Viewpoint

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The heritage Spanish phonetic/phonological system: Looking back and moving forward

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Abstract: This paper overviews what we currently know about the phonetics/phonology of heritage speakers of Spanish based on previous research on this topic, and also provides suggestions for future directions to pursue, as inspired by previous work on heritage Spanish, adult learners of Spanish, native Spanish, and other heritage languages. Specifically, we examine the past and future of heritage Spanish phonetics/phonology at both the segmental (i.e., consonants and vowels) and suprasegmental (i.e., intonation, rhythm, stress) levels in terms of how this part of heritage Spanish grammars differs from that of other Spanish-speaking populations. Finally, we discuss a series of methodological factors to consider as investigators continue to advance this area of linguistic inquiry.

Keywords: phonetics, phonology, heritage speaker, Spanish

1 Introduction

Within the past few decades, the growing interest in heritage speakers (HS) of Spanish (HSS) in the United States has prompted a considerable amount of innovative research aimed at understanding this diverse and unique population. Thus far, much of the research has focused on their morphosyntactic knowledge or has been aimed at devising pedagogy tailored specifically to meet their linguistic needs (see Magaña, Pascual y Cabo and Stafford and Azevedo, this Viewpoints Section).

Heritage Spanish phonetics and phonology, on the other hand, has received considerably less attention. This lack of research may stem, in part, from the notion that HS experience a benefit in the area of pronunciation as a result of their early exposure to the heritage language (Au et al. 2008). While this may be
the case for many HS, Polinsky and Kagan (2007) urge investigators to shed more light on the sound systems of HS in general: “While instrumental studies targeting the phonetics of heritage speech are badly needed, virtually nothing is known about the nature of phonological representations in heritage speakers” (378). Inspired by this comment, we will use the present paper as a platform to encourage researchers to fill the aforementioned research gap. We will do this by: reviewing past relevant research in order to understand what we know to date; suggesting concrete directions for future studies based on previous experimental work on HSS, HS in general, second language (L2) learners, and/or language/dialectal variation; and discussing challenges facing past, present, and future investigators in the field.

2 Looking back

2.1 Consonants

A limited number of studies have focused on the perception and production of stops in HSS. Au et al. (2002) examined both voiced and voiceless stops in HSS and L2 learners and reported that HSS produced both series in a more native-like fashion. In terms of /bdg/, their HSS demonstrated more articulatory weakening than L2 learners. This finding was perceptually confirmed using the judgments of native speakers. Additionally, Knightly et al. (2003) conducted a similar, larger-scale study with /bdg/ in HSS and L2 learners and observed that /b/ and /d/ were produced and perceived as more native-like in HSS. However, HSS’ /g/ was distinct in that it was less weakened and judged as less native-like. Next, Au et al. (2008) looked at stops in L2 learners and two groups of HSS differing in childhood experience: one group actively used Spanish while the other was only receptive. This team’s results, incorporating data from reading and narrative tasks, showed that both groups of HSS were perceived as more native-like than the L2 learners. In more recent years, Amengual (2012) asserted that the main difference between HSS/bilinguals and native speakers was in the voice onset time (VOT) of /t/ in words with English cognates. Such a cognate effect, leading to increased VOT in the former speaker groups, had not been investigated in-depth prior to Amengual’s study. Furthermore, Kim (2011) only noted production (not perception) differences in the stops of English-dominant HSS and native speakers. Finally, Rao (2014), who categorized articulations of intervocalic /b/ corresponding with both <b> and <v> as pure approximants, tense approximants (not fricatives), and stops (Martínez Celdrán 1984, 1985),
found that less experience with Spanish, stressed syllables, reading tasks, and word boundaries all significantly decreased native-like pure approximants in favor of tense approximants for <v>, and stops for <b>. In a follow-up study on /bdg/ adopting a similar analytical approach, Rao (2015) noted that /b/ in both of its orthographic representations was realized in a less native-like (i.e., pure approximant) fashion than /d/ and /g/ in his HSS. This was particularly salient in read speech and, for <b>, at word boundaries.

2.2 Vowels

More recently, research on heritage Spanish phonology has extended to include the vowel system. While the monolingual Spanish vowel system has traditionally been characterized as symmetrical, HSS’ vowels have been found to exhibit a distinct organization that differs from the monolingual norms presented in Quilis and Esgueva (1983). In his study of New Mexican Spanish, Willis (2005) was the first to note a fronting of /u/ and lowering of /o/ in HSS. Boomershine’s (2012), and Ronquest’s (2012) investigations echoed Willis’ findings for HSS residing in North Carolina and Chicago, respectively, while also reporting a highly condensed back vowel space and a more widely dispersed front vowel space. Combined, these studies suggest that the heritage Spanish vowel space may not be as symmetrical and triangular as that described for monolingual native speakers of Spanish.

Additional findings in the vowel literature on HSS pertain to the impact of lexical stress and speech style on vowel production. Multiple studies of HSS across the United States have reported a greater tendency for unstressed vowels to reduce or centralize than what has been described for monolingual varieties of Spanish (Alvord and Rogers 2014; Boomershine 2012; Ronquest 2012, 2013; Willis 2005). Ronquest (2013) also found that atonic vowels were significantly shorter than tonic vowels but that the differences in vowel quality (i.e., centralization) observed in a semi-spontaneous speech task were not the result of the shorter duration of atonic vowels. Despite their differences with respect to organization and stress effects, however, the vowel production of HSS and monolinguals seem to be similarly affected by speech style. Vowels produced in informal tasks (e.g., sociolinguistic interviews, narrative re-telling tasks) were more centralized and condensed than those produced in formal, controlled word lists and carrier phrases (Alvord and Rogers 2014; Ronquest 2012). These findings are consistent with research on monolingual Spanish varieties (Harmegnies and Poch-Olivé 1992; Martín Butragueño et al. 2008), which also described a tendency for vowels produced in spontaneous speech to be less dispersed than those of formal speech.
2.3 Suprasegmentals

With regard to the prosodic system of HSS, very little previous work exists, and the few studies that we have seen were only realized in the last few years. Henriksen’s (2012) analysis of tonal configurations compared the features of various types of statements and interrogatives in the speech of Mexican HSS with those of native speakers. While both groups manifested very similar statement patterns, HSS demonstrated more variety in their interrogative tonal configurations than native speakers, possibly as a discursive resource emerging from language contact. However, HSS did not produce the final circumflex (i.e., rise-fall) pattern, which is typical of many Mexican varieties, as much as the native speakers. While this feature was absent in HSS speech, Henriksen claims that attrition is not an appropriate argument for HSS’ distinct final configurations. In a large-scale study, Hoot (2012) investigated the prosody-syntax interface in terms of presentational focus in HSS and native speakers. He first proposed an account of this phenomenon in Optimality Theory and put it to the test through a perceptual experiment with both subject groups. He discovered that both groups employed stress shift to convey presentational focus and that the two groups did not demonstrate differences. In sum, this study presented evidence for incorporating interfaces into current and future analyses of heritage grammars. Furthermore, Kim (2015) analyzed HSS and native Spanish speakers’ perception and production of lexical stress in verb minimal pairs (e.g., paso/pasó ‘I go ahead’/’he went ahead’ stressed vowels are bolded). She reported that HSS were less accurate in their perception of penultimate stress (i.e., perceiving paso as pasó) than their native monolingual peers, and also had a greater tendency to produce verbs with final stress in contexts that required penultimate stress (i.e., producing paso as pasó). Kim’s results suggest a mismatch between perception and production in the HSS group; while HSS’ accuracy scores in the perception task were significantly above chance and, although lower, did not differ significantly from those of native speakers, the HSS were significantly less accurate with respect to production. Finally, Robles-Puente’s (2014) work on monolingual and bilingual intonation and rhythm in Los Angeles incorporated two groups of HSS. His intonational findings, based on a variety of utterance types, demonstrated that HSS generally did not significantly differ between their Spanish and English speech, which suggests a lack of accommodation strategies. He also found that the intonation of HSS born in Los Angeles was closer to native-like than that of the adult early bilingual HSS group. Regarding rhythmic differences related to vowel duration and voicing, Robles-Puente observed that adult early bilinguals produced English trends when speaking both English and Spanish, whereas those born in Los Angeles tailored their rhythmic properties to reflect the norms of English or Spanish.
3 Moving forward

3.1 Specific directions

We will dedicate the remainder of this paper to encouraging avenues for future work on the segmental and suprasegmental phonetics and phonology of HSS. Pursuing the ideas outlined here, which are inspired by unaddressed issues in previous work on HSS, as well as by non-HS studies on Spanish and a variety of other languages, will better inform us about what may factor into a ‘heritage accent,’ and about some key differences between native and non- or near-native grammars.

From a segmental perspective, even though Rao’s (2014, 2015) extension on voiced stops shed further light on the phonetic and phonological system of HSS, his experiments did not include certain linguistic variables that have been included in fairly recent studies on the production of /bdg/ in native Spanish. For example, surrounding vowels have been noted as influencing the realizations of these stops. Additional factors to consider are word frequency, cognate status and, particularly in the case of /d/, its presence in past participles (Amengual 2012; Carrasco et al. 2012; Cole et al. 1999; Eddington 2011).

Researchers investigating the heritage Spanish vowel system also face a series of challenges, perhaps chief among them, a general lack of acoustic studies of monolingual Spanish vowels to which HSS’ vowel productions can be compared. Previous work on HSS’ vowels has primarily used as a point of reference the results of Quilis and Esgueva (1983), which is one of the most comprehensive, cross-dialectal studies of Spanish vowels to date. Given the advances in technology over the past decades and the vastly different methodologies employed across studies, however, the extent to which such comparisons are meaningful or truly demonstrative of similarities and differences between monolingual and heritage varieties is still unclear. In addition, Menke and Face (2010) emphasize the importance of comparing bilingual speakers not only to monolingual controls, but also to other bilingual populations. While such comparisons were particularly crucial for the late L2 learners analyzed in their study, researchers examining HSS’ vowel production may also find comparisons across groups of HSS who differ with respect to sociolinguistic generation (i.e., second, third, and so forth) insightful. In sum, future investigations should aim to employ comparable data elicitation instruments and include appropriate monolingual and bilingual control groups.

An additional and related challenge involves determining the impact of lexical stress on both bilingual and monolingual Spanish vowel production.
Nearly all of the studies on heritage Spanish vowels to date have reported larger stress-induced quality differences than what might be expected for monolingual Spanish, but the pattern of reduction does not suggest a general centralization toward schwa. While contact with English – a language which is characterized by considerable unstressed vowel reduction – likely has some influence on shaping heritage Spanish vowel systems, the role of lexical stress in Spanish is not yet completely understood; some investigators have reported very minimal quality differences between stressed and unstressed vowels in Spanish (e.g., Delattre 1969; Quilis and Esgueva 1983), while others have described the presence of notable phonetic differences (Martínez Celdrán 1984; Nadeu 2014). There remains the possibility that such phonetic reduction is inherent in some monolingual varieties, in which case what has thus far been cited as one of the main differences between heritage and monolingual vowel systems may actually reflect a similarity.

A final important direction for future research on heritage Spanish vowels entails obtaining the English (or majority language) vowel productions of the same speakers. Although previous studies have served to characterize the vowel system of HSS, the magnitude of influence of the majority system on the heritage system, and vice-versa, has yet to be fully explored. Thus far, only Alvord and Rogers (2014) have included analyses of both the English and Spanish vowel systems within the same group of bilinguals, reporting convergence of some vowel categories (e.g., English /æ/ and Spanish /a/). The inclusion of English or majority language vowel analyses in future studies, along with native monolingual control groups, as suggested above, will enhance our understanding of the vowel system as a whole.¹

Concerning the suprasegmental phonology of HSS, there is much room to explore this realm since previous work is relatively sparse. Due to the fact that the Autosegmental Metrical (AM) model (Ladd 1996, 2008; Pierrehumbert 1980) and the Spanish in the Tones and Break Indices (Sp_ToBI) framework (Beckman et al. 2002; Face and Prieto 2007) are currently the two most common theoretical tools to analyze the intonational phonology of Spanish, couching work in one or both of these models would be logical. A start would be to use Robles-Puente (2014) as a point of departure in attempting to increase our knowledge about the basic intonational patterns of various utterance types attested in HSS and compare them to documented trends of other speakers of their ancestral dialects and of dominant languages. This can be done from a phonetic standpoint by

¹ See also Konopka and Pierrehumbert (2010). Although their study focused primarily on Mexican Heritage English vowels, they did obtain Spanish vowel productions from native speakers living within the same community.
looking at, for example, peak alignment, height and scaling, or from a phonological lens by focusing on AM and Sp_ToBI pitch accent and boundary tone representations.

Further regarding the prosody and suprasegmental phonology of HSS, previous work on language contact situations and L2 learners can inspire fruitful future research avenues. One area that has seen increased exploration in recent years is speech rhythm, especially when comparing speakers of languages or dialects that demonstrate a stress-timed versus syllable-timed contrast (as done by Robles-Puente 2014). A key concept, which has been developed and modified over the years through the work of those such as Carter (2005), Gabriel and Kireva (2014), Grabe and Low (2002), Low et al. (2000), Low (1998), Low and Grabe (1995), and Thomas and Carter (2006) is the vowel variability index (PVI), or pairwise variability index (nPVI), which accounts for changes in vowel length, thus informing us about the rhythmic classification of languages and dialects. By referencing these studies on other languages, in addition to Robles-Puente (2014), we have a solid methodological foundation from which to study HSS’ speech rhythm in order to see if the stress-timing of English (or, for that matter, of any other majority language) influences these speakers’ ability to produce the more target-like syllable-timing in Spanish. A pair of researchers who have recently moved in this direction is Michnowicz and Griffith (2014), who examined speech rhythm in Spanish-English bilinguals residing in North Carolina. Preliminary analyses revealed that the heritage speakers’ Spanish nPVI values were slightly more stress-timed (i.e., English-like) than those reported in previous studies of monolingual Spanish varieties. Lastly, while (n)PVI is a common metric for looking at rhythm, it is important to mention that Harris and Gries’ (2011) study on native Mexican Spanish speakers and Spanish-English bilinguals called into question the utility of this metric, arguing that examining frequency data that is corpus-based is crucial to studying durational variability.

Anecdotally, many instructors of courses for HSS say that stress is one of the most difficult aspects for these speakers to perceive. That is, even though this prominence plays a phonological role in Spanish, HSS often cannot pick out stressed syllables in speech, including in their own speech. In Spanish, syllable weight is a cue that can be used to detect stress at the word level. One study on this topic, addressing perception in L2 learners, is Face (2005). He used nonce words (e.g., *fafurnal, landanson, bansil, tiroga*) showing variation in number and structure of syllables, while manipulating pitch and duration to be consistent in all syllables, in order to explore syllable weight as a cue to stress perception. He discovered some significant differences across learner levels, with more advanced students being more accurate in their perception of stress. Similar
laboratory work would be interesting to carry out with HSS. As we saw earlier, Kim (2015) has provided a valuable contribution in this area; however, the use of nonce words would be a unique methodological angle that would avoid potential confounds such as word frequency effects. A controlled task such as that of Face could be replicated using HSS with differing past and present social and academic experiences with the language (as corroborated through standardized surveys, questionnaires, etc.). In this fashion, one could correlate exposure to and use of Spanish with success in stress perception. Beyond syllable weight, modifications to duration, intensity, and pitch, or combinations of these acoustic cues to stress, could also be tested in order to see which cue or set of cues yields higher accuracy rates.

3.2 General factors to consider

We conclude this paper with some general remarks concerning future studies on the heritage Spanish phonological system, whether they are from a segmental or suprasegmental perspective. First, the studies cited in this paper deal mainly with HSS residing in the United States who are, to varying degrees, bilingual in Spanish and English. However, immigrants from Spanish speaking countries are all over the world, and thus, heritage Spanish phonology (among other linguistic realms) should be considered in a wider range of countries, especially those in which English is not the majority language. It is certainly possible that HSS who are bilingual in Spanish and a language other than English manifest a distinct phonological system from those in the United States due to the influence of a different dominant language.

Additionally, work on HS often discusses their grammars as being distinct from those of native speakers due to processes such as attrition, incomplete acquisition, and phonological leveling. However, in order to clearly see these processes play out, we need studies that are either longitudinal or cross-generational. The former option is not very feasible, given that it is logistically challenging to follow a group of speakers for the time needed to comment on the linguistic processes in question, but looking at young children with relatively little exposure to the dominant language, teenagers and young adults, as well as older adults, all within the same speech community, would at least provide some useful insight into phonological changes over time. Model studies of this sort are Hrycyna et al. (2011) and Nagy and Kochetov (2013), whose analyses of VOT across three generations of Italian, Russian, and Ukrainian HS in Toronto revealed cross-generational change.

Furthermore, we still do not have much commentary on the influence of extralinguistic factors on the phonology of HSS. For example, are there any
correlations between language attitudes, social networks, travel experiences, educational experiences, ancestral dialect and attitude toward it, contact with a specific parent, use of Spanish with siblings, etc., and a more native-like phonology? A useful starting point for exploring some of these factors is Potowski and Matts’ (2008) work on MexiRicans. Implementing a similar framework to that of their study, but gearing it specifically toward phonetics and/or phonology, would fill an existing research gap. One investigator who began addressing this gap is Ronquest (2012), who explored the connection between vowel production and extralinguistic factors, reporting that frequent travel to the heritage country, and Spanish use in a wider variety of contexts resulted in a potentially more native-like (i.e., farther back) production of /u/. Delving into such variables is quite challenging, however, due to the tremendous amount of individual variation that is present in populations of HSS, which even extends to methodological concerns such as the ability to read Spanish in data elicitation protocols and to think in Spanish on the spot when asked to produce spontaneous speech, among other issues. While it is methodologically challenging to grapple with such individual variation, attempting to address the role of extralinguistic variables in HSS’ phonology through the use of standardized materials, the meticulous recruitment of participants, and appropriate statistical models is an encouraged endeavor that could yield breakthroughs in our field. Adopting or modifying some of the materials in Oh and Au (2005) would be a useful point of departure.

Finally, in relation to variation, in studies on the heritage Spanish phonological system, it is crucial to clearly determine the baseline to which HSS are being compared. That is, the “non-native” phonological patterns we may claim to find in our participants could actually be due to childhood exposure to an already non-native variety belonging to their parents and/or other relatives. This is of particular importance in later generations of HSS. Also related to the idea of a baseline variety is accounting for the regional native dialect with which HSS had contact. For example, the most straightforward interpretation of non-native productions of /b/ in HSS in the United States is due to interference from English’s orthographic <v>. However, in some native varieties, such as Chilean Spanish, the allophone [v] is clearly evidenced (Sadowsky 2010), and as such, if we fail to consider the baseline of HS of Chilean varieties, we may be misguided when interpreting instances of [v].

4 Conclusion

In sum, we hope the present summary of work on the phonetic and phonological system of HSS and the subsequent discussion of topics that merit future
exploration lead to an increase in our area of research. Previous studies have laid a strong foundation for additional work in this field, facilitating in-depth, methodologically sound, and creative investigations that will offer additional insight into the similarities and differences between HSS and native speakers with respect to phonetics and phonology. Ultimately, such studies will permit the areas of phonetics and phonology to catch up to and complement other areas of linguistic inquiry concerning HSS.

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