Partial Phonetic Convergence in Misionero German-Portuguese Bilinguals

Robert Klosinski

1. Introduction

Research on language contact in the domains of phonetics and phonology is well established in the literature (e.g. Coetsem 1988; Kupisch et al. 2017; Weinreich et al. 2011). However, it remains less attested what kind of effects a second language (L2) can have on the first language (L1). The current paper is concerned with the phonetic realization of phonological contrasts in a heritage German-language enclave spoken in the northeastern province of Misiones, Argentina. Misiones is an area characterized by the presence of diverse cultures and languages as a consequence of heavy immigration throughout the last century.

In particular, this paper focuses on the production of plosives in German and Portuguese by three German-Portuguese bilinguals, who acquired German as a heritage language. It is important to note that none of these speakers was born in German-speaking Europe, and if they were not born in Misiones, they arrived there over seven decades ago from Brazil. Accordingly, the amount of contact these speakers had with speakers of continental varieties of German is limited if not non-existent, which consequently may be a contributing factor to the preliminary results of this study. The aim of this paper is to analyze the phonetic realization of plosives in the respective languages to ascertain whether the phonetic realization(s) of their phonological systems have approximated one another unidirectionally or bidirectionally. More specifically, word-initial voice onset time (VOT) will be analyzed to determine a potential change of the phonetic realization in the phonologies of these speakers.

The following research questions guide this paper:

1) Does stop production by heritage speakers of MSG show evidence of (phonetic) change (e.g. in terms of shifted VOT values)?
2) What is the driving factor behind these changes? i.e., Can the changes be attributed to attrition or incomplete acquisition?

In line with previous research (e.g. Hoffman & Klosinski 2018; Schereschewsky et al. 2017), the phonological systems of the Misionero German (MSG) bilinguals should remain largely distinct from each other. However, some degree of convergence towards Portuguese in terms of VOT values is expected. Following Simon (2010: 9), no complete overlap between the different phonological categories of stops is expected.

Before these research questions can be answered, it is necessary to provide a working definition of heritage speakers as it pertains to this study. Following Polinsky (2018) a “heritage language speaker (for short, heritage speaker) is a simultaneous or sequential (successive) bilingual whose weaker language corresponds to the minority language of their society and whose stronger language is the dominant language of that society” (Polinsky 2018: 9). While recent research on heritage speakers considers attrition as a factor for the heterogenous outcomes among heritage speakers (e.g. Polinsky &

Montrul 2019), it seems unreasonable to interpret the results of this paper in light of attrition when no attestation of earlier proficiency is available.

The current paper adopts a theoretical framework proposed by Putnam and Sánchez (2013), because no substantial claims can be made about the past of these speakers. In other words, it is not clear how much and how well they used to speak German. Also, while the speaker biographies indicate that the speakers were raised with German as their L1, it is unclear when speakers 1 and 2 started speaking Portuguese (i.e. sequential vs. simultaneous bilinguals). Consequently, it is also impossible to measure the quality and quantity of the linguistic input these speakers received during the childhood of either German or Portuguese. Therefore, positioning this study in light of incomplete acquisition (Montrul 2008) is unwarranted, since no claims regarding their early exposure can be posited. However, what can be presumed and supported by the speaker interviews of this study, is that they do not speak the language as often as they used to. This will also be laid out in §3.1. when the speakers are introduced. Therefore, it is not a question of input and acquired linguistic features but rather of activation or the lack thereof nowadays. Finally, Putnam and Sánchez’s model can also account for a variety of different outcomes which makes it especially appropriate for the speakers in this study, as well as for heritage speakers in general.

2. Background
2.1. Theoretical background

VOT is an acoustic measurement of plosives (but also of ejectives and implosives (Abramson & Whalen 2017: 78), which was first proposed by Lisker and Abramson (1964). It refers to the period of time between the release of stop closure and the onset of glottal pulsing (voicing). Lisker and Abramson (1964) argue that it is an effective measure to distinguish the stop consonants in terms of voicing as well as place of articulation. However, it is by no means the only measurable acoustic property to distinguish stop consonants, as formant values, amplitude, closure duration and burst intensity, and others can also be measured (Abramson & Whalen 2017; Halle et al. 1957; Ohde 1984). VOT will be used here as it remains one of the most widely-used measurements (Abramson & Whalen 2017).

Looking at the languages spoken by the participants of the study, categorical differences between them are apparent. Misionero German is an enclave variety of German, which is surrounded by numerous immigrant languages, but most importantly by Portuguese and Spanish. The latter two are Romance languages, whereas German is a Germanic language. These language families differ in several linguistic domains (for example word order e.g. Bernstein 1997). Of particular relevance for this study, however, Romance and Germanic languages tend to differ with respect to the phonology of their languages.1

More specifically, German is an aspiration language, so fortis obstruents are laryngeally marked [spread glottis], while the lenis obstruents are left unmarked ([ ]). In contrast the heritage language of the Misionero German, Portuguese is a voicing language. Portuguese marks the lenis obstruents with [voice], while the fortis counterparts remain unmarked ([voice]) (Iverson & Salmons 1995; Salmons in press). The standard VOT categorization is summarized in Table 1 below.

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1 Dutch and Yiddish are regarded as exceptions to the phenomenon of focus here. For a brief discussion on these two exceptions see Iverson & Salmons (2008).
Table 1: VOT categorization in ms of lead, short-lag, and long-lag stops (e.g. Yavaş 2011: 10)

<table>
<thead>
<tr>
<th></th>
<th>&lt; 0 (lead)</th>
<th>0 – 30 (short-lag)</th>
<th>&gt; 30 (long-lag)</th>
</tr>
</thead>
<tbody>
<tr>
<td>German</td>
<td>/bdg/</td>
<td>/bdg/</td>
<td>/ptk/</td>
</tr>
<tr>
<td>Portuguese</td>
<td>/bdg/</td>
<td>/ptk/</td>
<td></td>
</tr>
</tbody>
</table>

Following Putnam and Lipski (2016), who argue that the German variety spoken in Misiones most closely resembles Western Palatinate varieties of continental German, VOT values of the Palatinate area serve as a standard of comparison in this analysis. Importantly, Palatinate is comprised of a variety of different dialects and no definite statements regarding the ancestral VOTs can be made. Barry and Pützer (1995) conducted word-list reading experiments with participants from the Rhineland-Palatinate area of Germany. The following average VOTs were recorded (Barry & Pützer 1995 in Braun 1996: 24):

Table 2: VOT measurements in ms of Palatinate (Barry & Pützer 1995)

<table>
<thead>
<tr>
<th></th>
<th>/p/</th>
<th>/t/</th>
<th>/k/</th>
<th>/b/</th>
<th>/d/</th>
<th>/g/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palatinate</td>
<td>38.5</td>
<td>52.0</td>
<td>65.5</td>
<td>9.0</td>
<td>13.5</td>
<td>16.5</td>
</tr>
</tbody>
</table>

2.2. Sociolinguistic background

Previous research on the sociolinguistic domains of Misiones has focused mainly on the primary languages spoken in the area, namely Spanish and Portuguese. At the beginning of the 20th century, many Brazilian immigrants moved to Misiones, which is separated by the Río Uruguay, numerous small creeks, and an area that lacks any demarcated border (Lipski 2016: 48). Lipski (2016) argues that Portuguese is, in fact, the dominant language of many rural parts of the province despite being located in Argentina. *Misiones Portuguese* is comprised primarily of Portuguese grammar with incorporated Spanish lexical borrowings. In other words, the linguistic borders of Misiones do not correspond to the political borders, which are indicated in Figure 1:
To provide a glimpse into the rich linguistic landscape of Misiones, it seems reasonable to look at the immigrant movements to the area that go beyond the Brazilian immigration. With the first immigrants arriving around the turn of the 20th century, Misiones became a place of independence and liberty for various religiously and politically persecuted groups (Stemplowski 1988: 87). Most of the immigration took place between the two world wars 1918-1939. The Germans settled in the north of the region, where they founded the cities of Eldorado and Monte Carlo. Scandinavian immigrants settled in the center (e.g. in Posadas & San Javier), while those from Poland and the Ukraine moved to the south of the province (Flodell 1996: 220). Furthermore, Swiss immigrants moved to Puerto Rico and Ruiz de Montoya in the north-west of Misiones. Interestingly, Stemplowski (1988: 97) reports that there are over 40 different nationalities in Misiones. This influx of immigrants has led to a linguistic landscape which is not only characterized by the societal languages of the area (Spanish and Portuguese), but also by many different immigrant languages. Besides various European languages, an indigenous language contributes to the diversity in Misiones as well. Misiones Mbya, a Tupi-Guarani language, is spoken by the indigenous Mbya people (Paula 2016: 1).

Taking a more detailed look at the German immigration, it becomes clear that there was not one common path to Misiones. At the conclusion of WWI, many Germans residing in the Volga region of modern-day Russia immigrated to South America, primarily to Argentina and Brazil. Most of the Germans in Brazil lived in the southern province Rio Grande do Sul, which borders Misiones. From there, some eventually moved to Misiones when they heard about the agricultural opportunities in Argentina. In addition, the Hunsrik variety, a German minority language, is spoken here and surrounding areas (Maselko et al. 2014). In summary, Germans in Misiones today came from different areas,
including middle and low German-speaking areas, introducing a variety of different German dialects to the area. Interdialectal communication between these speakers has led to a levelling of dialects (i.e. koineization) (Putnam & Lipski 2016: 89) that requires more in depth investigation in future studies. Putnam and Lipski (2016) also argue that this dialect is predominantly moribund, i.e. that the remaining speakers of the dialect represent the final generation of speakers that acquired the language as an L1 (with Portuguese being the language of the surrounding larger society) (2016: 86).

3. Methodology

3.1. Participants

The following serves as an introduction to each speaker, providing relevant information regarding age, birthplace, L1, L2, language use of MSG at the moment, and language spoken to their children. Each of these speakers was interviewed by Lipski and Putnam in the Summer of 2012.

Speaker 1 is a female between 60 and 80 years old, who was born in Argentina. She grew up speaking MSG as her first language and still converses in the language daily to her (close) friends. She also spoke MSG to one of her two children. Speaker 1 did not report why she only spoke German to one of the children, while the other one was raised speaking Portuguese. However, it is a common scenario in other heritage language communities.

Speaker 2 was 68 years old at the time of the interview. He was born in Brazil and grew up speaking German as a first language. He reports that he still speaks German on a daily basis; however, he did not pass the language on to his children.

Speaker 3 was 79 years of age in 2012. Like Speaker 2, he was born in Brazil. During his childhood he only spoke German and also did so to his children. Nevertheless, he is Portuguese-dominant, as he prefers to speak mainly Portuguese today.

Even though these three speakers still converse in German relatively frequently, they report being more proficient and, in fact, Portuguese-dominant, which is, besides the heterogeneity, another common characteristic ascribed to heritage speakers (Rothman & Treffers-Daller 2014: 95). Importantly, Putnam and Lipski (2016: 89) state that even though “no ready proficiency measures exist for this speech community, by asking numerous questions about domains of language usage as well as by observing actual linguistic production, it is clear that most of the participants are effectively Portuguese-dominant, despite being born and raised in Argentina.”

3.2. Data Collection

Putnam and Lipski’s recordings concentrated on the eastern part of Misiones. More specifically, they visited the communities of El Soberbio (star symbol in Figure 1), San Francisco, and Oberá. Interviews were conducted at the participants’ homes, on porches, and in a laundromat. In total, they were able to record 22 MSG speakers, totaling approximately 11.5 hours of natural speech. Even though the conversations were predominantly conducted in German, there were occasional code-mixing and clarification questions in the dominant language of the participant (i.e., Portuguese). This current paper reports on the speech of three speakers, who are among the most proficient MSG speakers interviewed. In particular, each of the six stop consonants in German as well as Portuguese were analyzed in terms of VOT. The recordings were imported into Praat (Boersma & Weenink 2015). VOT was measured in word-initial, pre-vocalic, stressed context, only. In total, 793 tokens were extracted, evenly distributed across participants and languages. It should be noted however that the stops themselves were not

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2 Unfortunately, the interviewer did not record the age of the speaker, so the age provided is an estimate.
3 As an example, during interviews conducted by the author in the Swiss German community of Kidron, OH, it was often reported that the younger siblings of the family were not raised speaking Swiss German to avoid any disadvantages in the English-speaking grade school as evidenced by the older sibling(s).
4 It is unclear which variety of German they spoke growing up. Most likely, it is a dialect of Rio Grande do Sul, where the speakers originated from.
distributed evenly, as the Portuguese voiced velar stop /g/ is lenited to [ʒ] preceding #__e and #__i. Therefore, those instances of /g/ were omitted from the analysis.

4. Results

Since heritage speakers represent a highly heterogeneous group (e.g. Montrul 2015), it is not appropriate to merge them into one homogenous group (i.e. language community), as it would not yield in a detailed analysis and run the serious risk of skewing the results. Therefore, each speaker is considered individually. One-sample t-tests were conducted to determine whether the MSG VOT values are statistically different to the Portuguese VOTs produced by the respective speaker, as seen in column p.

Table 3: VOT measurements for Speaker 1 in MSG and Portuguese

<table>
<thead>
<tr>
<th>Stop</th>
<th>MSG VOT in ms</th>
<th>Portuguese VOT in ms</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>/p/</td>
<td>15.7</td>
<td>13.6</td>
<td>0.238</td>
</tr>
<tr>
<td>/t/</td>
<td>17.3</td>
<td>12.8</td>
<td>*&lt;0.05</td>
</tr>
<tr>
<td>/k/</td>
<td>32.2</td>
<td>21.7</td>
<td>**&lt;0.001</td>
</tr>
<tr>
<td>/b/</td>
<td>-10.6</td>
<td>-57.7</td>
<td>**&lt;0.001</td>
</tr>
<tr>
<td>/d/</td>
<td>1.9</td>
<td>-39.0</td>
<td>**&lt;0.001</td>
</tr>
<tr>
<td>/g/</td>
<td>-0.1</td>
<td>-21.6</td>
<td>*&lt;0.05</td>
</tr>
</tbody>
</table>

Table 3 represents the results for Speaker 1. All of her MSG stops are produced with longer VOT than the Portuguese counterparts, which was expected following the stop distribution across the two languages in use (see Table 1). Both phonologically voiceless stops have positive VOTs, but only the MSG /k/ has a long lag. All other voiceless stops have a short lag, regardless of language. This is to some extent surprising, since the values measured by Barry and Pützer (1995) returned long lags for all voiceless stops. For Speaker 1, /p/ and /t/ are approaching the Portuguese equivalents. In fact, MSG /p/ is not statistically different from the Portuguese variant (p=0.238), while /t/ remains significantly distinct. The phonologically voiced stops /bdg/ have also approached the Portuguese stops, in that /b/ and /g/ are now pre-voiced, while /d/ exhibits a short lag. Crucially, the discrepancy in VOTs between the MSG and Portuguese voiced stops is larger than for the phonologically voiceless stops. Each of the MSG voiced stops is statistically different than its Portuguese counterpart. The lenited [ʒ] realizations of /g/, a subsection of the overall data, were disregarded for this analysis, as mentioned above.
Table 4: VOT measurements for Speaker 2 in MSG and Portuguese

<table>
<thead>
<tr>
<th>Stop</th>
<th>MSG VOT in ms</th>
<th>Portuguese VOT in ms</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>/p/</td>
<td>13.8</td>
<td>12.2</td>
<td>0.09</td>
</tr>
<tr>
<td>/t/</td>
<td>16.6</td>
<td>15.9</td>
<td>0.33</td>
</tr>
<tr>
<td>/k/</td>
<td>21.0</td>
<td>21.6</td>
<td>0.64</td>
</tr>
<tr>
<td>/b/</td>
<td>-35.4</td>
<td>-62.6</td>
<td>**&lt;0.001</td>
</tr>
<tr>
<td>/d/</td>
<td>-16.3</td>
<td>-45.1</td>
<td>**&lt;0.001</td>
</tr>
<tr>
<td>/g/</td>
<td>-31.9</td>
<td>-32.9</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The results for Speaker 2, as outlined in Table 4 are similar to results of Speaker 1, yet they are more pronounced. None of the MSG voiceless stops are statistically different than the Portuguese voiceless stops, which suggests that those stops have approximated one another (at least phonetically). All of them have short-lag VOT. Interestingly, MSG /k/ shows a shorter VOT than in Portuguese, which is unexpected, as previously mentioned. However, the VOTs of /b/ and /d/ are statistically different in MSG from Portuguese. The velar voiced consonant seems to be an exception for Speaker 2 in terms of the realization of voiced MSG consonants, since it is produced with almost identical lead VOT (i.e. pre-voicing) in MSG and Portuguese. Thus, the stops in MSG for this speaker are similarly distributed to those found in Portuguese, as seen in Table 1 (i.e. phonologically voiceless are short-lag, phonologically voiced stops have lead voicing).

Table 5: VOT measurements for Speaker 3 in MSG and Portuguese

<table>
<thead>
<tr>
<th>Stop</th>
<th>MSG VOT in ms</th>
<th>Portuguese VOT in ms</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>/p/</td>
<td>15.8</td>
<td>17.5</td>
<td>0.89</td>
</tr>
<tr>
<td>/t/</td>
<td>18.4</td>
<td>19.3</td>
<td>0.83</td>
</tr>
<tr>
<td>/k/</td>
<td>30.0</td>
<td>25.6</td>
<td>**&lt;0.001</td>
</tr>
<tr>
<td>/b/</td>
<td>-23.1</td>
<td>-35.6</td>
<td>0.26</td>
</tr>
<tr>
<td>/d/</td>
<td>-11.9</td>
<td>-28.7</td>
<td>**&lt;0.001</td>
</tr>
<tr>
<td>/g/</td>
<td>13.1</td>
<td>-54.3</td>
<td>**&lt;0.001</td>
</tr>
</tbody>
</table>

Speaker 3 as shown in Table 5 also patterns differently than speakers 1 and 2, which is yet again an indicator of the heterogeneity ascribed to heritage speakers. The plosives /p/ and /t/ have a shorter VOT in MSG than in Portuguese which is, as stated previously, contrary to our expectations. All other stops, however, follow the pattern in which the German variants exhibit longer VOT. In contrast to Speaker 2, who pre-voiced /g/, Speaker 3 produces a short voicing lag, which is also statistically distinct from his production of Portuguese /g/. Thus for Speaker 3, /g/ is also the only phonologically voiced stop with positive VOT in MSG. This plosive is the only case that does not fit the Portuguese stop distribution pattern seen in Table 1.
5. Discussion

The results of this study indicate partial convergence with the dominant language (here, Portuguese). The phonetic realization of stops in the heritage German of these three MSG speakers seems to be more Portuguese-like and less like the base dialect from the Palatinate region, which is taken as the basis for comparison (Barry & Pützer 1995). In a similar vein, German as spoken in the Palatinate area in 1995 had undoubtedly undergone some degree of change when compared to the Palatinate variety that was spoken when the ancestors of the three participants emigrated several decades ago.

Returning to the guiding research questions, these results suggest that there is a phonetic change in the phonological system in terms of VOT of these MSG bilinguals. A tendency for MSG voiceless stops to converge with Portuguese stops can be observed, while voiced stops tend to remain more distinct in the two languages. Furthermore, it appears the phonologically voiceless stops, which are aspirated in the base dialect of Palatinate German (Barry & Pützer 1995) have become unaspirated in MSG (with the exception of /k/ for Speaker 1). Similarly, voiced stops, which have a short lag in the baseline variety of Palatinate German have shifted to lead voicing (i.e. prevoicing) (with the exception of /d/ for Speaker 1 and /g/ for Speaker 3).

It seems unlikely however that language contact (with Portuguese and several German dialects) is the only factor that has led to an apparent change in speech production from these individual speakers. While recent work has focused on purported attrition effects in language (e.g. Leeuw 2017; Leeuw et al. 2017; Meisel 2017; Stoehr et al. 2017), this study cannot make definite claims with respect to attrition-related effects, since previous recordings are lacking, thus preventing access to necessary longitudinal data. Similarly, no claims regarding previous input and a potential cessation of input can be established, which rules out incomplete acquisition as a viable culprit. However, what is evident, as noted in the interviews, is that the speakers do not speak German as often as they used to. The model that cannot only account for the decreasing usage which correlates with the activation of the language but also for the differing results between the speakers was proposed by Putnam and Sánchez (2013). In fact, the speakers of this study fit into the third stage proposed by them, as these speakers “[e]xhibit difficulties in activating P[honological]F[orms] [… ] in the L1 for production purposes but are able to do so for comprehension of some high frequency lexical items” (Putnam & Sánchez 2013: 490).

Additionally, the phonetic change of these speakers may likely have been facilitated by the co-activation of Portuguese and through the crosslinguistic similarity of the stop consonants in the two languages (for a proposal on defining and modelling typological proximity see Putnam et al. 2018).

These results suggest the possibility that the MSG phonologies in the individual speakers has changed. Yet, on the basis of three speakers, community-wide language shift cannot be ruled out. Therefore, while these results suggest that the phonologies of both grammars (e.g., German and Portuguese) remain distinct, future studies must target language-specific phonological processes, such as final consonant devoicing and assimilation in consonant clusters, to further support this claim.

6. Outlook

There are several factors future studies need to consider. The recording environment was often noisy, which made the analysis of the recordings difficult. While this field research trip was regarded as a “fishing expedition” (i.e. the researchers wanted to see how much German, if any, was still spoken in Misiones) and thus did not employ any specific production or comprehension tasks, future studies on MSG bilinguals should use these preliminary findings and expand upon them by using specific tasks, such as picture naming or video narration (e.g. Nu Pogodi) (Polinsky 2018: 82). Additionally, the analysis of the speech should focus on more environments other than those segments occurring word-initially. Similarly, other segments can be looked at to determine phonetic change from one of the base
dialects. For example, Brazilian German as spoken in Rio Grande du Sol has a velarized lateral /l/ (Rosenberg 2005: 229), which might either be present or lost in MSG.

Finally, as noted by one attendee of WILA 9, it would be useful to conduct more detailed analyses on the stop consonants that go beyond VOT, e.g. intensity of the burst (Braun 1988: 159 (my translation); Halle et al. 1957), formant values (especially F0 & F3) (Ohde 1984; Stevens et al. 1999: 1120), and closure duration. Nevertheless, these results should be interpreted as preliminary and initial findings, while acknowledging that more detailed analyses and guided recordings are needed to make definite claims about the phonological systems as a whole.

References


Hoffman, Andrew & Robert Klosinski. 2018. Resisting Contact-Induced Sound Change in Heritage Swiss German. Paper presented to the The Eight Annual Workshop on Immigrant Languages in the Americas (WILA 8), Copenhagen, Denmark, 2018.


