THE INTEGRATION OF FRENCH LOANWORDS INTO VIETNAMESE: A CORPUS-BASED ANALYSIS OF TONAL, SYLLABIC AND SEGMENTAL ASPECTS

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Abstract

Due to its history of language contact with French, modern Vietnamese contains numerous loanwords of French origin, many of which refer to a variety of culturally transmitted items (such as clothing, food, technology, tradeable objects more generally). The present study deals with the phonological aspects of such loans, considering tone, syllable structure and segmental structure. The analysis is based on a corpus of roughly 500 Vietnamese nouns of French origin that, according to native speakers' judgments, are still in use. As for tonal structure, generalizations about tone assignment made in previous research are modified. The systematic analysis of repair strategies applying to French consonant clusters in onsets and codas shows that Vietnamese generally prefers deletion over epenthesis, unlike many other languages, with two additional repair processes being attested in specific contexts, as well.

Keywords: loanwords, phonology, tones, syllables, language contact
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1 Introduction

The integration of loanwords is one of the classical research topics in linguistics, since the processes occurring in loanword integration potentially shed light on questions pertaining to a variety of linguistic subdisciplines, among which are sociolinguistics, historical linguistics as well as grammatical theory. The present study addresses the integration of French loanwords into Vietnamese, with a focus on the phonology of tone and syllable structure.

The phonological systems of French, an Indo-European language of the Romance branch, spoken in Western Europe, and Vietnamese, an Austroasiatic language of the Vietic branch, spoken in Vietnam, are structurally distinct. First, concerning the prosodic type (in the sense of Hyman 2006), French is (probably) a stress accent language (Pulgram, 1965; Di Cristo, 1999), while Vietnamese is a tone language (Nguyễn, 1997; Pham, 2003; Kirby, 2011; Brunelle, 2014; Brunelle and Kirby, 2016). Second, French and Vietnamese have different phonotactics: While French allows complex syllable onsets and codas (Klausenburger, 1970; Tranel, 1987), in Vietnamese onsets and codas consisting of more than a single consonant are illicit (Nguyễn, 1997; Kirby, 2011). In addition, only a subset of the Vietnamese consonants can occur in coda position, but in French the inventories of onset and coda consonants are roughly identical.

Furthermore, the French lexicon contains many content words consisting of three or more syllables, while a relatively high proportion of Vietnamese content words are mono- or disyllabic (cf. Đ. H. Nguyễn, 1997 and Trần, 2011). One might expect these differences to be reflected in maximality and minimality constraints on the size of prosodic words in each language, but the prosodic structure of French and Vietnamese may not be so different, after all. For both languages, it is controversial whether they have prominence at the word level, cf. Brunelle (2017) for Southern Vietnamese and Bosworth (2017) and Özçelik (2017) for two recent — and conflicting — views on French. Therefore, it is not clear to what extent the level of the prosodic word is relevant to the description of the phonology of Vietnamese — and less so — of French; cf. in particular Schiering, Bickel and colleagues for Vietnamese (Schiering, Bickel and Hildebrandt, 2010) and Pulgram (1965) and much subsequent work for French (e.g., Delais-Roussarie, 1996; Jun and Fougeron, 2002). Finally, the segmental inventories of French and Vietnamese overlap only partially, both with regard to consonants and to vowels (cf. section 4).

In the light of these structural differences, when adapting a French word into Vietnamese, speakers need to assign each syllable a tone, simplify consonant clusters, and map French segments without direct correspondents in Vietnamese onto word forms permitted in the target language. In the present study, French

loanword integration in Vietnamese is analysed on the basis of a corpus of roughly 500 loanwords that are still in use in contemporary Vietnamese, selected from a more comprehensive loanword corpus currently containing around 1000 French loans. The sub-corpus analysed here is accessible online; see section 4. In what follows, section 2 defines some basic concepts concerning the integration of loanwords and provides background information on the language contact situation between Vietnamese and French. A brief summary of previous research on the integration of French loanwords into Vietnamese is given in section 3. The corpus is described in section 4. Section 5 presents the result of the present study, starting with tone assignment in section 5.1. The mapping of French consonantal segments onto Vietnamese consonants is discussed in section 5.2, while section 5.3 deals with the integration of French consonant clusters. Conclusions are presented in section 6.

2 Processes of loan integration and the contact situation between Vietnamese and French

2.1 Lexical borrowing and loan integration

Language contact, however shallow it may be, often leads to the borrowing of words from one language (the 'source language') into the other (the 'target language'). Borrowing is thus an uncontroversial case of language change caused by contact (cf. also Thomason 2006). Language contact occurs whenever a given speaker makes use of, in addition to his or her first language ('L1'), linguistic material of another language (ranging from a few words to fluent production in that language). This language may have been acquired as a second language ('L2'), but it may also be a first language in the case of multilingual first language acquisition. For the sake of simplicity, we assume here a somewhat prototypical definition of the terms 'first' and 'second' language, primarily based on age of acquisition (i.e., roughly speaking, before or after the age of six years, cf. Saville-Troike 2006; Lenneberg 1967). Depending of the sociolinguistic characteristics of the contact situation, borrowing may be symmetric, i.e., both languages borrow from each other to a similar degree, or, as is more frequently attested, asymmetric, i.e., borrowing proceeds primarily from the language with more overt prestige in a given contact situation into the language with less overt prestige in that situation (Haspelmath, 2009).

The present article focuses on situations of language contact between, on the one hand, speakers with Vietnamese as a first language and French as a second language and, on the other hand, French as L1. During the period of close contact between Vietnamese and French for almost a century of French rule from 1867 to 1954, linguistic borrowing — in the sense of 'language change' with somewhat stable effects on the lexicon, as conceived of by Thomason and colleagues (Thomason and Kaufman, 1988; Thomason, 2001) — occurred primarily from the language with more overt prestige in that specific situation, i.e. French, into the language with less overt prestige, Vietnamese.

Following Paradis & LaCharité (1997:391), who in turn base their definition on Poplack, Sankoff & Miller (1988), we consider a word of a target language L1 (here: Vietnamese) to be a 'loanword' from a source language L2 (here: French) if it 'is incorporated into the discourse of L1; ... has a mental representation in L1; and ... is made to conform with ... the ... phonological constraints of L1.' According to this definition, processes of loanword adaptation consist of the integration of a non-native lexeme, drawn from a source language L2, into the lexicon of a recipient language L1, modifying, among other things, the word's phonetic and phonological representation such as to adapt it to the phonetics and phonology of L1. It is precisely these processes of phonetic and phonological integration that are the focus of the present study.

Two aspects of this definition are worth further mention. First, a form is considered a loanword only if it is actually used ('incorporated into the discourse') by speakers of L1 (i.e., Vietnamese) and if it is considered part of the lexicon ('has a mental representation'). The present study has ensured that the data adhere to this condition by analysing only data which are still in use, checking potential loanwords against both native speaker judgments and a current Vietnamese dictionary; see section 4.

Second, and more importantly, the study of loanword integration provides a window into the productive phonetic and phonological constraints of the target language, which become visible in the form of changes that word forms of the source language undergo in the course of their integration into the target language. The native lexicon of a language contains words that have been living in the language for centuries and that often have accumulated a host of morphophonological irregularities that are no longer related to productive alternations. Loanwords, in contrast, are new words, and the integration of a loanword into the target language is a creative process in which native speakers draw on their knowledge of currently productive rules and patterns of the language. For this reason, productive processes and default properties of the target language

may be more readily visible in loanword adaptation than in the historically evolved native lexicon. Hence, we consider the study of loanword adaptation as a fruitful path to a better understanding of the productive patterns of Vietnamese phonology.

Finally, research of the last two decades has yielded a growing body of knowledge on universal principles of loanword adaptation that is too comprehensive to be summarized here; recent reviews are provided by, e.g., Uffmann (2015); Kang (2011); Haspelmath & Tadmor (2009) and Paradis & Lacharité (2011). The integration of loans in Vietnamese appears instructive in this respect, as it does not follow commonly accepted typological generalizations concerning the repair of consonant clusters. First, cross-linguistically there seems to be, at least in word initial (onset) position, a preference for epenthesis over deletion (cf. Kang's 2011 discussion of more than 30 languages, Shinohara's 2006 study on the five typologically distinct languages Cantonese, Marshallese, Fijian, Yoruba and Samoan). Second, strategies of segmental integration have been found to be more variable in word-final position as compared to word-initial position (Kang 2011). In 5.4, we will discuss the results of the present study in the light of these two generalizations.

2.2 Language contact between French and Vietnamese

According to Alves' (2009) study on a selection of about 1,200 loanwords, around 90 per cent of the loanwords in Vietnamese are of Chinese origin. Loanwords from French, in contrast, make up only around 4 per cent of Vietnamese loanwords, with the proportion of English loanwords being even smaller. During the Chinese domination from 111 B.C. to 938 A.D., i.e., for roughly a millennium, the Chinese administrators introduced, among other innovations, a Chinese-style educational system (Wright, 2002). The French, in contrast, dominated Vietnam for less than a century. In 1867, the South of Vietnam became a French colony (Cochinchina), and the French rulers aimed at replacing the traditional Chinese-style education with a French school system, though with little success (Le, 2008). Education according to the Chinese model was preferred by the Vietnamese elites even during the French presence (Le Failler, 2015). Consequently, the teaching of French from elementary school onwards between 1876-1906 did not succeed in spreading knowledge of French and was abandoned in the 20th century (Nguyen and Nguyen, 2008). Finally, in 1954, the French lost all political power in Vietnam.

Though there are ample general historical records of this period to date, we do not have a precise picture of the language contact situation between French and Vietnamese during the French domination. Given that at the end of the nineteenth century less than 10 per cent of the population of Vietnam was of French origin (Le 2008), and given the low number of native speakers of Vietnamese enrolled in French-style primary or secondary schools (with less than 2 per cent of the total population having completed elementary school according to Nguyen & Nguyen 2008), we consider it likely that most L1 speakers of Vietnamese had little to no knowledge of French. Uneducated speakers of Vietnamese communicated with French speakers in a French-Vietnamese pidgin language, but little is known of the structure of this pidgin, as serious attempts at its description were made only after it had already fallen out of use (Reinecke, 1971; Phillips, 1975).

We would like to speculate that in a situation with – supposedly – a low degree of bilingualism, where few speakers of the target language Vietnamese had knowledge of the source language French, it appears likely that loanword adaptation has been based on the phonetic surface structure of French, without interference from any knowledge of French phonology. The hypothesis, ultimately to be checked against much more data, is thus that adaptation of French words into Vietnamese is based on the French phonetic surface structure, as perceived by L1 speakers of Vietnamese with little knowledge of French and filtered through the phonological system of Vietnamese. The processes of adaptation of French loanwords into Vietnamese thus provide a window onto Vietnamese phonology, with minimal interference of French phonology.

3 Previous research on lexical borrowing from French into Vietnamese

The integration of French loans in Vietnamese has been the topic of a couple of previous studies, beginning with an article by Barker (1969), who formulates a number of generalizations about segment integration and tone assignment. Barker's study is based on a corpus of 136 loans, published in full length in his article. Most of his observations remain valid today. In the following three decades, the integration of French loans into Vietnamese received little interest in the research literature. A thesis by Vương (1992) and an article by Nguyễn (1997) focus on the phonology and orthography of French loans, dealing with truncation, tone assignment,

adaptation of consonants as well as consonant cluster repair. In a more recent monograph, Vương (2011), building on his thesis (1992), considers language contact in Vietnam in a broader setting, providing insights into dialectal variation found in processes of French loanword adaptation in the North as compared to the South. Nguyễn (2013), in another monograph on loanwords in Vietnamese, deals with orthographic differences between source lexeme and loanword. Huynh's (2008; 2010) work on French loans in Vietnamese is based on a corpus of approximately 600 words (including mostly nouns, but also adjectives and verbs), focussing on tone assignment in French loans. The corpus is published in full length in Huynh (2010), complemented with a thorough documentation and discussion of the data.

On the basis of Barker's (1969) corpus and generalizations, Pham (2012) develops an optimality-theoretical analysis of tone assignment in Vietnamese loans. A detailed recent study by Kang, Phạm & Storme (2016) has been conducted on the basis of a very large, but so far unpublished corpus of more than 1,000 words, with a focus on the adaptation of vowels. The authors show that French phonotactic tendencies with respect to vowel quality (such as the *Loi de position*, regarding the differing distribution of lax and tense vowels in closed or open syllables, cf. Storme, 2017 and Eychenne, 2014) seem to be preserved in loan adaptions by Vietnamese speakers. A recent study by Nguyen & Dutta (2017) proposes an optimality-theoretical analysis of consonant cluster integration, based on Barker's (1969) & Huynh's (2010) data. Unfortunately, this study contains no information about the size of the corpus.

4 Methods

The analysis presented here is based on a selection of 533 Vietnamese nouns of French origin, drawn from a corpus of currently 1038 words, which was compiled on the basis of various published sources. Corpora from Barker (1969), Huynh (2010) and V. K. Nguyễn (2013) were taken as a starting point. Informal interviews with Vietnamese informants helped to expand the corpus. The informants are native speakers of Vietnamese living in Germany who have learned Vietnamese in Vietnam as a first language and acquired German in their adult life as a second language. Although they do not have any knowledge of French, they are aware of the French origin of the words they mentioned. For all 533 selected nouns, it has been checked that they are still in use, drawing on native informants' judgments as well as on word frequency and use in the World Wide Web and a Vietnamese dictionary (Bùi *et al.*, 2003). Concerning the pronunciation of loanwords in the corpus, the phonetic transcriptions of the Vietnamese loanwords were first generated automatically on the basis of the orthographic representation (Kirby, 2008) and then checked with reference to native informants' pronunciation. Phonetic transcriptions of the French source words are based on the standard hexagonal pronunciation as may be found in common dictionaries (Rey-Debove and Rey, 2013). The corpus is accessible online at http://dx.doi.org/10.17169/refubium-1023.

5 Results and Discussion

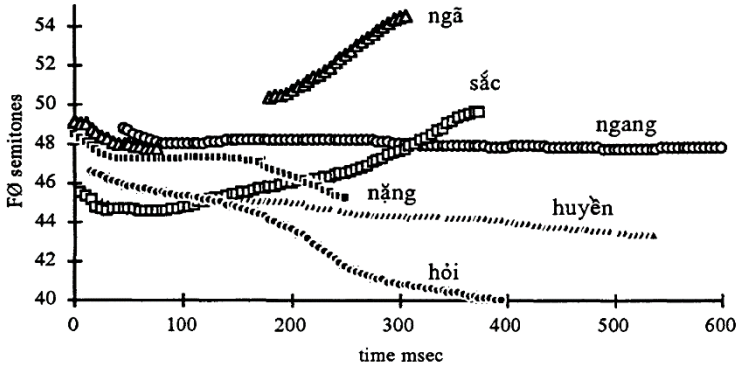
In this section, three aspects of Vietnamese loanwords from French are dealt with: first, we briefly discuss our results with respect to tone assignment, basically confirming and refining generalizations stated in previous research, then we consider the integration of French consonantal segments, and finally we deal with processes of repair of syllable structure.

5.1 Tone assignment in French loanwords in Vietnamese

French is a stress accent language (in the sense of Hyman's 2006 typology); yet, the main correlate of stress accent in French is pitch. Vietnamese, in contrast, is a tone language (again in the sense of Hyman 2006). Vietnamese tones are obligatory and culminative, with the tonal domain being the syllable (more precisely the rhyme), so that that every syllable is realized with a tone. Six tones (five in Southern varieties) can be discriminated in open syllables and in syllables ending in a sonorant, whereas only two tones occur in syllables ending in an oral stop (Kirby, 2011). It is a topic of debate whether the two tonal categories to be distinguished in stop-final syllables are identical to two of the six tonal categories occurring in open and sonorant-final syllables or not, that is, whether the phonological system of Vietnamese differentiates six tones or eight tones. While the traditional stance is that Vietnamese has six tones, A. H. Pham (2001, 2003) as well as Michaud (2004) argue for the eight-tone view, based on evidence from tonal constraints in traditional poetry as well as in reduplication processes. Here, we follow the assumption that Vietnamese has a six tone system (Nguyễn, 1997; Brunelle, 2014; Brunelle and Kirby, 2016). Phonetically, tonal distinctions are implemented by pitch

contour, intensity and duration, as well as laryngealization, glottalization and other aspects of voice quality (Brunelle, 2009). To date, there is no consensus which of the various phonetic correlates of tone are phonologically relevant. While the traditional assumption is that pitch contour is phonemic (Vũ, 1981), A.H. Pham's view is that 'instead of pitch height being contrastive as is generally assumed, it is phonation types of creakiness and breathiness which are distinctive as the register feature in North Vietnamese, and the differences in pitch heights are predictable' (A. H. Pham, 2001, p. ii). The pitch differences of one speaker of Northern Vietnamese are shown in Figure 1.

Figure 1: *Vietnamese Tones (Northern standard variety), adapted from Nguyễn & Edmondson (1998)*



In Table 1, we list the Vietnamese names of the tones, their phonetic features (cf. Brunelle, 2009), diacritics used in the standard orthography, as well as the numbers employed standardly in IPA transcriptions (cf. Kirby, 2008). In following, we only refer to the numbers.

Table 1: *Vietnamese Tones*

Name	Phonetic Features			Orthographic representation	Number (IPA representation)
	Contour	Height/Register	Voice Quality		
Ngang	Level	High	Modal	a (no diacritic)	1
Huyền	Falling	Low	Modal/Breathy	à	2
Ngã	Falling-Rising	High	Creaky/Glottal	ã	3
Hỏi	Falling (-Rising)	Low	Creaky	ả	4
Sắc	Rising	High	Modal	á	5
Nạng	Falling	Low	Glottal[1]	ạ	6

Let us start with the two basic generalizations about tone assignment of French loanwords in Vietnamese already described in the literature (cf. Barker 1969, Huynh 2008, M. Pham 2012), confirmed by our data. The majority of loanwords are assigned tone 1, as shown by the examples in (1) as well as in Tables 2 and 3.

(1)	<pénicilline>	[penisilin]	<pê ni ci lin>	[pe1 ni1 si1 lin1]	'penicillin'
	<relais>	[r(ə)lɛ]	<rơ le>	[zɤ1 lɛ1]	'relay'
	<ragoût>	[ʁagu]	<ra gu>	[za1 ɣu1]	'ragout'

If a syllable ends in a plosive, it is never assigned tone 1, but either tone 5 or 6, as shown in (2). While the most frequent pattern is the assignment of tone 5 (191 syllables = 92 per cent of all 208 syllables ending in a plosive), tone 6 is assigned only in a few cases (17 syllables ending in a plosive= 8 per cent).[2] These results are in line with the distribution in Huynh (2010).

[1] This feature is absent in syllables ending in a plosive consonant, cf. Michaud (2004) for further discussion.

[2] We did not count cases with potential intra- and inter-speaker-variability between tone 5 and 6 when there is no tone specification in the orthography.

(2)	<biciclette>	[siklɛt]	<xích>	[sik5]	‘bike (FR.)/chain (VN)’
	<atlas>	[atlas]	<át-lát>	[at5 lat5]	‘atlas’
	<cartable>	[kaʁtabl]	<cặp táp>	[kặp6 tap5]	‘briefcase’
	<gaze>	[gaz]	<gạc>	[ɣak6]	‘gauze’

Table 2: *Tone assignment in monosyllabic loanwords*

	Absolute number of words	**Per Cent**
Tone 1	94	55 %
Tone 2	10	6 %
Tone 3	0	0 %
Tone 4	0	0 %
Tone 5	62	36 %
Tone 6	6	3 %
Total	172	

Further generalizations can be drawn with respect to disyllabic loanwords, as shown in Table 3.

Table 3: *Tone assignment in disyllabic loanwords*

Tonal sequence	**Absolute number of words**	**Per Cent**
1 1	163	53,4 %
1 2	3	1,0 %
1 5	33	10,8 %
1 6	7	2,3 %
2 1	17	5,6 %
2 2	4	1,3 %
2 5	6	2,0 %
2 6	5	1,6 %
4 1	2	0,7 %
4 5	2	0,7 %
4 6	1	0,3 %
5 1	41	13,4 %
5 5	16	5,2 %
5 6	1	0,3 %
6 1	2	0,7 %
6 2	1	0,3 %
6 5	1	0,3 %
Total	305	

In disyllabic loanwords, the syllable structure of the initial syllable appears to be relevant to tone assignment of this syllable. First, if the initial syllable is closed, tone 2 is hardly ever assigned. As shown in (3a-b), either tone 5 or tone 6 is assigned to word-initial syllables ending in a plosive (59 items = 58 per cent of all 103 disyllabic loanwords with a closed word-initial syllable). Tone 1 is assigned to most closed word-initial syllables ending in a sonorant (41 items = 40 per cent of 103), as shown in (3c-d), but in three of the relevant words (3 per cent of 103) the first syllable is assigned tone 2; see (3e-g).

(3)	a. <antenne>	[ãtɛn]	<ăng ten>	[ăŋ1 tɛn1]	‘antenna’
	b. <balcon>	[balkɔ̃]	<ban-công>	[ban1 koŋ͡m1]	‘balcony’
	c. <taxi>	[taksi]	<tắc xi>	[tăk5 si1]	‘taxi’
	d. <tabiler>	[tablije]	<tạp-dề>	[tap6 ze2]	‘apron’
	e. <bidon>	[bidɔ̃]	<bình toong>	[biŋ2 tɔŋ͡m1]	‘water bottle’(milit.)
	f. <paletot>	[palto]	<bành tô>	[bɛŋ2 to1]	‘long coat’
	g <mouchoir>	[muʃwaʁ]	<mùi soa>	[muj2 swa1]	‘handkerchief’

If the initial syllable is open, it is likewise sometimes assigned tone 2 (26 words, i.e. 14 per cent of 187 disyllabic loans with an open word-initial syllable); see (3b-e). Of the 27 word-initial open syllables bearing tone 2, the nucleus is a central vowel – [a] or [ɤ] – in 21 words (84 per cent), as shown in (4a-c), as compared to 5 items with other vowels and tone 2, as shown in (4d).

(4)	a.	<chemise>	[ʃ(ə)miz]	<sơ mi>	[sɤ1 mi1]	‘shirt’
	b.	<carotte>	[kaʁɔt]	<cà rốt>	[ka2 zot1]	‘carrot’
	c.	<blouse>	[bluz]	<bờ lu>	[bɤ2 lu1]	‘blouse’
	d.	<ressort>	[ʁəsɔʁ]	<lò xo>	[lɔ2 sɔ1]	‘spring’(tec.)

As shown above, the generalizations about tone assignment to the first syllable of disyllabic loans are gradient. They complement Barker’s (1969) less specific claim that the first syllable of disyllabic borrowed words *often* takes tone 2, as well as M. Pham’s (2012) statement that in disyllabic words with an open initial syllable and a final closed syllable, the initial syllable mostly receives tone 2. According to our data, whether the second syllable is closed or open is irrelevant. In sum, while tone 1 may be considered the default in tone assignment to French loanwords, segmental quality plays a role, as well. On the one hand, it is relevant whether a syllable ends in a plosive or a sonorant; on the other hand, whether the vowel is a central vowel or a front/back vowel.

5.2 Adaptation of segmental structure

Let us start with two basic generalizations concerning the adaptation of segmental structure. Subsequently, a more detailed view of onset and coda retention and replacement will be provided. On the one hand, segments found in the inventories of both languages are retained; on the other hand, French segments which are not part of the Vietnamese inventory are replaced. Given that in Vietnamese, differently from French, only a subset of consonants is licit in the coda of a syllable, consonants that are illicit in the coda are likewise replaced. As a consequence, repairs occur more frequently in coda positions than in onset position, an observation about loan integration that holds for other language pairs, as well (Shinohara, 2006; Kang, 2011). In general, segments illicit in the target language are replaced by segments that are similar to the source segment.

5.2.1. Onset consonants

Before providing a more detailed view of the integration of onset consonants, we start with an overview of the segment inventories of French (based on standard descriptive works such as Tranel 1987; Walker 2001), as shown in Table 4, and of Vietnamese consonants that are licit in onset position, illustrated in Table 5 (cf. Kirby 2011; Thompson 1965; Nguyễn 1997; Brunelle 2014).

Table 4: *French onset consonants (Ile-de-France-variety)*

	Labial	**Dental**	**Alveolar**	**Palatal**	**Dorsal**	**Glottal**
Plosive	b	t d			k g	
Nasal	m	n		ɲ		
Frikative	f v		sz	ʃ ʒ	ʁ	
Lateral		l				
Approximant	w			j ɥ		

Table 5: *Vietnamese onset consonants (Hà-Nội-/Northern standard variety)*

	Labial	**Dental**	**Alveolar**	**Palatal**	**Dorsal**	**Glottal**
Plosive	(p[3]) ɓ	t tʰ	ɗ	tɕ	k	ʔ
Nasal	m	n		ɲ	ŋ	
Flap			ɾ[4]			
Frikative	f v		s z		x ɣ	h
Lateral		l				
Approximant	w					

In onset position, twelve of the French consonants have direct correspondents in Northern standard Vietnamese, i.e., [ɓ, t, ɗ, k; m, n, ɲ; f, v, s, z; w]. French onset consonants without a corresponding segment in the Vietnamese inventory are replaced systematically by similar segments; as shown in Table 6.

Table 6: *Replacement of onset consonants*

Replacement	**What changes?**		**Example**
ʃ → s	Place	Loss of feature [high]	<choc> [ʃɔk] → <sốc> [sok͡p5] ‘choc’
ʒ → z	Place	Loss of feature [high]	<gène> [ʒɛn] → <gien> [zɛn1] ‘gene’
g → ɣ	Manner (Constriction)	[plosive] → [continuant]	<golf> [gɔlf] → <gôn> [ɣon1] ‘golf’

Three onset consonants, i.e., [j], [ʁ] and [p], show variable integration. The integration of [p] has been discussed in previous studies (cf. Nguyễn 1997, Đoàn, Nguyễn & Phạm 2009, Kirby 2011) and shall not be dealt with here.

The dorsal fricative [ʁ] is integrated into Vietnamese in most cases by the coronal fricative [z]. It seems possible that this sound has been integrated into Southern Vietnamese as [ɾ], due to the perceptive similarity between [ʁ] and [ɾ]. Subsequently, it may have been replaced in the North by its allophonic counterpart [z]; it could also be a reading adaptation. Still, some speakers of the Northern standard variety use the sound [ɾ] when they are aware of the word’s status as a loanword. If they have knowledge of English, they sometimes use the approximant [ɹ]. Below, we refer to the pronunciation of one speaker, using [z] for some words (5a-b), [ɾ] or [ɹ] for others (5c-d).

[3] A voiceless bilabial as an allophonic variant of [ɓ] occurs in only a few loanwords and is not realized by all speakers.

[4] The same holds for the alveolar flap [ɾ]. In many other varieties of Vietnamese, [ɾ] is an allophone of [z]; therefore, speakers of all varieties are familiar with that sound.

(5)	a.<rail>	[ʁɑj]	<ray>	[zăj1]	‘rail’
	b.<relais>	[r(ə)lɛ]	<rơ le>	[zɤ1 lɛ1]	‘relay’
	c.<radio>	[ʁadjo]	<ra đi ô>	[ɾa1 đi1 o1, ɹa1 đi1 o1]	‘radio’
	d.<rideau>	[ʁido]	<riđô, ri-đô>	[ɾi1 đo1]	‘curtain’

The palatal glide [j] may be replaced by [ŋ], [z] or [i]. At first sight, these sounds have little phonetic similarity to each other. Under a phonological perspective, however, the adaptation of [j] as [ŋ], [z] or [i] appears systematic. As to its replacement by [z], let us briefly mention that for socio-historical reasons it seems plausible that the contact variety for many words has been Southern Vietnamese (cf. Huynh 2008). In Southern Vietnamese varieties, the sound [j] is, in fact, a possible onset consonant. Crucially, its allophonic counterpart in the Northern standard variety is [z]. Hence, the French consonant [j], which may originally have been integrated as [j] into Southern Vietnamese, is replaced by [z], as shown in (6a-c). There is only one item replacing the glide [j] with the corresponding vowel; see (6d).

(6)	a. <yaourt>	[ja.uʁt]	<da ua>	[za1 ʔuə1]	‘yogurt’
	b. <billiard>	[bijaʁ]	<bi-da>	[ɓi1 za1]	‘billiard’
	c. <tablier>	[tablije]	<tạp-dề>	[tap6 ze2]	‘apron’
	d. <iode>	[jɔd]	<i-ốt>	[ʔi1 ot5]	‘iodine’

What has been said in the previous paragraph holds for [j] in simple onset position not preceded by a vowel. If, in contrast, the sound [j] stands in word-internal simple onset position and is preceded by a vowel, it is syllabified as a coda consonant and therefore preserved as [j]; see (7). This is possible only because Vietnamese (cf. Nguyễn, 1997), unlike French, is apparently not subject to the principle of onset maximization (Vennemann, 1988).

(7)	<glaïeul>	[glajœl]	<lay-ơn>	[lăj1 ɤn1]	‘gladiolus’
	<maillot>	[majo]	<may-o>	[măj1 o1]	‘vest’
	<maillechort>	[majʃɔʁ]	<may-so>	[măj1 sɔ1]	‘nickel silver’
	<moyeu>	[mwa.jø]	<moay-ơ>	[mwăj1 ʔɤ1]	‘hub’

Finally, as shown in (8), if the [high] segment [j] stands in complex onset position and is preceded by a nasal consonant [m] or [n], it is either replaced by the [high] nasal consonant [ɲ] or by the vowel [i]. The former process may be conceived as a progressive (or perseverative) spreading of the feature [nasal] to the following glide, with the result of changing the illicit onset [j] into the licit one [ɲ], as shown in (8a-b). Where the glide [j] is replaced by the vowel [i], all features are preserved, but the segment is syllabified as a syllable nucleus rather than as a syllable margin; see (8c-d).

(8)	a. <camion>	[ka.mjɔ̃]	<cam-nhông>	[kam1 ɲo͡ŋm1]	‘truck’
	b. <aluminium>	[alyminjɔm]	<nhôm>	[ɲom1]	‘aluminium’
	c. <amiante>	[amjãt]	<a-mi-ăng>	[a1 mi1 ăŋ1]	‘asbestos’
	d. <ammoniac>	[amɔnjak]	<a-mô-ni-ác>	[a1 mo1 ni1 ak5]	‘ammonia’

The data presented in this paragraph show that the integration of onset consonants is systematic and may be accounted for by phonological as well as by socio-historical factors. Furthermore, orthography may have played an important role. It seems possible that certain words are reading adaptations (cf. Vendelin & Peperkamp 2006).

5.2.2. Coda consonants

In Vietnamese, only ten consonants are licit in coda position: the three voiceless obstruents [p, t, k], three (non-palatal) nasal consonants [m, n, ŋ], the glides [j,w] as well as the double-articulated sounds [ŋ͡m, k͡p], standing in complementary distribution with [ŋ, k] after back rounded vowels (cf. Kirby, 2011). Fricative, palatal (with

the exception of the palatal glide [j]), glottal and lateral segments as well as voiced obstruents are illicit in coda position. In French, in contrast to Vietnamese, basically all consonants are licit codas. French coda consonants that are not licit codas in Vietnamese are thus replaced by similar segments, delinking or replacing as few features as possible; an overview of selected replacement processes is given in Table 7. Note that one and the same segment may be replaced by different segments, depending on whether it occurs in coda or in onset position. To give an example, French [ʁ] is replaced by [z] in onset position and by [k] in coda position.

Table 7: *Replacement of selected coda consonants*

Replace-ment	**What changes ?**		**Example (Fr.|Viet.|Glosse)**		
l → n	Manner of articulation	[Lateral] → [Nasal]	<caramel> [ka ʁa mɛl]	<caramen> [ca ra men]	'caramel'
d → t	Voicing	Delinking of [Voiced]	<acide> [asid]	<a-cít> [a1 sit5]	'acid'
f → p	Manner & Place	[Continuant] → [Plosive] [Coronal] → [Dorsal]	<bifteck> [bif tɛk]	<bíp tếch> [bip5 tek5]	'beef-steak'
s → t	Manner (Constriction)	[Continuant] → [Plosive]	<caisse> [kɛs]	<két> [kɛt5]	'cash desk'
ʃ → t, k	Manner & Place	[Continuant] → [Plosive] Delinking of feature [high]	<bâche> [baʃ]	<bát> [bat6]	'tarpau-lin'
		[Continuant] → [Plosive] [Coronal] → [Dorsal]	<fiche> [fiʃ]	<phích> [fik5]	'plug'
ʁ → k	Manner (Constriction) & Voicing	[Continuant] → [Plosive] Delinking of [Voiced]	<garde> [gaʁd]	<gác> [ɣak5]	'guard'

As shown in Table 7, a few cases of consonant replacement are variable, while others are categorical. In other cases, French coda consonants that are not licit in Vietnamese are deleted, and in a few cases, they are replaced by one of the vowels [i, o, u]. When considering the whole picture, the integration of coda consonants appears to be based on a complex interaction of constraints that for reasons of space are not considered here.

5.3 Adaptation of consonant clusters by deletion and epenthesis

In what follows, we briefly summarize the most important generalizations concerning French and Vietnamese syllable structure, followed by an analysis of the two major repair processes applying to consonant clusters: vowel epenthesis and consonant deletion. A third, and minor, strategy consists in the syllabification of the first consonant in an onset cluster as a coda of the preceding syllable. Table 8 presents an overview of the frequency of different repair processes in onset and coda clusters.

Table 8: *Adaptation of consonant clusters by deletion and epenthesis*

	Onset clusters		**Coda clusters**		**Total**	
	Absolute number of words	**Per Cent**	**Absolute number of words**	**Per Cent**	**Absolute number of words**	**Per Cent**
Deletion	34	60 %	33	100 %	67	74 %
Epenthesis	15	26 %	0	0 %	15	17 %
Resyllabification	8	14 %	0	0 %	8	9 %
Total	57		33		90	

For reasons of space, we disregard the rather complex processes of adaptation observed in French consonant clusters preceded or followed by a schwa-vowel (25 words).

In Vietnamese, the onset is an obligatory constituent of the syllable. A syllable may have a coda, but only a subset of the consonant inventory is licit in coda position; see 5.2.2. Complex onsets and codas are disallowed, with the exception of the sequence C[w]V (Nguyễn, 1997; Kirby, 2011). It is, however, unclear whether the glide [w] should be analysed as part of the onset. As this structure occurs in both languages, no repair is needed for loans. In contrast to Vietnamese, French does allow complex onsets and codas (Klausenburger, 1970; Tranel, 1987). Here, we consider only French onset and coda clusters consisting of two consonants; more complex clusters are possible in French, but are not attested in the corpus analysed here.

French onset and coda clusters, illicit in Vietnamese, thus need to be repaired in loanword adaptation. Speakers generally use two possible repair strategies, i.e., vowel epenthesis (**CC**VC → **C**V.**C**VC) and consonant deletion (**CC**VC → **C**VC). As shown in Table 8, deletion is much more frequent than epenthesis (cf. also Nguyen and Dutta 2017). While deletion (5.3.1) is found in onset and coda clusters, epenthesis (5.3.2) is restricted to onset clusters. Resyllabification, i.e., the syllabification of the first consonant in an onset cluster as a coda of the preceding syllable, is by definition only possible in onset clusters. In onset clusters containing the glide [j], the glide is often replaced by the corresponding vowel [i]; see 5.3.3.

5.3.1. Deletion

Where deletion applies, the most common strategy is to maintain the consonant in the first position and to delete the second one. This is valid for both onset and coda clusters, with few exceptions (cf. Table 9).

Table 9: *Deletion of the first vs. the second consonant in a cluster*

	First consonant deleted		**Second consonant deleted**		**Total**
	Absolute number of words	**Per cent**	**Absolute number of words**	**Per cent**	**Absolute number of words**
Onset	11	32 %	23	68 %	34
Coda	4	12 %	29	88 %	33
Total	15	22 %	52	78 %	67

French consonants are replaced whenever they are either not part of the Vietnamese inventory or illicit in coda position. This also holds for consonant clusters, and the replacement patterns are the same as for single consonants; see Tables 6 and 7. An illicit consonant in the first position of a cluster is thus typically replaced rather than deleted.

In the corpus analysed here, many cases of deletion in onset clusters are sequences of C+[ʁ] (20 words) and C+[l] (6 words), exemplified in (9) and (10). The pattern exemplified in (10) constitutes an exception: In onset clusters with a lateral consonant in second position, it is the first consonant that is deleted, while the second is maintained. These findings fall in line with Vương (1992).

(9) Deletion in onset clusters: C+[ʁ] → C (Deletion of second consonant)

<brancard>	[bʁɑ̃kaʁ]	<băng ca>	[ɓăŋ1 ka1]	‘stretcher’
<cravatte>	[kʁavat]	<cà vạt>	[ka2 vat6]	‘tie’
<fromage>	[fʁɔmaʒ]	<pho mát>	[fɔ1 mat5]	‘cheese’

(10) Deletion in onset clusters: C+[l] → [l] (Deletion of first consonant)

<complet>	[kɔ̃plɛ]	<com lê >	[kɔm1 le1]	‘suit’
<glaïeul>	[glajœl]	<lay-ơn>	[lăj1 ʔɤn1]	‘gladiolous’
<chou-fleur>	[ʃuflœʁ]	<su lơ>	[su1 lɤ1]	‘cauliflower’

As to coda clusters, it is generally the second consonant which is deleted; the first is replaced if illicit in coda position; see (11). Examples in which the first consonant is preserved and the second deleted are given in (12); the first consonant is replaced and the second deleted in (13).

(11)

[ʁ]+C → [k]	14 items (and three exceptions, see 13 a,c,d)
[l]+C → [n]	6 items (and one exception, see 13b)
[s]+C → [t]	6 items
[k]+C → [k] or [k͡p]	2 items
[m]+C → [m]	1 item

(12) Deletion in coda clusters: First consonant preserved, second deleted

<contact>	[kɔ̃takt]	<công-tắc>	[koŋ͡m1 tak5]	‘switch’
<inox>	[inɔks]	<i-nốc>	[ʔi1 nok͡p5]	‘stainless steel’
<pompe>	[pɔ̃p]	<bơm>	[ɓɤm1]	‘pump’

(13) Deletion in coda clusters: First consonant replaced, second deleted

<harpe>	[aʁp]	<hạc>	[hak6]	‘harp’
<citerne>	[sitɛʁn]	<xitéc>	[si1 tɛk5]	‘tank’
<talc>	[talk]	<tan>	[tan1]	‘talc’

The integration of the consonant [ʁ] in coda position has been studied by Vương (1992) and in detail by Kang et al. (2016), who claim that the neutralization of the French phonemes /ʁ/ and /k/ is due to Vietnamese phonological restrictions, ‘but the Vietnamese adaptation systematically retains the contrast in the quality and length difference in the preceding vowel’ (Kang et al. 2016, p. 11). The same holds for clusters with [ʁ]+C in the following examples given in their article: French <cirque> [siʁk] and <course> [kuʁs] are adapted as Vietnamese <xiếc> [siək5] ‘mustard’ and <cuốc> [kuək5] ‘ride’.

Let us now briefly turn to the three exceptions for [ʁ]+C-clusters and one exception for [l]+C-clusters, where the output is not, as expected, [k] or [n], as shown in (14). In the first two cases (14a, b) [ʁ/l+m] → [m], the first consonant is deleted, but the second preserved. This may be due to the saliency of the second consonant of the cluster, the nasal [m]. In the third case (14c) V+[ʁ]+C → VV, the consonant [ʁ] is replaced by a vowel, possibly due to the perceptual similarity between [ʁ] and low vowels. The last exception, (14d), is an irregular variant to the regular integration of French *moutarde*.

(14) Exceptional cases for the deletion in coda clusters

a. <forme>	[fɔʁm]	<phom>	[fɔm1]	‘form’
b. <film>	[film]	<phim>	[fim1]	‘film’
c. <yaourt>	[jauʁt]	<da ua>	[za1 ʔuə1]	‘jogurt’
d. <moutarde>	[mutaʁd]	<mù tạt>	[mu2 tat6]	‘mustard’

Table 10 summarizes the patterns of deletion attested in the adaptation of consonant clusters in the corpus studied here.

Table 10*: Patterns of deletion in the adaptation of consonant clusters*

Integration of the Cluster	**Consonant**		**Position plays a role**	
	1st	**2nd**		
C+[ʁ] → [C]	preserved	deleted	yes	Onset
C+[l] → [l]	deleted	preserved	–	
[l]+C → [n]	replaced	deleted	yes	Coda
[s]+C → [t]	replaced	deleted	yes	
[k] +C→ [k]/[k͡p]	preserved	deleted	yes	
[m]+C → [m]	preserved	deleted	yes	
[ʁ]+C → [k]	replaced	deleted	yes	
[ʁ]+C → V	replaced (vowel)	deleted	yes	
[ʁ,l]+[m]→ [m]	deleted	preserved	–	

5.3.2. Epenthesis

In the adaptation of French consonant clusters into Vietnamese, epenthesis applies far less frequently than deletion, attested only in onset clusters; see Table 8. A few words are adapted alternatively with deletion or epenthesis (4 items[5]). Some examples for epenthesis are given in (15).

(15) Epenthesis in CC sequences

<blouse>	[bluz]	<bờ lu>	[ɓɤ5 lu1]	'blouse'
<clef>	[kle]	<cơ lê, cờ lê>	[kɤ1 le1], [kɤ2 le1]	'spanner'
<crème>	[kʁɛm]	<kem, cà rem>	[kɛm1], [ka2 zɛm1]	'ice-cream'
<scandal>	[skɑ̃dal]	<xì căng đan>	[si2 kăŋ1 ɗan1]	'scandal'

Three epenthetic vowels are attested in the corpus, [a, i, ɤ]; of these, [ɤ] has the highest frequency. It seems possible that the place of articulation of the preceding consonant is one of the factors that determine the choice of the low, high, or mid vowel (cf. Uffmann, 2006); additional data is needed to confirm this hypothesis.

5.3.3. Adaptation of the glide [j] in onset clusters

The corpus analysed here contains a total of 23 clusters of the structure C+[j] in onset position. In these clusters, the glide [j] is mapped onto and syllabificated as the vowel [i] in 19 instances (87 per cent), as shown in (16a-f) and onto the vowel [ɯ] in one instance; see (16g).

(16) Adaptation of C+[j] sequences

a. <barrière>	[baʁjɛʁ]	<barie>	[ɓa1 zi1]	'fence, gate'
b. <magnesium>	[maɲezjɔm]	<magie>	[ma1 zi1]	'magnesium'
c. <radium	[ʁadjɔm]	<ra-đi>	[za1 ɗi1], [ɾa1 ɗi1]	'radium'
d. <diode>	[djɔd]	<đi-ốt>	[ɗi1 ot5]	'diode'
e. <piano>	[pjano]	<piano>	[pi1 a1 no1]	'piano'
f. <violette>	[vjolɛt]	<vi-ô-lét>	[vi1 o1 lɛt5]	'pancy'
g. <légion>	[leʒjɔ̃]	<lê dương>	[le1 zɯəŋ1]	'Fr. Foreign Legion'

The same pattern of replacement of [j] by [i] is found where the glide [j] occurs in simple onset position; see (8c-d) above, i.e., all features of [j] are preserved, but the segment is syllabified as syllable nucleus rather than as syllable margin.

5.4. The adaptation of consonant clusters in a cross-linguistic perspective

When compared to generalizations about cluster integration in the scholarly literature, Vietnamese appears to be cross-linguistically unusual. According to Paradis & Lacharité (1997), it appears that epenthesis is generally preferred over deletion. In fact, typological generalizations about deletion and epenthesis in loanword adaptation made in previous studies state that deletion is generally infrequent in word-initial position, though some languages use both strategies, or even use deletion only (cf. Kang, 2011 for an overview). In many other languages, however, such as Sesotho (Rose and Demuth, 2006), Shona (Uffmann, 2006) or Akan (Adomako, 2008), epenthesis is the only repair strategy available in word-initial position. In Vietnamese, in contrast, the preferred strategy in onset position is deletion. Furthermore, it seems that the segmental context is not relevant in the choice between epenthesis and deletion, differently to what has been shown for, e.g., Hawaiian (Adler, 2006), Thai, and a number of other languages discussed in Fleischhacker (2005). Concerning repair strategies in word-final clusters, 'it is not clear whether epenthesis is cross-linguistically the preferred strategy over deletion in this position' (Kang, 2011: 14). A number of other languages are like Vietnamese in that epenthesis is unattested in word-final position, or in coda position more generally.

[5] In the sample of 77 illicit consonant clusters, these four items were counted twice.

In Thai, for instance, 'loans with a final cluster never employ epenthesis' (Kenstowicz & Suchato, 2006 : 932).

Another aspect in which Vietnamese may be unusual relates to the factors that determine which of the two consonants in a cluster undergoes deletion. In a couple of other languages, such as Cantonese, Marshallese, Yoruba, Fijian, patterns of deletion have been found to depend on the segmental identity of the consonants (cf. Shinohara 2006). Deletion patterns in Vietnamese, in contrast, depend on the position of a segment in the cluster rather than on the segmental content (with the exception of sequences consisting of an obstruent followed by a nasal or lateral). In this respect, however, Vietnamese is similar to Thai: In Vietnamese, it is mostly and in Thai it is always the second consonant that deletes (cf. Kenstowicz & Suchato, 2006).

6 Conclusion

From an empirical perspective, the present study has contributed a couple of new empirical generalizations, both with respect to the question of how tones are assigned as well as to how consonant clusters are adapted in Vietnamese loanwords from French. From a theoretical perspective, it has become clear that the phonological structure of Vietnamese is a crucial factor in the adaptation of French single consonants and consonant clusters. In contrast, the data analysed here do not suggest that French phonological structure (as opposed to phonetic form) plays a role in loanword integration into Vietnamese.

In future research, we will both extend the methods employed and the amount of data analysed. Concerning the methodological perspective, it may be fruitful to compare experimentally elicited native speakers' pronunciations for nonce formations having specific phonological properties to loanword patterns and to lexico-statistical patterns extracted from a large electronic corpus of Vietnamese. Empirically, the loanword corpus is being enlarged in order to be able to describe patterns of syllable truncations and augmentations (via vowel epenthesis) and to better understand the role of minimality and maximality requirements on word length that may be relevant in loanword adaptation.

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References

Adler, Allison N. 2006. Faithfulness and Perception in Loanword Adaptation: A Case Study from Hawaiian. *Lingua* 116(7):1024–45.

Adomako, Kwasi. 2008. Vowel Epenthesis and Consonant Deletion in Loanwords: A Study of Akan. Unpublished Master's Thesis. University of Tromsø.

Alves, Mark J. 2009. Loanwords in Vietnamese. *Loanwords in the world's language: A Comparative Handbook*, edited by Martin Haspelmath and Uri Tadmor. Mouton de Gruyter, 617-637.

Barker, Milton E. 1969. The Phonological Adaption of French Loanwords in Vietnamese. *Mon-Khmer Studies Journal* 3:138–47.

Bosworth, Yulia. 2017. High Vowel Distribution and Trochaic Markedness in Québécois. *The Linguistic Review* 34(1):39–82.

Brunelle, Marc. 2017. Stress and Phrasal Prominence in Tone Languages: The Case of Southern Vietnamese. *Journal of the International Phonetic Association* 47(03):1–38.

Brunelle, Marc. 2009. "Tone Perception in Northern and Southern Vietnamese." *Journal of Phonetics* 37(1):79–96.

Brunelle, Marc. 2014. Vietnamese (Tiếng Việt). *The Handbook of Austroasiatic Languages. Volume 2*, edited by M. Jenny and P. Sidwell. Leiden: Brill, 907-953.

Brunelle, Marc and James Kirby. 2016. Tone and Phonation in Southeast Asian Languages. *Linguistics and Language Compass* 10(4):191–207.

Bùi, Khắc Việt et al. 2003. *Từ điển tiếng Việt. Viện Ngôn Ngữ Học*. Hà Nội - Đà Nẵng: Nhà Xuất Bản Đà Nẵng.

Di Cristo, Albert. 1999. Vers Une Modélisation de l'accentuation Du Français: Première Partie. *Journal of French Language Studies* 9(02):143–79.

Delais-Roussarie, Élisabeth. 1996. Phonological Phrasing and Accentuation in French. *Dam Phonology : HIL Phonology Papers II*, vol. 3, edited by M. Nespor and N. Smith. The Hague: Holland Academic Graphics.

Đoàn, Thiện Thuật, Khánh Hà Nguyễn, and Như Quỳnh Phạm. 2009. *A Concise Vietnamese Grammar*. Hanoi: Thế Giới Publishers.

Eychenne, Julien. 2014. Schwa and the Loi de Position in Southern French. *Journal of French Language Studies* 24(2):223–53.

Le Failler, Philippe. 2015. L'intégration des exonymes à la langue vietnamienne ou quand l'usage d'internet force la normalisation. *Moussons* 25:79–97.

Fleischhacker, Heidi Anne. 2005. *Similarity in Phonology: Evidence from Reduplication and Loan Adaptation*. Doctoral dissertation. Los Angeles: University of California

Haspelmath, Martin. 2009. Lexical Borrowing: Concepts and Issues. *Loanwords in the World's Languages*, edited by M. Haspelmath & U. Tadmor. Berlin: De Gruyter, 35-54.

Haspelmath, Martin and Uri Tadmor. 2009. *Loanwords in the World's Languages: A Comparative Handbook*. edited by M. Haspelmath and U. Tadmor. Berlin: de Gruyter Mouton.

Huynh, Sabine. 2008. L'assimilation Des mots d'emprunts français à la langue vietnamienne: La question des tons [The Assimilation of French Loanwords into the Vietnamese Language: The Question of Tones]. *Cahiers de Linguistique – Asie Orientale* 37(2):223–40.

Huynh, Sabine. 2010. *Les mécanismes d'intégration des mots d'emprunt français en vietnamien*. Paris: Harmattan.

Hyman, Larry M. 2006. Word-Prosodic Typology. *Phonology* 23(02):225–57.

Jun, Sun-Ah and Cécile Fougeron. 2002. Realizations of Accentual Phrase in French Intonation. *Probus* 14(1):147–72.

Kang, Yoonjung. 2011. Loanword Phonology. *The Blackwell companion to phonology*, edited by M. van Oostendorp, C. Ewen, E. Hume, and K. Rice. Malden, MA: Wiley-Blackwell, 2258-2282.

Kang, Yoonjung, Andrea Hoa Pham, and Benjamin Storme. 2016. French Loanwords in Vietnamese: The Role of Input Language Phonotactics and Contrast in Loanword Adaptation. *Annual Meeting on Phonology* 1–12.

Kenstowicz, Michael and Atiwong Suchato. 2006. Issues in Loanword Adaptation: A Case Study from Thai. *Lingua* 116(7):921–49.

Kirby, James. 2011. Vietnamese (Hanoi Vietnamese). *Journal of the International Phonetic Association* 41(03):381–92.

Kirby, James. 2008. VPhon: A Vietnamese Phonetizer.

Klausenburger, Jürgen. 1970. *French Prosodics and Phonotactics*. Berlin: de Gruyter.

Le, Thu Hang. 2008. Le Viêt Nam, un pays francophone atypique: Regard sur l'emprise française sur l'évolution littéraire et journalistique au Viêt Nam depuis la première moitié du XXe Siècle. *Documents pour l'histoire du Français langue étrangère ou seconde* 40/41:341–50.

Lenneberg, Eric Heinz. 1967. *Biological Foundations of Language*. New York: Taylor and Francis.

Michaud, Alexis. 2004. Final Consonants and Glottalization : New Perspectives from Hanoi Vietnamese. 61(2–3):119–46.

Nguyễn, Đình Hoà. 1997. *Vietnamese: Tiếng Việt không son phấn*. Amsterdam: John Benjamins.

Nguyễn, Đức Dân. 1997. Về âm và chính tả các từ tiếng Việt gốc Pháp. *Ngôn Ngữ* 3:40–44.

Nguyen, Huynh Trang and Hemanga Dutta. 2017. The Adaptation of French Consonant Clusters in Vietnamese Phonology: An OT account. *Journal of Universal Language* 18(1):69–103.

Nguyen, Quang Kinh and Quoc Chi Nguyen. 2008. Education in Vietnam: Development History, Challenges and Solutions. Pp. 109–54 in *An African exploration of the East Asian education experience*, edited by B. Fredriksen and J.-P. Tan. World Bank Publications.

Nguyễn, Văn Khang. 2013. *Từ ngoại lai trong tiếng Việt*. Thành Phố Hồ Chí Minh: Nhà xuất bản Tổng hợp Thành phố Hồ Chí Minh.

Nguyễn, Văn Lợi and Jerold A. Edmondson. 1998. Tones and Voice Quality in Modern Northern Vietnamese. *Mon-Khmer Studies* 28:1–18.

Özçelik, Öner. 2017. The foot is not an obligatory constituent of the prosodic hierarchy: 'Stress' in Turkish, French and Child English. *The Linguistic Review* 34(1):157–213.

Paradis, Carole and Darlene Lacharité. 2011. Loanword Adaptation: From Lessons Learned to Findings. *The Handbook of Phonological Theory*, edited by J. Goldsmith, J. Riggle, and A. C. L. Yu. Oxford: Wiley-Blackwell, 751-778.

Paradis, Carole and Darlene Lacharité. 1997. Preservation and Minimality in Loanword Adaptation. *Journal of Linguistics* 33(2):379–430.

Pham, Andrea Hoa. 2001. *Vietnamese tone, tone is not pitch*. Doctoral dissertation. Toronto: University of Toronto.

Pham, Andrea Hoa. 2003. *Vietnamese Tone. A New Analysis*. edited by Laurence Horn. New York & London: Routledge.

Pham, Mike. 2012. *Tone Assignment of French Loanwords in Vietnamese*. Unpublished manuscript.

Phillips, John Seward. 1975. *Vietnamese Contact French: Acquisitional Variation in a Language Contact Situation*. Doctoral dissertation. Bloomington: Indiana University.

Poplack, Shana, David Sankoff, and Christopher Miller. 1988. The Social Correlates and Linguistic Processes of Lexical Borrowing and Assimilation. *Linguistics* 26(1):47–104.

Pulgram, Ernst. 1965. Prosodic Systems: French. *Lingua* 13:125–44.

Reinecke, John. 1971. Tây Bôi: Notes on the Pidgin French of Vietnam. *Pidginization and creolization of languages*, edited by D. Hymes. Cambridge: Cambridge University Press.

Rey-Debove, J. and A. Rey, eds. 2013. Le Nouveau Petit Robert. Dictionnaire Alphabétique et Analogique de La Langue Française. Version Électronique.

Rose, Yvan and Katherine Demuth. 2006. Vowel Epenthesis in Loanword Adaptation: Representational and Phonetic Considerations. *Lingua* 116(7):1112–39.

Saville-Troike, Muriel. 2006. *Introducing Second Language Acquisition*. Cambridge: Cambridge University Press.

Schiering, René, Balthasar Bickel, and Kristine A. Hildebrandt. 2010. The Prosodic Word Is Not Universal, but Emergent. *Journal of Linguistics* 46:657–709.

Shinohara, Shigeko. 2006. Perceptual Effects in Final Cluster Reduction Patterns. *Lingua* 116(7):1046–78.

Storme, Benjamin. 2017. The Loi de Position and the Acoustics of French Mid Vowels. *Glossa* 2(1):1–25.

Thomason, Sarah G. 2006. Language Change and Language Contact. *Encyclopedia of Language and Linguistics*, edited by K. Brown. Oxford: Elsevier, 339-346.

Thomason, Sarah Grey. 2001. *Language Contact. An Introduction*. Edinburgh: Edinburgh University Press.

Thomason, Sarah Grey and Terrence Kaufman. 1988. *Language Contact, Creolization, and Genetic Linguistics*. Berkeley: University of California Press.

Thompson, Laurence C. 1965. *A Vietnamese Grammar*. Seattle: University of Washington Press.

Trần, Thị Thúy Hiền. 2011. *Processus d'acquisition des clusters et autres séquences de consonnes en langue seconde: De l'analyse acoustico-perceptive des séquences consonantiques du vietnamien à l'analyse de la perception et production des clusters du français par des apprenants vietnamiens du FLE*. Doctoral Dissertation. Grenoble: Université de Grenoble.

Trần, Thi Thuy Hien, Nathalie Vallée, and Silvain Gerber. 2016. Syllabe CVC et cycle mandibulaire : Une étude articulatoire des asymétries. Le Cas Du Vietnamien." *Journées d'Etudes sur la Parole*. Paris.

Tranel, Bernard. 1987. *The Sounds of French: An Introduction*. Cambridge: Cambridge University Press.

Uffmann, Christian. 2006. Epenthetic Vowel Quality in Loanwords: Empirical and Formal Issues. *Lingua* 116(7):1079–1111.

Uffmann, Christian. 2015. Loanword Adaptation. *The Oxford Handbook of Historical Phonology*, edited by P. Honeybone and J. Salmons. Oxford University Press.

Vendelin, Inga and Sharon Peperkamp. 2006. The Influence of Orthography on Loanword Adaptations. *Lingua* 116(7):996–1007.

Vennemann, Theo. 1988. *Preference Laws for Syllable Structure and the Explanation of Sound Change: With Special Reference to German, Germanic, Italian, and Latin*. Berlin: Mouton de Gruyter.

Vũ, Thanh Phương. 1981. *The Acoustic and Perceptual Nature of Tone in Vietnamese*. Doctoral dissertation. Canberra: Australian National University.

Vương, Toàn. 2011. *Tiếng việt trong tiếp xúc ngôn ngữ từ giữa thế kỷ XX. Le vietnamien en contact linguistique depuis la deuxième moitié du XXe Siècle*. Hà Nội: Nhà Xuất Bản Dân Trí.

Vương, Toàn. 1992. *Từ gốc pháp trong tiếng Việt*. Hà Nội: Nhà Xuất Bản Khoa Học Xã Hội.

Walker, Douglas C. 2001. *French Sound Structure*. Calgary: University of Calgary Press.

Wright, Sue. 2002. Language Education and Foreign Relations in Vietnam. *Language Policies in Education: Critical Issues*, edited by J. W. Tollefson. Mahwah: Erlbaum, 225-244.

Yip, Moira. 1993. Cantonese Loanword Phonology and Optimality Theory. *Journal of East Asian Linguistics* 2(3):261–91.