Phonological and sociolinguistic factors in the integration of /l/ in Turkish in borrowings from Arabic and Swedish

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This article investigates the phonological integration of the front coda /l/ after a back vowel in the final rime of words borrowed from Arabic and Swedish into Turkish. This original donor structure is interesting because it is in conflict with the core rules of Turkish phonology. Several sub-disciplines of linguistics have dealt with the role of different phonological and sociolinguistic factors in the phonological integration of lexical borrowings, but there is no consensus on their respective weights in borrowing nor on the way in which their interaction is to be conceptualised. The Arabic data in the study are based on historical loanwords while the Swedish data have been obtained through an experiment. The focus of the article is the choice between adoption and adaptation as integration strategies and how different factors interact in producing the attested integration patterns. The results show that adoption is predominantly preferred to adaptation in both cases due to the dominant status of the donor languages in the contexts of borrowing. Hence, it is argued that sociolinguistic factors play the main role in these two particular cases.

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1. Introduction

From Ottoman Turkish to Modern Standard Turkish, /l/ has been one of the phonemes that have been affected most by contact-induced language change (cf. Zimmer 1985). This is due to large-scale lexical borrowing from several languages such as Persian, Arabic, Greek, Italian, French and English, which all feature laterals in phonological positions or environments where Turkish laterals were previously not attested. Hence, the status of the phoneme /l/ as a phonological exception and the underlying causes related to language contact make it an interesting object of study. This article will discuss /l/ in borrowed words in only the word-final coda position after a back vowel, as this particular environment enables an investigation of both the phonetic quality of /l/ and its phonological behaviour in suffixation. The focus will be on historical loanwords from Arabic and new experimental data from Swedish. The reason for choosing these particular instances of borrowing is firstly the structural fact that both Arabic and Swedish have a non-velarised lateral

approximant /l/ as their only lateral phoneme. This phoneme also appears in word-final coda position after back vowels, which is an illicit environment for a non-velarised /l/ in Turkish. Secondly, there are important sociolinguistic differences between these two contexts of borrowing such as the status of the borrowers and the recipient language. Therefore, these structural similarities and sociolinguistic differences can provide us with valuable insights into the role of sociolinguistic factors in the phonological integration of lexical borrowings.

2. Theoretical background

In this article, the term *borrowing* and accompanying metaphors such as *donor language* and *recipient language* will be used instead of the more appropriate term "copying" proposed by Johanson (2002: 8–18) as the former are more established in the linguistic literature. It is generally accepted that the integration of lexical borrowings from a donor language (DL) into a recipient language (RL) can involve one of two phonological strategies: adaptation or adoption. Adaptation entails the alteration of the phonological form of the borrowing in the DL in order to make it fit the phonological system of the RL. Adoption is the opposite strategy whereby deviant DL forms are incorporated into the RL without alteration resulting in the addition of DL forms and patterns to the RL system. Adaptation is thus a conservative strategy which preserves the RL system, whereas adoption means contact-induced phonological change in the RL system due to lexical borrowing from the DL.

2.1. Phonological and sociolinguistic factors in phonological integration

Several sub-disciplines of linguistics have dealt with the phonological integration of lexical borrowings. The loanword-phonology literature has largely assumed that the borrowers are monolingual or have low phonetic-phonological competence in the DL and has consequently emphasised adaptation as an integration strategy. The focus of this type of research has been on phonological factors, mainly the phonetic approximation of deviant donor-language structures (cf. Silverman 1992 and Yip 1993 and 2002). Bilingualism research has also investigated phonological integration of lexical borrowings as an instance of mixed language use. Naturally, this sub-discipline has attributed bilingualism and proficiency in the DL a greater role and has consequently included sociolinguistic factors in its analyses. These factors include the degree of community bilingualism (Paradis & LaCharité 2008), the socio-political status of the DL as a minority or majority language (Poplack, Sankoff & Miller 1988) and attitudes towards mixed language use (Poplack, Sankoff & Miller 1988). Paradis & LaCharité (2008) maintain that the bilingual borrowers set the standard for the phonological integration in the whole speech community. They also claim that a high degree of community bilingualism increases the likelihood of adoptions as opposed to adaptations. Similarly, Poplack, Sankoff & Miller (1988) have found that adoption is more common when the RL is a minority

language in a context where the DL is the majority language. They explain this finding by referring to the borrowers' high proficiency in the DL in such a minority context. Poplack, Sankoff & Miller (1988) also remark that the borrowers' integration patterns are partly acquired in the local sociolinguistic context where certain social norms of mixed language use are established.

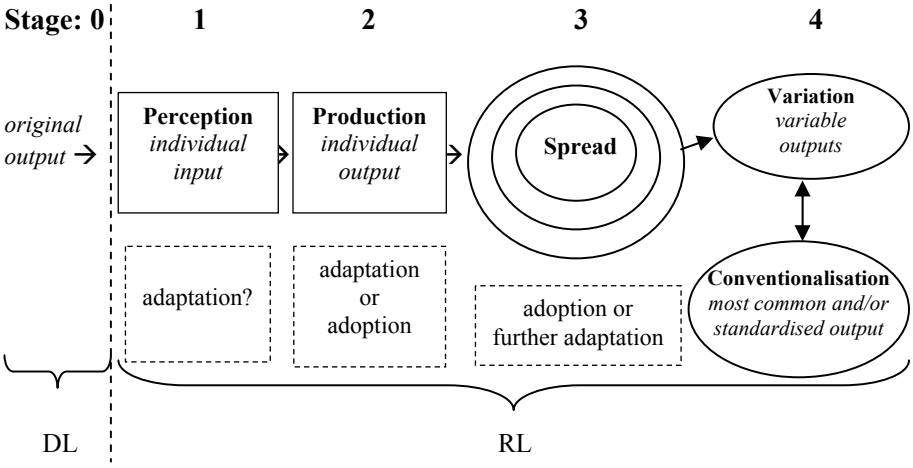
Finally, the literature on language contact and change has dealt with adoption as an instance of contact-induced language change. While this sub-discipline has focused on both phonological and sociolinguistic factors as well as their interaction, a common view is that sociolinguistic factors can "trump" phonological factors given the right social circumstances of contact (cf. Thomason 2001: 85). A commonly cited factor in language change through borrowing is the degree of bilingualism in two senses. The first sense is the degree of community bilingualism (cf. Croft 2000: 201–207; Thomason 2001: 70–71; Johanson 2002: 5-6 and Sakel 2007: 19, 25) while the second sense is the level of proficiency in the DL among individual borrowers (cf. "familiarity with the donor language" in McMahon 1994: 205; "imperfect learning" in Thomason 2001 and in Matras 2007: 39–40; and "quality of bilingualism" in Johanson 2002: 5). In summary, both the loanword-adaptation literature and the literature on language contact and change have shown a tendency to emphasise the importance or primacy of one type of factor (phonological factors in the former and sociolinguistic factors in the latter case) at the expense of the other type of factor. Bilingualism research has, on the other hand, taken a more balanced view of the roles played by both types of factors. Despite the wealth of knowledge and insights provided by these sub-disciplines on phonological integration, how the interaction between phonological factors (including phonetic factors) and sociolinguistic factors should be treated theoretically remains a central issue in need of further discussion.

2.2. The phonological integration process of a lexical borrowing

In Figure 1, a schematic overview of the integration process is presented. The original output from the DL enters the RL through an individual borrower in Stage 1. Depending on the phonetic-phonological competence of the borrower in the DL, he/she may or may not perceive the DL output correctly. Hence, the RL input may or may not be identical to the DL output during this stage. If the RL input is different from the original DL output, the first instance of adaptation is considered to have taken place in perception (cf. Silverman 1992; Yip 1993 and 2002; Peperkamp & Dupoux 2003; Vendelin & Peperkamp 2004; Adler 2006; Boersma & Hartman 2009; Calabrese 2009 and Kim 2009). In Stage 2, the input is subjected to either (further) adaptation or adoption by the borrower resulting in the borrower's individual output. If a phonological structure in the borrowing is absolutely marked (i.e. has high phonetic complexity) or relatively foreign to the RL (cf. the notion of structural "attractiveness" in Johanson 2002: 41–48), the borrowers might not possess the ability to produce the structure in question. This means that the more

demanding the phonological structure in question is, the more advanced the phonetic-phonological competence of the borrowers has to be in the DL (i.e. no or little foreign accent) in order for adoption to be available to them. Therefore, phonetic-phonological competence in the DL is a key factor as to whether adaptation starts already during Stage 1 as well as in the choice between adoption and adaptation during Stage 2. Competence in the DL is viewed as a sociolinguistic factor here because on the societal level it is directly related to the socio-political status of the DL and the socioeconomic status of the borrowers.

Figure 1. Overview of the phonological integration of a lexical borrowing



Legend: The bold numerals on top indicate the stages in the integration process. The solid-lined rectangles represent processes in individual speakers, while the ellipses refer to processes in the speech community. The dotted-lined rectangles indicate the integration strategies that are available at a particular stage. The horizontal curvy brackets indicate processes that pertain to the donor language (DL) and to the recipient language (RL).

Once the original borrower has produced his/her individual output after Stage 2, this output is introduced during Stage 3 to other individuals and thus into the speech community and can potentially start spreading as a lexical, and possibly phonological, innovation. Stage 3 crucially involves the original borrowers' individual outputs becoming inputs for other speakers. This can potentially start a new cycle of phonological integration for further speakers who themselves go through Stages 0–2 and consequently introduce their own individual outputs into the speech community. In this process, the output of the first generation of borrowers is not necessarily the only input to the second generation of borrowers if their proficiency in the DL allows them additional access to the DL, including access to the DL orthography. However, if the second generation of borrowers is monolingual

or has low phonetic-phonological competence in the DL, the first generation's output may be the only or main input. When the lexical innovation spreads through the speech community, these cycles of borrowing are repeated over and over again. These processes of spread can potentially result in variation in the RL speech community regarding the pronunciation and use of the lexical borrowings. This variation during Stage 4 can be based on different proficiency levels in the DL and/or social class to name just a few relevant factors. Since there are normative forces in every speech community, one variant might eventually become conventionalised as the community norm or the prescriptive norm. The most common type of normative linguistic force is standardisation. The chosen standard variant can be the most common one or a less common one preferred by the elites. In any case, there is interaction between variation and the forces of conventionalisation whereby the actual use throughout the speech community both influences and is influenced by the conventionalised norms as indicated by the bidirectional arrow in Figure 1. During Stage 4, such factors as the degree of community bilingualism, which is crucially linked to the prestige and socio-political status of the DL, and the socioeconomic status of the original borrowers in the RL community play an important role.

In the loanword-phonology literature, one of the most debated issues has been the role of perception. Some researchers argue that Stage 1 does not exist (cf. Paradis & LaCharité 1997; Paradis & Prunet 2000; Jacobs & Gussenhoven 2000 and LaCharité & Paradis 2005) and that integration only has to do with production i.e. Stage 2. Following Calabrese & Wetzels (2009), the view that claims that both Stage 1 and Stage 2 exist will be referred to as the "the perceptual stance", while the view that dispenses with Stage 1 will be called "the phonological stance". The crucial difference between these stances from the perspective of the present study is that the perceptual stance allows for phonetic details to play a greater role than the phonological stance. Paradis & LaCharité (1997 and 2008) maintain that the main justification for the phonological stance is the fact that the original borrowers are predominantly bilinguals with advanced phonetic-phonological competence in the DL. Consequently, these bilinguals' individual inputs in the RL are always identical to the original DL output. In order to overcome the apparent contradiction between these two stances, Heffernan (2005) has suggested a division of labour between the stances, whereby the perceptual stance should be applied to borrowing by monolinguals while the phonological stance should be reserved for borrowing by bilinguals.

2.3. The appropriateness of comparisons

When comparing different instances of borrowing, it is crucial to be aware of the fact that the particular data available for the different contexts may pertain to different stages of the phonological integration process described in Figure 1. This issue is often neglected in the literature, leading to the false assumption that

contemporary data from Stage 4 necessarily reflect the integration strategies applied by the original borrowers in an earlier period. This assumption practically amounts to dispensing with potential spread effects during Stage 3. In the present study, the experimental data on new Swedish borrowings provide us with information on a group of speakers' individual outputs, i.e. data from Stage 2. Data on historical Arabic loanwords, on the other hand, are obtained from contemporary dictionaries of Turkish and thus reflect conventionalised community outputs from Stage 4. Consequently, a direct comparison of these data from two different stages would not be appropriate. Therefore, a valid comparison requires making a qualified inference as to the group of original borrowers for Arabic loanwords and reconstructing that group's output, i.e. the original Stage 2. Thus, a reconstructed Stage 2 in one context of borrowing (Arabic) can be more appropriately compared with an actual Stage 2 in the other context (Swedish).

3. The status of the phoneme /l/ in the three languages

3.1. Laterals in the recipient language Turkish

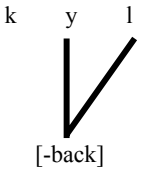
3.1.1. The native underspecified lateral phoneme /L/

In the native vocabulary of Turkish, the lateral phoneme /L/ is underspecified with respect to its phonological classification as front or back. As we can see in (1), in coda position the phoneme /L/ has a front allophone [l] after phonologically front vowels in (1a) and (1c) as well as a back allophone [ɬ] after phonologically back vowels in (1b) and (1d).

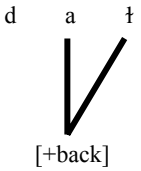
(1)	After front vowels			After back vowels		
a.	*kül*	'ash'	[kyl]	b. *kul*	'slave'	[kuɬ]
	göl	'lake'	[gœl]	*kol*	'arm'	[koɬ]
c.	*kil*	'clay'	[kil]	d. *kıl*	'body hair'	[kɯɬ]
	kel	'bald (person)'	[kel]	*dal*	'branch'	[daɬ]

According to Zimmer & Orgun (1999), the front allophone [l] is categorised as a post-alveolar lateral approximant and lacks secondary velarisation. The back allophone [ɬ], on the other hand, is categorised as a dental lateral approximant and displays secondary velarisation. Hence, the phonological feature that determines if the lateral is classified as front or back is not its place of primary articulation but the absence or presence of a secondary articulation in the form of velarisation, i.e. the raising of the tongue's body at the back of the mouth. These allophony rules result in palatal spreading in the rime whereby the [back] feature of the nucleic vowel is spread to the coda /L/ as in (2).

(2) a. Front allophony



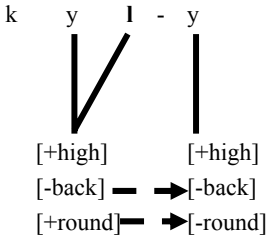
b. Back allophony



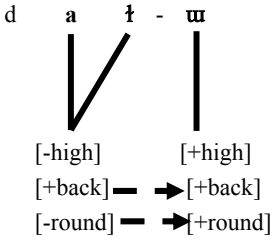
According to the rules of Turkish vowel harmony, in suffixation the last stem vowel provides the underspecified vowel of the suffix with two of its own features, namely [back] and [round] through spreading. In (3) and (4) the accusative suffix /-(j)I/ is used as an example. Thus, the [back] value of the stem's final vowel is spread further to the suffix's vowel, building a continuous string of either front or back segments across the morpheme boundary as in (4).

(3) a.	*kül-ü*	'ash-ACC'	[kyly]	b.	*kul-u*	'slave-ACC'	[kułu]
	göl-ü	'lake-ACC'	[gœly]		*kol-u*	'arm-ACC'	[kołu]
c.	*kil-i*	'clay-ACC'	[kili]	d.	*kıl-ı*	'body hair-ACC'	[kɯɬɯ]
	kel-i	'bald (person)-ACC'	[keli]		*dal-ı*	'branch-ACC'	[dałɯ]

(4) a. Front suffixation



b. Back suffixation



3.1.2. Two exceptions regarding /l/ in loanwords

In native stems, the allophony rules require that the coda /L/ have the same [back] value as the preceding vowel, while according to the rules of vowel harmony between the stem and its suffixes, the stem's final vowel alone determines the suffix vowel's [back] and [round] values. These two phonological rules apply for all native Turkish words as well as for some nativised loanwords. However, in Modern Standard Turkish the same rules can be violated or altered in many loanwords where the original DL form contains in its final rime a back vowel followed by a front /l/. As a result, exceptions to the aforementioned rules arise. Together with Persian loanwords, Arabic loanwords were historically among the first exceptions to these rules and make up a large portion of the exceptions regarding /l/. Later, these exceptions were further consolidated by the influx of French loanwords of the same

type. This borrowing pattern, which violates the allophony and vowel-harmony rules of Turkish, is still productive in Modern Standard Turkish today as proper names of this type are regularly integrated into the language, some of which become new exceptions.

3.1.3. Violation of the lateral allophony rules in loanwords

As we can see in (5b) the original front quality of /l/ in the DL is preserved in Turkish despite the fact that the preceding vowel is back. In (5b) *sol* has been borrowed from the Italian *sol* [sɔl]. *bol* has been borrowed from the French *bol* [bɔl]. *usul* comes from the Arabic [usˤu:l]. The lexical entries for such loanwords do not contain an underspecified /L/ as in native words in (5a) but a fully specified front /l/ as in (5b) whose palatal value is independent of the preceding vowel's value as in (6b). Thus, through this type of borrowing which *preserves* the DL's original lateral, the native lateral allophone [l] has acquired phonemic status as /l/ in Turkish. This leads to the minimal pairs in (5) and (6), which can only be distinguished by the front or back quality of the lateral in their surface forms.

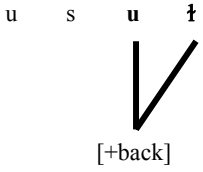
(5) a. Native words

sol	'left'	/soL/	[soɬ]
bol	'plentiful'	/boL/	[boɬ]
usul	'quiet'	/usuL/	[usuɬ]

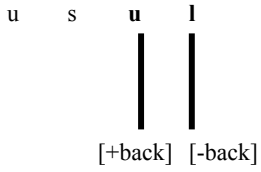
b. Loanwords

sol	'a musical note'	/sol/	[sol]
bol	'bowl'	/bol/	[bol]
usul	'method'	/usu:l/	[usul]

(6) a. Lateral allophony respected



b. Lateral allophony violated



3.1.4. The harmonisation of /l/ in the suffixation of loanwords

The second exception resulting from the preservation of the original front quality of /l/ in loanwords is the violation of the rules of vowel harmony between stems and suffixes. In suffixation the preserved original /l/ starts participating in stem-suffix harmony processes as a [-back] segment by spreading its [-back] value to the suffix's vowels as in (7b) and (8b). This phenomenon will be referred to as the *harmonisation of /l/*.

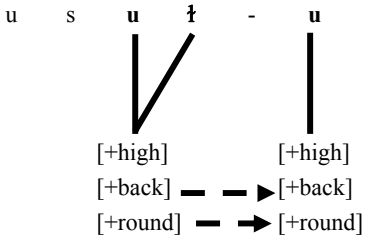
(7) a. Native words

bol-u	'plentiful-ACC'	[boɬu]
usul-u	'quiet-ACC'	[usuɬu]

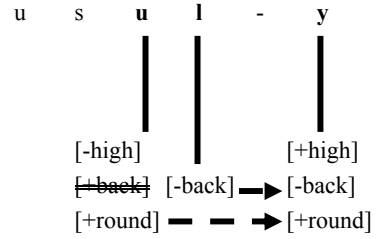
b. Loanwords

bol-ü	'punch-ACC'	[boly]
usul-ü	'method-ACC'	[usu:ly]

(8) a. Regular suffixation pattern with non-harmonised /L/



b. Irregular suffixation pattern with harmonised /l/



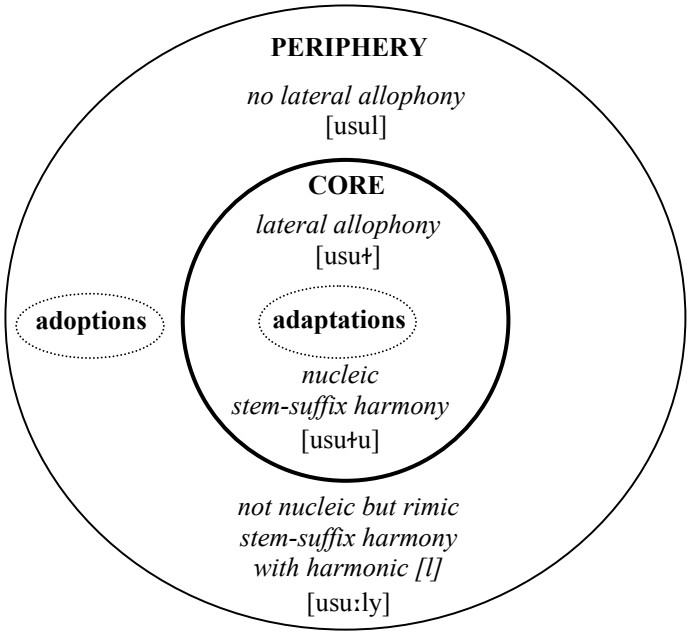
This results in a case of irregular suffixation where it is no longer solely the stem's last vowel (i.e. its last nucleus) as in the regular cases in (8a) but the whole final rime including the coda /l/ that determines the underspecified features of the suffix vowel as in (8b). To be precise, the last vowel continues to provide the suffix's [round] feature as in regular suffixation while the [back] feature is now supplied by the stem's last palatally classified segment, which in this case is the coda consonant /l/. The stem-suffix harmony process becomes rimic instead of nucleic as it is divided between two components of the rime, the nucleus and the coda. This integration strategy in (7b) and (8b) will be referred to as *harmonic preservation* because the [-back] feature of /l/ is not only preserved but also participates in harmonic processes between the stem and the suffix.

3.1.5. The core and the periphery of the Turkish phonological lexicon

A useful conception of the described violations of Turkish phonological rules in some loanwords is provided by the view that the phonological lexicon is stratified. Such a conception has been proposed by several researchers for the integration of borrowings (cf. Paradis & LaCharité 1997 and 2008; Itô & Mester 1999; and Friesner 2009). According to this view, the phonological lexicon consists of a *core* where all the rules of the RL phonology apply, and of a *periphery* where the violation of some rules is tolerated, *inter alia* in loanwords. The core consists of one single stratum while the periphery can potentially consist of different strata (see Itô & Mester 1999 for an example of several peripheral strata). In the case of Turkish, the rules for lateral allophony and vowel harmony apply fully to native words in the core whereas they can be violated in the periphery due to harmonic preservation in some loanwords. Here, stem-suffix harmony is rimic instead of nucleic due to the harmonisation of /l/ (see Figure 2). One major advantage of the stratified conception of the phonological lexicon is that it echoes the fundamental choice made in the phonological integration of borrowings, namely the choice between adaptation and adoption. Adaptations are placed in the RL core since they are made to fully fit the RL phonology whereas adoptions of deviant DL structures and patterns are placed in the periphery since they do not fully fit the RL phonology. Furthermore, if previous

adoptions go through adaptation at later stages of the process of spread, they can be said to have been moved from the periphery to the core of the phonological lexicon.

Figure 2. The status of words with a final /l/ in the Turkish phonological lexicon



Legend: In the core all native phonological rules apply, whereas in some exceptional cases their violation is tolerated in the periphery. As an integration strategy, adaptation is related to the core, whereas adoption is related to the periphery as indicated by the dotted ellipses. The examples in phonetic transcription are the same as examples 5–8 in the text.

3.2. Laterals in the donor languages

From the perspective of Turkish phonology, the crucial property for the classification of a word-final coda lateral as front or back is the absence or presence of secondary velarisation respectively. Phonetically speaking, DL laterals without velarisation are potentially more likely to be perceived as similar or identical to the Turkish front allophone [l], whereas velarised DL laterals are potentially more likely to be perceived as closer to the Turkish back allophone [ɬ].

3.2.1. Laterals in Arabic

Arabic is generally described as having only one lateral phoneme /l/, a lateral approximant lacking velarisation (cf. Watson 2002). Thelwall & Sa'adeddin (1999) describe the lateral phoneme /l/ in Arabic as having a variable place of articulation across dialects between dental and postalveolar. We know that the input variety of Arabic in the Ottoman context was Classical Arabic but we lack more detailed information about the exact pronunciation of the phoneme /l/ in the input. Nevertheless, in the most crucial respect we can assume that it must have lacked velarisation because this is a non-variable property of Classical Arabic. However, there are some exceptions to the lack of velarisation in Arabic. The first exception regards the word *Allah* '(the) God' [alˁːaːh] and its derivates, where a so-called emphatic [lˁ] involving velarisation is used (cf. Watson 2002: 16). Due to its limited use, this lateral is not considered a separate phoneme of Arabic and it does not appear in the word-final coda. The second case of exception has to do with a phonological process in Arabic called *emphasis spread*, whereby a so-called emphatic feature can spread from one segment to nearby segments. The extent and domain of emphasis spread varies from dialect to dialect and can in some cases lead to an emphatic realisation of the phoneme /l/ as [lˁ] (cf. Watson 2002: 273–279). Such emphatically realised laterals with velarisation are phonetically quite similar to the Turkish back allophone [ɬ].

3.2.2. Laterals in Swedish

All varieties of Swedish have only one lateral phoneme. This phoneme's phonetic realisation can vary from dialect to dialect and involve velarisation in some dialects (Garlén 1988: 74). However, in Standard Swedish spoken in the Mälar Valley around Stockholm, the lateral phoneme /l/ lacks velarisation and is described as a dental lateral approximant (cf. Engstrand 1999). Currently, there are no studies known to the author which have shown that the Standard Swedish /l/ varies in velarisation depending on the phonetic environment or on sociolinguistic factors. Although its place of articulation is the same as the Turkish back allophone's, namely dental, the Standard Swedish /l/ lacks velarisation just as the Turkish front allophone does.

4. Methodology

Different data collection methods were used for the two contexts of borrowing as they differ substantially in terms of the age of the borrowings. The investigation of the new Swedish borrowings through an experiment allowed more detailed data collection on the individual borrowers' backgrounds. An equally detailed data collection on individual borrowers was not possible for the historical Arabic loanwords, but other methods were used to overcome this difficulty.

4.1. Data on historical loanwords from Arabic

Three different types of data were obtained for the Arabic loanwords. Firstly, different sources were surveyed for information on when borrowing from Arabic into Turkish occurred, the role and status of Arabic in Ottoman society and the background of the likely group of borrowers in order to construct an adequate description of the sociolinguistic context of borrowing. Secondly, an etymological dictionary of contemporary Turkish (Nişanyan 2002) was used as a corpus containing 3285 Arabic loanwords. In the Nişanyan corpus, Arabic loanwords that contain a word-final coda lateral after a back vowel were identified. Then, the standard pronunciations and suffixation patterns of these loanwords were checked in the online dictionary of the Turkish Institute of Language (Türk Dil Kurumu 2010). The final type of data comes from a so-called transcription text by Viguier (1790). Since the writing system used in original Ottoman texts does not reveal whether the word-final coda /l/ is velarised or not and whether the following suffixes were front or back, it does not provide us with any evidence regarding the treatment of word-final coda /l/ in loanwords. In order to overcome similar problems, texts in Ottoman Turkish rendered in Latin transcription are commonly consulted in historical turkology. The phonetic quality of /l/ is not described in this type of texts either, but the quality of the word-final coda /l/ can be inferred from the vowels of the following suffixes. Some reservations can be expressed about using this type of inference as it is based on the assumption that the coda /l/ has the same palatal value as the vowels of the following suffix. Nonetheless, this method can still provide useful information.

4.2. Data on new borrowings from Swedish

Data on the phonological integration of new borrowings from Swedish were collected within the framework of an experiment. The first reason for choosing an experiment was the lack of a relevant corpus. Secondly, recordings of natural speech would not have supplied the amount of specific data needed for this investigation. Due to similar reasons, experimental data are commonly used in studies of loanword adaptation (cf. Silverman 1992; Peperkamp & Dupoux 2003 and Adler 2006). Hence, the only viable method was to use elicited data, but the experiment was designed and presented in a way that did not make the data elicitation transparent for the participants.

4.2.1. The participants

The participants were selected on the basis of their advanced functional proficiency in the standard varieties of Turkish and Swedish. Most of the participants were known to the researcher prior to data collection, which facilitated an initial informal assessment. Others were recruited through recommendations. The term *advanced functional proficiency* refers to a level of general proficiency that enables the participants to use both languages at an advanced level for the functional

requirements of everyday life. Additional to the researcher's prior assessment, data acquired through background interviews and through different language tasks in the experiment were used toward the final assessment of the participants' general proficiency.

Table 1. Overview of the participants' backgrounds

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
Age at data collection (in years)	36	25	27	27	27	27	23	38	21	30	34	29
Length of residence in Sweden (in years)	32	25	25	26	26	16	23	27	13	30	13	24
Age of onset for Turkish	17†	0	0	0	0	0	0	0	0	0	3	0
Age of onset for Swedish (<: before the age of)	0	3	6	7	5	<6	<6	11	<6	7	0	4
Parents' mother tongues (S: Swedish, T: Turkish)	S-T	T	T	T	T	T	T	T	T	T	S-T	T

† This participant reported some early exposure to Turkish as well as low-to-intermediate proficiency throughout his childhood and early teenage years but high proficiency only after the age of seventeen (when the family moved to Turkey) which he reported as the onset for his acquisition of Turkish.

Data were collected from a total of twelve participants. Half of them were male and half were female. All participants had some form of tertiary education and were living in the Mälar Valley region at the time of data collection. An overview of the participants' backgrounds is presented in Table 1. The ages of the participants varied between twenty-one and thirty-eight and all but one were children of Turkish immigrants in Sweden. Ten of the participants had two Turkish-speaking parents whereas two had one Turkish-speaking and one Swedish-speaking parent. Not all participants were born in Sweden but all of them had spent a significant portion of their lives there. The range of residence in Sweden was between thirteen and thirty-two years. All but one of the participants reported that their age of onset for Swedish was seven at the latest. One participant had an age of onset for Swedish at eleven years of age. Ten of the participants had Turkish as their first acquired language. Two participants, who had one Turkish and one Swedish parent, had Swedish as their first acquired language. One of these reported an age of onset for Turkish at three years of age. The other participant reported some exposure to Turkish as well as low-to-intermediate proficiency throughout his childhood and early teenage years but high proficiency only after the age of seventeen when he moved to Turkey. With some reservations for this last participant, all participants can thus be viewed as early bilinguals who started acquiring both languages before puberty and have acquired advanced functional proficiency in both languages.

4.2.2. The composition of data collection

Table 2. Components of the data collection

	Name of component	Description of component	Language used in component
1	Semi-structured background interview	Self-report on language background Self-report on language proficiency and use	mainly Turkish
2	Evaluation of nativeness in Turkish	Recording of natural speech: 1-3 minute-long elaborated comment on the topic "Where would you travel if you were given 10,000 US dollars?"	only Turkish
3	Evaluation of nativeness in Swedish	Recording of natural speech: 1-3 minute-long elaborated comment on the topic "Could you tell me about the last film you saw?"	only Swedish
4	Evaluation of specific phonetic-phonological proficiency in Turkish	Orally answered fill-in-the-blanks test designed to check the participants' command of exceptions in the periphery regarding the word-final coda laterals in established loanwords in Turkish	only Turkish
5	Evaluation of the degree of foreign accent in Swedish	Reading aloud of a one-page Swedish text containing proper names which display the three structures under investigation	only Swedish
6	Oral translation task	Online translation of the same Swedish text as in 5 into Turkish	only Turkish
7	Follow-up questions about the translation task	Specific questions on parts of the translated text with more explicit elicitation of integration	only Turkish

The data collection took between one hour and one and a half hours per participant. All data were recorded by computer with the help of the phonetic analysis program Wavesurfer. The data collection involved seven different components as can be seen in Table 2. A part of the recordings from Component 2 were later evaluated for nativelikeness of the participants' Turkish pronunciation by a linguist who is a native speaker of Turkish. Three short passages from the recordings in Components 3 and 5 were submitted to a panel of three first-year phonetics students, all native speakers of Standard Swedish, for an evaluation of the participants' nativelikeness in Swedish. The first passage consisted of natural speech. The second passage consisted of a short text recitation. The third passage was a slightly longer text recitation where the panel also had access to the recited text for comparison. For all three passages, the participants featured in a different order and the panel was asked to judge if the participants were native speakers of Swedish. For the last passage, the

panel was also asked to evaluate the participants' degree of foreign accent. The reason for using three different passages was to capture the participants' pronunciation in Swedish under different circumstances so that both natural speech and controlled speech would be included in the evaluation. In all evaluations, additional recordings from extra participants were included to diversify the material and to check for evaluator reliability.

As mentioned in sections 3.1.2-3.1.5, the periphery of the Turkish lexicon contains exceptions. Component 4 was designed to check if the bilingual participants had in fact mastered these exceptions in Turkish. To this end, they were given fifty sentences in Turkish, which included blanks and adjacent nouns in parentheses, which were to be used appropriately to fill in the blanks. Thus, the participants' pronunciation and suffixation of these exceptions was investigated. The translation text in Component 6 was designed in a way that would elicit both unsuffixed and suffixed integration of relevant Swedish proper names in Turkish phonology. In Component 7, thirty-one follow-up questions were used in more explicit elicitation to ensure that all relevant types of integration were included in the material in case some should be absent in the translation. Here, the participants were asked and reminded to answer the questions with exactly the same sentences by only substituting the question words with the answers. The recordings from Components 4, 6 and 7 were analyzed auditively and transcribed by the researcher, where only the loanwords' final rimes which included a coda /l/ were analyzed. Approximately five percent of this material was later submitted for a reliability check to a linguist who is a native speaker of Turkish and has advanced proficiency in Swedish. The reliability check showed that the two researchers' analyses were identical in 91 percent of all cases. Some of the results were finally subjected to statistical analysis with the help of the program SPSS.

5. Results and discussion

In this section, results regarding the two contexts of borrowing will be presented in diachronic order beginning with the historical Arabic loanwords followed by the contemporary Swedish borrowings. First, a categorised overview of the attested phonological integration strategies will be presented. Then the sociolinguistic context including background information about the original borrowers will be surveyed. Finally, the relationship between the attested integration strategies and phonological and sociolinguistic factors will be discussed.

5.1. Historical Arabic loanwords

5.1.1. Phonological integration strategies in Arabic loanwords

In the Nişanyan Corpus, 92 Arabic loanwords with an original back vowel followed by a front coda /l/ in the word-final rime were identified. The phonological integration strategies for these loanwords are evaluated in two morphological

environments, the simplex environment and the suffixed environment. In the simplex environment, two strategies are attested: 1) Preservation which entails the adoption of the original [-back] value of /l/ in Turkish as in (9a) and 2) Velarisation which entails the adaptation of the original [-back] value of /l/ to Turkish by being converted to [+back] as in (10a). In the suffixed environment, two accompanying strategies are attested. When the final coda /l/ is preserved in the simplex environment, it is followed by a [-back] suffix as in (9b). This pattern was previously referred to as harmonic preservation and is associated with the periphery (cf. sections 3.1.2–3.1.5). On the other hand, when the final coda /l/ is velarised, it is followed by a [+back] suffix as in (10b), which is the regular suffixation pattern in the core. The analysis of the corpus reveals that the dominant pattern in the phonological integration of Arabic loanwords is preservation as in (9), which is attested in 86 percent of all cases. This points to a clear tendency in Turkish to adopt the Arabic final coda /l/ in its original DL form.

(9) Dominant strategy in Arabic loanwords: Preservation (Adoption), mean = 86 %

	Arabic output: 'state'	[ħaːl]
Morphological environment		
Simplex	a.	hal
Suffixed (e.g. accusative)	b.	haːl-i
Underlying form in Turkish	c.	/haːl/

(10) Alternative strategy in Arabic loanwords: Velarisation (Adaptation), mean = 14 %

	Arabic output: 'fortune' [faːl]	
Morphological environment		
Simplex	a.	faɬ
Suffixed (e.g. accusative)	b.	faɬ-ɯ
Underlying form in Turkish	c.	/faL/

Certain orthographic conventions in Ottoman Turkish which are relevant in the integration process deserve some attention here. The rich consonant inventory of Arabic with two series of consonants, a neutral and an emphatic one, makes a good match for the rich vowel inventory of Turkish with two series of vowels, a front and a back one. Since the vowels of Turkish are not visible in the Arabic orthography, in writing, their palatal value needs to be inferred from the adjacent consonants' emphatic value. This creates a special sensitivity for the emphatic value of the word-final consonants. Therefore, in Ottoman Turkish there are conventions dictating whether an Arabic consonant is to be classified as front or back in Turkish (cf. Nişanyan 2002: 15). According to these conventions, the Arabic /l/ is classified as front. This orthographic convention can thus have contributed to the preservation of the front quality of the word-final /l/.

5.1.2. The role of phonological factors

A relevant question at this point is if the 14 percent of the cases that deviate from the dominant pattern have structural factors as their underlying cause. Could the phonological environment of /l/ have led to a preference for adaptation in these cases? In section 3.2.1, the spread of Arabic emphasis from other segments to the /l/ was suggested as a possible process whereby the word-final coda /l/ might become velarised in the Arabic output. Watson (2002: 273–279) indicates that two main factors are relevant in emphasis spread. The first is the domain of spread, which can be the same word or the same syllable as /l/. The second factor is the lexically emphatic segment from which emphasis spreads. This segment can be a pharyngealised coronal, a pharyngeal or the voiceless uvular stop /q/, which is classified by some phonologists as emphatic. If emphasis spread were to bias the integration pattern in Turkish towards velarisation, we should find higher frequencies of velarisation in at least some of these phonological environments. However, in all of the emphatic environments in Table 3 preservation is clearly the preferred strategy. A possible explanation for the attested lack of emphasis effects is that it is not present in all varieties of Arabic. Therefore, the Arabic output that Turkish speakers had access to may not have contained emphasis effects to begin with.

Table 3. Frequency of velarisation and preservation of the word-final coda /l/ in Arabic loanwords with respect to different phonological environments

Phonological environment of /l/	Tokens (total)	Velarisation (in percent)	Preservation (in percent)
Pharyngealised coronal within the same word	14	29	71
Pharyngealised coronal within the same syllable	11	18	82
Pharyngeal within the same word	23	9	91
Pharyngeal within the same syllable	12	8	92
/q/ within the same word	14	4	86
/q/ within the same syllable	8	25	75
After /a/	69	17	83
After /u/	23	4	96

Another phonological factor that could potentially affect the borrowers' preference for velarisation is the place of articulation of vowel preceding the /l/. In velarisation, the relevant articulatory dimension from the perspective of Turkish phonology is that the back part of the tongue is involved in the secondary articulation. However, velarisation also crucially involves a raising of the body of the tongue towards the velum. Therefore, back vowels that involve some raising could potentially create a bias towards velarisation. Classical Arabic has a low central vowel /a/ and a high

back vowel /u/ which are treated as back in Turkish. If the further back and higher place of articulation of /u/ were to create a velarisation bias, we should find a higher frequency of velarisation when /l/ is preceded by /u/ than when it is preceded by /a/. However, the data in Table 3 show that this is not the case. In summary, the survey of relevant phonological factors suggests that the underlying cause for the preference for velarisation in 14 percent of the cases is not likely to be the phonological environment of word-final coda /l/.

5.1.3. Elite bilingualism in connection with Arabic loanwords

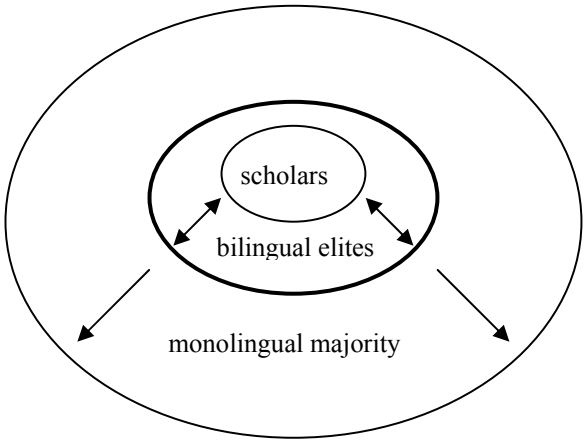
According to Prokosch (1996: 35) many Arabic loanwords were borrowed into Ottoman Turkish indirectly via Persian and therefore already contained some prior Persian adaptations. Since Persian and Arabic both have only one lateral phoneme which lacks velarisation, this does not affect the input to Turkish. He goes on to report that there were also learned loans which were borrowed directly from Arabic via written works. In the absence of detailed etymological dictionaries of Turkish documenting when specific words were borrowed, it is difficult to determine with certainty whether a particular Arabic borrowing came via Persian or not. Under the Ottoman empire an imperial high culture emerged from the mid-fifteenth century onwards, where Arabic came to play an important role especially among the elites (Kerslake 1998: 179–180). The Ottoman elites are often described as trilingual in Turkish, Arabic and Persian (Kerslake 1998: 180 and Lewis 2002: 9). Arabic was the dominant language in domains such as education, natural sciences, historiography, theology and law (Lewis 2002: 5–27). It is likely that there was some indirect and some direct borrowing prior to the imperial Ottoman era, but direct borrowing from written texts is likely to have increased during the imperial era culminating in the stylistically elaborate *inšā* period starting in the sixteenth century (see Kerslake 1998: 182). Therefore, it is appropriate to assume that the bulk of Arabic loanwords were borrowed after the fifteenth century. According to Thomason's borrowing scale (2001: 70–71), which stipulates four degrees of contact intensity in increasing order from Degree 1 (casual contact) to Degree 4 (intense contact) with accompanying lexical and structural borrowings, the intensity of Ottoman Turkish contact with Arabic is classified as Degree 2.

5.1.4. The original borrowers of Arabic loanwords

The most likely original borrowers of Arabic words were Muslim and Turkish-speaking Ottomans who had access to the above-mentioned Arabic-dominant domains. All of these domains require literacy, which was very low in the empire, and some degree of formal education. Therefore, the educated elites in the empire are the most probable original borrowers of Arabic loanwords (see the inner circle in bold in Figure 3). The kind of bilingualism that led to the borrowing of Arabic loanwords can therefore be classified as elite bilingualism among a small minority in the Turkish speech community. The descriptions provided by Yıldız & Abalı (2003)

suggest that the average educated Ottoman mainly had receptive command of Arabic grammar and vocabulary, which he/she used in reading and copying texts in Arabic. Those who proceeded to higher education and became members of the *ilmīye* class of professional scholars and clergymen were required to have more substantial and active knowledge of written Arabic (cf. Prokosch, 1997: 54). These descriptions suggest that most educated Ottomans had low-to-intermediate levels of functional proficiency in Arabic which was mostly receptive. Nevertheless, there was a small group of professional scholars and clergymen who had high proficiency in written Arabic, some of whom could also use it in oral communication (see the innermost circle in Figure 3). Uneducated members of the Ottoman Turkish speech community had very little direct contact with and no or very low proficiency in Arabic and consequently received the output of the elites as their input (see the outer circle titled "monolingual majority" in Figure 3). Hence, the intensity of contact with Arabic among the Ottoman elites can be classified as belonging to Degree 3 on Thomason's borrowing scale (2001: 70–71). The scholars teaching the elites in schools are likely to have set the standard for and closely monitored the phonological integration of Arabic loanwords among their students.

Figure 3. Likely spread of Arabic loanwords from more to less proficient speakers of Arabic in the Ottoman Turkish speech community



Legend: Unidirectional outward arrows show the direction of spread of Arabic loanwords. The bidirectional arrow represents feedback processes between different segments of the speech community.

There is very little information on the actual pronunciation of Arabic by Ottomans. Nonetheless, Prokosch (1997: 55) reports that the pronunciation used in schools was largely correct regarding the consonants but deviated from the classical norm in the vowels. Hence, an intermediate-to-advanced level of phonetic-phonological

competence seems most probable among the elite borrowers. On the other hand, the scholars and clergymen were more likely to have an advanced level. Based on these descriptions, a plausible hypothesis is that the high prestige of Arabic and the close scrutiny of highly proficient scholars motivated the elites to preserve the original /l/ as in (9). Thus, the Arabic phoneme /l/ was mapped onto the phonetically similar Turkish allophone [l]. This type of phoneme-to-allophone mapping is commonly attested in borrowing (cf. Aitchison 1991: 117; McMahon 1994: 210; Danchev 1995: 69 and Johanson 2002: 14) and constitutes a case where the original DL structure is relatively familiar to the RL's phonological system. Therefore, such cases do not require nativelike competence in the DL in order for adoption to be available to the borrowers as a strategy.

This preserved /l/ later became the input for the rest of the speech community with the normative connotation that the elite type of integration was to preserve the /l/ and to harmonise it by suffixing it with front suffixes. The motivation for following this elite norm might have been stronger for some members of the speech community than others, which consequently could have led to variation in the speech community. Some speakers could have adapted the elite's adoption by velarising the /l/. Therefore, the possibility that the data from the Nişanyan corpus (see examples 9 and 10) may partly mask existing variation in the contemporary Turkish speech community cannot be excluded as the corpus data are based on standard norms. The fact that the investigated phonological factors cannot explain the attested cases of velarisation and the discussion on the likely original borrowers suggest that the presence of velarisation is best explained by a later adaptation of the elite's adoptions in the broader Turkish speech community. Furthermore, the fact that the original borrowers' preference for adoption is still dominant today can be explained by their socioeconomic status as the elites of Ottoman society. In order to check if this reconstruction hypothesis is correct, we now need to look at a historical text.

5.1.5. Reconstruction of the diachronic development

Viguier (1790) is a Turkish textbook for French speakers and consists of three different types of text, namely lectures, dialogues and a French-Turkish dictionary. Here, only data from the lectures will be analysed as they constitute the only authentic text type based on speech by native speakers during lectures in school. In some of the lectures, Viguier also distinguishes between elite pronunciation by the scholars and vernacular pronunciation. In Viguier, eight words were identified producing a total of twenty-two tokens which have a word-final coda /l/ after a back vowel (rows 1 and 2 in Table 4).

Table 4. Suffixation of Arabic loanwords with word-final /l/ after a back vowel in Viguier (1790)

	Data type	Only front suffix	Only back suffix	Variation between front and back suffixes
1	8 words	5 (63 %)	0 (0 %)	3 (37%) *2 of these words have front suffix in elite speech but back suffix in vernacular speech*
2	22 tokens	16 (73 %)	6 (27 %)	-
3	Comparison with the words in the Nişanyan Corpus for Modern Standard Turkish	86 %	14 %	
4	Change from Viguier to Nişanyan: front > back	Words: 1 Tokens: 4	Words: 0 Tokens: 0	Tokens: 3/9 front>back
5	Same value in Viguier and Nişanyan	Words: 4 Tokens: 9	Words: 0 Tokens: 0	Tokens: 6/9

There is some variation in the distribution of these loanwords between front-suffixed ones and ambiguously suffixed ones. The predominance of front-suffixation in Viguier resembles the contemporary pattern found in Nişanyan (2002) as presented in row 3 in Table 4. Of the eight words, three display both front-suffixed and back-suffixed variants. For two of these words Viguier provides evidence of suffixation from both elite speech and vernacular speech. In elite speech front suffixes are preferred whereas in vernacular speech back suffixes are preferred. This indicates that harmonic preservation was more prevalent among elites than in the rest of the speech community. When we look at the tokens for these ambiguous words in rows 4 and 5 in Table 4, we see that the pattern of back suffixation, which we also find in Modern Standard Turkish, was more common in six out of nine tokens. This suggests that the variation might be due to ongoing language change where most but not all tokens of the same word are affected by the change process involving a transition from front to back suffixation.

The data also contain one word whose suffixation pattern deviates from the pattern in Modern Standard Turkish. In Viguier, the Arabic word /maːl/ has the accusative [mali] with front suffixation in four tokens but in Modern Standard Turkish it displays the opposite pattern with *mal* [mał] ‘goods, wealth’ in the nominative and *malı* [małɯ] in the accusative. Furthermore, in compound verbs in Modern Standard Turkish where the same word *mal* is followed by a vowel-initial auxiliary verb as in *mal olmak* [maːłoɫmak] and *mal etmek* [maːletmek], the final /l/ of *mal* is realised as front just as in Viguier (1790). This comparison provides further evidence for a process of language change whereby a historically preserved front /l/ among elites has later been velarised in the vernacular with the exception of

a few idiomatic expressions. The most likely explanation for this diachronic increase in velarisation is the frequency of use. More frequently used words would have maintained the front /l/ while it would have been velarised in less frequently used words, with idiomatic expressions being affected by this development to a lesser extent. Very important changes have taken place in the Turkish linguistic landscape since the foundation of the Turkish Republic in 1923. These changes are likely to have affected the frequency and use of Arabic loanwords. The Latin script replaced the Arabic-based one. Education reforms diminished the status of and proficiency in Arabic in the republican society. The language reform replaced many Arabic loanwords with native or newly coined alternatives and many of the remaining Arabic loanwords began to be used less frequently. Consequently, the intensity of contact with Arabic increased remarkably. In the case of loanwords, this also meant that it became more difficult to compare loanword forms with their Arabic originals and to base notions of correctness on such comparisons. Hence, these developments after 1923 are likely to have contributed to the existing trend towards velarisation in Arabic loanwords.

5.2. New Swedish borrowings

The translation experiment included seven proper names with a front word-final coda /l/ after a back vowel. Six of these names were expected to be integrated into Turkish as part of the task design and therefore occur at least twice per participant, while the seventh one was spontaneously included by some participants and displayed at least two tokens per participant. There were a total of 813 tokens corresponding to a mean occurrence of 68 per participant.

5.2.1. Phonological integration strategies in new Swedish borrowings

The nouns display some variation with a mean of phonetic quality preservation at 78.32 percent and a standard deviation of 16.99. The examples in (11) and (12) are based on the means for all seven nouns and do not necessarily reflect the results for the particular noun chosen as the example but only the *type* of integration strategy.

(11) Dominant strategy in Swedish borrowings: Preservation (Adoption), mean = 78 %

	Swedish output:	*Östermalm*	[œstɛrˈmalm]
<u>Mophological environment</u>			
Simplex		a.	œstɛrmalm
Suffixed (e.g. accusative suffix)	40 %	b1.	œstɛrmalm-i
	38 %	b2.	œstɛrmalm-ɯ
Underlying form in Turkish		c.	/œstɛrmalm/

(12) Alternative strategy in Swedish borrowings: Velarisation (Adaptation), mean = 22 %

	Swedish output: 'Östermalm'	[œstɛrˈmalm]
Morphological environment		
Simplex	a.	œstɛrmaɬm
Suffixed (e.g. accusative suffix)	b.	œstɛrmaɬm-ɯ
Underlying form in Turkish	c.	/œstɛrmaLm/

The dominant pattern is that the front quality of /l/ is preserved in both simplex and suffixed environments (see 11a and 11b). In the suffixed environment, three different strategies are attested. When the front quality is preserved in (11), this preservation can be broken down to two distinct patterns in suffixation. In (11b1) *harmonic preservation* is observed with a frequency of 40 percent among all suffixed cases. In (12b) *velarisation* is observed with a frequency of 22 percent. These two strategies are the same as the ones attested in Arabic loanwords and are both fully grammatical in Modern Standard Turkish. However, a third and innovative strategy is also observed in the Swedish data in (11b2) whereby the front /l/ is preserved but does not participate in the stem-suffix harmony processes, i.e. is deharmonised. Therefore, this strategy with a frequency of 38 percent will be referred to as *deharmonised preservation*. From the perspective of Modern Standard Turkish, deharmonised suffixation is strictly speaking ungrammatical.

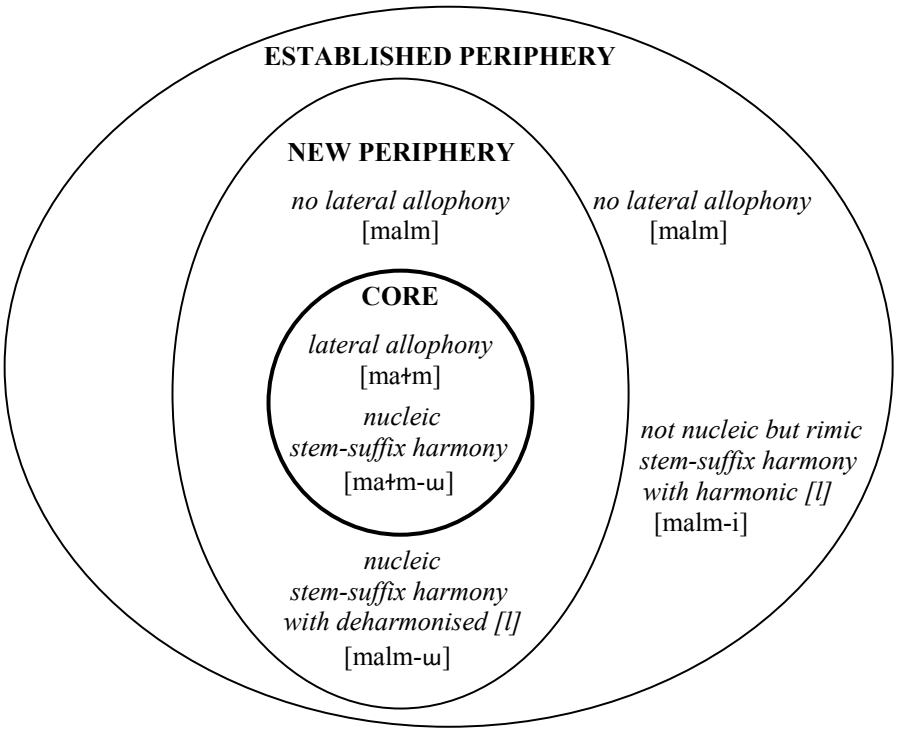
(13) Overview of attested integration strategies in new Swedish borrowings

STRATUM: Established periphery	STRATUM: New periphery	STRATUM: Core
FREQUENCY: 40%	FREQUENCY: 38%	FREQUENCY: 22%
a. Harmonic suffixation as in (11b1)	b. Deharmonised suffixation as in (11b2)	c. Regular suffixation as in (12b)
a l m - i	a l m - ɯ	a ɬ m - ɯ
[-high] [+high]	[-high] ~~[-back]~~ [+high]	[-high] [+high]
~~[+back]~~ [-back] → [-back]	[+back] - - - ▶ [+back]	[+back] - - - ▶ [+back]
[-round] - - - ▶ [-round]	[-round] - - - ▶ [-round]	[-round] - - → [-round]
Violation:	Violation:	Violation:
1) lateral allophony rules	1) lateral allophony rules	none
2) vowel-harmony rules		

As the overview in (13) shows, harmonic and deharmonised suffixation have the violation of the lateral allophony rules in common. However, deharmonised

suffixation involves one less violation than harmonic suffixation since it follows the rules of vowel harmony regarding stem-suffix harmony processes in the core. In this sense, deharmonised suffixation can be placed between the core and the established periphery in a new peripheral stratum. This is illustrated in Figure 4, where the periphery of the bilinguals' Turkish phonological lexicon is divided into two strata. The first stratum closer to the core is the new periphery with only one violation where deharmonised preservation can be placed. The outermost stratum is the established periphery in Modern Standard Turkish with two violations where harmonic preservation can be placed.

Figure 4. The status of words involving different integration strategies in the Swedish-Turkish bilinguals' Turkish phonological lexicon



5.2.2 The role of the phonological factors

One factor that could explain the choice between the preservation and velarisation of /l/ is the phonological environment of /l/ in the specific borrowings. In Table 5 we can see the seven words from the experiment with their phonetic transcriptions,

tokens and integration strategies. The words *Östermalm* and *Södermalm* are treated as one and the same phonological form here because their final rime is identical.

Table 5. Overview of the new Swedish borrowings integrated into Turkish in the experiment

Swedish borrowing	Meaning	Tokens (percent of all)	Swedish output form	Preservation of front /l/ (in percent)	Velarisation (in percent)
(Café) Emalj	'enamel' a place name	106 (13)	[ɛˈmalj]	96	4
Stockholm	a place name	255 (31.4)	[ˈstɔkːˌhɔlm]	89	11
Östermalm Södermalm	a place name a place name	227 (27.9)	[œstɛrˈmalm] [søːdɛrˈmalm]	78	22
saluhall	'market hall'	42 (5.2)	[ˈsɑːlʉˌhalː]	71	29
Hudiksvall	a place name	60 (7.4)	[hədɪksˈvalː]	67	33
Gröndal	a place name	123 (15.1)	[grønˈdɑːl]	47	53
Total of tokens		813 (100)			
Mean of all words				75	25
Mean of all tokens		136		78	22
Standard deviation		87		17	

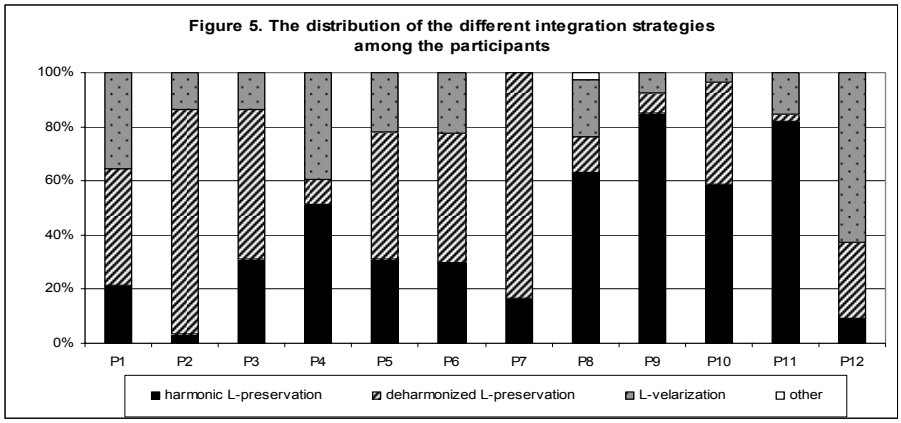
The word with the highest preservation score is *Emalj*. The nearly complete preservation in *Emalj* can be attributed to the effect of the palatal consonant /j/ following /l/. Thus, the Swedish dental /l/ receives a point of articulation that is further back than dental, closer to the post-alveolar articulation of the Turkish front /l/. This place of articulation leads to a closer phonetic match between the Swedish /l/ in this environment and the Turkish front /l/. These phonetic details seem to bias the participants towards preservation. We observe the opposite effect in *Gröndal* where the preservation frequency is lowest. The preceding vowel [ɑː] is the Swedish vowel with the farthest back place of articulation and involves a slight raising of the body of the tongue (Engstrand, 1999: 140). Therefore, there could be a slight velarisation of the /l/ in this environment in the Swedish input which is detected and utilised by the participants. However, no study on Swedish to date has investigated the precise pronunciation of /l/ in different environments. Therefore, it is uncertain if the input really contains some velarisation.

A possible contradiction to the latter conditioning effect is the word *Stockholm*, which has the second highest degree of preservation, despite the fact that we would expect the opposite effect if backness of the place of articulation and the raising of the body of the tongue in the preceding vowel [ɔ] were to play an equally important role here as in *Gröndal*. However, this type of velarisation bias might be neutralised by a stronger preservation bias here. *Stockholm* is namely the only word in the

experiment which is part of the monolingual lexicon of Modern Standard Turkish by virtue of being a European capital and has a preserved front /l/ in the standard pronunciation. This standard norm might be biasing the participants towards preservation. When the 255 tokens for *Stockholm* are removed from the data, the preservation mean of all tokens is not affected radically as it only falls from 78 to 72 percent. In the rest of the borrowings, /l/ is preceded by the short Swedish vowel [a] which has a central place of articulation and does not involve any raising. The little variation observed in the integration of the three borrowings with this vowel is therefore not likely to be due to any articulatory biases. In the great majority of the words and tokens, there is a clear and strong preference for preservation, which does not seem to stem from phonological factors but can be strengthened or weakened to a limited extent by phonetic details in the phonological environment.

5.2.3. Individual variation among the participants

Apart from variation depending on the phonological environment of /l/ in specific borrowings, there is also variation among the participants as regards their preference for different integration strategies in the suffixed environment. Figure 5 illustrates the distribution of the integration strategies among the participants. A fourth type of integration strategy called "other" is also attested here in one case for one single participant (participant 8). This involves the suffixation of a velarised [ɬ] with a front suffix and is disregarded in the analysis due to its very low frequency. All of the three other strategies are attested in all twelve participants but to varying degrees. This suggests that all three strategies are in competition with each other and can be viewed as part of every participant's phonological lexicon as previously suggested in Figure 4. In order to explain this individual variation, several background factors for the individual participants will be discussed in the following sections.

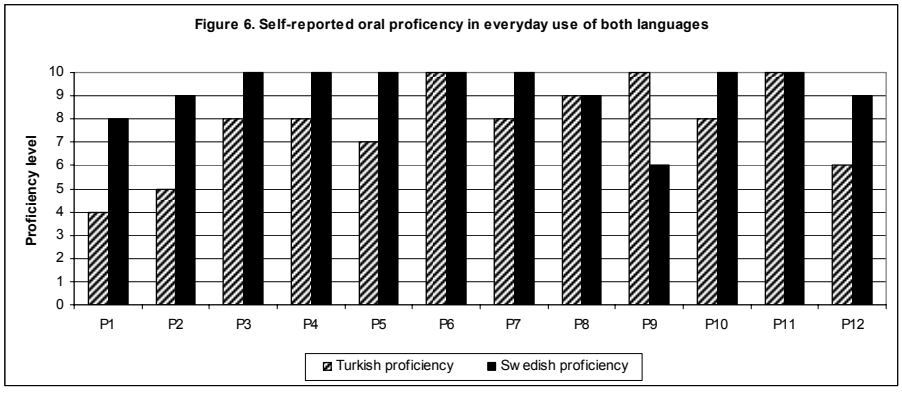


5.2.4. Immigrant bilingualism in the Swedish context

The Turkish-Swedish bilingualism attested in the Swedish context is due to the immigration of Turkish speakers to Sweden after the 1960s. The degree of community bilingualism is high among Turkish speakers, where most but not all members of the first generation have functional proficiency in Swedish. A characteristic trajectory for the language development of the second generation is that they begin as Turkish-dominant in early childhood but become either balanced bilinguals or Swedish-dominant later with increasing years of schooling. The strongest domains of use for Turkish are the family and religion while Swedish is stronger in other domains especially in academic and formal contexts. On Thomason's borrowing scale (2001: 70–71) the Swedish context can be categorised as having the highest degree of contact intensity i.e. Degree 4.

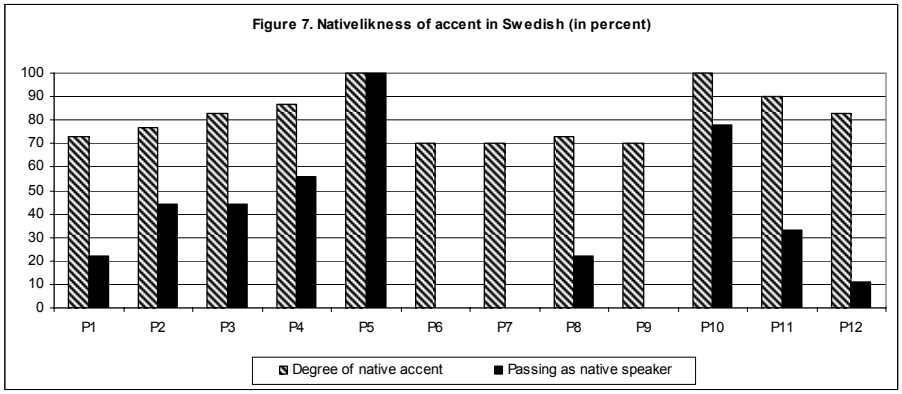
5.2.5. General proficiency levels in both languages

The proficiency levels were documented on the basis of self-reports where the participants were asked to evaluate their level in both languages by answering the question "How comfortably and effectively can you express yourself in Turkish and Swedish in everyday situations on a scale of 0–10?" The proficiency results are summarised in Figure 6. Using self-reporting as a form of evaluation has obvious drawbacks such as underestimation. In Figure 6, two individuals have a reported proficiency level lower than six and two others a reported level lower than seven for either of their languages despite the fact that they were all evaluated to have advanced functional proficiency in both languages on the researcher's overall assessment based on several components. Eight participants reported higher oral proficiency in Swedish than in Turkish, three reported the same oral proficiency for both languages and one participant reported higher proficiency for Turkish than for Swedish. The participants were asked to evaluate dominance relations in their written proficiency by answering the question "Is there a language in which you can express yourself best in written form or do you have the same level in all your languages?" Nine participants reported Swedish as their strongest written language, one participant reported the same level for both languages and two participants reported Turkish as their strongest written language. Although there is some variation among the participants, the general picture is one where Swedish is the dominant language both in the oral and written modalities.



5.2.6. Nativelikeness in both languages

The nativelikeness of the participants' pronunciation in both languages was evaluated based on audio-recordings. In the evaluation of their Turkish, the expert linguist evaluated all participants as native speakers of Turkish. The evaluation of their nativelikeness in Swedish was carried out by a panel. Two different measures of nativelikeness are presented in Figure 7. The first measure *degree of native accent* is based on the mean of the three panelists' evaluation of the participants' degree of foreign accent on a scale of 0–10 based on one task. Later the foreign accent score was subtracted from ten to obtain the score for 'degree of native accent'. The second measure *passing as a native speaker* is based on the evaluation of the participants' performance on three tasks by three different panelists. Thus, nine different scores were obtained for every participant, and the measure expresses in percent in how many of these nine instances the participants could pass as native speakers of Swedish. All participants obtained degree-of-native-accent scores equal to or above seven out of ten, while nine of the twelve participants could pass as native speakers according to the evaluation of at least one panelist on one of the tasks. Given that all the participants had started learning Swedish prior to puberty, it is not surprising that they have advanced-to-nativelike pronunciation in Swedish.



5.2.7. Specific phonological competence in the Turkish periphery

The command of a specific phonological property of Turkish, namely the harmonic suffixation pattern in established loanwords in the periphery was also investigated among the borrowers. The reason for checking for this type of specific competence in Turkish was the fact that bilinguals' knowledge of their first and second languages can diverge from monolingual speakers' knowledge in the respective languages. It should not be assumed that the bilinguals will have exactly the same competence in all aspects of Turkish phonology as monolingual speakers of Turkish do, especially in the current context where Turkish is a minority language dominated

by the majority language Swedish. The scores in Table 6 show in what percentage of all cases in the test the participants produced a standard suffixation pattern which is associated with the periphery (as in 7b and 8b). In cases where they did not produce such a pattern they velarised the /l/ and suffixed it with a [+back] suffix (as in 7a and 8a) which is not standard but can be associated with the core. Five out of twelve participants got full scores, three participants received scores just under 80 percent, while three participants scored just under 70 percent and one participant had a score just above 30 percent. The group mean was 80.56 percent with a standard deviation of 20.72 indicating advanced competence in the established periphery. However, the fact that seven out of twelve participants performed under the 80-percent level suggests that the established periphery regarding /l/ might have been weakened in the immigrant minority context. This would also explain why a new peripheral stratum closer to the core (see Figure 4) could arise in the first place.

Table 6. Harmonic preservation in established loanwords in the Turkish periphery (in percent of all cases)

Integration strategy	P1	P2	P3	P4	P5	P6	P7	P8	P9	P0	P1	P2
Standard harmonic preservation	33	78	100	67	78	100	67	100	100	78	100	67
Non-standard velarisation and back suffixation	67	22	0	33	22	0	33	0	0	22	0	33

5.2.8. Frequency and share of Turkish use

The participants were asked to report how often they used Turkish in everyday life and what the average share of Turkish was in their everyday language use compared to other languages such as Swedish. Table 7 summarises the results. Of the twelve participants, ten reported using Turkish on a daily basis while nine of these reported using it between 25 and 50 percent on an average day. This pattern points to a stable bond between the majority of the participants and their Turkish.

Table 7. Frequency and degree of Turkish

Use data	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
Frequency of Turkish use	every day	every day	every day	every day	every day	every day	every day	every day	every day	every day	every week	every week
Share of Turkish in daily average language use (in percent)	25-40	25-40	25-40	25-40	less than 25	25-40	50	50	25-40	25-40	less than 25	less than 25

5.2.9. Explaining choice of integration strategy with individual background factors

We have previously seen that phonological factors could explain some of the variation among the different borrowings. The next question is if the data on individual background factors can also contribute to explaining the attested variation among the participants as seen in Figure 5. To answer this question, statistical correlation analyses were carried out in which the three attested integration strategies for the individual participants were used as the dependent variables (see rows 2–4 in Table 8). The independent variables were general oral proficiency in both languages, oral dominance in Swedish, nativelikeness of accent in Swedish, periphery competence in Turkish and share of daily use of Turkish (see columns 2–7 in Table 8). Oral dominance in Swedish was calculated by subtracting the general oral proficiency scores for Turkish from those for Swedish. The one-tailed Pearson correlation analysis was preferred here because the directionality of the correlations, i.e. whether the correlation will be positive or negative, is predictable from the context.

Table 8. Correlations between attested integration strategies and individual background factors (N=12, one-tailed Pearson)

Integration strategy	Oral proficiency in Swedish	Oral proficiency in Turkish	Oral dominance in Swedish	Nativelike-ness of accent in Swedish	Periphery competence in Turkish	Share of daily use of Turkish
Total preservation (adoption)	r = 0.054 p = 0.433	r = 0.403 p = 0.097	r = -0.324 p = 0.152	r = -0.022 p = 0.473	r = 0,390 p = 0,105	r = 0.404 p = 0.096
Harmonic preservation	r = -0.266 p = 0.202	r = 0.731** p = 0.003	r = -0.785** p = 0.001	r = 0.161 p = 0.309	r = 0,530* p = 0,038	r = -0.012 p = 0.486
Deharmonised preservation	r = 0.284 p = 0.186	r = -0.470 p = 0.061	r = 0.567* p = 0.027	r = -0.179 p = 0.288	r = -0,271 p = 0,197	r = 0.281 p = 0.188
Velarisation (adaptation)	r = - 0.026 p = 0.468	r = -0.416 p = 0.089	r = 0.350 p = 0.132	r = 0.040 p = 0.450	r = -0,418 p = 0,088	r = -0.445 p = 0.074

** Significance at the 0.01 level * Significance at the 0.05 level

The correlation results in Table 8 show that only three of the six investigated individual background factors deliver statistically significant correlations. Before we interpret these correlations, it should be noted here that there are significant internal correlations between some of the background factors. Since oral dominance in Swedish is a composite of oral proficiency in Turkish and Swedish, it correlates strongly with both. Periphery competence in Turkish also turns out to correlate

significantly (two-tailed Pearson: r = 0.815, p = 0.001) with oral proficiency in Turkish. This suggests that they are both measuring different aspects of the same phenomenon, namely overall competence in Turkish. The analysis shows that preference for harmonic preservation as an integration strategy correlates positively with oral proficiency in Turkish and with periphery competence in Turkish but negatively with oral dominance in Swedish at the 0.05 level. This means that the more a speaker uses harmonic preservation in established loanwords in Turkish, the more likely he/she is to prefer the same integration strategy in new borrowings. Furthermore, the higher a speaker evaluates his/her own oral proficiency in Turkish, either in absolute terms (oral proficiency in Turkish) or relative to oral proficiency in Swedish (oral dominance in Swedish), the more likely the speaker is to prefer harmonic preservation in new borrowings. Deharmonised preservation, on the other hand, correlates positively with oral dominance in Swedish at the 0.05 level. This means that the more a speaker is orally dominant in Swedish, the more likely he/she is to prefer deharmonised preservation. The statistical analyses do not show that velarisation can be explained by the investigated background factors.

Regarding oral dominance in Swedish as a relative measure, what matters more in the minority context is variation in oral proficiency in Turkish (standard deviation: 1.96) rather than variation in oral proficiency in Swedish (standard deviation: 1.22). The greater variation as measured in standard deviation is namely found in the minority language Turkish. The chances of developing advanced oral proficiency are thus greater in the majority language than in the minority language. Therefore, the overall picture that emerges from the interpretation of these significant correlations is that the more competent speakers of Turkish (who also happen to be more balanced bilinguals with less oral dominance in Swedish) show a preference for harmonic preservation, while the more Swedish-dominant speakers show a preference for deharmonised preservation.

Let us evaluate the three integration strategies in terms of their faithfulness to the original output of the donor language Swedish and their faithfulness to the phonological rules of the recipient language Turkish. Table 9 shows that harmonic preservation constitutes the optimal integration strategy because it is faithful to both Swedish and Turkish (in the established periphery) provided that the speaker is highly competent in the Turkish periphery. The other integration strategies, on the other hand, involve preferring faithfulness to one language over faithfulness to the other language. Deharmonised preservation is more faithful to Swedish, while velarisation is more faithful to Turkish (in the core). The results show that faithfulness to Swedish, i.e. preservation of /l/, is very dominant (78 percent), possibly due to the majority status of Swedish and the borrowers' advanced proficiency in Swedish. Once we establish that harmonic preservation facilitates optimal faithfulness to both languages, it seems natural that more balanced bilinguals prefer this strategy over others. Similarly, since deharmonised preservation involves preferring faithfulness to Swedish to faithfulness to Turkish, it also makes sense that more Swedish-dominant borrowers should prefer this strategy.

The background factor that provided the strongest correlations and the only correlation that was significant in both harmonic and deharmonised preservation in Table 8, was oral dominance in Swedish. In addition to its statistical robustness, this background factor has two further advantages. Firstly, it concentrates information from two proficiency factors in one single factor. Secondly, as a relative measure it is more reliable than the separate absolute proficiency measures as the speakers can be expected to evaluate more competently if they speak one language better than the other compared to how they evaluate their absolute level in both languages.

Table 9. Integration strategies in terms of their faithfulness to different strata in the phonological lexicons of Swedish and Turkish

Integration strategy	Faithfulness to original Swedish output	Faithfulness to phonological rules in the established Turkish periphery	Faithfulness to phonological rules in the Turkish core
Harmonic preservation	✓	✓	✗✗
Deharmonised preservation	✓	✗	✗
Velarisation	✗	–	✓

Legend: ✓: completely faithful, ✗: not faithful to one rule, ✗✗: not faithful to two rules, –: does not apply

6. Summary and comparison of the analysed results

One commonality between the cases is that the tendency to preserve the front quality of /l/, i.e. the preference for adoption rather than adaptation, is very strong in both contexts of borrowing (86 present in Arabic loanwords and 78 percent in Swedish borrowings). This is particularly striking because the phonetic quality of /l/ in the donor language output is not related to any phonemic contrasts in either Arabic or Swedish. Hence, adaptation of /l/ by velarisation would not lead to any loss of lexical contrasts between potential minimal pairs. Since the phonetic realisation [l] exists in Turkish, the issue of being able to perceive its original phonetic quality is not particularly tricky, even for speakers with no or low phonetic-phonological competence in the donor languages. Moreover, in both discussed cases the original borrowers have levels of phonetic-phonological competence on or above the intermediate level (see the last column in Table 11). These facts mean that adoption was an available strategy in these particular speech communities.

The analysis of the phonological factors has shown that they play a limited role in the two investigated cases. In the Arabic case, no phonological factor could be identified as relevant for the choice of integration strategy. In the Swedish case, the adjacent phonological environment of /l/ was shown to have some effect, but it did not influence the choice of strategy profoundly. Therefore, it seems that the clear

preference in the data for the preservation of the original /l/ is best explained by sociolinguistic factors in both cases. Table 10 summarises the sociolinguistic characteristics of the two contexts. General proficiency and phonetic-phonological competence in the donor language are also included here because they are often strongly determined by the sociolinguistic circumstances although they are not sociolinguistic factors per se.

Table 10. Main sociolinguistic characteristics of the two contexts of borrowing

DL *Type of bilingualism*	Status of DL	Degree of bilingual-ism in the RL community	Intensity of contact with DL (1–4)	Domains of use for DL	Modality of use for DL	Borrower profile	General proficiency in DL among borrowers	Phonetic-phonological competence in DL among borrowers
ARABIC *Elite bilingualism*	Minority language with high prestige	Low in general High among elites	Degree 2 in general Degree 3 among elites	Education Law Research Religion	Mainly receptive	Educated elites	Low-to-intermedi-ate	Intermediate -to-advanced
SWEDISH *Immigrant bilingualism*	Majority language	High	Degree 4	Nearly all except for family and religion	Receptive and productive	Second generation immigrants	Advanced-to-nativelike	Advanced-to-nativelike

Legend: DL = donor language, RL = recipient language (Turkish). The degree of intensity of contact is based on Thomason's increasing borrowing scale (2001: 70–71).

The strong preference for adoption rather than adaptation can be explained satisfactorily by the relatively high intensity of contact (see Table 10) and the high prestige that both Arabic and Swedish have in their sociolinguistic contexts. In the Swedish case this high prestige is matched by advanced-to-nativelike proficiency in the donor language because Swedish is the majority language. However, in the Arabic context the type of minority language that Arabic was did not lead to such high proficiency levels. Nevertheless, both donor languages can be claimed to have some kind of dominance over the recipient language Turkish among the borrowers. In the Arabic case, this can be called *weak dominance* because the high prestige is not matched by equally high proficiency levels in Arabic. In the Swedish case, we can speak of *strong dominance* or *dominance proper* because the high prestige is matched by equally high proficiency levels in Swedish (cf. Johanson, 2002: 9 for a similarly central role for dominance).

The main difference between the circumstances of borrowing is that adoption through harmonic preservation in the periphery was already an established alternative to adaptation in the Swedish case. In the Arabic case, this periphery was not yet established in the phonological lexicon. Therefore, in the Arabic case the

alternative to adaptation had to arise through the phonological integration process itself. From this perspective, especially given that harmonic preservation offers optimal faithfulness to both the donor language and the recipient language, it is surprising that this integration strategy is preferred in only 40 percent of all cases in the Swedish context. This was explained by the dominance of Swedish as a majority language. It was argued that the minority status of Turkish has consequences for some relevant aspects of phonological competence in Turkish among the bilinguals. The attested weakening of the established periphery of Turkish was demonstrated to reduce the productivity of that periphery for the participants. The study has shown that when the sociolinguistic motivation to adopt a front /l/ is coupled with the weakening of the established periphery, the result is a third and innovative integration strategy, namely deharmonised integration.

We do not have any evidence suggesting that deharmonised preservation was also used initially in the integration of Arabic loanwords. Due to the Arabic-based writing system and the lack of transcription texts that record the phonetic quality of /l/, it is almost impossible to detect such evidence in written sources. Therefore, the possibility that deharmonised preservation might have preceded harmonic preservation as the initial adoption strategy in the Arabic case cannot be fully discounted. Deharmonised preservation with its violation of lateral allophony rules could have been the first diachronic step towards harmonised preservation with its further violation of the rules of vowel harmony between stems and suffixes. Such a development would look exactly as in Figure 4, where the new periphery would have diachronically preceded the established periphery. Another possibility is that harmonic preservation emerged directly without a transitory phase of deharmonised preservation. The previously mentioned Ottoman orthographic convention whereby the Arabic /l/ is classified as a front segment and the prominent role of the written modality for Arabic in Ottoman society support the latter hypothesis. It is more likely that the word-final Arabic /l/ would have been harmonised directly based on these orthographic conventions. Therefore, Figure 2 probably constitutes a better representation of the diachronic development.

It is also tempting to ask what kind of preservation strategy would have emerged in the Swedish context if harmonic preservation had not existed as an established strategy to begin with. Would harmonic preservation still have emerged as in the Arabic case, or would only deharmonised preservation have emerged? The fact that the latter integration strategy *did* emerge despite the obvious advantages of the former points to the strength of deharmonised preservation in this Swedish-dominant context. Two further arguments suggest that only deharmonised preservation would have emerged in such a hypothetical scenario. Firstly, the orthographic support in the Arabic case is not present in the Swedish case. Secondly, as deharmonised preservation involves one less violation than harmonic preservation, it constitutes a less dramatic case of language change. Therefore, it is possible to conjecture that it was the intertwining of special phonological and sociolinguistic circumstances in the Arabic case that led to the emergence of a periphery in the Turkish lexicon as an

instance of contact-induced language change which had far-reaching consequences for the phonological system of Turkish such as altering the rules of vowel harmony.

7. Conclusion

Two findings of the present study have important repercussions for theories regarding the phonological integration of lexical borrowings. Firstly, the study found that phonetic details do play a role, albeit a limited one, in the perception of bilingual borrowers. This finding lends support to the perceptual stance and contradicts Paradis & LaCharité's (1997 and 2008) claim that phonetic details which are not related to phonemic contrasts in the donor language do not play a role in borrowing by bilinguals. This also undermines the proposal by Heffernan (2005) that there should be division of labour between the perceptual stance and the phonological stance stating that the former is valid for monolingual borrowing and the latter for bilingual borrowing. The conclusion we can draw from this finding is that any theory of phonological integration should allow for perceptual effects regardless of the competence of the borrowers in the donor language. A further word of caution for studies on bilingual borrowing regards the importance of checking for phonological competence in the recipient language if it is a minority language. The weakening of the established periphery in Turkish that was observed in the present study makes a strong case for the need to pay attention to the borrowers' competence in the recipient language as well as in the donor language (cf. Oñederra, 2009 for a similar case in Spanish-Basque bilinguals).

The second theoretically relevant finding is that sociolinguistic factors which are rooted in language dominance relations in the context of borrowing play a crucial role in bilingual borrowing, both when the degree of community bilingualism is low (the Arabic case) and when it is high (the Swedish case). In the Arabic case, the bilingual borrowers who were in the minority have still succeeded in setting the standard for the phonological integration for the larger speech community. This is exactly what Paradis & LaCharité (2008) found for English loanwords in Old Quebec French, where the degree of community bilingualism was low. However, it should be noted that the impact of the bilinguals is contingent upon their socioeconomic status in the recipient speech community. Paradis & LaCharité (2008) do not remark on the status of the bilinguals in their study. In the Arabic case in the present study, the borrowers belong to an elite minority with great sociolinguistic capital in the speech community. This points to the need to pay more attention to the socioeconomic status of the borrowers in studies on phonological integration. The central role played by different sociolinguistic factors in the present study is in line with previous research on bilingual borrowing (Poplack, Sankoff & Miller 1988; Thomason 2001; Sakel 2007; McMahon 1994 and Matras 2007). Several studies have shown that sociolinguistic factors are especially important for the prevalence of adoption over adaptation as an integration strategy (cf. Thomason 2001: 135 on early Russian loanwords in Yupik; Poplack, Sankoff & Miller, 1988

on English loanwords in French; and Sandfeld 1930 and Marioţeanu et al. 1977 on Greek loanwords in Romanian).

However, the greater impact of sociolinguistic factors compared to phonological factors in the present study does not necessarily lend support to the view that sociolinguistic factors can "trump" phonological factors given the right social circumstances of contact (cf. Thomason 2001: 85). In both cases of borrowing, it was shown that adoption was available as a strategy for the borrowers. Once adoption is available, sociolinguistic factors are free to trump phonological factors in the sense that adoption is preferred to adaptation. However, this does not mean that sociolinguistic factors could override phonological factors if the phonological structure in question were absolutely more marked or relatively more foreign to the recipient language than in the present study. If the borrowers had difficulty in perceiving and producing the foreign donor structures correctly, sociolinguistic factors could hardly be expected to result in adoption. As the present study has demonstrated, phonological and sociolinguistic factors are inextricably intertwined in the phonological integration process and neither type of factor should be underestimated or neglected. Positive attitudes towards the donor language are the primary driving force behind the borrowing of lexemes to begin with, which can also create a powerful incentive to adopt them in their original form. In this sense sociolinguistic factors do have a primacy. However, such a willingness to adopt is necessarily and crucially constrained by the borrowers' ability to perceive and produce donor-language structures in their original form. From this perspective, sociolinguistic factors such as dominance relations initially set the stage where the relevant phonological abilities in the borrowers develop. Later these abilities constitute the precondition for the sociolinguistic factors' impact on the choice between adoption and adaptation.

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