The pronunciation of the L3 Polish labiovelar approximant by Ukrainian-Russian bilinguals.
The interplay between cross-linguistic influence from the background languages and L3 phonotactics*

Jolanta Sypiańska (Szczecin)

Abstract

This paper aims to examine the interplay between cross-linguistic influence from the background languages and L3 phonotactics in the pronunciation of the L3 Polish labiovelar approximant by Ukrainian-Russian speakers. The predictions were developed based on the Speech Learning Model's mechanism of equivalence classification. The multilinguals were asked to read out Polish words containing the target sound in a number of contexts and positions in the word. The realizations were classified based on an auditory analysis aided by spectrogram consultation. The results revealed that the multilinguals mostly considered the L3 Polish labiovelar approximant as a new sound and produced it on target. The majority of substitutions included a velarized lateral followed by a labiodental fricative. The results of Chi-square tests pointed to significant effects of both context based on L1 distribution of a similar sound and position in the L3 Polish word on the realization of the L3 Polish labiovelar approximant. The paper offers a novel investigation of the realization of an L3 sound which does not have equivalents with phonemic status in the L1 and L2 and addresses the issue of L3 phonotactics. A final contribution is the application of the Speech Learning Model to multilingual phonology acquisition.

1   Introduction

The majority of acquisitional studies in the area of multilingual phonology focus on L3 sound production in a setting in which a similar sound or sound contrast exists in one of the background languages. What merits attention is the analysis of an L3 sound which does not have equivalents with phonemic status in the L1 and L2. Another research void is the inclusion of L3 phonotactics in understanding cross-linguistic influence (CLI) from the background languages to the L3. The aim of this contribution is to address both issues and extend the existing literature of L3 sound production.

The analysis centers on the labiovelar approximant /w/ in L3 Polish which does not have equivalents with phonemic status in the background languages of Ukrainian-Russian bilingual speakers (discounting English which will be explained in section 2.1.). The mispronunciation of the sound has been reported as one of the chief characteristics of Ukrainian-accented Polish by (cf.

Sypiańska, under review). The labiovelar is also frequently enumerated as a problematic sound by teachers of Polish as a foreign language, thus theoretical and experimental contributions on the subject are essential and called for.

2 Theoretical background

Many of the studies in the area of multilingual acquisition of phonology deal with laryngeal contrasts where the same contrast found in the L3 exists in one of the background languages (cf. e. g. Gabriel/Krause/Dittmers 2018; Llama/Cardoso/Collins 2010; Llama/López-Morelos 2016; Sypiańska 2017; Wrembel 2011). On the other hand, there are also analyses with language repertoires in which the L3 sound has an equivalent sound in one or both of the background languages that has phonemic status but is realized differently. Abbas Syed/Bibi (2024) analysed L1 Balochi learners with Pakistani English as an L2 who learned British English, where only the L3 had aspirated voiceless stops. Conversely, Wunder (2011) studied the production of L3 Spanish laryngeal contrasts of L1 German, L2 English speakers, in which the L3 was the only language without aspirated stops.

Studies of language repertoires in which the L3 sound does not have equivalents with phonemic status in the L1 and L2 are lacking. The aim of this contribution is to fill this research void by analysing the production of the Polish labiovelar approximant in a group of L1 Ukrainian, L2 Russian, L3 Polish speakers. The Russian consonant inventory does not include a labiovelar approximant whereas it is only an allophone of the labiodental approximant in Ukrainian. The analysis focuses on the interplay between cross-linguistic influence (CLI) from the background languages and L3 phonotactics (position in a word) in the production of the L3 Polish labiovelar approximant. The predictions for sources of CLI that shape the realization of the labiovelar are derived based on Flege's (1995, 2002, 2005) Speech Learning Model and the revised version SLM-r (cf. Flege/Bohn 2021) (henceforth SLM). A novel element of the study is the inclusion of the position in the L3 word as a possible explanatory factor of CLI to the L3. There has been limited research on L3 phonotactics. Andreassen/Lyche (2016) studied schwa acquisition in a group of L1 Norwegian, L2 English and L3 French learners and they found a gradually increasing sensibility towards the phonotactic context. However, further research is necessary to understand how L3 phonotactics interact with cross-linguistic influence from the background languages.

2.1 Speech Learning Model predictions for the acquisition of the L3 Polish labiovelar

The theoretical framework applied to the formation of the hypotheses in the study is the SLM. It is a model developed for bilingual acquisition of the sound system, however, it is possible to extend its postulations to a multilingual setting. The SLM posits that the more dissimilar an L2 (or in this case, L3) sound is from the closest L1 (in this case, L1 and/or L2) category, the more likely it is for the learner to establish a new phonetic category for it. On the other hand, the ability to form a new category for an L2/L3 sound is modulated by a cognitive mechanism referred to as equivalence classification (cf. Flege 1987). The mechanism is responsible for impeding the formation of the new L2/L3 category if the L2/L3 sound is perceived to be an instance of an existing L1 (or L2) category.

For the current study, it means that if the L3 Polish labiovelar approximant is perceived to be a new sound, a new L3 phonetic category will be established resulting in target pronunciation. However, should the Ukrainian-Russian learners of Polish perceive the L3 Polish labiovelar approximant as an instance of a sound from the inventories of their background languages, then equivalence classification will block target pronunciation. There are two sound candidates on which the mechanism of equivalence classification could rely to block new category formation: (1) the velarized lateral present in both Ukrainian and Russian with which it shares one feature [+back] and (2) the labiodental approximant present in Ukrainian only with which it shares one feature [+labial] and the manner of articulation. First of all, the Polish labiovelar approximant could be assimilated to the velarized lateral which has phonemic status in both Ukrainian and Russian. Secondly, it could be perceived as an instance of the labiodental approximant from Ukrainian. In Ukrainian, the labiovelar approximant surfaces only as an allophone of the labiodental approximant before back rounded vowels [u, ɔ] (cf. Pompino-Marschall/Steriopolo/ Żygis 2017) but can also be devoiced before voiceless consonants (cf. Buk/Mačutek /Rovenchak 2008). There is also a fricative realization of the labiodental approximant before front vowels (cf. Žovtobrjux/Kulyk 1965) or an asyllabic vocoid [u̯] in the syllable-final position (cf. Rusanivs'kyj/Taranenko/Zjabljuk 2004). The Russian language does not possess a labiovelar approximant. The second scenario which involves perceiving the L3 Polish labiovelar approximant as an instance of the Ukrainian labiodental approximant may be realized in a twofold manner. Either the L3 Polish sound will be pronounced as a labiodental approximant across the board, or the entire distribution of the labiodental approximant from Ukrainian will be mirrored in L3 Polish. The latter option is supported by the fact that the labiovelar approximant is one of the allophones in that distribution which could facilitate the process of mirroring at least some part of the entire distribution.

Importantly, although the linguistic background of the participants also comprises English, it has been decided not to include this language in the current analysis. The decision stems from the fact that the application of SLM to multilingualism is a novel approach thus it is preferable to include only the L3 rather than an L4 as well. Since there is scant literature on SLM from a multilingual angle, it is difficult to develop scenarios for the learning outcomes of the labiovelar approximant in the L3. The simplification is a necessary bridge towards a comprehensive application of SLM to multilingualism that should eventually be employed regardless of the number of languages in a linguistic repertoire. Including more than three languages at this point would obscure the process of implementing the model in a multilingual setting. However, further attempts should proceed in the direction of full inclusion.

2.2   Beyond segment based (dis)similarity in a multilingual setting

Zhang claims that "learners do not transfer all of their phonological knowledge from a previously-acquired language" (2019: 3743) even when beneficial. One of the reasons for not relying on positive CLI in every possible circumstance is that the phonology of the foreign language is not solely shaped by segment-based (dis)similarity to the background languages. The particular relation of languages to one another in a multilingual repertoire which is unique to every multilingual or homogenous group of multilinguals effectuates a hierarchy of languages which are more or less prone to act as a source of cross-linguistic influence for the L3 in a given setting.

The array of factors includes but is not restricted to the L1 status factor (cf. García Lecumberri/ Gallardo del Puerto 2003; Hermas 2014; Ringbom 1987), the foreign language effect (cf. De Angelis/Selinker 2001; Meisel 1983) or L2 status factor (cf. Williams/Hammarberg 1998), recency of use (cf. e. g. Hammarberg 2001), language dominance (cf. e. g. Sypiańska 2022), typology (cf. Rothman 2011, 2013; Westergaard et al., 2016) or psychotypology (cf. Kellerman 1978) and level of proficiency (cf. Gut 2010; Hammarberg 2001; Sánchez 2014; Sypiańska/Cal 2020). The structure of L3, including L3 phonotactics, may also play a role in shaping the developing L3 as pointed out by Andreassen/Lyche (2016). However, this factor has not been included in in-depth analyses in the literature on multilingualism as yet.

3 Study design

3.1 Aims, research questions and hypotheses

The aim of the study was to analyse how an L3 sound is realized when the choice of its equivalent sounds from the background languages is very limited. Another aim was to study the interplay between CLI from the background languages and L3 phonotactics (position in a word) in a context where all three languages from the speakers' linguistic repertoire are closely related and structurally similar. Such a context, with no clear favourite as a source of CLI based on overall language proximity or no obvious sound similarity, may lead to the necessity of relying on other aspects of language that is L3 phonotactics. However, the participants may still associate the L3 labiovelar with the allophone of the labiodental approximant from their native Ukrainian and rely on its distribution when producing the L3 sound.

The study was guided by the following research questions:

RQ1: How do Ukrainian-Russian bilinguals pronounce the L3 Polish labiovelar approximant?
RQ2: Do the Ukrainian-Russian bilinguals treat the L3 Polish labiovelar approximant as a new or similar sound?
RQ3: If similar, do they perceive the labiovelar as an instance of the velarized lateral or the labiodental approximant?
RQ4: Is the realization of the L3 Polish labiovelar approximant conditioned by its position in the L3 Polish word?

The first hypothesis was that the L3 Polish labiovelar approximant may be problematic for the Ukrainian-Russian speakers as they only possess the sound as an allophone in one of their background languages. This is why we expected to find various substitutions of the L3 Polish labiovelar in the data. The second hypothesis was based on the predictions derived from SLM. The multilinguals may either perceive the labiovelar approximant as a similar or new sound. In the first case, they can perceive the labiovelar as an instance of the velarized lateral or the labiodental approximant. They could produce the labiodental approximant across the board, limit the labiovelar approximant to the context of back rounded vowels and before voiceless consonants or copy the entire distribution of the labiodental approximant from Ukrainian to L3 Polish. Since these are not obvious candidates for equivalence classification to take effect, the multilinguals may as well perceive the labiovelar as a new sound and produce it on target. Finally, it was hypothesised that the production of the L3 Polish labiovelar would be conditioned by its position in the L3 Polish word.

3.2 Participants

There were 21 L1 Ukrainian, L2 Russian, L3 Polish multilingual speakers. They had been residing and studying in Poland for 4 to 7 months prior to taking part in the study. The participant pool included two males and 19 females with a mean age of 19.76. They were all raised in Ukrainian speaking families and started Russian acquisition up to the age of three and can be considered early bilinguals. The participants were speakers of south-western dialects of Ukrainian. Apart from weekly classes in Polish, their entire instruction at the university was delivered in Polish. Their Polish language proficiency was assessed by means of a standardized Polish placement test (cf. Burkat et al. 2008) at A2 to B1 according to the Common European Framework of Reference. They also reported knowing English as a foreign language. The participants were not paid for their participation. An ethics committee approval was obtained prior to the study. More detailed information on the participants' language background is available in Sypiańska (2022).

The choice of this particular group of multilingual speakers was carried out with the aim to control the factors discussed in 2.2 to minimise their effects and, simultaneously, put segment (dis)similarity to the fore. First of all, the Ukrainian-Russian speakers were early onset bilinguals (with age of onset of both languages 0–3 years of age) with self-reported equal proficiency in both languages. They used both Ukrainian and Russian on a daily basis in their native country with comparable frequency and recency of use. As an effect, both their background languages had been acquired and not learned which equalizes their status and does not lend validity to either the L1 or the L2 status factor.

Furthermore, the effect of different structural proximity between L1–L3 and L2–L3 was limited due to the choice of a multilingual repertoire in which (1) all languages under analysis belong to the same family of languages (Slavic), (2) two background languages belong to one subgroup of that family (East Slavic), (3) two background languages that share one type of alphabet (Cyrillic, unlike the L3 which uses a Roman alphabet). This allowed to unify both actual overall language structural- and perceived proximity between the L1 and L3 and the L2 and L3.

3.3 Stimuli and procedure

The stimuli included 30 words with the target labiovelar approximant presented in isolation one word per slide by means of an automatic slide show to ensure a comparable speech rate. The words were randomized but presented in the same order for each participant. Fillers were used in a 1:1 ratio. Some tokens were discarded due to creaky voice or garbling that rendered them unfit for analysis resulting in 615 tokens. In order to unify word frequency, a 5000 frequency list of Polish vocabulary was used to prepare the tokens. The participants were unaware of the purpose of the experiment.

In Polish, the labiovelar approximant is always spelled <ł> and has a voiced, voiceless and a rare palatalized allophone mostly in loanwords. The voiceless allophone [ẘ] appears word-finally, e. g. *szał* (Eng. 'fury') and in clusters in which at least one consonant is voiceless, e. g. *przyszedłszy* (Eng. 'having arrived') (cf. Dukiewicz/Sawicka 1995) whereas a palatalizing context is necessary for the palatalized allophone [wʲ] e. g. *whisky* (Eng. 'whisky'). The current study only included contexts for the voiced and voiceless allophones. The L3 words were

divided into three contexts, with 10 words for each context, reflecting the distribution of the labiodental approximant in Ukrainian:

Context 1: before a back rounded vowel and before a voiceless consonant, e. g. *łobuz* (Eng. 'scoundrel') or *pałka* (Eng. 'stick')
Context 2: syllable-final, e. g. *muł* (Eng. 'mud')
Context 3: elsewhere, e. g. *zauważyła* (Eng. 'noticed', fem., 3rd p., sing.)

The contexts in which a labiovelar approximant as an allophone of the labiodental approximant is expected have been merged into one category (Context 1). The syllable-final context in Context 2 should favour vocoid pronunciations whereas labiodental approximants should be preferred in Context 3.

The same 30 words with the target labiovelar approximant were also analysed in terms of the sound's positions in the L3 words (6 words per position). The words that were chosen represented most possibilities of the sound's distribution in Polish but excluded contexts with complex clusters that could be simplified in pronunciation by the participants reducing the number of valid tokens for analysis. Based on the distribution of the Polish labiovelar approximant, Positions 1–3 should favour the voiced allophone. The voiceless allophone should be preferred in Position 5 whereas voicing of the other consonant in the cluster should enforce the voicing of the labiovelar approximant in Position 4. However, during the analysis voiced and voiceless tokens were collapsed into one group for ease of analysis.

Position 1: word-initial, pre-vocalic, e. g. *łabędź* (Eng. 'swan')
Position 2: word-medial, inter-vocalic, e. g. *myślałem* (Eng. 'think' past, masc., sing.,1st p.)
Position 3: word-final, post-vocalic, e. g. *kanał* (Eng. 'channel')
Position 4: in a word-initial cluster, e. g. *właśnie* (Eng. 'exactly')
Position 5: in a word-medial cluster with a voiceless consonant, e. g. *pałka* (Eng. 'stick'*)*

The recording took place in a quiet room at a Polish university with the use of Focusrite Scarlett 2i2 2Gen audio interface and a Røde NT2-A kit with a condenser microphone. The participants were asked to read out Polish words as they appeared on auto-advancing slides for a comparable speaking rate. The data extraction procedure was done manually by a trained phonetician. The auditory analysis was aided by spectrogram analysis. The labiovelar approximants were labelled as such when the two first formants were low which reflected the tongue backing and the lip rounding. This was followed by a rise in the F2 and generally not much information available above 1000Hz. An example of a target labiovelar pronunciation is visible in Figure 1.
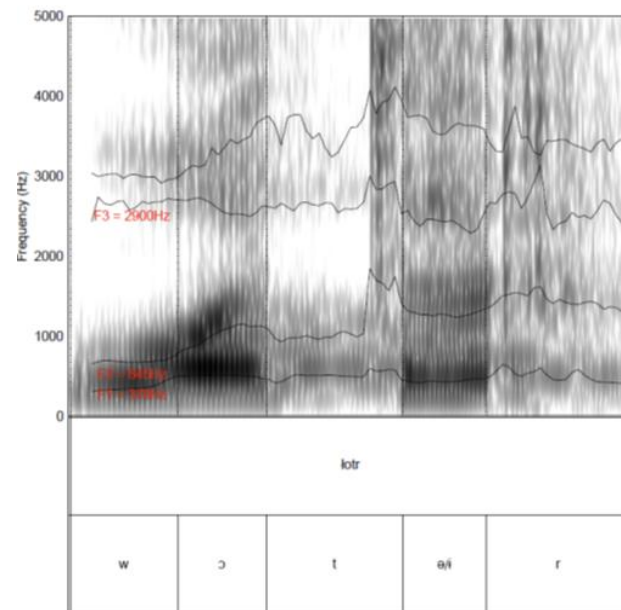
Figure 1: Spectrogram for the L3 Polish target labiovelar approximant in *łotr* (Eng. 'villain')

The data also included other pronunciations chief amongst them a velarized lateral with a low F2 (approx. 1000Hz) and a higher F1 in comparison to the labiovelar approximant resulting in a small difference between F1 and F2. In most cases, it was also accompanied by a higher F3 than for the labiovelar approximant (Figure 2). A labiodental fricative (either voiced or voiceless) was another frequent pronunciation. The fricative was identified when fricative noise but no discernable formant structure was present and a voice bar in the lowest frequencies was visible for the voiced sound (Figure 3).
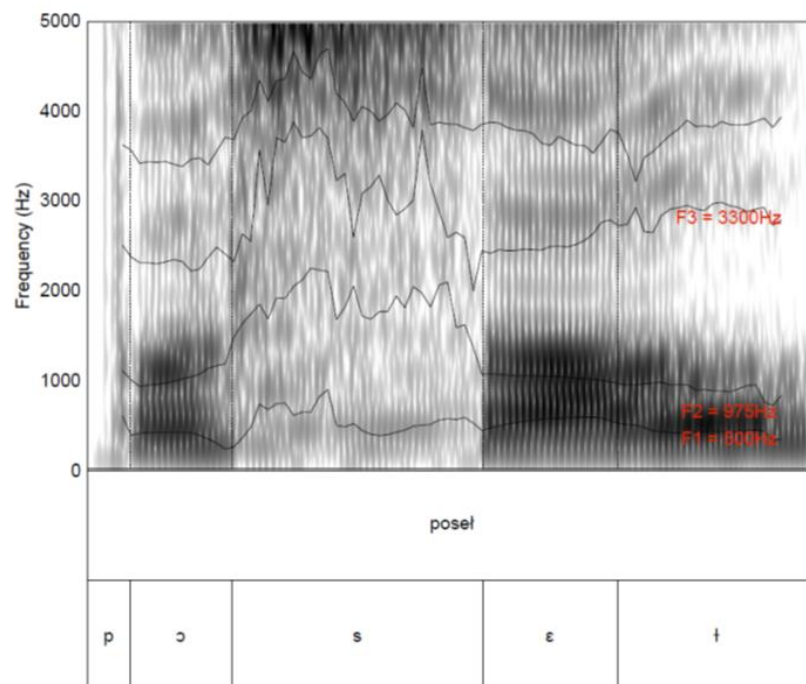

Figure 2: Spectrogram for the L3 Polish velarized lateral in *poseł* (Eng. 'member of parliament')
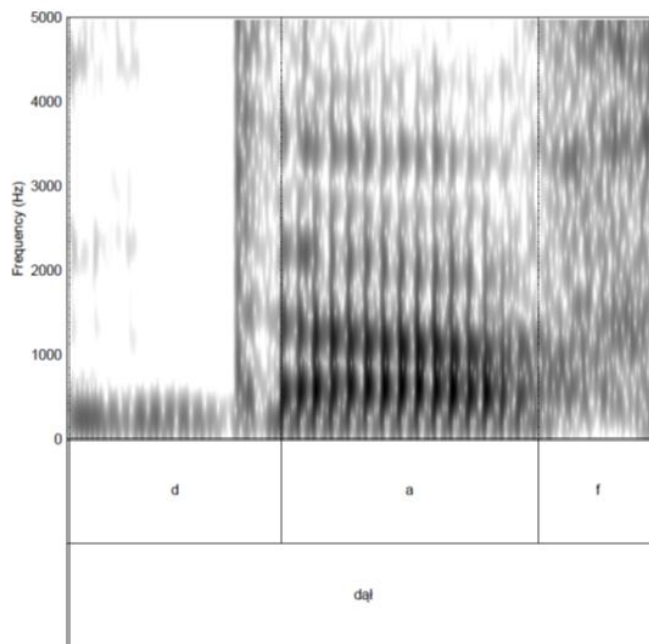
Figure 3: Spectrogram for the L3 Polish labiodental fricative in *dął*
(Eng. 'blow', past tense, 3ʳᵈ person, masc.)

The statistical analyses were carried out in R Studio (2023) version 2023.6.1.524. The Chi-square-tests were applied to the expected associations between context/position and observed rather than correct realizations.

4 Results

In order to answer the first and the second research questions, the pronunciations were categorized based on an auditory analysis aided by spectrogram consultation (Figure 4). They included (1) labiovelar approximant, (2) velarized lateral, (3) labiodental fricative, (4) labiovelar approximant + labiodental fricative, (5) labiodental fricative + labiovelar approximant, (6) elision, (7) bilabial nasal, (8) dental nasal stop, (9) palatalized lateral, (10) dental oral stop.
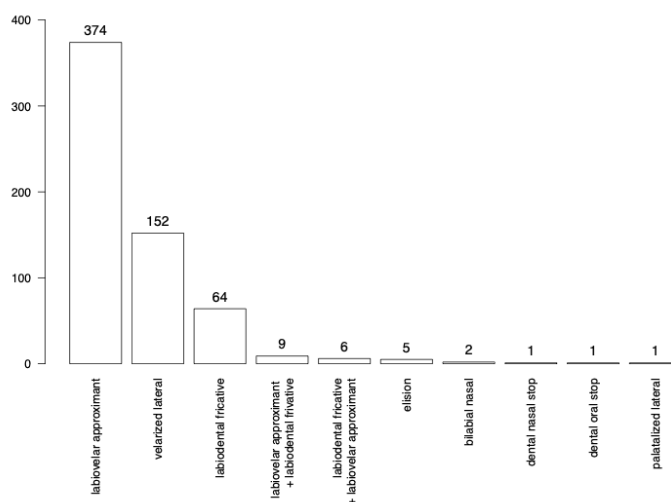

Figure 4: The number of occurrences of each pronunciation

In order to answer the third research question, a chi-square test of independence was performed to examine the relation between the type of pronunciation (limited to the three most frequent in the data set) and the contexts (1–3) based on the distribution of the labiodental approximant in L1 Ukrainian. The results pointed to a significant relationship between the two variables (X^2(4, N = 590) = 11.3, p = .024). The speakers were more likely to produce a target labiovelar approximant or a labiodental fricative in Context 2 (syllable-finally). There was a greater likelihood of the velarized lateral in Context 1 and 3 (before back rounded vowels, before voiceless consonants and everywhere else). Cohen's *w* = 0.14 indicated a small effect size for the relationship between the type of pronunciation and the distribution of the labiodental approximant in L1 Ukrainian.
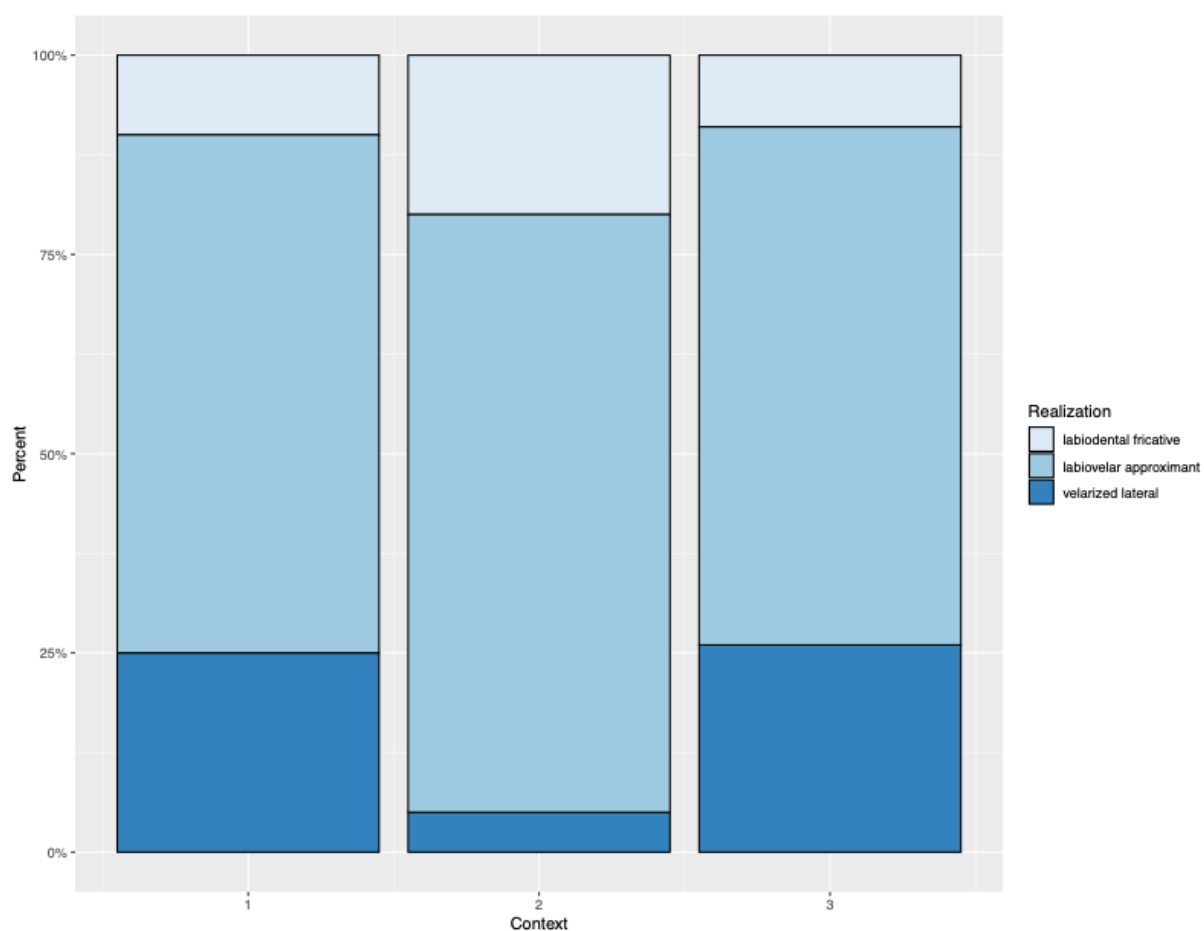

Figure 5: The results divided based on the distribution of the labiodental approximant in L1 Ukrainian

In order to answer the fourth research question, another chi-square test of independence was run to investigate the relation between the type of pronunciation (limited to the three most frequent in the data set) and the position in the L3 Polish word (Positions 1–5) (Figure 6). The results showed a significant relationship between the two variables (X^2(8, *N* = 590) = 26.3, p < .001). The speakers were more likely to produce a target labiovelar approximant in Position 5 (in a word-medial cluster with a voiceless consonant) compared to all the other Positions. They did not substitute the target pronunciation with a labiodental fricative in Position 4 and 5 (in clusters). Position 4 also triggered a likelihood for the velarized lateral. Cohen's w = 0.21 indicated a medium effect size for the relationship between the type of pronunciation and the position in the L3 Polish word.
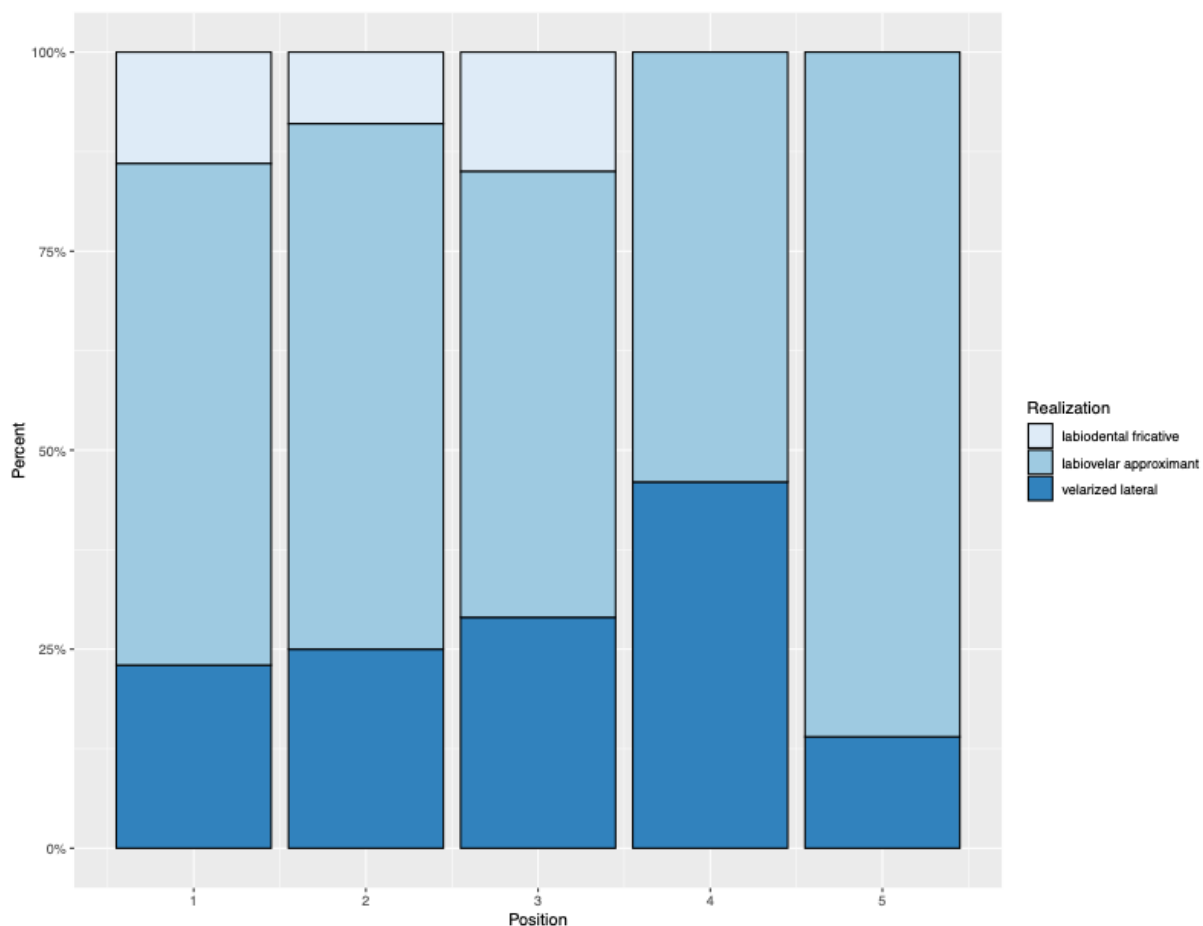
Figure 6: The results divided into five positions in the L3 Polish word

5 Discussion

The labiovelar approximant was pronounced correctly in approximately 60% of all the tokens. The main substitutions included a velarized lateral (25%) and a labiodental fricative (10%). The less common pronunciations were very infrequent as some of them appeared in the data set only once. As predicted in the first hypothesis, the Polish labiovelar approximant was to some extent difficult for the Ukrainian-Russian speakers as various substitutions were present in the data.

The reasons for the problems with pronouncing the L3 Polish labiovelar were sought in the lack of a similar sound among the phonemic inventory in the background languages. Based on the mechanism of equivalence classification, it was hypothesised that the speakers may associate the Polish labiovelar with the Ukrainian labiodental approximant as one of its allophones is a labiovelar approximant. Although the chi-square test results pointed to a significant effect of distribution in the L1, the results showed that it was the number of tokens pronounced with a velarized lateral and labiodental fricative that was responsible for the effect. There was a tendency to increase the frequency of labiodental fricative pronunciations in syllable final contexts and increase the number of velarized lateral pronunciations in the other two contexts. The number of target labiovelar realizations did not vary significantly from context to context. Also, no instance of labiodental approximant was found and the participants did not show a tendency to produce the labiovelar approximant more correctly in the context of back rounded vowels and before voiceless consonants (as it surfaces in Ukrainian). These results indicate that they did

not make the predicted perceptual link between the Polish labiovelar and the Ukrainian labio-dental approximant nor any of its allophones. The hypothesised transfer of an entire distribution of a potentially similar L1 sound, or its part, did not take place. On the other hand, non-target pronunciations mostly included the velarized lateral. This result suggests that, on many occa-sions, the Polish labiovelar approximant was perceived as a similar sound, that is, an instance of the velarized lateral present in both background languages.

Another possible explanation for problems with pronouncing the L3 Polish labiovelar approx-imant was hypothesised to be based on the position in the L3 Polish word. The medium effect size of position in the L3 Polish word showed that the phonotactics in the third language sig-nificantly conditioned the pronunciation of the L3 labiovelar approximant. The differences were visible in cluster positions as opposed to non-cluster ones. In both cluster positions, the participants did not pronounce the labiovelar as a labiodental fricative and had a higher correct-ness rate of the labiovelar approximant. This tendency to simplify clusters shows a need for the L3 speakers to opt for universal ease of articulation in the face of the difficult Polish phonotac-tics.

One other possibility for the choice of the velarized lateral as a substitution of the labiovelar approximant may be grounded in graphemics. The grapheme <ł> that is used in Polish for all instances of the labiovelar approximant, bears resemblance to <l> that stands for the clear lat-eral in Polish. However, in Ukrainian or Russian the lateral can either be palatalized or velar-ized, but the clear variant is not possible. This claim can be further substantiated by the fact that Sypiańska (2022) found the velarized lateral to be the main non-target realization of the L3 Polish lateral among the same research group. In order to verify whether graphemics or percep-tion is responsible for the substitutions of the labiovelar approximant, the current analysis should be followed by a perception study.

We conclude that although the Polish L3 labiovelar approximant was not as problematic for the Ukrainian-Russian as expected, its realization included a significant amount of non-target real-izations. The results show that the L3 Polish labiovelar approximant was to a large extent per-ceived as a new sound and produced on target (60%). However, when it was realized with a non-target sound, the velarized lateral was heavily favoured as a substitution. These results indicate that the production of the labiovelar approximant in L3 Polish is not approached in a uniform manner by Ukrainian-Russian bilinguals. It can be treated as a new sound and produced on target, but when it is perceived as a similar sound, it is perceptually linked with the velarized lateral. Our results confirm the validity of the Speech Learning Model in a multilingual setting. The study shows that, although it is a model developed for bilingual acquisition, it can success-fully be used to generate valid and testable hypotheses in a multilingual setting.

An interesting observation is that the speakers associated the labiovelar approximant with the velarized lateral but not the labiodental approximant even though the latter shared the feature [+labial] and the manner of articulation with the target sound, whereas the former only one feature [+back]. The labiodental approximant in L1 Ukrainian also includes the labiovelar ap-proximant as one of its allophones altogether making it theoretically a more likely candidate for a perceptual link with the target sound. These results could imply that velarization may be more salient than labialization and the speakers may use it as a basis to apply the equivalence

classification mechanism. Another possibility for the choice of the velarized lateral is that it is present in all their background languages (including English), whereas the labiodental approximant is only part of the L1 sound inventory. On the other hand, the fact that a speaker possesses a sound as an allophone in one of the languages of their repertoire does not mean they can rely on it as a source of positive CLI.

A final conclusion is that the results show an interplay between CLI from the background languages and L3 phonotactics. Cross-linguistic influence in the realization of the L3 Polish labiovelar stemmed from the L1 and the L2 as the main substitution was a sound present in both background languages. However, the realization of the L3 Polish labiovelar approximant was also conditioned by the context in the target word. The Ukrainian-Russian bilinguals applied the principle of least effort and opted for a universal tendency of ease of articulation to simplify clusters.

6   Significance, limitations and future research avenues

The study extends existing literature on multilingual phonological acquisition by analysing a unique language repertoire in which all three languages belong to the same language family. The main novelty of the study lies in the fact that it focuses on an L3 sound that does not have equivalents with phonemic status in the L1 and L2. It also investigates the vastly unexplored effect of L3 phonotactics and its interplay with CLI to the L3. Last but not least, it provides further evidence of cross-linguistic influence from the background languages to the L3.

Moreover, it offers a successful application of SLM to the multilingual context. This aspect of the current contribution is very important as up to date no phonological model of multilingual learning has been proposed. The field is in great need of a framework that would allow to formulate and verify hypotheses on the acquisition of phonology in a multilingual setting. Adaptions of existing bilingual models are one possible way to solve the problem.

The limitations include slightly varied levels of proficiency in the L3 and different degrees of dominance in Ukrainian of the Ukrainian-Russian bilinguals. Both aspects could potentially influence the amount and nature of substitutions for the L3 Polish labiovelar. That is why future research avenues may include analyses of the effects of dominance and level of proficiency on the production of the L3 Polish labiovelar approximant.

This study could potentially spark further analyses that will apply multi-factorial designs which the current study did not employ because of its exploratory character. Adding visual data to observe lip rounding would be an important methodological improvement that could significantly ease and enhance sound categorization especially for the labiovelar approximant versus velarized lateral distinction. One planned contribution involves a study that will be aimed at investigating the perception of the labiovelar approximant and the sounds that were used as substitutions by the Ukrainian-Russian bilinguals.

7   Conclusions

The aim of this contribution was to analyse the production of the Polish labiovelar approximant in a group of L1 Ukrainian, L2 Russian, L3 Polish multilingual speakers. The analysis focused on the interplay between cross-linguistic influence from the background languages and L3

phonotactics, whereas the predictions were developed based on the Speech Learning Model (cf. Flege 1995). The results showed that the realization of the L3 Polish labiovelar approximant was not uniform across the participants. There was a great extent of on-target productions which confirmed that the multilingual speakers perceived the sound as new in many cases and formed a separate phonetic category for it. However, the nature of the substitutions revealed several important findings. First of all, when the L3 Polish labiovelar approximant was perceived as a similar sound, it was perceptually linked with the velarized lateral which was the main substitution found in the data. This constitutes CLI from both background languages as both Ukrainian and Russian possess the velarized lateral sound. It could, however, be a result of grapheme confusion in which <ł> could have been mistaken for <l> and produced with velarization. This would still be evidence of CLI from the L1 and L2 as they possess the velarized lateral which the Polish language does not have. Second of all, the multilingual speakers did not choose the labiodental approximant which was a theoretically more likely candidate for perceptual linkage with the L3 labiovelar approximant. These results suggest that, on the one hand, velarization may be very salient and that is why the velarized lateral was preferred. On the other hand, the fact that the velarized lateral exists in both background languages enforced its status and made it a more prominent candidate for CLI to the L3. Finally, the substitutions were conditioned by the position of the sound in the L3 Polish word. There was a tendency not to substitute the labiovelar approximant with the labiodental fricative in cluster contexts which embodied the principle of least effort to simplify clusters.

All in all, the study attempted to fill a void in the literature on the acquisition of phonology by multilingual speakers by focusing on an L3 sound which does not have equivalents with phonemic status in the L1 and L2 and addressing the issue of L3 phonotactics. The results revealed that cross-linguistic influence from the background languages is conditioned by the position of the target sound in the L3 Polish word. A final contribution of the study to the field of multilingual phonology acquisition is the successful application of SLM. Although it is a model developed for bilingual acquisition, it can be used to produce testable hypotheses in a multilingual setting.

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