A Preliminary Exploration of Declarative Intonation in the Chilean Diaspora of Sweden

Brianna Butera, Rajiv Rao, and Maryann Parada

Abstract: Motivated by a growing body of research on heritage Spanish prosody, the current study uses the Sp_ToBi framework for the transcription of Spanish intonation to report trends in phonological targets of broad focus declaratives produced by heritage speakers of Chilean Spanish living in Stockholm, Sweden. Data were collected via semi-structured interviews from six participants belonging to the same social network including two Spanish-dominant first-generation immigrants and four Swedish-dominant second-generation speakers who were born and raised in Sweden and are heritage speakers of Spanish. The G1 participants are the primary source of Spanish input for the G2 speakers. Data were analyzed by identifying word- and phrase-level phonological targets and associating them with the appropriate pitch accent and boundary tones. Results show that the heritage Spanish declarative intonation patterns of the G2 speakers closely resemble those of the G1 speakers. These patterns are scrutinized in terms of the potential influence of Swedish and/or other varieties of Spanish. This analysis exhibits evidence of the importance of source input variety and cross-generational transmission of phonological targets in a heritage language as well as the potential contributions of multiple intonational systems in forming the phonological inventory of heritage speakers.

Keywords: Chilean Spanish; boundary tone; declaratives; heritage speaker; intonation; pitch accent; Sweden

1. Introduction

While heritage phonetics and phonology have consistently lagged behind the study of other domains of heritage linguistic systems, within the last decade, we have significantly increased our knowledge of heritage Spanish phonetics and phonology. General evidence of this growth can be observed when chronologically comparing state-of-the-art type chapters that have been written on the topic (Rao 2019; Rao and Amengual 2021; Rao and Kuder 2016; Rao and Ronquest 2015; Ronquest and Rao 2018). However, upon closely examining the subfield of heritage accent, we continue to note the following trends in previous studies on relevant topics: (1) they deal with heritage speakers of Mexican Spanish; (2) they are based in the US, where the societally-dominant language is English; (3) they deal with segmental phenomena, meaning consonants and vowels; however, in his overview chapter on the sound systems of a broad range of heritage languages, Chang (2021) suggests that suprasegmental features appear to contribute more to what is often perceived as a “heritage accent”; (4) they tend to elicit data through relatively controlled tasks; (5) they often do not consider cross-generational change (or lack thereof), and when they do, they rarely analyze speakers from the same speech community, which helps shed light on the role of source input varieties in shaping heritage speakers’ linguistic outcomes (Pascual y Cabo and Rothman 2012).
In the current study, we take inspiration from points (1)–(5) above but also move beyond them by providing, to our knowledge, the first (and therefore, exploratory in nature) analysis of any aspect of the sound system of heritage speakers of Chilean Spanish who were raised and continue to reside in the Stockholm area of Sweden. In particular, we use unscripted data to acoustically analyze and phonologically transcribe the declarative intonation of not only a modest sample of Swedish-dominant heritage speakers of Chilean Spanish but also their Spanish-dominant, adult-immigrant relatives of a previous generation; in other words, the data all come from members of the same speech community who have frequent contact with one another. Additional aspects that distinguish the speakers in this study from those in most previous work on heritage Spanish are the unique sociopolitical circumstances that served as an impetus for the Chilean diaspora in Sweden, their now lengthy history as an established immigrant group in Sweden (spanning six separate decades), and the fact that geographically speaking, their homeland and country of immigration are extremely far from one another (unlike, for example, Mexico and the US), making exposure to geographically proximal varieties like Peninsular Spanish much more relevant.

The remainder of this paper is organized as follows: Section 2 offers detail on Chileans’ historical and modern existence in Sweden and linguistic research in this community, relevant frameworks of intonational phonology, and relevant findings from previous work on the intonation of homeland Chilean Spanish, Swedish, and heritage Spanish, all of which motivate the research questions posed at the end of this section; Section 3 describes our methodology in terms of participants, data collection instruments, and analytical techniques; Section 4 includes the descriptive results of our intonational transcriptions and compares these results by speaker generation; and Section 5 interprets the findings through the lens of previous work and explains how we have complemented or expanded upon it before mentioning limitations of the current study that hope to inspire future research.

2. Background

2.1. Chilean Diaspora in Sweden

In the years following Pinochet’s 1973 military coup in Chile, an estimated 200,000 citizens were forced into exile, leading to a large and widespread Chilean diaspora. Wright and Oñate (2005, p. 57) detail how Pinochet’s regime “used state terror to seize and retain control, systematizing the violation of human rights by employing arbitrary detention, torture, murder, and disappearance against those it deemed enemies”. These events were quickly followed by similar actions and mass flight in neighboring nations. Many Chileans initially sought asylum in embassies from which they received assistance to go into exile. Others escaped to neighboring nations, such as Peru and Argentina, which served as first stops until political unrest or other factors forced them out. However, most exiles departed Chile later between 1974 and 1976 under increasing government pressure and threats or to avoid prison sentences. The mass exile carried economic consequences, resulting in a second exodus in the 1980s and early 1990s despite the restoration of political democracy.

The Latin American nations of Mexico, Venezuela, Cuba, and Costa Rica were especially welcoming to exiles, and Brazil’s thriving economy welcomed many skilled Chileans (Wright and Oñate 2005). In North America, a significant number also settled in Canada, whereas the US, for political reasons, was not a popular destination until the latter economic exodus. Australia is also home to a sizeable Chilean diaspora. In Europe, the social democratic policies of France and Sweden allowed for the settlement of particularly large numbers of exiles. Today, the number of Chilean-born migrants in Sweden hovers just under 30,000, and their Swedish-born descendants now include great-grandchildren. According to Statistics Sweden (2022), they are among the most well-integrated migrant groups. A large-scale 2004 survey of Chilean-born and Chilean-origin individuals abroad published by the Chilean Ministry for Foreign Affairs and Chilean National Institute of Statistics made a similar observation, finding that 55% had adopted Swedish nationality (compared to only 22.5% in the US) and, although 91% still had direct family in Chile, only 17.5% visited Chile every year or two. However, the survey also found that 33% belonged
to a Chilean organization, such as a political association or sports group, a higher rate than in any of the other Chilean diasporas.

Although Chileans are by far the largest Spanish-speaking group in Sweden (comprising around 35%), they have been joined in recent decades by growing numbers of fellow Latin Americans of varied origin, particularly Colombia, Peru, Bolivia, and Central American nations, who, like their Chilean counterparts, have largely settled in the urban areas of Stockholm, Malmö, and Gothenburg. Immigration from Spain has also increased exponentially since the early aughts. Additionally, Spain is an extremely popular vacation destination for Chilean Swedes, where they experience regular intense linguistic contact with Peninsular dialects. Parada (2018) found that 39 of her 53 Chilean-Swede study participants had traveled to Spain at least once, though more commonly they had visited on multiple occasions, with many reporting spending several weeks there every summer. Participants also reported regular consumption of media out of Spain, often broadcast on Swedish television. In a study on dialect contact effects in the community, Parada (2021) noted certain high-frequency Peninsularisms like coche (car) and ordenador (computer) in several participants’ productions on a timed semantic association (i.e., lexical availability) task. She concludes that the productive presence of the items, although offered far less frequently and readily than the corresponding Chilean Spanish variants (e.g., auto and computador), may signal rather mature contact effects with Peninsular Spanish dialects.

In contrast with the massive Latinx/Hispanic minority in the US, Chileans do not figure among even the top 20 migrant groups in Sweden, making them a minority among minorities. In the broader immigrant context in Sweden, which currently accounts for a hefty 20% of the population, Middle Eastern and European origin groups are most heavily represented, with Syrians and Iraqis at the top and together constituting 16% of the immigrant population, followed by those of Finnish origin at 6.2%. By contrast, Latin Americans constitute only 3.8%, and, including those from Spain, a mere 4.4% of immigrants are native Spanish-speaking. Figure 1 displays the growth of the top immigrant Spanish-speaking groups in Sweden since the 1950s. Migration from Chile has slowed to a standstill over the last decade while other groups’ numbers climb, pointing to a rapidly changing Spanish language landscape.

![Figure 1. Foreign-born immigrant Spanish-speaking population in Sweden since 1950.](image)

Research on Spanish as a heritage language in this population has included qualitative work on the ethnolinguistic identities and language attitudes of Chilean-background youth (Baez-Duffy and Österberg 2021; King and Ganuza 2005), as well as multiple studies on language contact effects and bilingualism in the following areas: the role of aptitude in attrition (Bylund et al. 2010; Bylund and Ramírez-Galán 2016), temporal structuring patterns in bilingual cognition (Bylund 2011), use of discourse markers and linguistic feedback items (Bravo-Cladera 2010), adjective placement patterns (Parada 2018), lexical availability and cultural conceptualizations in the lexicon (Parada 2018), trilingual language contact and dialect contact (Parada 2021), and the relationship between heritage language
instruction and proficiency (Bylund and Diaz 2012; Parada 2018). The present study adds to this growing body of work on the characteristics of heritage Spanish in Sweden.

2.2. Autosegmental Metrical Model and Spanish in the Tones and Break Indices Framework

The current analysis to determine intonational patterns of Chilean Spanish in Sweden uses the autosegmental metrical (AM) model (Ladd 2008; Pierrehumbert 1980), whose basic tenets have inspired the formation of language-specific transcription systems for intonation, one of which is Spanish in the tones and break indices framework (Sp_ToBI; Beckman et al. 2002; Face and Prieto 2007; Hualde and Prieto 2015). The AM model operates within a rule-governed, suprasegmental hierarchy in which the various constituents are listed from smallest to largest, where the syllable is the smallest unit, and the utterance is the largest. While there are other versions of this hierarchy, we have chosen to use the one found in (1).

(1) Prosodic hierarchy

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
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<tbody>
<tr>
<td>U</td>
<td>Utterance</td>
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<tr>
<td>IP</td>
<td>Intonational Phrase</td>
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<tr>
<td>ip</td>
<td>Intermediate Phrase</td>
</tr>
<tr>
<td>PW</td>
<td>Prosodic Word</td>
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<tr>
<td>F</td>
<td>Foot</td>
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<td>σ</td>
<td>Syllable</td>
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The most relevant levels of the prosodic hierarchy as they pertain to the current study of Spanish declarative sentences are the two phrase levels: the intonational phrase (IP) and the intermediate phrase (ip) as well as the prosodic word (PW) level. When comparing the two phrase levels, speakers typically implement an intonational distinction to show a pragmatic contrast: I am finished speaking vs. I am not finished speaking and have more to say. The IPs, therefore, are larger meaning-bearing units and can be associated with a complete thought, manifesting through phonetic cues such as longer pauses and final lengthening. The ip, on the other hand, can be just a partial idea with shorter pauses, shorter final lengthening, and a rise to a high point at the ip boundary to indicate that the speaker is not finished talking yet, often followed by reset to a lower level. Dividing the phrases into IPs and ips is a way to separate the discourse into meaningful units, which can depend on informational or syntactic structure. Both IPs and ips are marked by a boundary tone at the right edge of the phrase: falling (L boundary), mid-level (M boundary), rising (H boundary), or some combination of these boundaries to form a complex boundary. Images and descriptions of the most common boundary tones in Spanish declaratives applicable at both IP and ip phrase boundaries are in Figure 2, where the vertical line represents the left edge of the final syllable of a PW in ip-nuclear or IP-nuclear phrase position.

Within each IP and ip for studies on intonation, separating each phrase into prenuclear and nuclear positions yields different prosodic behavior; for example, contours of PWs in nuclear position behave differently than in prenuclear position, in part because nuclear position is by default the strongest position in Spanish. Likewise, PWs in ip-nuclear position behave differently from those in IP-nuclear position. For the current study, the data target the movement associated with the stressed syllable of all PWs, or content words that have lexical stress (Hualde 2002). For PWs in prenuclear position, the stressed syllable associated with each one is associated with high (H) and low (L) mono- or bitonal targets, whereas at the phrase level, for PWs in nuclear position, the phonological targets are associated with phrase boundary tones at the right edge of the phrases (Gussenhoven 2004; Hualde 2003; Ladd 2008; Pierrehumbert 1980; among others). The phonological conventions used to identify ip phrase boundaries and IP phrase boundaries are - and %, respectively. For example, the phrase boundaries in Figure 2 would be labeled at the IP level as L%, M%, and H% and at the ip level as L-, M-, and H-.
L boundary: f0 is descending or flat, both associated with the lower end of the pitch range.

M boundary: f0 is descending or ascending, the end associated with a midpoint relative to its pitch range.

H boundary: f0 begins at either an L or H tone and then ascends, the end associated with a high point relative to its pitch range.

Figure 2. Pitch movements linked with monotonal phrase boundaries.

While there are many possible pitch accents based on dialectal variation, for the purpose of the current study, the most frequently cited are found in Figure 3 (based on Aguilar et al. 2009). Each individual diagram is divided by vertical lines into three sections, where the middle section represents the stressed syllable of a PW, the first third represents the pre-tonic syllable, and the last third the post-tonic syllable. The movement associated with this stressed syllable is the pitch accent labeled directly above or below its respective diagram. The symbol * identifies the tone with the strongest association to the stressed syllable, and the symbol ¡ is used to mark upstep, that is, a significantly higher H tone relative to the previous H tones within the same ip. Of these common pitch accents in Spanish, L+>H* is identified by a rising pitch accent throughout the stressed syllable reaching an H tone in the post-tonic, showing peak displacement indicated by the symbol > (the first panel of Figure 3). This pitch accent is most often found in prenuclear position in broad focus declaratives with gradual decay across an utterance, i.e., downstepping (Prieto 1998). The pitch accent L* is often found in nuclear position and is frequently followed by an L% boundary indicating the completion of a thought. L+H* is typical of narrow focus, showing the prominence of a particular item, often associated with nuclear position, which is the strong position in Spanish. This pitch accent can, however, be found in prenuclear position to highlight a particular item (Face 2001; Hualde 2002).
while nuclear position yielded the frequent L+!H* (peak within the stressed syllable but lower than the previous one) and the less frequent !H+L* (falling from a high point that is still lower than the previous peak). While tasks across studies on Santiago Spanish have varied, these results generally reflect those of previous work on the intonation of this region couched in the AM model (e.g., Cid et al. 2000; Cid and Ortiz 2000; among others). It is worth noting that the patterns outlined here for prenuclear position reflect those of previous work on Chilean Spanish, where peak displacement is the norm; however, nuclear position displays divergence, with pitch suppression to an L* being most common in Peninsular Spanish (see Estebas-Vilaplana and Prieto 2010; Face 2001; among many others).

In terms of other findings on Chilean Spanish since 2010, Rogers (2013, 2020) and Rogers et al. (2020) detail a novel “hat pattern” found in spontaneous interview data, which they have analyzed from various angles, including as a manner of conveying extended focus, as a feature originating in contact with Mapudungun, and as a byproduct of time compression caused by the drastic speech rate increases employed when realizing these rise–plateau–fall movements. It should be noted that these studies include falling movements resembling the H+L* pitch accent. As such, one can ascertain that this pitch accent characterized by descending movement actually may be more common in Chilean Spanish.

Figure 3. Common pitch accents in Spanish where the middle section of each diagram represents the stressed syllable of the PW and its associated pitch accent. 2

2.3. Relevant Notes on Chilean Spanish Declarative Intonation

Within the field of Spanish intonation, Chilean varieties remain relatively understudied; however, there is sufficient data on different types of pitch accents and boundary tones that help form an object of comparison with the Chilean-Swede data that comprise the present study. Ortiz et al. (2010) give the most comprehensive summary of the topic, where they mention that it was studied as far back as the 1950s, has been linked to geographies such as Concepción, Santiago, and Valdivia, and after the turn of the century, has resulted in studies couched within the AM model. Here, we summarize findings from Santiago given that it is the homeland variety to which our speaker pool has had the greatest exposure. Furthermore, given that we are mainly interested in broad focus (neutral) declaratives in the current study, rather than providing an exhaustive list of phonological targets yielded from previous work on Chilean Spanish, we will restrict ourselves to prenuclear and nuclear pitch accents, boundary tones, and nuclear configurations dealing with this specific utterance type and pragmatic context.

Ortiz et al. (2010), who used a discourse completion task tailored to Chilean Spanish, report trends in Santiago Chilean Spanish intonation for a variety of utterance types; for broad focus declaratives in particular, they found that the most common prenuclear pitch accent was L+>H* (rise through the stressed syllable culminating in a post-tonic peak), while nuclear position yielded the frequent L+!H* (peak within the stressed syllable but lower than the previous one) and the less frequent !H+L* (falling from a high point that is still lower than the previous peak). The most highly attested boundary tone is L%, meaning the most common nuclear configuration is L+!H* L%. While tasks across studies on Santiago Spanish have varied, these results generally reflect those of previous work on the intonation of this region couched in the AM model (e.g., Cid et al. 2000; Cid and Ortiz 2000; among others). It is worth noting that the patterns outlined here for prenuclear position reflect those of broad focus declaratives in Peninsular Spanish, where peak displacement is the norm; however, nuclear position displays divergence, with pitch suppression to an L* being most common in Peninsular Spanish (see Estebas-Vilaplana and Prieto 2010; Face 2001; among many others).
declaratives than previously thought, although the question of how often it occurs in broad focus remains unclear. Finally, these more recent studies are all based on naturalistic data, which differ from those of older studies, so it could be the case that speech style has a function in the presence of this fall pitch accent as well.

2.4. Relevant Notes on Stockholm Swedish Intonation

Investigations on the intonational phonology of varieties of Swedish were initiated in the 1970s and have received significant attention across the decades since then (see, e.g., Bruce 1977, 2005, 2007, among others; Gussenhoven and Bruce 1999; Myrberg 2010, 2021; Myrberg and Riad 2015, 2016; Riad 1998, 2006, 2012). Despite this range and depth of work, here, as in our section on Chilean Spanish, we will limit our discussion solely to concepts that inform the analysis put forth in subsequent sections of this paper. Given our data collection site, this also means that we will highlight relevant aspects of Stockholm Swedish.

Myrberg (2021) presents an excellent and relatively recent overview of issues surrounding the conceptual framework of the current study that is grounded in the work cited above. One takeaway from this paper is that Stockholm Swedish and Spanish differ in that the former contains a prominence-based tonal distinction between pitch accents; that is, those that are perceptually more salient are known as big accents (called focus accents by others), while those that are less salient are labeled small accents (called word accents by others). Within each of these two categories, there are two types of tone accents that create distinctions at the lexical level: tone accent 1 (also referred to as acute) and tone accent 2 (also termed grave). In terms of contour shape, within the small accent category, both tone accents exhibit falling movement (tone accent 1: HL*; tone accent 2: H*L), whereas within the big accent category, we note either rising movement (tone accent 1: L*H) or high–low–high (medial sag) movement (tone accent 2: H*LH or H*L*H). Within the big accent category, morphology plays a role, with tone accent 1 and the first representation of tone accent 2 being linked to simple words, and the second sequence of targets of tone accent 2 being used in compounds. Concerning phrasing in general, while much previous work on Swedish did not view a distinction between two levels of phrasing as necessary, more recent work, such as Myrberg (2021) and Myrberg and Riad (2015), do indeed propose two levels within their prosodic hierarchy: the prosodic phrase (lower level, similar to the ip for Spanish; also houses prosodic words, a level intimately linked to small accents) and the intonation phrase (higher level). Within these two levels, the two studies just cited support a distinction between nuclear and prenuclear representations within the big accent category (a stance not often taken in previous work), with the former being at the far right of an intonation phrase, serving as its head phrase, and having a role in focus tied to information structure, while the latter is situated anywhere left of the former at the intonation phrase level, heads prosodic phrases, and helps with phrase-parsing rather than information structure. While there has been debate in the literature on Swedish regarding the number of big accents per sentence (only one or more than one), Myrberg (2021) provides experimental data showing that multiple big accents are commonly manifested in a sentence. Another notion related to the prenuclear big accent subcategory is that of the initiality accent, which is when such accents serve as a leftward signal to the beginning of a prosodic phrase; its counterpart is a default version that aligns with the right edge of a prosodic phrase. It is worth noting that big and small accents coexist within the overall prenuclear realm. Lastly, regarding boundary tones, as in Spanish, a fall to L% is typical in Swedish. An H tone associated with the big accents referred to above, which exhibits variation in its timing relative to a preceding tone accent, serves as a cue to focus (see Gussenhoven and Bruce (1999) for a detailed discussion).

2.5. Relevant Previous Work on Heritage Spanish Intonation

In this section, we will look at a series of studies from the relatively small body of literature on heritage Spanish intonation to date that have helped motivate and mold the current study’s research agenda. Studies at the heart of the matters taken up in our analysis
are outlined in more detail, while those that are relevant yet somewhat peripheral are briefly noted, mainly to support or supplement insight arising from the core studies.

The first pair of studies on the Spanish intonation of Spanish-English bilinguals who fit the description of heritage speakers was Alvord’s (2009, 2010) investigation of Miami Cubans, where he compared broad focus declaratives and yes-no questions. His analyses generated three main takeaways: first, the wider pitch range of questions set them apart from declaratives; second, questions could end in either a rising or falling movement, indicative of either an English or Cuban Spanish pattern, respectively; and third, a comparison across three generations of question data demonstrated that the first and third generations preferred the Cuban Spanish falling movement, while the second generation favored the rising trend, with the social circles of participants playing a key role in conditioning the results. Moving from Florida to Los Angeles, the portion of Robles-Puente’s (2014) dissertation addressing intonation revealed that his Mexican Spanish-English bilingual heritage speakers’ Spanish and English intonational systems were strikingly similar across a range of utterance types. An unexpected finding in this dissertation was that the Spanish intonation of participants born in the US more closely reflected monolinguals’ rather than that of those who came to the US from Mexico as youngsters. Furthermore, Colantoni et al.’s (2016) comparison of the broad focus declaratives of heritage speakers and long-term immigrants identifies differences among the phonological targets produced across groups in data coming from a controlled reading task; however, the two groups exhibited similarities in a narrative task. This is a key methodological contribution to the field and is quite logical given that heritage speakers typically use their heritage language in ways that do not depend on literacy skills. Next, Rao (2016) conducted an analysis of nuclear movements in declaratives and questions across a series of pragmatic contexts in a group of Mexican heritage speakers in the midwestern US and compared their trends to those cited for homeland Mexican Spanish. He discovered that while the heritage speakers did not show as much pragmatically-based nuclear variation in declaratives, their data yielded just as much complexity in questions, although the type of complexity differed from what was observed in homeland speech. In conclusion, he emphasized the crucial role of source input when interpreting variation observed within heritage speaker groups and when drawing comparisons between heritage and homeland varieties. Finally, in a recent study inspired by the findings and limitations of Rao (2016), Aziz et al. (2022) recruited Argentinian and Venezuelan heritage speakers residing in Ontario, Canada, as well as their adult-immigrant parents and monolingual English-speaking controls, to participate in a task eliciting yes-no questions in both English and Spanish. Regarding the Spanish productions of the heritage speakers, they demonstrated a higher rate of English influence than their parents but also showed significant within-group variation. Interestingly, innovative phonological targets emerged in heritage speech as well, suggesting that source input from parents on top of majority language influence can generate new intonational structures. On a related note, in a more phonetically grounded study, Rao et al.’s (2022) exploration of the intonational reflexes of sarcastic and sincere meanings in heritage speakers of Spanish in the US also pointed to the importance of considering both dominant language (English, in this case) and parental (or source input) trends. Spanish pitch manipulations in Spanish-English bilingual heritage speakers pointing to English influence have also been highlighted in studies on information structure (e.g., Gries and Miglio 2014; Harris et al. 2015). Additionally, the notion of innovation or hybridity emerging from the diverse variables alluded to in Aziz et al. (2022) is reflected in Kim (2019) as well, where she finds that heritage speakers creatively use both syntax and prosody to signal narrow focus, while monolinguals and L2 learners clearly favor one strategy. Thematically tied to Kim (2019) is Feldhausen and del Mar Vanrell’s (n.d.) study on German-dominant heritage speakers of Peninsular Spanish (the only relevant study situated in Europe), where the authors also revealed distinct strategies employed by heritage speakers versus monolingual controls when expressing narrow information and contrastive focus. For both categories of focus, the former exhibited a preference for stress shift, while also using p-movement and
simple clefts to a lesser degree, whereas the latter avoided stress shift and distinguished productions based on focus type, employing pseudo-clefts and p-movement for narrow information focus and simple clefts and focus fronting for contrastive focus. Finally, the last pair of studies to which we should draw attention, by Kim and Repiso-Puigdelliura (2021) and Kim (2023), deals with uptalk in heritage speakers of Mexican Spanish in California. While this feature is commonly tied to California English, the former study actually shows that it is present in the Spanish of both heritage speakers and monolingual speakers of Mexican Spanish, but is manifested in different ways (pointing to majority language influence in the former group), revealing that understanding the origin of intonational phenomena attested in heritage speech requires delving deeper into comparison groups rather than defaulting to majority language influence alone. The latter study expanded upon the former, couching itself in L2 Intonation Learning Theory (LiLT; Mennen 2015) to demonstrate that phonetic and phonological variation in the English and Spanish uptalk of heritage speakers of Spanish is a complex issue in which crosslinguistic effects vary based on the multiple dimensions called up in LiLT.

2.6. Research Questions

Based on the findings presented to this juncture as well as the gaps we have identified, we seek to address the following questions in subsequent sections of this paper: (1) What is the inventory of Spanish phonological targets (pitch accents, boundary tones, and combinations of them) in declaratives produced by adult-immigrant and heritage speakers of Chilean Spanish in Sweden?; (2) What are potential factors that could be contributing to shaping this inventory?; (3) Do we observe evidence of cross-generational transmission of phonological targets in members of the same minority-language speech community?

3. Materials and Methods

3.1. Data Collection

The data analyzed in this study were originally collected for a project exploring crosslinguistic influence at the syntax-semantics/pragmatics interfaces of evaluative adjective placement (Parada 2011, 2018). The participants, all ethnic Chileans recruited using snowball sampling, included 11 second-generation (G2) Swedish-dominant heritage speakers residing in Stockholm, three first-generation (G1) Spanish-dominant speakers also in Stockholm, and three monolingual Spanish speakers in Chile. In addition to a Spanish language use questionnaire and proficiency test, they completed a series of tasks: a written grammaticality judgment task, aurally-supported multiple-choice tasks, and an interview-based storytelling narrative. The present study draws from data obtained in the latter narrative task. Although these data were not collected for the purposes of phonetic/acoustic analysis, through inspection of recording quality and impressionistic judgments of the uniqueness of the participants’ prosodic patterns, we decided to repurpose the data toward the goals of this study.

For the current analysis, we selected six total participants from the data set: two Spanish-dominant G1 speakers, ages 59 and 50, who, at the time of the interviews, had been living in Sweden for 32 and 20 years, respectively, and four Swedish-dominant G2 speakers in the same social network, ages 37, 36, 33, and 31, who were born and raised in Sweden or moved there upon beginning school. The younger two G2 speakers are siblings and the children of the 59-year-old G1 speaker; the older two G2 speakers are also siblings and the 59-year-old G1 speaker’s nephews. These speakers are in the same social network since the G1 speakers serve as the primary source of Spanish input for the G2 speakers.

During the interviews, participants were asked to narrate a series of images depicting the familiar childhood fairy tale, “Little Red Riding Hood” in their own words using at least 1–2 sentences per image and including as much detail as possible. Using this type of task lessens the effects of the observers’ paradox (Labov 1972) by attempting to elicit natural, unscripted speech. The most commonly cited intonational trends for neutral Spanish declaratives mentioned in Section 2.2 represent those found in laboratory speech, where researchers can control the variables by creating the ideal environment for data collection.
However, considering the semi-spontaneous task used to collect speech samples in the current data set, contrasting laboratory and spontaneous speech and how these variables manifest in the acoustic analysis is particularly relevant (cf. Face 2003). Factors such as turn-taking strategies, emotion, and other variable pragmatic contexts found in spontaneous speech lead to increased deaccenting, frequent stressed syllable peak alignment (as opposed to peak displacement to the post-tonic), and less downstepping and final lowering. This analysis, even with the use of semi-spontaneous data collection, further informs previous work on Spanish declarative intonation among unique speaker populations like the Chilean Spanish heritage speakers in this study.

3.2. Acoustic Analysis

Recorded data were analyzed using **Praat** (Boersma and Weenink 2022) to identify perceptibly neutral declarative utterances via phonetic cues and divide them into the two phrasal levels: ips and IPs (cf. Rao 2009, 2010). Other phrase types, such as interrogatives or narrow focus declaratives were not included in the analysis. Considering the semi-spontaneous nature of the image-narration task, speakers at times used one-word utterances or 2–3-word phrases; during the data collection, all efforts were made to ensure the selection of clear, defined declarative utterances. As mentioned previously, IPs were identified by longer pauses at the end of a speaker’s complete thought, which were accompanied by considerable final lengthening, and smaller ips were identified by a pitch reset, shorter pauses, and final lengthening. Following the identification of IPs and ips, each was assigned a boundary tone at the right edge of the phrase. A total of 200 IPs and 349 ips were analyzed in the current data set. After coding for all ips and IPs, locating the peaks and valleys with respect to the beginning and end of stressed syllables yielded the transcription of pitch accents for 1449 stressed content words, 607 for G1 speakers and 842 for G2 speakers, using the most recent AM and Sp_ToBI conventions (cf. Prieto and Roseano 2010). Of the 1449 stressed content words, 66.5% (964/1449) exhibit the paroxytone stress pattern, 32.9% (476/1449) exhibit the oxytone stress pattern, and <1% (9/1449) exhibit the proparoxytone stress pattern. Because most of the stressed content words show either the paroxytone or oxytone stress pattern, frequent peak alignment within the stressed syllable could not be attributed to stress pattern, that is, a tendency of early peak alignment in stressed content words with oxytone stress patterns (cf. Hualde 2002). The position within the larger IPs and smaller ips was coded as either prenuclear or nuclear where 62.1% (900/1449) of the stressed content words were in prenuclear position. The stressed content words in nuclear position were divided into two groups: those that were in ip-nuclear position but not IP-nuclear position and those that were in ip-nuclear position as well as IP-nuclear position, or rather IP-final. By using these subdivisions of nuclear position, we were able to compare intonational patterns and boundary tones at both phrasal levels, the smaller intermediate phrase and the larger IP, to determine how speakers signal the continuation or completion of a thought.

Figures 4–7 below show sample contours for declarative utterances by G1 and G2 speakers. The contours highlight H+L* pitch accents in prenuclear position where peak displacement, L+>H*, would be found in more commonly cited varieties of Spanish. Speakers also use an H- boundary at non-terminal junctures to indicate that they have not finished speaking and an L% boundary in IP-nuclear position to show completion of a thought.
Speakers also use an H- boundary at non-terminal junctures to indicate that they have not finished speaking and an L% boundary in IP-nuclear position to show completion of a thought.

**Figure 4.** $f_0$ contour by a G1 speaker representing the production of *de usar ese traje, lo usaba todo el tiempo para jugar y salir*, ‘using that suit, she used it all the time to play and go out’.

**Figure 5.** $f_0$ contour by a G1 speaker representing the production of *y en un canasto y hecho muchas, eh, cosas*, ‘and in the basket and made many, um, things’.
4. Results

Results for the current analysis are divided into prenuclear and nuclear pitch accents since research shows that intonational patterns exhibit distinctions between these two positions. Additionally, content words in nuclear position include both pitch accents and boundary tones. This section will first discuss prenuclear pitch accents and then move on to nuclear configurations.

4.1. Prenuclear Pitch Accents

The pitch accents of stressed content words in prenuclear position by both G1 speakers and G2 speakers in Table 1 do not conform to the intonational patterns of the more commonly cited varieties of Spanish mentioned in Section 2.2. The most common pitch accent found in the data set among both G1 speakers and G2 speakers is (¡)H+L*, occurring in 41.3% and 46.6% of cases, respectively. The upstepped variant of this pitch accent ¡H+L* represents only 7/169 cases for G1 speakers and only 2/229 cases for G2 speakers. The second most common pitch accent in prenuclear position for both groups of speakers is H+L*.
accent found in the data set among both G1 speakers and G2 speakers is (¡)H+L*, occurring in 41.3% and 46.6% of cases, respectively. The upstepped variant of this pitch accent ¡H+L* represents only 7/169 cases for G1 speakers and only 2/229 cases for G2 speakers. The second most common pitch accent in prenuclear position for both groups of speakers is L+(¡)H*, at 27.1% for G1 speakers and 23.4% for G2 speakers where 11/111 cases for G1 speakers and 9/115 cases for G2 speakers exhibit the upstepped variant L+¡H*. Also noteworthy is that the third most common pitch accent found among both groups of speakers is (¡)H*, in 25.2% and 14.9% of cases, respectively. The three most common pitch accents in prenuclear position for G1 and G2 speakers include an H tone aligned within the stressed syllable in 93.6% of words for G1 speakers and 84.9% of words for G2 speakers, which diverges from patterns found in more commonly cited varieties of Spanish, such as Peninsular Spanish, for example, where post-tonic peak alignment, or L+>H*, is typical. In the current data, this pitch accent is only found in 4.2% and 2.9% of cases for G1 and G2 speakers, respectively. In addition to the high frequency of H tones aligned with the stressed syllable, of particular interest to the current study are the similarities between both generations of speakers in terms of both frequency and type of pitch accent, pointing to the role of source input variety: G1 > G2.

Table 1. Pitch accents of stressed words in prenuclear position by G1 speakers and G2 speakers.

<table>
<thead>
<tr>
<th>Pitch Accent</th>
<th>G1 Frequency (n = 409)</th>
<th>G2 Frequency (n = 491)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(¡)H+L*</td>
<td>41.3% (169/409)</td>
<td>46.6% (229/491)</td>
</tr>
<tr>
<td>L+(¡)H*</td>
<td>27.1% (111/409)</td>
<td>23.4% (115/491)</td>
</tr>
<tr>
<td>(¡)H*</td>
<td>25.2% (103/409)</td>
<td>14.9% (73/491)</td>
</tr>
<tr>
<td>L*</td>
<td>1.7% (7/409)</td>
<td>10.6% (52/491)</td>
</tr>
<tr>
<td>L+&gt;(¡)H*</td>
<td>4.2% (17/409)</td>
<td>2.9% (14/491)</td>
</tr>
<tr>
<td>Other</td>
<td>&lt;1% (2/409)</td>
<td>1.6% (8/491)</td>
</tr>
</tbody>
</table>

4.2. Nuclear Configurations

4.2.1. Non-Terminal ips

As with prenuclear pitch accents, pitch accents of stressed words in ip-nuclear position at non-terminal junctures yield similar trends across generations, supporting evidence of cross-generational transmission. Table 2 shows that the most common pitch accents at non-terminal ips are L+(¡)H* and (¡)H+L*, where they represent more than 80% frequency among G1 and G2 speakers in this position. The upstepped variants of these pitch accents, L+¡H* and ¡H+L are present in 4.4% (7/158) and 6.3% of cases (10/158), respectively, for G1 speakers and 12.6% (24/191) and 1.6% (3/191) for G2 speakers. The most frequent pitch accent found in this position, L+(¡)H*, reflects Chilean Spanish, whereas the second most frequent, (¡)H+L* is more indicative of Swedish, although less commonly attested in Chilean Spanish as well.

Table 2. Pitch accents of stressed words in ip-nuclear position when ips are at non-terminal junctures by G1 speakers and G2 speakers.

<table>
<thead>
<tr>
<th>Pitch Accent</th>
<th>G1 Frequency (n = 158)</th>
<th>G2 Frequency (n = 191)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L+(¡)H*</td>
<td>44.9% (71/158)</td>
<td>53.4% (102/191)</td>
</tr>
<tr>
<td>(¡)H+L*</td>
<td>36.7% (58/158)</td>
<td>29.3% (56/191)</td>
</tr>
<tr>
<td>(¡)H*</td>
<td>10.1% (16/158)</td>
<td>7.9% (15/191)</td>
</tr>
<tr>
<td>L*</td>
<td>5.7% (9/158)</td>
<td>5.8% (11/191)</td>
</tr>
<tr>
<td>Other</td>
<td>2.5% (4/158)</td>
<td>3.7% (7/191)</td>
</tr>
</tbody>
</table>

Boundary tones associated with ip-nuclear position at non-terminal junctures show similar cross-generational trends. As shown in Table 3, the most frequent boundary tone for both G1 and G2 speakers is H-, at 57.6% (91/158) and 49.5% (98/191), respectively. An H- boundary at the end of ips is most frequent in Spanish as well, as mentioned in Section 2.2,
where rising pitch movement indicates that the speaker has not yet completed their thought. The prevalence of the L- at the ip boundary occurs in 37.3% of cases (59/158) for G1 speakers and 39.4% (98/191) for G2 speakers, which is not typically found in ip-nuclear position at non-terminal junctures.

Table 3. Boundary tones in ip-nuclear position when ips are at non-terminal junctures by G1 speakers and G2 speakers.

<table>
<thead>
<tr>
<th>Boundary Tone</th>
<th>G1 Frequency (n = 158)</th>
<th>G2 Frequency (n = 191)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-</td>
<td>57.6% (91/158)</td>
<td>49.5% (98/191)</td>
</tr>
<tr>
<td>L-</td>
<td>37.3% (59/158)</td>
<td>39.4% (78/191)</td>
</tr>
<tr>
<td>M-</td>
<td>3.8% (6/158)</td>
<td>4.2% (8/191)</td>
</tr>
<tr>
<td>HL-</td>
<td>---</td>
<td>2.1% (4/191)</td>
</tr>
<tr>
<td>LH-</td>
<td>1.3% (2/158)</td>
<td>1.6% (3/191)</td>
</tr>
</tbody>
</table>

Table 4 combines both pitch accents and boundary tones to show the most common ip-nuclear configurations used among both groups of speakers. Frequencies again show evidence of cross-generational transmission where configurations for G1 speakers are found at similar rates for G2 speakers as well. The most common ip-nuclear configuration for G1 and G2 speakers is L+(¡)H*H-, employed in 27.2% (43/158) of cases for G1 speakers and 35.6% (68/191) of cases for G2 speakers, where only 1/43 show the upstepped variant L+¡H*H- for G1 speakers and 18/68 for G2 speakers. The second most common ip-nuclear configuration found for both G1 and G2 speakers is ¡H+L*L-, representing 19.6% (31/158) of configurations for G1 speakers and 20.9% (40/191) for G2 speakers. The upstepped variant ¡H+L*H- is present in 5/31 for G1 speakers and only 1/40 for G2 speakers. Nuclear configuration frequencies in Table 4 show that speakers are employing the same two pitch accents, L+(¡)H* and ¡H+L* with both H- and L- boundary tones at non-terminal junctures. Most important to note are the similar frequencies used by both groups of speakers, showing evidence of cross-generational transmission and the strength of the source input variety.

Table 4. ip-nuclear configurations by G1 speakers and G2 speakers.

<table>
<thead>
<tr>
<th>Nuclear Configuration</th>
<th>G1 Frequency (n = 158)</th>
<th>G2 Frequency (n = 191)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L+(¡)H*H-</td>
<td>27.2% (43/158)</td>
<td>35.6% (68/191)</td>
</tr>
<tr>
<td>¡H+L*L-</td>
<td>19.6% (31/158)</td>
<td>20.9% (40/191)</td>
</tr>
<tr>
<td>¡H+L*H-</td>
<td>15.8% (25/158)</td>
<td>6.8% (13/191)</td>
</tr>
<tr>
<td>L+(¡)H*H-</td>
<td>15.2% (24/158)</td>
<td>13.1% (25/191)</td>
</tr>
<tr>
<td>¡H<em>L</em>H-</td>
<td>8.2% (13/158)</td>
<td>5.8% (11/191)</td>
</tr>
<tr>
<td>Other</td>
<td>17.7% (28/158)</td>
<td>17.3% (33/191)</td>
</tr>
</tbody>
</table>

4.2.2. IP-Nuclear Configuration

In IP-nuclear position at terminal junctures, both G1 and G2 speakers show a preference for the ¡H+L* pitch accent. The frequency of this pitch accent is higher at IP boundaries than at ip boundaries (Table 1), suggesting that the majority language influence may enter certain prosodic levels prior to others. Table 5 shows that this pitch accent represents 60% (24/40) of stressed words in IP-nuclear position at terminal junctures for G1 speakers and 53.1% (85/160) for G2 speakers where upstepped variants are 5/24 for G1 speakers and 1/85 for G2 speakers. Noteworthy for IP-nuclear position is the second most common pitch accent since it is not the same for G1 and G2 speakers. G1 speakers employ L+(¡)H* in 27.5 (11/40) cases whereas G2 speakers only employ this pitch accent in 15% (24/160) of cases. More common in IP-nuclear position for G2 speakers is the L* pitch accent present in 28.1% (45/160) of stressed content words in this position. The L* pitch accent is only present in 5% (2/40) cases for G1 speakers, showing different patterns between the two generations. This pattern is more common in Peninsular Spanish than in
homeland Chilean Spanish (see, e.g., Ortiz et al. 2010; Estebas-Vilaplana and Prieto 2010); therefore, this could suggest that there may be three source input varieties in play for the G2 speakers: Stockholm Swedish, Chilean Spanish, and Peninsular Spanish, where the latter may be used in specific instances but not transferred from G1.

Table 5. Pitch accents of stressed words in IP-nuclear position when ips are at terminal junctures by G1 speakers and G2 speakers.

<table>
<thead>
<tr>
<th>Pitch Accent</th>
<th>G1 Frequency (n = 40)</th>
<th>G2 Frequency (n = 160)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(¡)H+L*</td>
<td>60.0% (24/40)</td>
<td>53.1% (85/160)</td>
</tr>
<tr>
<td>L+(¡)H*</td>
<td>27.5% (11/40)</td>
<td>15% (24/160)</td>
</tr>
<tr>
<td>L*</td>
<td>5% (2/40)</td>
<td>28.1% (45/160)</td>
</tr>
<tr>
<td>(¡)H*</td>
<td>5.0% (2/40)</td>
<td>2.5% (4/160)</td>
</tr>
<tr>
<td>Other</td>
<td>2.5% (1/40)</td>
<td>1.3% (2/160)</td>
</tr>
</tbody>
</table>

The most common boundary tone exhibited by both G1 and G2 speakers in IP-nuclear position is L%, occurring in at least 90% of cases for each group as seen in Table 6. This is to be expected since the L% boundary is used almost exclusively in this position in declarative utterances in both Spanish and Swedish.

Table 6. Boundary tones in IP-nuclear position when ips are at terminal junctures by G1 speakers and G2 speakers.

<table>
<thead>
<tr>
<th>Boundary Tone</th>
<th>G1 Frequency</th>
<th>G2 Frequency (n = 160)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L%</td>
<td>90.0% (36/40)</td>
<td>91.3% (146/160)</td>
</tr>
<tr>
<td>H%</td>
<td>5.0% (2/40)</td>
<td>6.9% (11/160)</td>
</tr>
<tr>
<td>HL%</td>
<td>5.0% (2/40)</td>
<td>---</td>
</tr>
<tr>
<td>M%</td>
<td>---</td>
<td>1.9% (3/160)</td>
</tr>
</tbody>
</table>

Combining the pitch accents and boundary tones below in Table 7 shows the most common IP-nuclear configurations for both G1 and G2 speakers in Spanish. The most frequent nuclear configuration for G1 speakers is (¡)H+L*L% at 57.5% (23/40) where 5/23 cases show upstep. Similarly, for G2 speakers, this nuclear configuration is found in 51.9% (83/160) of cases where only 1/83 instances exhibit upstep. The high frequency of this configuration again is evidence of cross-generational transmission. As mentioned previously, the prevalence of the L*L% configuration among G2 speakers could indicate multiple source input varieties including Peninsular Spanish, where L*L% is the preferred nuclear configuration in broad focus declaratives in addition to Stockholm Swedish and Chilean Spanish.

Table 7. IP-nuclear configurations by G1 speakers and G2 speakers.

<table>
<thead>
<tr>
<th>Nuclear Configuration</th>
<th>G1 Frequency (n = 40)</th>
<th>G2 Frequency (n = 160)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(¡)H+L*L%</td>
<td>57.5% (23/40)</td>
<td>51.9% (83/160)</td>
</tr>
<tr>
<td>L+(¡)H*L%</td>
<td>20.0% (8/40)</td>
<td>8.1% (13/160)</td>
</tr>
<tr>
<td>H*L%</td>
<td>5.0% (2/40)</td>
<td>1.9% (3/160)</td>
</tr>
<tr>
<td>L*L%</td>
<td>5.0% (2/40)</td>
<td>28.1% (45/160)</td>
</tr>
<tr>
<td>L+(¡)H*H%</td>
<td>5.0% (2/40)</td>
<td>6.3% (10/160)</td>
</tr>
<tr>
<td>Other</td>
<td>7.5% (3/40)</td>
<td>3.8% (6/160)</td>
</tr>
</tbody>
</table>

This section has reviewed the pitch accents, boundary tones, and nuclear configurations for this variety of Spanish in two generations of speakers within the same social network. Overall, trends show strong evidence for cross-generational transmission and the importance of the source input variety in the production of Spanish by second-generation speakers. The following section will contextualize these results and draw conclusions.
about the involvement of multiple intonational systems in the phonological inventory of second-generation Chilean Spanish speakers living in Sweden.

5. Discussion and Conclusions

Recall that the three primary drivers of the analysis laid out in the current paper deal with the set of Spanish phonological targets produced by Chilean Swedes at the word- and phrase-level in broad focus declaratives; possible influences that would help interpret these intonational phonological outcomes; and evidence of convergence or divergence of the results across the two generations of participants. While all explanations put forth in subsequent portions of this section are certainly plausible based on previous knowledge of relevant topics, we reiterate that our findings are preliminary and exploratory and should be interpreted cautiously and as inspiration for further exploration along new yet related research avenues, to which we will return at the end of this section.

Regarding phonological targets, in prenuclear position, the three most frequent pitch accents realized were H+L*, L+H*, and H* (and their downstepped variants). This ranked order was the same across both generations of speakers, with H+L* being the clearly preferred pitch accent. Interestingly, none of these three pitch accents coincide with the displaced-peak prenuclear pitch accent in Chilean or Peninsular Spanish broad focus declaratives that one might have expected to appear to a higher degree based on previous work; in fact, the most common one resembles the earlier described small tone accent 1 of Swedish. In nuclear position at the ip level, both generations once again exhibited the same ranking of favored pitch accents, but this time, the order of the top two candidates was reversed, with L+H* being produced at a higher rate than H+L*. These two are attested in this context of Chilean Spanish broad focus declaratives, but L+H* is more observed in Peninsular Spanish. Furthermore, at the phrase level, our ip analysis, once again, yielded similar frequencies and the same ranking across generations, with H- being atop the list and L- being the next most viable option. The preference for H- is what one might anticipate based on previous work on Spanish broad focus declaratives, but the notable occurrence of L- is less predictable. When looking at ip-level nuclear configurations, where both generations most commonly produced L+H*H-, followed by H+L*L-, we see evidence of why ip boundaries at both relative highs and lows appear; that is, the former disjuncture occurs when preceded by a rising pitch accent and the latter when preceded by a falling pitch accent. Finally, at the IP level, we notice our first and only divergent cross-generational trend. While in both cases the top-ranked pitch accent is clearly H+L*, G1’s second choice is L+H*, while that of G2 is L*. Interestingly, the top two G1 candidates more closely match previously documented trends for Chilean Spanish, while the second G2 option reflects a common pattern in Peninsular Spanish. These observations leak into IP-nuclear configurations, where even though L% is an overwhelmingly preferred boundary tone (as expected), and thus H+L*L% is the most frequent configuration, the secondary options are L+H*L% for G1 and L*L% for G2.

We will now delve into the topic of the potential sources of trends described above. Given the societal context in which both G1 and G2 participants have resided for multiple decades, one area to explore is the influence of Stockholm Swedish intonation on their Spanish; however, this issue is complicated since, as summarized in Sections 2.2–2.4, the intonational systems of the two languages are quite distinct, and it is challenging to decipher if, for example, speakers are directly mapping pitch accents of a prominence-based system onto their Spanish, which does not possess the same types of tonal distinctions. We would need much more data from both languages, in addition to a series of fine-grained acoustic-phonetic measures taken in data obtained in a controlled setting, to arrive at any insight on this matter. On the other hand, if we zoom out from these details, our data do allow us to comment on the implications of the presence of rising and falling pitch movements in our data and how they compare to previous trends cited for Stockholm Swedish and Chilean Spanish. We can also lean on the fact that, when transfer enters the equation in contact between Swedish and Spanish, speakers are much more inclined to impose the
Swedish tone accent 1 onto their Spanish than tone accent 2,\(^5\) which leaves us with a falling small accent (HL\(^*\)) and a rising big accent (L\(^*\)H) as candidates influencing our participants’ Spanish. Recall that both our G1 and G2 speakers produced falling pitch accents (H+L\(^*\)) at the most frequent rates overall and that this trend is not highly observed in the broad focus declaratives of homeland Chilean Spanish. As such, one possibility is that due to years of contact with Stockholm Swedish post immigration, our G1 speakers incorporated movements resembling those of small tone accent 1 into their Spanish repertoire, after which, through interaction with family members, it was passed on to members of G2 (see upcoming discussion). This proposed source of G2 (heritage speakers) variation is one of the main reasons why adult-immigrant comparison groups are crucial in studies on heritage speakers in general. Furthermore, the higher rate of appearance of movements resembling the small (word) accent over the big (focal) accent could point to crosslinguistic intonational effects tapping into lower levels of prosodic hierarchies first, but it could also simply be due to our data containing broad rather than narrow focus declaratives. Despite the preference for falling pitch accents, we must acknowledge the secondary ranking of the rising pitch accent (L+H\(^*\)). In terms of explanations external to varieties of Spanish, it could occur as a reflex of the big accent, but other possibilities are that it has emerged as a default pitch accent that is a byproduct of language contact (see Korfhagen et al. 2021 for support for this line of thought in a range of Afro-Hispanic contexts) or that this earlier than expected alignment in broad focus declaratives is an artifact of a more spontaneous speech style (see Face 2003). Overall, any claimed influence of Stockholm Swedish is more feasible in prenuclear position, as it is where we attest a clearer distinction in our data and Stockholm Swedish versus previously cited trends for homeland Chilean Spanish broad focus declaratives. In nuclear position, falling and rising pitch accents are found here and in homeland Chilean Spanish broad focus declaratives (although rising L+H\(^*\) has been viewed as more common); if we expect only tone accent 1 to enter into Spanish, both rising and falling targets from Swedish are also possible, although, if we had to choose, we would speculate that the rising big accent would be more likely in this context, given the prominence of nuclear position.

A converse, Spanish-internal lens through which we could interpret our findings relies on the increased levels of falling pitch movements in homeland Chilean Spanish reported in Rogers (2013, 2020) and Rogers et al. (2020) and the fact that both these studies and the current one rely on more spontaneous speech styles than those in most previous studies on intonation. In particular, Rogers (2020) identified long-term contact with Mapudungun as a possible explanation for the introduction and maintenance of falling pitch movements in homeland Chilean Spanish. If we were to assume this perspective, in large part due to speech style similarities, we could posit that the falling pitch accent (H+L\(^*\)) was already in the speech of our G1 speakers when they arrived in Sweden, was actually supported by contact with the similar, falling small tone accent 1 in Stockholm Swedish, and was then transmitted to G2 due to frequent interactions in Spanish and the density of the Chilean diaspora in the Stockholm area. This discussion shows some alignment with work on uptalk by Kim (2023) and Kim and Repiso-Puigdelliura (2021), where it was uncovered that while this feature is associated with Californians, it was also exhibited in monolingual speakers of Mexican Spanish but implemented in different ways. Through more detailed phonetic analyses and data sets of comparison, we can further elucidate the nature of the falling movements in question. Despite this alternative, Spanish-centered explanation, we note that the account of the rising pitch accent (L+H\(^*\)) and the comments on prenuclear versus nuclear position do not change from what was put forth in the previous paragraph; however, one final observation on nuclear position that we can suggestively attribute to Spanish influence is in order. Recall from the results from Tables 5 and 7 that final suppression to L*L\(^%\) is the one noteworthy case of divergence between G1 and G2; that is, it is seen at higher rates in G2 at the cost of the circumflex L+H\(^*\)L\(^%\). While H+L\(^*\)L\(^%\) is clearly the preferred configuration across both generations, the secondary preference of the suppressed configuration, which has been reported much more in Peninsular Spanish than Chilean
Spanish, could serve as a glimpse of evidence into increased contact by G2 with varieties outside of their heritage, perhaps through travel and various forms of media. That said, it would be interesting to explore how attitudes toward (including issues such as prestige) and contact with the geographically proximal Peninsular Spanish impact the intonation of Chilean Swedes through a larger participant pool (see the upcoming discussion of Alvord 2009, 2010).

Perhaps the clearest implication of the current study concerns the importance of source input varieties in studies on heritage speakers (Pascual y Cabo and Rothman 2012). The fact that the patterning of word- and phrase-level phonological targets in terms of type, frequency, and frequency-based rankings was so similar across generations supports the notion of intergenerational transmission of minority languages, which Alvord (2009, 2010), Aziz et al. (2022), Rao (2016), and Rao et al. (2022) have addressed in the past for Spanish in North America. While Alvord’s (2010) work on Miami Cubans emphasized the role of social networks, he did not limit his agenda to intrafamilial participants. Contrary to the current study, he found divergent trends between his G1 and G2 (but convergence between G1 and G3), which could, in part, be due to the aforementioned participant pool differences or social and linguistic context of two distinct geographies; however, a useful parallel between Miami Cubans and Chilean Swedes is that both groups’ waves of immigration to the regions in question began several decades ago. As such, Alvord’s inclusion of three generations of speakers could potentially be repeated with Chilean Swedes (if we observe evidence that the presence of Spanish, tight-knit nature of the community, sense of identity, etc., are strong enough to maintain their minority language into a third generation), and it would be interesting to see the same trends we report here hold or if increased levels of divergence take place. Additionally, while both Aziz et al. (2022) and Rao et al. (2022) demonstrate the value of gathering data from speakers within a family, and do so in both English and Spanish, Aziz et al. (2022) also show that innovative intonational targets in heritage speakers can emerge based on the cumulative effect of the Spanish source input from parents and the majority language. In order to shed further light on related issues, we would need to expand the current study to include comparable data from Swedish (produced by both our participants and controls) and Spanish (from other adult-immigrant and heritage speakers in Sweden, as well as homeland Chilean and Peninsular Spanish controls). These would be valuable future avenues to build upon the foundation we have established here, which has only been able to suggest possible influences of all of these varieties on the Spanish intonation of Chilean Swedes; in other words, these extensions would allow us to comment on a deeper level, not only on our positive findings on source input and transmission across generations but also on origins of and reasoning behind why specific pitch accents and boundary tones are observed.

Although the current study is preliminary and exploratory in nature, along with addressing a new bilingual dyad in a previously understudied region, it offers an important avenue for future work in the field of heritage Spanish intonation, and Chilean heritage Spanish in Sweden in particular. It is important to note the small sample size of the dataset with two G1 speakers and four G2 speakers. Trends discussed here will be more robust with the addition of homeland data with Chilean monolingual speakers as well as Swedish bilingual data and Swedish controls. This project relies on the previous literature on Swedish declarative intonation patterns to draw conclusions about the patterns found in the systems of the G2 participants; further investigation would benefit from various speaker groups completing the same task. Within the dataset, and considering the small sample size, we have also begun to look closer at individual variation to further confirm the conclusions.

Author Contributions: Conceptualization, R.R. and M.P.; methodology, B.B., R.R. and M.P.; formal analysis, B.B.; investigation, B.B., R.R. and M.P.; data curation, B.B., R.R. and M.P.; writing—original draft preparation, B.B., R.R. and M.P.; writing—review and editing, B.B., R.R. and M.P. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.
Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board of the University of Illinois Chicago (protocol code 2011-0874).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data are unavailable due to privacy restrictions.

Acknowledgments: We are grateful to Berit Aronsson, Johanna Einarsson, Tomas Riad, and Brandon Rogers for discussing topics within this paper with us and for providing useful input on ways of interpreting our results. We also thank three peer reviewers for their valuable feedback on a previous version of this paper.

Conflicts of Interest: The authors declare no conflict of interest.

Notes
1 For a deeper discussion of intonation and prosodic hierarchies outside of the studies cited here, see, for example, Féry (2016), Gussenhoven (2004), and Nespor and Vogel (2007).

2 We acknowledge the more recent peak-displaced pitch accent L+<H* (see Hualde and Prieto 2015) but opt for the older one because it aligns more closely with relevant work we cite in this paper. In general, we wish to communicate “a rise through the stressed syllable to a peak that is displaced to a post-tonic location,” so we are not placing emphasis on the nuances of notational conventions.

3 We acknowledge the challenges of this approach—a tradeoff of working with spontaneous speech and a lack of control over what is being elicited—due to potential subjectivity and pragmatic nuances that could be at play, but trained researchers in this area have used similar approaches successfully, leading us to follow suit (see Butera et al. 2020; Froemming and Rao 2021; Rao and Sessarego 2016; among others).

4 We are grateful to Tomas Riad for his correspondence regarding such complexities.

5 We thank Berit Aronsson for her insight on how tone accent distinctions in Swedish can manifest in L2 Spanish. While, to our knowledge, there is no empirical basis for his trend, it is based on multiple decades of Aronsson’s observations in the classroom during interactions with L1 Swedish-L2 Spanish speakers.

6 Results in terms of frequency of tonal targets show that the intonational contours of G1 speakers are more aligned with Swedish patterns than those produced by G2 speakers. An anonymous peer reviewer suggests that G1 speakers may exhibit more Swedish-like patterns due to potential linguistic stigma during the period when they moved to Sweden, one that is not the social reality of the G2 speakers due to more recent changes in migratory patterns. This idea of assimilation vs. an increased sense of security complements Alvoord’s (2010) work on three generations of Miami Cubans cited in the current paper. Regarding the current speaker pool, the extent of exposure to homeland Chilean Spanish is unknown, so this point brought up by the reviewer merits further exploration.

7 See Carter and Wolford (2016) for evidence of increased convergence toward English rhythm across three generations of bilinguals in Texas.

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