the past five years. The majority of /s/-weakening contacts reported were from weakening regions within Colombia (primarily the coastal regions) (N=12) and neighboring Venezuela (N=12). Other contacts from weakening regions included Chile (N=4), Argentina (N=3), the Dominican Republic (N=2), and Puerto Rico (N=2)[5].

The distribution of Bogota participants according to the different forms of dialect contact is presented in Table 1. While the majority (19 of 27) reported one or more social contacts from weakening regions, exposure to the different dialect groups through Media and short-term travel was more equally distributed.

Table 1. *Distribution (N) of Bogota participants across dialect contact types*

	/s/-conserving only	**/s/-weakening**	**Total**
Media	14	13	27
Travel	16	11	27
Social contacts	8	19	27

5.4 Data analysis

Identification accuracy scores were calculated for each participant based on the percentage of correctly identified stimuli for each variant of word-internal syllable-final /s/ ([s, h]). Accuracy is defined here as a match between the identified phone chosen by the listener and the intended category (<s>) produced by the speaker. First, a general linear mixed model was conducted to test differences in identification of the sibilant and aspirated forms across the two listener groups. Then, independent samples t-tests were run to test effects of each of the three exposure variables on identification of aspirated-/s/ by the Bogota listener group. The statistical tests were computed using arc-sine transformations of identification accuracies (%) in order to address problems associated with proportional data (i.e., data strictly bounded between 0-1). However, all tables and figures report the proportional (non-transformed) data. The identification response types (<s, f, l, r, n> or no coda) for each of the variants of /s/ were also tabulated according to dialect exposure and compared to those identifications made by the control group. Finally, the frequency with which this feature was mentioned in the two open-ended questions in the questionnaire regarding regional pronunciation differences and "strange" or "funny" sounds in the experiment was examined in order to explore sociolinguistic perceptions held by the *Bogotanos*.

[5] Individuals could have reported contacts from more than one /s/-weakening region.

6. Results

6.1 Perception of Spanish variants of syllable-final /s/

The results section begins with a comparison of the identification accuracies of the two variants of /s/ ([s, h]) across listener dialect group (/s/-maintaining Bogota, /s/-weakening La Rioja). Table 2 presents the identification accuracy scores for variants of word-internal coda /s/ according to listener dialect. While both groups consistently identified the full sibilant variant [s] as Spanish <s>, only the La Rioja group displayed a similar tendency for the identification of the aspirated variant [h].

A general linear mixed model was run to determine if the observed differences between the experimental and control dialect groups in identification of the sibilant and aspirated forms were significant. IDENTIFICATION ACCURACY (from the transformed data) was entered in the model as the dependent variable, DIALECT and CODA CONDITION as fixed effects, and SUBJECT as a random effect. The model revealed significant main effects of DIALECT [$F(1, 90)=17.895$, $p<.001$] and CODA CONDITION [$F(1, 90)=47.531$, $p<.001$] and an interaction between DIALECT and CODA CONDITION [$F(1, 90)=19.666$, $p<.001$]. As predicted, Bonferroni *post hoc* pairwise comparisons confirmed that the /s/-weakening dialect group (La Rioja) was significantly better than the /s/-maintaining group (Bogota) in identification of the [h] stimuli as <s>, [$p<.001$], with no significant differences between the two groups in identification of the [s] stimuli. Furthermore, while both listener groups had higher identification accuracies of coda [s] than of coda [h], this difference was significant only for the Bogota group, [$p<.001$] (La Rioja [$p=.11$]).

Table 2. *Mean identification accuracy scores (%) for variants of /s/ according to listener group (SD)*

Variant	/s/-maintaining dialect (Bogota)	/s/-weakening dialect (La Rioja)
[h]	43.7 (.50)	82.5 (.38)
[s]	95.0 (.22)	94.3 (.23)

6.2 Effects of dialect exposure types

Despite the fact that aspirated-/s/ in syllable-final position is absent from the local variety spoken by the Bogota listener group, some individual *Bogotanos* displayed a tendency to identify the aspirated variant as <s> (range = 0.0%-92.9%). In the sections that follow, effects of each of the different dialect exposure variables on perception of this non-local variant by the Colombian group are discussed. For each exposure variable (TRAVEL, MEDIA, SOCIAL CONTACTS), results are reported from independent samples t-tests, which were run to determine whether there were significant differences between the Bogota listeners in the /s/-weakening exposure vs. non-exposure groups in IDENTIFICATION ACCURACY of aspirated-/s/ (transformed data).

6.2.1 Travel to weakening regions

Short-term travel to /s/-weakening regions, as defined by a stay of two weeks or longer (M=30 days), was not found to have a significant effect on the identification of aspirated-/s/ by the *Bogotano* listeners, $t(25)= -.753$, $p = .459$. The mean identification score was 40.6% (SD=34.0, N=16) for those with no travel experience to weakening

regions and 48.1% (*SD*=34.4, *N*=11) for those who had reported a short-term travel experience. The overlapping distributions of the identification scores for the [h] variant according to travel experience are shown in Figure 1; the Argentine listener group (control) is also included in the following figures for comparison.

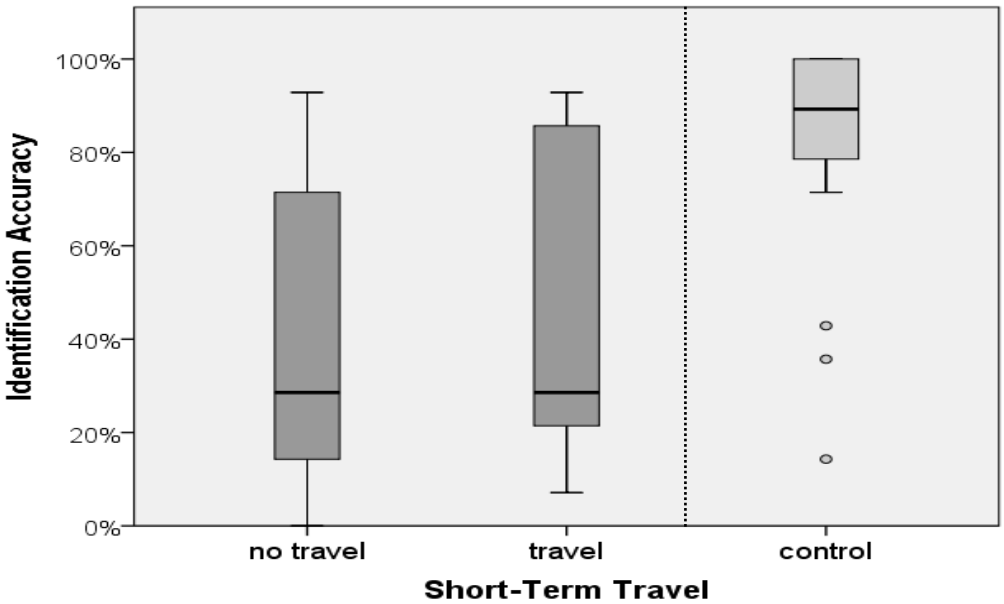

Figure 1. *Boxplots of identification scores for [h] stimuli according to travel experience (weakening dialect shown as control)*

Thus, the experience of short-term travel (2-8 weeks) within a /s/-weakening dialect community did not afford an advantage in identification of aspirated-/s/. As discussed in Section 7.1 below, this likely reflects a need for extended exposure to new linguistic forms in order for long-term changes in perceptual norms to take place.

6.2.2 Exposure to Media from weakening regions

Likewise, no significant effect of exposure to Media (television programs, music, and films) originating from /s/-weakening regions was found on the identification of the [h] variant by the *Bogotanos* (Figure 2), $t(25) = -.339$, $p = .737$. The infrequent exposure to weakening Media group scored a mean of 41.8% (*SD*=34.8, *N*=14) in identification of the [h] stimuli and the frequent exposure group a mean of 45.6% (*SD*=33.8, *N*=13).

More frequent exposure to Media from nonlocal /s/-weakening dialect regions did not result in an advantage in identification of the aspirated variant as <s>; as seen in Figure 2, the distributions of the two Media exposure groups are highly overlapping. It may be that regular exposure to /s/-weakening speakers in the Media – five times or more per month, as operationalized in the current study – is still insufficient to affect perceptual norms. Or, this finding may be a reflection of importance of psychological engagement or social interaction for the acquisition of new linguistic forms to take place (see Section 7.1).

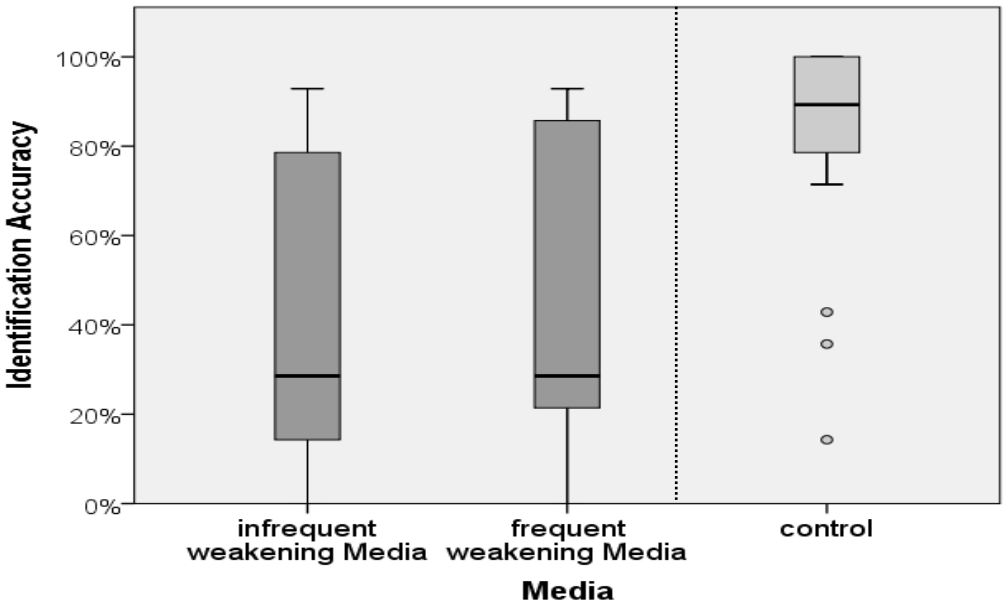

Figure 2. *Boxplots of identification scores for [h] stimuli according to Media experience (weakening dialect shown as control)*

6.2.3 Social contacts from weakening regions

Figure 3 shows the distribution of scores for the identification of syllable-final aspirated-/s/ according to the origin of reported social contacts from other Spanish-speaking regions (again, the Argentine listener group is shown as a control). Those *Bogotano* listeners who reported /s/-weakening personal contacts scored significantly higher in identification of the aspirated variant (M=51.9%, SD=32.5, N=19) than those *Bogotanos* who reported only /s/-maintaining social contacts (M=24.1%, SD=29.8, N=8), $t(25) = -2.107$, $p = .045$[6].

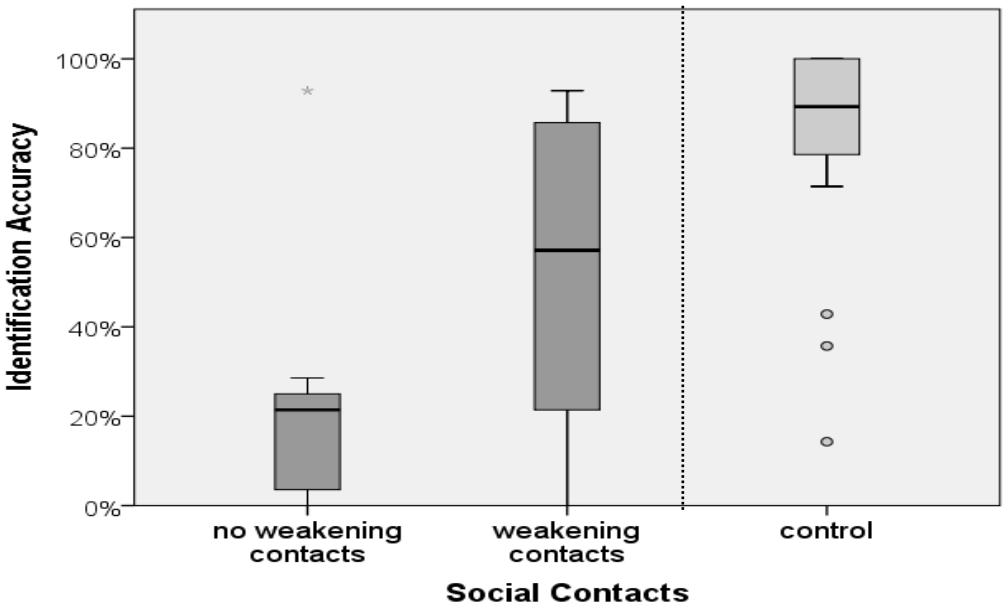

Figure 3. *Boxplots of identification scores for [h] stimuli according to origin of social contacts (weakening dialect shown as control)*

[6] There was no effect on identification of [h] of whether the weakening social contacts were from nearby weakening regions within Colombia (M=54.1%, SD=36.2, N=7) or from external /s/-weakening regions, such as Venezuela or Puerto Rico (M=50.6%, SD=31.7, N=12), $t(17) = .220$, $p = .829$.

The effect of social contacts from /s/-weakening dialects on how aspirated-/s/ is identified by the *Bogotano* listeners is striking. Of the 9 *Bogotanos* who reported no weakening social contacts, all but 1 outlier failed to associate syllable-final [h] with Spanish <s>. Greater within-group variation was observed for those *Bogotanos* who reported one or more weakening contacts: 11 individuals categorized [h] as <s>, while 8 did not. Social contacts cannot explain all of the variation observed in identification of the non-local dialectal variant by the /s/-conserving listeners, and other factors most likely are also at play, as reflected in the variability (large *SD*) within the weakening social contacts exposure group.

Unfortunately, due to the small and unbalanced sample sizes of male (N=10) and female (N=17) participants, we cannot make claims as to the role of listener sex in identification of aspirated-/s/. While at first glance it appears that there is an effect of sex on perception of aspirated-/s/, with males more prone to associate aspirated-/s/ with Spanish <s>, *M*=59.0% for males (*SD*=33.5, *N*=10) vs. *M*=34.9% for females (*SD*=31.5, *N*=17), truly we can not separate sex from the social contact variable, as nearly all male participants (9 of 10) reported weakening social contacts, while only approximately half of the female participants did so (10 of 17) (see also Schmidt 2013). It is not clear whether the unequal distribution of individuals with /s/-weakening social contacts across sex is a characteristic of the current sample (and potentially an artifact of the small sample size of male participants), or if it is representative of the larger Bogota population. This needs to be clarified in future research.

Finally, we consider the distribution of identification responses for the two variants of syllable-final /s/, [s] and [h], according to the origin of reported social contacts (no weakening contacts vs. weakening contacts). Confusion matrices for the identification of the variants of syllable-final /s/ are shown in Table 3. Data for the control group are again included as a comparison. Overall, those *Bogotanos* who reported contacts from /s/-weakening regions patterned more similarly to the /s/-weakening speakers (Argentine listener group) in patterns of identification of the aspirated-/s/ form: for both groups the most frequent identification of syllable-final [h] was <s>, followed by <f> and then <none of the above>. The preferred identification response of syllable-final [h], however, for the group of *Bogotano* listeners who reported social contacts from maintaining regions only was <f>, followed by <none of the above> and <s>.

Table 3. *Confusion matrices for the variants of /s/ according to origin of social contacts*

		Response						
		s	f	l	r	n	no coda	none
Conserving contacts	[h]	24.1	47.3	.9	.9		.9	25.9
	[s]	92.9	4.5					2.7
Weakening contacts	[h]	51.9	31.6	.4		.4	3.0	12.8
	[s]	95.9	2.3				.4	1.5
Control (Arg.)	[h]	82.5	11.8			.4		5.4
	[s]	94.3	4.6					1.1

Thus, those *Bogotanos* with one or more personal contacts (family, friend, and/or colleague) from /s/-weakening regions show a greater tendency to accept the [h] phone as a legitimate variant of Spanish /s/, while those without /s/-weakening personal contacts more often misidentify aspirated-/s/ as /f/ or do not associate [h] with any of phonemic categories provided (i.e., selected <none>). The labiodental fricative /f/ may be a favored categorization choice due to the acoustic similarity between the voiceless glottal fricative [h] and the voiceless labiodental fricative [f], sharing voicing and manner of articulation features.

6.3 Linguistic awareness of /s/-weakening

The results section concludes with findings from the dialect contact questionnaire regarding metalinguistic awareness of the /s/-weakening feature amongst the Spanish speakers in the current study. It is recalled that the written questionnaire included two open-ended questions about variation in pronunciation in the identification task and in general in the Spanish-speaking world: (1) to identify any "strange" or "funny-sounding" sounds heard in the experiment, and (2) to describe any pronunciation differences noted for Spanish speakers from different regions or countries.

In the responses to the question on noticing "strange" or "funny-sounding" sounds in the experiment, over 40% of the *Bogotanos* (N=11) mentioned the pronunciation of /s/ and described confusions or difficulties discriminating between /s/ and /f/. This was not the case for the control group (/s/-weakening Argentine listeners), who did not report the forms of /s/ presented in the experiment as unusual or strange sounding. As such, the perceptual association patterns observed in the data from the identification task are supported by the metalinguistic comments made in the background questionnaire. For the weakening dialect control group (Argentina), the word-internal, syllable-final [h] phones in the task were not unexpected or strange, but rather perceived as legitimate forms of Spanish /s/ in this position. However, [h] was reported as a different or funny sound for many *Bogotanos*, and led to confusions in its identification.

For the second question regarding the description of dialectal differences in Spanish, both the *Bogotano* group and the Argentine group identified several dialectal segmental and suprasegmental features[7]. However, once again more than half of the *Bogotano* participants (N=15) identified pronunciation of <s> or deletion of sounds when describing dialectal pronunciations in the Spanish-speaking world, while this feature was only listed by 4 of the Argentine participants. The Argentine speakers may not consider pronunciation of /s/ as a dialectal feature in Spanish *per se*, but rather as a norm, an expected, local form. Whereas the conserving Bogota group appears to more readily have an overt awareness of the feature, consciously associating it with regional, nonlocal varieties of Spanish, and at times making overt commentary, such as the questionnaire response from participant CA32 (a 21 year-old female from Bogota), "*En personas de la costa, se comen la 's'*" ("People from the coast swallow the 's'"; author's translation). Following Labov's (1972) distinction of linguistic variables as indicators, markers, and stereotypes, according to their degree of consciousness and social and stylistic correlates, weakening of /s/ seems to fall into the last category, social stereotype, at least for these /s/-conserving Bogota speakers.

[7] The features most frequently described included Castilian [θ], the assibilated palatal [ʃ] pronunciation of <ll, y>, assibilated <r, rr>, and dialectal variation in intonation, accentuation, and speech rate.

7. Discussion

As was predicted, overall the *Bogotanos,* speakers of a conservative (non-/s/-weakening) variety of Spanish did not show the same tendency as the La Rioja participants, speakers of a weakening variety, to associate the syllable-final aspirated form [h] with Spanish /s/. However, several individual *Bogotano* listeners did identify the aspirated variant as a legitimate form of Spanish /s/, despite the fact that syllable-final aspiration is not a recurrent form in the local regional variety and that these participants had lived exclusively in /s/-maintaining regions. Results from the analyses of the effects of different types of dialect contact on perception of [h] by the Colombian group revealed that *short-term travel* and *Media* were not significant predictors for the perception of dialectal aspirated-/s/. However, exposure to *social contacts* from /s/-weakening regional varieties did play a significant role in identification of the dialectal variant. These findings are discussed as follows.

7.1 Absence of an effect on dialectal perception: Short-term travel and Media

The lack of effects of short-term travel and exposure to Media from weakening dialectal regions may be attributed to the *quantity* and *quality* of the exposure, respectively. First, it seems likely that prolonged exposure (*quantity*) is necessary to induce changes in categorization of non-native speech sounds. Short-term exposure to dialect variants through travel to a new dialect region does not be appear to be sufficient to affect long-term changes in how those dialectal sounds are perceived. Those participants in the current study with travel experience spent on average only one month in /s/-weakening regions (from two weeks to two months). This short experience did not result in an advantage in categorization of dialectal aspirated-/s/.

It is perhaps not surprising that no perceptual effects were observed from such a short period of exposure. Those adult speakers in previous studies that found effects of second dialect immersion on language use had spent much longer periods of time in a new dialect region (for example, an average of 4.5 years (Scott & Cutler 1984), 7.7 years (Munro, Derwing & Flege 1999), and 8.6 years (Evans & Iverson 2004)). Moreover, work on second dialect acquisition by children in a new dialect region suggests that lexical variation is more quickly acquired, while phonological variation – especially complex phonological patterns, as would be the case here – is acquired more slowly (Chambers 1992). Indeed, Tagliamonte and Molfenter (2007) found that frequency of use of second dialect variants by Canadian children living in northeastern England increased over time, and that after even 6 years living in a second dialect region, the children had not completely acquired all those features of the second dialect.

Furthermore, it is not clear *when* these short-term travel experiences occurred (i.e., recency of exposure), nor how much interaction actually occurred between the participants and members of the local dialectal community when traveling in the /s/-weakening regions. Under the framework of Exemplar Theory (e.g., Goldinger 1996; Johnson 1997; Pierrehumbert 2001), it is posited that listeners encode and store detailed, instance-specific information about speech (Pisoni & Levi 2007), with variable forms explicitly represented in the cognitive system (Pierrehumbert 2006). Such a framework would predict that these Bogota speakers may encode detailed exemplars of the weakened-/s/ variants as a result of interacting with /s/-weakening speakers during their travel experiences. However, it is not clear how many instances of the "new" variants are needed to potentially influence representations and probability distributions. Moreover, strength of exemplar representations may depend

on recency of experience with phonetic tokens in addition to frequency (number) of tokens (Pierrehumbert 2001).

Second, the lack of an effect of frequent exposure to Media from /s/-weakening regions might be additionally understood by the nature (*quality*) of the interaction. Those *Bogotano* speakers who reported frequent exposure, as defined by more than five times per month, to Media (here, primarily music) from /s/-weakening regions did not have an advantage in categorization of aspirated-/s/. This is in line with previous studies that expressed surprise in findings of "at-home" control groups who did not use dialectal perceptual norms even when assumedly exposed to that dialect through the Media (e.g., British speakers exposed to American films (Scott & Cutler 1984), northern British speakers exposed to Standard Southern British English in the Media (Evans & Iverson 2004)). Furthermore, in a recent study on influences of television on language change in Glasgow English, Stuart-Smith and colleagues (2013) found that exposure through television in general was not important in TH-fronting and L-vocalization, both traditionally associated with the south east of England, by Glasgow youth (however, interestingly, psychological engagement with the London-based program *EastEnders* was). Indeed, Labov (1994: 288) argues that live social interaction via "face-to-face interaction with peers" is fundamental for language change.

Pioneering research in first language acquisition may furthermore shed light on this apparent lack of effect of Media on language use. Kuhl, Tsao and Liu (2003) propose that *social interaction* may be a necessary component for language learning, at least in natural language-learning situations. They found that 9-month old American English infants who received exposure to Mandarin Chinese through interactive in-person sessions with native Mandarin speakers learned a Mandarin phonetic contrast after the 4-week training period, while infants who watched and listened (audio-video) to or just listened (audio only) to the same types of interactive sessions with native Mandarin speakers recorded on DVDs did not learn the Mandarin contrast. The authors concluded that statistical learning through exposure to speech does not lead to language learning in the absence of social interaction. Results from the 2003 study led Kuhl to develop the Social Gating Hypothesis (2007), in which she proposes that language learning is "gated" by social factors in the sense that infants focus in on those signals found in human interactions as they develop language. Specifically, the social context increases: "(1) attention and/or arousal, (2) information, (3) a sense of relationship, and/or (4) activation of brain mechanisms linking perception and action" (Kuhl 2010: 720). For example, infants are more attentive and aroused in a human interaction than when simply watching and listening to the DVDs (Kuhl, Tsao & Liu 2003), which may lead to greater encoding and remembering of the speech information. Furthermore, social cues such as eye gazing and pointing may help reference information with speech sounds, and social interaction may aid in connecting perception and action.

Although there certainly may be many differences in how an infant learns the components of his or her native language and in how an adult speaker incorporates second dialect sounds into their language use later in life, it is not untenable that second dialect learning shares some fundamental principles with first language learning, much as it may with foreign language learning (e.g., Munro, Derwing & Flege 1999). As such, social interaction appears to be an important component in the adoption of second dialect variants. Those *Bogotano* speakers who reported frequent exposure to Media from /s/-weakening regions are missing the human social connection with those speakers. As a result of a lack of this social interaction, they

may not be as attentive to the complex details of the dialectal speech, and may not, in turn, store exemplars of the new sounds in memory.

Indeed, Pierrehumbert (2006: 519) defines *effective exposure* as "a function of actual exposure as well as cognitive factors such as attention and memory." Exposure alone to dialectal forms may not be sufficient to affect change or learning of those forms – certain conditions surrounding exposure may be necessary to influence language use. Moreover, additional social factors, such as identity and perception of interlocutor identity, may also contribute to form the conditions necessary for exposure to influence language learning and use. Kendall and Fridland (2010) suggest that social identity might play an important part in the formation of perceptual norms, as social motivations may lead to stronger or weaker acquisition of certain forms depending on social associations with speakers of different systems. Certainly, social factors play an important role in dialect contact situations (Zentella 1990; Kerswill & Williams 2000; Ghosh Johnson 2005). Indeed, we recognize that results from the current study regarding effects of Media are preliminary and limited by how exposure was measured and quantified (i.e., relying on participants' accounts); future work is needed to further understand the short- and long-term linguistic effects of exposure to dialectal speech through this medium (music, film, television, etc.)

7.2 Effect of social contacts on dialectal perception

While no effects on perception of dialectal aspirated-/s/ were found for short-term travel or exposure to Media, region of origin of reported *social contacts* had significant consequences for sociophonetic perception. The group of *Bogotano* speakers who reported frequently conversing with at least one social contact – family member, friend, and/or colleague – from a /s/-weakening region had a significant advantage in identification of syllable-final [h] as a variant of Spanish /s/. The conditions of exposure to weakened-/s/ variants through interaction with social contacts were sufficient to induce changes in how these non-local variants are perceived. The conserving *Bogotanos* with weakening contacts are exposed to the second dialect variant in a human-to-human socially interactive context, with assumedly prolonged exposure, as in order to form social relations, participants in the relationship would typically require long-term interaction to create social bonds. These effects of social contacts on how the non-local variant is perceived are striking given that these participants do not use the variant in their own production and that they are not necessarily exposed to a large number of speakers who use this variant (i.e., no intensive immersion experience such as moving to a new dialectal region).

We do point out that variability was observed in rates of identification of aspirated-/s/ in both contact type groups (maintaining contacts only, weakening contacts). Not all *Bogotano* speakers who reported social contacts from weakening regions tended to identify [h] as a form of /s/, and *vice versa*. As it is quite difficult to control for and measure dialect exposure (e.g., relying on participants' perceived reflections on language experience), it is not clear how much contact each individual has with different social contacts or if inaccurate or incomplete information is reported, nor can we ascertain that the /s/-weakening contacts actually use dialectal forms when interacting with the *Bogotano* speakers. It is recalled that weakening of syllable- and word-final /s/ is subject to social and stylistic variation in additional to regional differences, with the weakened-/s/ forms typically more frequently used in less formal or vernacular speech and amongst speakers of different social groups (see Section 3).

Moreover, it is possible that even if the *Bogotanos* are "effectively exposed" to /s/-weakening, that they "choose" not to identify the [h] stimuli as Spanish /s/ because of

potential negative emotive values towards the weakened forms, or associations with vernacular speech, for example. This may particularly be a possibility given the nature of the off-line task used, which allowed participants time to think about the stimulus, and thus, listeners could potentially access lexical and metalinguistic information (Kirby 2010). Garrido's (2007) findings from an attitude survey administered to Colombian speakers from the /s/-conserving capital region and from the /s/-weakening coastal region highlight the sociolinguistic prestige associated with the capital dialect. In her study, Bogota residents assigned negative scores to coastal speech, speech that is characterized by weakened-/s/, amongst other phonetic differences, while Bogota speech was rated as most prestigious and pleasant. Certainly, the *Bogotanos* appear to be overtly aware of regional differences in pronunciation of /s/; analysis of the responses to the open-answer questions from the Dialect Contact Questionnaire points to regional associations held by the Bogota residents according to how Spanish /s/ is pronounced. Future research is needed to further understand how sociolinguistic principles might play a role in the *perception* and *representation* of dialectal variants.

8. Conclusion

The current study sought to determine if three different forms of dialect contact – forms that may more commonly make up part of one's experience rather than the extreme situation of moving to a second dialect community – have an effect on perception of dialectal speech sounds. Furthermore, this is the first study to explore consequences of dialect contact for Spanish varieties outside of the United States. Results from an Identification Task coupled with a Dialect Background Questionnaire revealed differences in perceptual norms of the regional aspirated-/s/ for /s/-conserving speakers in the metropolitan South American city, Bogota, according to origin of their reported social contacts, while exposure to the regional variant via the Media or short-term travel had no observed effect. The findings from the current study highlight the importance of live social interaction in the formation and adaptation of individual language systems and reveal that one's perception and processing of non-local regional forms may be influenced even without ever leaving the home dialectal region.

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Appendix

Examples of the task stimuli (N=158)

	Description	N	Examples
Target (N=28)	coda aspirated-/s/	14	ba[h]pe, fo[h]ca
	coda sibilant-/s/	14	le[s]te, mi[s]po
Control (N=50)	coda liquid	10	ni[l]to, do[l]ga
	coda rhotic	10	do[ɾ]te, ga[ɾ]da
	coda nasal	10	bi[n]co, ta[n]de
	coda labiodental fricative	10	pe[f]pa, lo[f]ta
	no coda ([V])	10	dape, lega
Distractor (N=80)	word-initial C	30	[l]inco, [r]inco
	word-internal V	10	d[i]ca, d[o]ca
	word-internal C onset	30	de[n]o, de[f]o
	word-final V	10	fap[e], fap[i]