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The phonotactics of syllabic liquids in Czech words of foreign origin

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Summary: The paper describes and analyzes the occurrence and combinability of Czech syllabic liquids in words of foreign origin in order to find out whether and how they differ from native Czech words. The comparison relies on the material taken from the Phonological Corpus of Czech. The phonotactics of the native words is treated as the primary system that has been enriched by phonological properties of the loanwords. It is shown that the loanwords have extended the range of the occurrence of the syllabic liquids as well as the range of combinations of a consonant plus a syllabic liquid. Most of the newly imported combinations are instantiations of latently possible phonotactic patterns, but there are some genuine innovations with a potential to reshape the native phonotactics. Special attention is paid to English loanwords because they contain most of the phonotactic peculiarities.

Keywords: syllable, loanword, trill, lateral, liquid, Anglicism, phonological corpus, English

1 Introduction

In comparison to vocalic syllables, syllables with consonantal nuclei are much less common cross-linguistically (Bell 1978; Gordon 2016). Yet many languages make use of them, for example those of the Slavic branch, but they are also present in some major languages like English (Akamatsu 2013). Their occurrence, origin, pronunciation and phonological properties have stirred much discussion

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in literature (e.g. in Tashlhiyt Berber, cf. Ridouane 2008; or in Bella Coola, cf. Bagemihl 1991).

Modern Czech is one of the languages with syllabic consonants, namely two liquids, the alveolar trill /r̩/ and the alveolar lateral approximant /l̩/, and two nasals, the bilabial /m̩/ and the alveolar /n̩/. The bilabial /m̩/ occurs in two native lexemes, *sedm* "seven" and *osm* "eight", and in their derivatives, though it is also found in several foreign-origin words (e.g. in the place name *Rožmberk*^{F} or the Anglicism *custom*^{F}).[1] On the other hand, the alveolar /n̩/ is limited to this type of vocabulary (e.g. *hexnšús*^{F} "lumbago" or *second-hand*^{F}).

In contrast to the nasals the syllabic liquids (SylLs) are much more frequent in Czech, and they occur both in the native and foreign-origin vocabulary. In the former type of lexicon they are products of the historical development from Common Slavic (Komárek 1962), whereas in the latter they result from loanword adaptation. It is generally assumed that the syllabicity of the liquids is a function of the context in which they occur, and the conditions under which they are syllabic have already been discussed in detail (Kučera 1961; Bičan 2013; Ziková 2017). However, these accounts primarily rely on the native vocabulary. Little or no attention has been given to the occurrence of the SylLs in Czech words of foreign origin, and to the question whether they are subject to the same distributional rules there and to what extent their phonotactics differs from the phonotactics of the native-word SylLs.

It is our goal here to deal with this problem. We will analyze the occurrence and the combinability of the SylLs in the Czech foreign-origin words in contrast to the native words. Our basic assumption is that, as results of loanword adaptation, the foreign-origin words abide by the same fundamental phonotactic rules like the native words, but they may have enriched the native phonotactics of Czech either by exploiting its latent, non-overt possibilities or by introducing new possibilities (cf. Haugen 1950; Filipović 1959, 1982). We will show that both types of enrichment took place, and that most innovative in this respect are recently borrowed Anglicisms, which may be viewed as forming a phonological system of their own.

Our analysis will be primarily descriptive and language-specific rather cross-linguistically comparative. We are convinced that particular languages must be minutely analyzed before they can be used for any cross-linguistic comparison. Likewise, we will not indulge ourselves in discussion of possible implications for

1 Czech words of foreign origin are marked with a superscript F. This conversion distinguishes the words that, though loans, are part of the Czech language from their sources in donor languages. For example, *tester*^{F} is a Czech word, an adaptation of the English word *tester*.

or interpretations in modern phonological theories, leaving it to other occasions or to others. Such discussions are of course necessary for the advancement of our understanding of language, but they often suffer from lack of detailed data. Rather, we will provide a thorough analysis of one particular phenomenon in order to fill in one piece in the linguistic puzzle. Yet, there cannot be any theory-free analysis. In this paper we adopt a functionalist phonotactic theory (Mulder 1989; Bičan 2013). The approach is not sonority-oriented, but rather distribution-oriented, which means that instead of relying on inherent and universal properties of phonemes, it focuses on the conditions of their occurrence and their function within phonotactic constructions in particular languages.

The paper is organized as follows. After introducing our material in section 2 and outlining the distribution of the SylLs in the native words in section 3, we turn to their occurrence within a word, which we regard as a domain of phonotactic distribution (section 4), and then to their combinability with left-hand and right-hand segments within this domain (section 5). The paper is concluded with a summarizing discussion of the most important findings (section 6).

2 Material

The analysis is based on a database of Czech words of foreign origin, which has been provided by the Phonological Corpus of Czech (see below). The Corpus includes two loanword dictionaries, VSČ (1978) and ASCS (1995). The first is a pronunciation dictionary consisting of a list of foreign-origin words and their pronunciation, while the second is a regular dictionary providing definitions, word origin, morphological information as well as pronunciation. The dictionaries, especially the latter, are quite comprehensive because they record over 53,000 words. However, since many of these expressions are of limited usage (such as various specialized terminologies), we have restricted ourselves to two groups of loanwords from the above-mentioned loanword dictionaries: (1) words that are at the same time included in at least one general defining dictionary of Czech (PSJČ, SSJČ, SSČ, CSN, SN – see references), and (2) words found in the list of 50,000 most frequent lemmas according to the Czech National Corpus (the general database SYN).

As other-language words are constantly introduced to Czech, the dictionaries VSČ and ASCS obviously cannot contain the most recent loanwords. This drawback has been at least partly balanced by the inclusion of recently borrowed words from English, which is the most common source of loanwords in Czech (and in many other languages). The words have been taken from the unpublished Phonological Database of Czech Anglicisms, which contains 4,220 dictionary-

attested Anglicisms and 392 recent borrowings either excerpted from the Czech National Corpus or commonly used nowadays.[2]

Since the SylLs also occur in Czech words of native origin, that is, in words inherited from Common Slavic, we have also made use of a database of such words for the sake of comparison. These forms have also been extracted from the Phonological Corpus of Czech. Although Common Slavic origin of Czech words is not explicitly mentioned by dictionaries, it is reasonable to assume that a lexeme that is not included in a loanword dictionary is most likely a native word or at least a well established old loanword whose foreign origin is now obscured (such as *škola* "school", borrowed Greek via Latin). We have taken the words recorded in SSČ, which is one of the most recent general dictionaries of Czech and a widely used reference work, and automatically filtered therefrom the words recorded in our foreign-word database. Then we have manually marked words that are obvious derivatives or spelling variants of loanwords, and moved them to the loanword database. The remaining items are most likely candidates of native origin.

The foreign-origin and native word sets provide the grounds for generalizations about the conditions of the occurrence and combinability of the SylLs. The native words are treated as the primary system, and the phonotactics of the SylLs in the foreign-origin words is compared to it. The native database consists of 33,593 unique phonological words, and the foreign-origin database of 36,247.[3] Since they are taken from Czech dictionaries, the words correspond to dictionary lemmas, that is, to nominative singulars for declinable words and infinitives for verbs (plus, of course, the forms of indeclinables). Every phonological word is transcribed as a sequence of phonemes with syllable boundaries indicated. Transcription is based on the pronunciation of a given word as provided in the dictionaries or as implied by its spelling (Czech having mostly a phonetic spelling).

The generalizations and conclusions drawn from the two word sets are checked against a larger database of forms provided by the Phonological Corpus or Czech (PCC), a phonologically transcribed and annotated database of dictionary lemmas and selected texts.[4] The forms come from three sources. The first is

2 The Phonological Database of Czech Anglicisms is a phonologically transcribed database of words (lemmas) that records variations in the pronunciation of the English loanwords in Czech and provides information about their English source words. It is analyzed in detail in Bičan et al. (2020).

3 We distinguish between phonological words and morphosyntactic or orthographic words because certain prefixes function as separate phonological words in Czech just as certain types of compound correspond to two or more phonological words (Bičan 2017). However, for the purposes of this paper, the two units can be understood as co-extensive. The only exception is mentioned in section 3.

4 Available at http://www.ujc.cas.cz/phword/. Last accessed: 17 October 2019.

a database of words (appellatives) recorded in major Czech dictionaries (PSJČ, SSJČ, VSČ, SSČ, CSN, SN, ASCS) and in other lexical sources (mostly proper names such as given names, surnames, names of municipalities, botanical and zoological terms). The second source is forms included in the textual part of the PCC, namely in a collection of Czech texts (mostly novels and dialogues from a TV talk show). The last source is words taken from a list of 50,000 most frequent words in the Czech National Corpus (the collective database SYN). Whereas the first source provides dictionary lemmas, the latter two contain inflected word forms and other words not included in the dictionaries used. In total, the word set taken from the FCC contains over 460,000 unique phonological words (word forms). The forms are transcribed in the same manner as the two main databases analyzed here.

Before proceeding further, one note is due here. Liquid syllabicity is usually not marked in Czech dictionaries, with the exception of VSČ, but even there not in all cases. This is because it is largely contextually predictable in Czech. Unless mentioned otherwise, the judgments about liquid syllabicity are based on the personal observation of the present writer and/or the researchers behind the Phonological Database of Czech Anglicisms, all of which are native speakers of Czech. However, where possible, the assessments are supported by the evidence either from perception experiments or from the way the cited examples are used in Czech verse. The invaluable source for the latter was the Corpus of Czech Verse consisting of over 76,000 poems and over 14 million words (Plecháč & Kolár 2015).[5]

3 SylLs in native words

In Czech native words liquid syllabicity is not a paradigmatic, distinctive property because the syllabic forms [r̩] and [l̩] are not opposed to their non-syllabic counterparts [r] and [l].[6] Instead, it is a function of the neighboring segments and the domain a liquid occurs in. The liquids are syllabic between two consonants (C_C, e.g. *prst* "finger", *vlhký* "wet") and word-finally after a consonant (C_#, e.g. *vítr* "wind", *mysl* "mind"), and non-syllabic next to a vowel (V_, _V, e.g. *tráva* "grass", *půl* "half"). The non-interference of a vowel is not a sufficient condition

5 See http://www.versologie.cz/en/kcv.html. Last accessed: 17 October 2019. The poems are primarily from the 19th and early 20th century. All texts have been lemmatized, phonetically transcribed and morphologically, metrically and strophically annotated. The present author has converted the phonetic transcription to the same phonological transcription used in the FCC.

6 The fact that we transcribe the syllabicity in phonological transcription is thus a matter of convenience, not an indication of the phonematic status of the variants.

for liquid syllabicity in Czech. Though the liquids are syllabic in the C_# context, the same does not hold for the mirror context, #_C. Word-initial liquids preceding a consonant are non-syllabic (e.g. *rtuť* "quicksilver", *lstivý* "cunning"). As will be argued below, the syllabicity of the Czech liquids is primarily dependent of the left-hand consonant, which is of course absent in the #_C context.

Liquid syllabicity is not only context-dependent but also domain-dependent. It does not manifest itself within any random string of segments, but within a string that corresponds to some higher-level unit, which is usually equated with the word. As examples (1) show, the liquids are both syllabic and non-syllabic next to the very same segments. They may be non-syllabic between two consonants provided that the consonant that precedes the liquid belongs to another word. Similarly, they may be syllabic next to a vowel if the vowel belongs to another word.

(1)	**Syllabic**		**Non-syllabic**
(a)	/-dr̩c-/ *podrtit* "to grind$_{\text{impf}}$"	(b)	/-drc-/ *pod rtíky* "under little lips"
	/vr̩t-/ *vrtech* "drill hole$_{\text{loc.pl}}$"		/vrt-/ *v rtech* "in lips"
	/vl̩ɲ-/ *vlněném* "woolen$_{\text{loc.sg}}$"		/vlɲ-/ *v lněném* "in linen$_{\text{adj}}$"
(c)	/-tr̩u-/ *vítr už* "wind already"	(d)	/-tru-/ *výtrus* "spore"
	/-sl̩u-/ *mysl už* "mind already"		/-slu-/ *vysluž* "earn$_{\text{imper.sg}}$"

It is reasonable, then, to interpret the pre-consonantal non-syllabicity of the liquids and the vowel-adjacent syllabicity of the liquids as a signal of word boundaries. Phonologically, these boundaries are not marked by any other means. The graphic space between the words is not normally phonically realized. Moreover, the examples under (1a, b) are single stress units, sharing the same stress pattern. Thus, the only phonic difference between, for example, the syntagm *v rtech* and the word *vrtech* lies in the syllabicity and non-syllabicity of the trill.

The function of consonant syllabicity as a boundary signal (in terms of Trubetzkoy 1939) is further exemplified by the following examples:

(2)	**Syllabic**		**Non-syllabic**
(a)	/zr̩t͡s-/ *zrcadlo* "mirror"	(b)	/zrd-/ *zrdousit* "to strangle$_{\text{impf}}$"
	/vl̩ɦ-/ *vlhnout* "to get wet"		/zlɦ-/ *zlhostejnět* "to become indifferent$_{\text{impf}}$"
	/-dl̩n-/ *spravedlný* "just"		/-dlɦ-/ *předlhůtní* "pre-deadline$_{\text{adj}}$"

Though the words are not exact minimal pairs, the fundamental difference between them rests on the syllabicity or non-syllabicity of the liquids. The words cited have the same stress pattern and are all single orthographic and morphosyntactic words. The reason why the liquids /r/ and /l/ are non-syllabic in (2b) has

to do with their morphological structure. They are derived from *rdousit* "to strangle$_{PF}$", *lhostejný* "indifferent" and *lhůta* "deadline", respectively, in which the liquids are non-syllabic – as explained above, the sonants are non-syllabic in Czech word-initially before a consonant (i.e. #_C). The non-syllabicity of the initial liquids is preserved in the prefixed derivatives of such words. Its function is obviously to signal the boundary between a prefix and a stem just as it signals boundaries between words – compare (2b) with examples (1b) or the word *předlhůtní* /-dlɦ-/ "pre-deadline" with the syntagm *před lhůtní* /-d#lɦ-/ "before the deadline", in which /l/ is also non-syllabic. For that reason, the prefixes in words like (2b) are best understood as separate phonological words (Bičan 2014).

To conclude this discussion, one final note is worth making: In Czech liquid syllabicity is not only a phonological property, but also a perceptional property. Users of Czech are generally capable of making judgments about syllabicity, though there are certain ambiguous cases (see section 5.6) and though their judgments need not necessarily coincide with a proposed scientific definition of the syllable. A question yet to be answered satisfactorily is to what extent syllabicity is also a phonetic, i.e. articulatory and/or acoustic property. Although some phonetic differences between the syllabic and non-syllabic liquids were reported in one comprehensive study, the authors interpreted them as statistically insignificant (Hůrková & Hlaváč 1981). A more recent unpublished analysis suggests a difference in quantity (Vernerová 2006), the SylLs being longer than their non-syllabic counterparts are. This finding needs further confirmation because length difference has also been reported for English syllabic and non-syllabic consonants, but the significance of this difference has been disputed (Toft 2002). More recently, Machač (2017) found a slight difference in the number of vibration cycles in his analysis of the Czech trill /r/. He suggests that although the trill is normally produced with only one vibration cycle of the tongue, the probability of two cycles rises a little in syllabic position.

4 Distribution of the SylLs

In comparison to vowels the SylLs have a rather restricted distribution in Czech, as they probably do in other languages (Gordon 2016). No more than 5 % of the words included in the PCC contain a SylL. The analysis has shown that the distribution of the SylLs in not identical in the native words and foreign-origin words. The latter are characterized by a number of peculiarities unknown or rare in the former type of vocabulary. In the following paragraphs we discuss the most obvious differences in the occurrence of the SylLs within words. Their combinability with other segments is treated in section 5.

4.1 Multiple occurrence within a word

To begin with, there appears to be an upper limit on the presence of the SylLs in the native Czech words. It is one SylL per word in a non-compound non-verbal form. If a native word has two SylLs, it is either a compound (e.g. *hrdomyslný*, ie. *hrdo-myslný* "proud-minded") or a 3P.SG.MASC verbal form ending in /l̩/ (e.g. *vrhl* "(he) casted", *zmlkl* "(he) became quiet"). The only other instance attested in the PCC of multiple SylLs within a non-compound native noun is *trpaslkyně*, but this word is an archaic and rare feminine derivative of *trpaslík* "dwarf".

In contrast, loanwords are not restricted by the one-SylL-per-word limit as witnessed by examples like *tingltangl*^{F} (< Ger. *Tingeltangel*), *keprnikl*^{F} "Meum athamanticum" or *pudlpointer*^{F} /-tr̩/ "Pudelpointer". These words have been introduced to Czech as wholes and do not have morphological partners in that language, and they are morphologically simple. Yet it is noteworthy that all of them are compounds in the donor languages. Thus, the presence of two SylLs in a Czech word is a signal of foreign origin or, if the word is not a verb, a signal of complex morphological structure.

4.2 Occurrence in the syllabic contexts

Leaving aside one exception to be discussed in section 5.4, the liquids are syllabic in the same general phonotactic contexts both in the native and foreign-origin words, that is, in the contexts C_C and C_#, and non-syllabic in the remaining contexts (#_C, and next to a vowel). The proportion of the occurrence of the two liquids in the syllabic contexts is not the same, though. Table 1 gives the number of the native and foreign-origin words in which a SylL stands in a given syllabic context. The counts are based on the two word samples described in section 2, but we have excluded 15 words with multiple SylLs.

Table 1: The number and percentages of the native and foreign-origin words with a SylL in the two syllabic contexts (15 words with multiple SylLs not counted)

	Native words		Foreign-origin words	
	/r̩/	/l̩/	/r̩/	/l̩/
C_C	1,344 (99 %)	309 (97 %)	171 (21 %)	40 (17 %)
C_#	20 (1 %)	10 (3 %)	661 (79 %)	193 (83 %)
Total	1,365 (100 %)	319 (100 %)	832 (100 %)	233 (100 %)

The table shows two facts. First, /r̩/ is the commoner of the two SylLs in either type of vocabulary. Second, the native words prefer SylLs in the word-internal context, while the loanwords show the reversed preference, favoring word-final SylLs. In fact, the occurrence of the native SylLs in the C_# context is severely limited. The word-final /r̩/ is found only in several interjections such as *fr*, *br*, *pr* and in a couple of disyllabic words of the structure (C)CVCr̩ such as *kmotr* "godfather", *bratr* "brother", *vichr* "windstorm" (and in *protivítr* "headwind", which is a derivative of *vítr* "wind"). The foreign-origin words allow for more patterns such as a syllabic trill preceded by two or three consonants (cf. /-ftr̩/ *rafter*[F], /-mstr̩/ *šamstr*[F] "boyfriend").

Even more restricted is the occurrence of the word-final /l̩/. Although there are 10 instances in our native-word sample, all of them contain the element *mysl* "mind" (e.g. *smysl* "sense", *důmysl* "ingenuity").[7] In the whole PCC there is one other instance of a native word with a final syllabic lateral, *žezl*, an archaic and most likely obsolete variant of *žezlo* "scepter". However, word-final syllabic laterals are otherwise quite common in native 3P.SG.MASC verbal forms, where they stand after one consonant (e.g. *mohl* "(he) could", *všiml* "(he) made note of") or two consonants (e.g. *dotkl* "(he) touched", *dorostl* "(he) grew up to").

The loanword sample contains many more words both with a word-final syllabic trill and with a word-final syllabic lateral. The trills are more common due to the presence of many loans from German and English ending in *-er* /r̩/. The final syllabic trill occurs in words of different structures, for example, in words with more than two syllables (e.g. *kandelábr*[F] "lamppost", *beachsoccer*[F] /-kr̩/) or in words in which the final /r̩/ is preceded by more than one consonant (e.g. *kanistr*[F] "canister", *dampr*[F] "dumper"). Similarly, the occurrence of the final /l̩/ extents to other phonotactic patterns. For instance, the syllabic lateral stands after a three-consonant cluster (e.g. *dirndl*[F]), which is not possible in the native vocabulary.

4.3 Occurrence in word-initial syllables

Table 2 quantifies the distribution of the SylLs according to their placement within words. Three placements are considered: initial, medial and final syllables. The values are based on the same word samples like the previous table, but we have left out monosyllabic words (50 native words, and 1 foreign-origin word; see below). Note that only words with three and more syllables have a medial syllable,

7 Some of these words like *průmysl* are not actually domestic derivatives of *mysl*, but old borrowings from Russian (Machek 1968).

and that the occurrence in final syllables is not the same of the occurrence in the C_# context because final syllables also encompass closed syllables like C_C#, C_CC# etc. Again, 15 words with multiple SylCs are not counted.

Table 2: Distribution of polysyllabic words according to the placement of a SylL (values do not add up to 100 due to rounding)

	Initial syll.	Medial syll.	Final syll.	Total words
Native	48.41 %	47.92 %	3.67 %	1,634
Foreign-origin	1.03 %	17.39 %	81.56 %	1,064
Both	29.73 %	35.88 %	34.40 %	2,698

The SylLs are possible in all syllable placements in both types of vocabulary. Yet their distribution shows a significant difference across the two word stocks. In the native words they are preferred in initial and medial syllables, but not in final ones, where a little less than 4 % of them occur. In contrast, final syllables are obviously a preferred place of occurrence in the foreign-origin words, which is of course partly a consequence of the high number of loanwords ending in a SylL (see table 1). What is more, the SylLs are not much attested in initial syllables in this type of vocabulary. In fact, in our loanword sample there are only 11 words with a SylL in the initial syllable. As many as six of them contain the element *srb-* "Serbian" (e.g. *srbochorvatština*[F] "Serbo-Croatian"). The remaining items are *krzno*[F] (type of coat), *krleš*[F] (interjection), *vrhcáby*[F] "backgammon", *škrpál*[F] "worn-out shoe" and *držgrešle* "scrooge", the last being originally a compound containing native *drž-* "hold". All these words are very old loans, and in all of them it is /r̥/ that stands in the initial syllable. As confirmed by the whole PCC, words with /l̥/ in the initial syllable are always of native origin. Thus, if the word-final occurrence of /l̥/ could be regarded as a signal of foreignness, its occurrence in initial syllables is a signal of nativeness. Since the initial syllable of a word is at least potentially stressed in Czech, loanwords seem to avoid the SylLs in prosodically prominent positions.

This avoidance is further confirmed by the rarity of monosyllabic loanwords with a SylL as their syllable nuclei. In the whole PCC there is only one such word, *Srb*[F] "Serbian".[8] In contrast, the Corpus records over 180 native monosyllabic words with a SylL (e.g. *vrt* "drill hole", *plch* "dormouse").

8 Our primary database of loanwords contains another word of this kind: *šmrnc* "oomph". In the loanword dictionary ASCS, it is said to be of German origin, but Rejzek (2015) explains it as a (native)

5 Combinability of the SylLs

The SylLs are limited in the way they combine with the left-hand consonants C_1 and C_3 in the contexts C_1_C_2 and C_3_#, and with the right-hand consonant C_2 in the context C_1_C_2. The following generalizations hold, though they have a few notable exceptions:

(i) Both liquids are capable of combining with the same neighboring consonants.
(ii) The range of C_1 and C_3 consonants is more restricted than the range of C_2 consonants.
(iii) If a consonant does not occur as C_2 consonant, it does not occur as C_1 or C_3 consonant either.
(iv) A consonant that can be a C_1 consonant may also be a C_3 consonant and *vice versa*.
(v) The set of C_1/C_3 consonants is restricted in both types of vocabulary, and the consonants that are allowed in the native words are also allowed in the foreign-origin words.
(vi) The foreign-origin words allow more C_1/C_3 consonants than the native words.

To begin with, we have not been able to discern any non-accidental difference between the two liquids. It is true that the lateral combines with fewer consonants than the trill, but this must be a matter of historical chance and a consequence of the fact that Czech has much fewer words with /l̩/ than with /r̩/ (cf. table 1). Thus, the individual differences between the liquids will be henceforth ignored.

Secondly, the range of possible left-hand consonants is more restricted than that of the right-hand consonants. In fact, the presence of a left-hand consonant is a necessary condition (but see section 5.5 for possible exceptions among the Anglicisms), whereas a C_2 consonant is optional – it may be substituted by a word boundary in the C_3_# context. Furthermore, there do not appear to be any specific restrictions on the right-hand consonants except for those that also concern the left-hand consonants (see (iii) above). That is, if a consonant cannot follow a SylL, it cannot precede it either, but the opposite does not hold. The sole exception is the approximant /j/, which may, in a limited set of Anglicisms, precede a SylL, though it never follows it (see section 5.4).

expressive formation. The latter etymology is more likely given the monosyllabic nature of the word.

Fourthly, there is no difference between the left-hand consonants C_1 and C_3. A consonant occurring in C_1 position may also stand in C_3 position and *vice versa*. Again, this generalization finds its exceptions among the loanwords. One concerns the absence of /ʒ/ as a C_1 consonant, though it is attested as C_3 consonant (*plunžr*^{F} "plunger"). The case is discussed in section 5.2. Another notable exception is the non-attestedness of /ɦ/ as a C_1 consonant. In fact, it is also rare as a C_3 consonant because the only example among the loanwords is *tahr*^{F}. In the native words /ɦ/ occurs as a C_1 consonant in many words such as *hrnek* "cup", *hltat* "to gollop".

The fifth and sixth generalizations given above concern the left-hand consonants. Although the right-hand consonants are not subject to any special combinational restriction, such restrictions exist for the left-hand ones. There are several well-defined classes of consonants that are disallowed before a SylL. They are of two kinds. To the first belong the consonants that never precede a SylL in any type of vocabulary. These are the palatal stops /c/, /ɟ/, the palatal nasal /ɲ/, and the fricative trill /r̟/ (*ř*). The reasons are historical. These consonants were in the majority of cases developed in Old Czech through palatalization of alveolars triggered by a following front vowel (Komárek 1962). Thus, the palatals cannot occur before the SylLs because such a context did not trigger the palatalization. Nevertheless, the non-occurrence of /c/, /ɟ/, /ɲ/ before a SylL must also be a matter of chance because Czech simply has not happened to borrow a foreign-language word containing such combinations.

To the second group belong the consonants that do not precede a SylL in the native words, but do so in the loanwords. First of all, these are /g/ and /d͡ʒ/. These consonants are present only in the loanwords, in which they do combine with the SylLs (*figl*^{F} "trick", *manager*^{F} /-d͡ʒr̟/). Much more interesting are the consonants that are found both in the native and foreign-origin words, but with which the SylLs combine only in the latter type of lexicon. These are discussed in the subsequent sections.

5.1 Combinations /n/ + SylL

The native words do not allow a SylL to be preceded by /n/, but the loanwords do. However, the combination /nl̩/ is not attested at all, and /nr̩/ occurs in word-final position only. The most obvious example is French-origin *žánr*^{F} "genre"; other examples are Anglicisms (*banner*^{F}, *runner*^{F} /-nr̩/).

In general, the combinability of the SylLs with preceding nasals (/m/, /n/, /ɲ/) is restricted in Czech. As already mentioned, the SylLs are never preceded by /ɲ/ in any type of vocabulary. The combinations /mr̩/ and /ml̩/ occur in the native words

as well as the loanwords, but there is a difference in their distribution. While in the loanwords they are found both word-internally (i.e. /m/ occurring in C_1 position, e.g. *hamrleska*[F] (type of gun), *zemlbába*[F] "apple pie") and word-finally (/m/ in C_3 position, e.g. *humr*[F] "hummer", *šiml*[F] "white horse"), the native words apparently avoid these combinations in the latter context. The word-final /ml̩/ is found in 3P.SG.MASC verbal form such as *zdřímel* "(he) took a nap", and the only clear example of word-final /mr̩/ in a native word is archaic *škemr*, apparently a back-formation from expressive *škemrat* "to whimper for". On the other hand, /mr̩/ and /ml̩/ are common among the native words (*mrkat* "to blink", *mlčet* "to be quiet"), in fact more common than among the loanwords.

5.2 Combinations /ʃ/, /ʒ/ + SylL

Although the SylLs are never preceded by palatal stops or palatal nasals in either type of vocabulary, the palatal fricatives /ʃ/, /ʒ/ are not affected by this restriction. Still, their occurrence before the SylLs is limited. The only combination found in the native words is /ʃl̩/. It occurs in a couple of native place names containing the element *myšl* such as *Litomyšl*, which is etymologically related to *mysl* "mind". The foreign-origin words provide other examples for /ʃl̩/ (e.g. *pajšl*[F] "hash (of calf's lights)"), although, overall, this combination is not very frequent. The loanwords also attest other combinations with the palatals. Leaving aside German-origin surnames like *Fleisher*[F], the combinations with /r̩/ are found only among the Anglicisms, namely /ʃr̩/ in *refresher*[F], *crusher*[F], and /ʒr̩/ in *plunžr*[F] "plunger". The remaining combination, /ʒl̩/, occurs in German-origin surnames like *Pižl*[F].[9]

5.3 Combinations affricates + SylL

Czech has two native affricates, /t͡s/ and /t͡ʃ/, and two other affricates, their voicing counterparts, /d͡z/ and /d͡ʒ/, which occur in foreign-origin words, onomatopoeic or dialectal words.[10] The voiced alveolar /d͡z/ never combines with a SylL; in fact, it is among the least frequent segments in Czech. The voiced palatal /d͡ʒ/ combines only with /r̩/ and only in the Anglicisms such as *manager*[F] or *ranger*[F].

9 The combinations /ʃl̩/ and /ʒl̩/ are not even found in native 3P.SG.MASC verbal forms.

10 Although the Czech affricates may be, due to their phonotactic properties, analyzed as two-consonant combinations (Bičan 2013), they are, for the sake of convenience, treated here as single segments.

The absence of the combination /d͡ʒl̩/ must be accidental because there is no reason why it could not have been acquired though borrowing.

Although the voiceless alveolar affricate /t͡s/ combines with a SylL in both types of vocabulary, it does not occur in many native words. The combination /t͡sr̩/ is found in native proper names such as *Crhonek*, *Crhák* (surnames) or *Crhov* (place name), all of which are historically derivatives of the Christian name *Crha*, the native form of foreign-origin *Cyril*[F] (Hosák & Šrámek 1970). Secondly, /t͡sr̩/ is part of words like *crčet* "to trickle" or *crnkat* "to flip". All of these native words are onomatopoeic in origin. The occurrence of /t͡sl̩/ is also limited. In the PCC it is found only in native *plácl* and *cucl*, 3P.SG.MASC verbal forms of the onomatopoeic verbs *plácnout* "to spank" and *cucnout* "to suck". Besides these attestations, the combinations /t͡sr̩/ and /t͡sl̩/ are recorded in a couple of German-origin words such as *pancrfaust*[F] "Panzerfaust", *špencr*[F] (type of short coat), *pucr*[F] "servant" and *špicl*[F] "spy", *šnycl*[F] "schnitzel".

The combinability of the voiceless palatal affricate /t͡ʃ/ is even more restricted in the native words. In our sample it appears in no other native words than *črtat* "to sketch, stroke" and its numerous derivatives. However, the word is actually a 19th-century borrowing from Russian (Machek 1968). Otherwise, the combination occurs in Anglicisms such as *puncher*[F], *feature*[F] or *voucher*[F].[11] Finally, the combination /t͡ʃl̩/ is found, in the whole PCC, just in the foreign-origin word *pinčl*[F] "pawn". There is also the word *hačl*, a 3P.SG.MASC verbal form of the onomatopoeic verb *hačnout* "to sit down", but this form does not happen to be included in the PCC.

In short, the combinations of the type Affricate + SylL are a feature of loanwords or of native words of onomatopoeic origin.

5.4 Combinations with /j/

It has been repeatedly said that the liquids are syllabic between two consonants or between a consonant and a word boundary. However, they are not syllabic next to any consonant. If a liquid is flanked by the palatal approximant /j/, which is traditionally classified among consonants, it is not syllabic. This case is exemplified by foreign-origin words such as those given under (3). In the native words combinations with /j/ are very rare, limited mostly to non-standard or dialectal words like *vejr* and *cejl* (which correspond to the standard language variants *výr* "eagle owl" and *cíl* "destination").

11 In the whole PCC it is also found in *črpat*, which is a rare and archaic variant of native-origin *čerpat*.

(3)	**j_C**	**j_#**	**C_j**
/r̩/	*madeirský*[F] /-jrs-/ “Madeiran”	*chejr*[F] “wallflower”	*matrjoška*[F] “Matroshka doll”
/l̩/	*detailně*[F] /-jl̩n-/ “in detail”	*e-mail*[F] /-jl/	*zemljanka*[F] “dugout”

The exceptional nature of /j/ may be accounted for either by a special distributional rule restricting its combinability with the SylLs (Bičan 2013) or by regarding it as a distributional class of its own, namely as a semivowel distinct from the classes of consonants and vowels (Kučera 1961). Whichever solution one chooses to account for the non-syllabicity of the liquids in examples such as (3), it is probably doomed to fail for the following Anglicisms. There is some variation in the pronunciation of these Anglicisms, but they share one significant thing: all of them may be realized with a syllabic trill after /j/.

(4)	**Variation**	**Examples**
(a)	/-jr̩n-/ ~ /-jron-/[12]	*byronismus*[F]
(b)	/-jr̩/ ~ /-jɛr/	*multiplayer*[F]
(c)	/-jr̩/ ~ /-jr/	*esquire*[F], *spitfire*[F], *umpire*[F]

For the first example, *byronismus*[F], the syllabicity of the trill is explicitly marked in the pronunciation dictionary VSČ, which is the only Czech dictionary marking consonant syllabicity. The word has also an alternative pronunciation with a syllabic trill, which is based on spelling. The loanword *byronismus* may be either an adaptation of English *Byronism* or, less likely, independently formed in Czech from *Byron* by suffixing *-ismus*. In either way the ultimate source is *Byron*, which is dissyllabic both in English and Czech. Its dissyllabic nature is preserved in *byronismus*[F]. The Czech syllabic /r̩/ corresponds to the English /rə/ in /baɪrənɪz(ə)m/ *Byronism*. The English schwa has been interpreted in Czech as a mark of syllabicity of the neighboring trill. This is a common adaptation strategy in this language, though *byronismus*[F] is the only example in which it is the sequence Cə that is adapted as a syllabic consonant. Much more common is the situation in which a syllabic consonant is an adaptation of the original reverse sequence əC (e.g. /mædɪsən/ *Madison* → Czech /mɛdɪsn̩/).

The second example is *multiplayer*[F], where the final /r̩/ is an adaptation of the English suffix *-er* realized as /ə/ in non-rhotic varieties or as /ər/ in rhotic vari-

12 The symbol ~ marks the variation in pronunciation, which is common for many Czech Anglicisms that still retain the original spelling. As a rule, one pronunciation variant is based on the phonological approximation of the original pronunciation, while another is based on spelling.

eties. The syllabic trill varies here with the vocalized sequence /ɛr/. Both the adaptation and the variation have numerous parallels in other English loanwords with the final *er*. For example, *hacker*^{F}, *tester*^{F} are realized either as /ɦɛkr̩/, /tɛstr̩/ or as /ɦɛkɛr/, /tɛstɛr/. The syllabicity of the English schwa /ə^{r}/ is thus preserved in Czech either by /r̩/ or by /ɛr/.

The last bundle of examples, consisting of the Anglicisms *esquire*^{F}, *spitfire*^{F} and *umpire*^{F}, is somewhat different. The Phonological Database of Czech Anglicisms records two pronunciations for each of them. For some Czechs, the words are dissyllabic, while others view them as three syllables. The latter pronunciation implies that the post-/j/ trill is syllabic. The variation is probably a reflex of a similar variation in English. All the three words contain, in British RP, the sequence /aɪ̯ə/. The latter is apparently treated by some native speakers as a triphthong, i.e. monosyllabically, and by others as a dissyllabic sequence consisting of the diphthong /aɪ̯/ and the schwa /ə/ (Wells 2009). In any case, the syllabic /r̩/ in the Czech words corresponds to the schwa in pronunciation and to the letter *r* in spelling. As we have just seen in examples such as *multiplayer*^{F}, *hacker*^{F}, *tester*^{F}, such a schwa is adapted to Czech as /r̩/.

In short, the syllabic trill corresponds to a syllabic segment in the donor language in all of the examples under (5). Since it is syllabic even in the context in which it is normally non-syllabic in Czech, the function of the syllabicity is apparently to preserve the syllabic constituency of the original source words. This is schematized in table 3 for *multiplayer*^{F}. Although the consonants and vowels of the English source word have been replaced by Czech phonemes, the number of syllables of the word has been retained, which has made the final trill syllabic. This is then an interesting example of so-called Structure Preservation, which Paradis & LaCharité (1997, 2011) suggest is one of the guiding principles of loanword adaptation. According to it, the phonological form of a source word with all its properties tends to be preserved when introduced to another language as far as the rules of that language permit. The principle has been mostly discussed in connection with the segmental level, but, if valid, it must apply to other phonological levels too. The adaptation of the English words to Czech provide evidence for this.

Table 3: Preservation of the syllabic structure of the English word *multiplayer*

Syllabic level	**σ**	**σ**	**σ**	**σ**	**English**
Segmental level	mʌl	ti	pleɪ	ə(r)	
	↓	↓	↓	↓	
Syllabic level adaptation	**σ**	**σ**	**σ**	**σ**	**Czech**
Segmental level adaptation	mul	tɪ	plɛ	jr̩	

5.5 Combinations with a vowel

The importation of English loanwords has resulted in a violation of another phonotactic restriction on the SylLs. Normally, these segments do not occur next to a vowel of the same word, but the Anglicisms recorded in the Phonological Database of Czech Anglicisms suggest that this occurrence is possible. The following examples are realized with a syllabic trill after a diphthong, although the (a) and (b) words also have a spelling-influenced pronunciation with the sequence /vr̩/.

(5)	**Variation**	**Examples**
(a)	/-ou̯r̩/ ~ /-ovr̩/	*follower*[F], *whistleblower*[F]
(b)	/-au̯r̩/ ~ /-avr̩/	*powerplay*[F], *tower*[F]
(c)	/-au̯r̩/	*happy hour*[F]

The diphthongs before /r̩/ are adaptations of the English diphthongs /əʊ̯/ (the (a) examples) and /aʊ̯/ (the (b) and (c) examples). The syllabic trill is itself an adaptation of the schwa spelled with the letter *r*. For the (a) and (b) examples, the adaptation has a parallel in the other Anglicisms ending in *er*, as we have already noted in connection with *multiplayer*[F]. The Czech trill is again syllabic due to the preservation of the donor-language syllabic constituency of the source words (see above). The Anglicism *happy hour*[F] has a parallel in the above-discussed *umpire*[F], *spitfire*[F] and *esquire*[F]. In the original pronunciation of this expression, we again encounter the ambiguous sequence /aʊ̯ə/, which is by some native speakers of English viewed as a monosyllabic triphthong, while others perceive it as a dissyllabic sequence. Note that it cannot be ruled out that the syllabic and non-syllabic pronunciation vary even for some Czechs for the Anglicism *happy hour*[F], but this variation is not recorded in the Phonological Database of Czech Anglicisms.

Since the diphthongs in Czech are usually treated as single vowels with a complex structure, examples (5) provide evidence that a syllabic trill may after all stand next to a vowel. Yet it need not be accidental that the diphthongs in question are falling diphthongs. A falling diphthong is one that may alternatively be understood as a sequence of a vowel and a non-syllabic semivowel. In this interpretation the syllabic trill does not stand after a vowel in the examples such as *follower*[F] or *tower*[F], but after a semivowel. It is not difficult then to see here a parallelism between these words and words such as *byronismus*[F] and *multiplayer*[F] discussed in the previous section. The latter two contain a syllabic trill standing after /j/, which may be classified as a semivowel too.

If falling diphthongs are interpreted as sequences of a vowel and a semivowel, and if a semivowel is defined as a non-syllabic vowel, the restriction ruling out the occurrence of a SylL next to a vowel can be reformulated. What is then

impossible in Czech is a combination of a SylL with another syllabic segment. Such a reformulation accounts not only for the fact that the SylLs do not flank monophthongs, but also for the fact that a combination of two SylLs next to one another is not found in Czech (and, furthermore, a SylL does not stand next to a syllabic nasal).

5.6 Two-liquid combinations

The last mentioned generalization leads us to another problem in the phonotactics of the Czech SylLs: their co-occurrence next to each other. It follows from that generalization that a SylL does not stand next to another SylL, be it either the same liquid or the other liquid. However, a SylL is found next to a non-syllabic liquid, both next to its non-syllabic counterpart and next to the non-syllabic form of the other liquid. The distribution of such combinations has some peculiarities, so that it deserves a detailed discussion.

If a SylL stands next to its non-syllabic counterpart, the latter may either precede it or follow it. However, no example of the sequences /r̩r/ and /l̩l/ are found in the whole PCC, from which fact we conclude they are impossible in Czech. In contrast, the reversed sequences /rr̩/ and /ll̩/ do occur, but only in a couple of words. The words are either (a) synchronically analyzable compounds (*kontrrozvětčík* "counter-intelligence agent", *ministrrezident*^{F} "minister-resident") or (b) words which were originally compounds or two words in donor languages (*kajzrrok*^{F} < Ger. *Kaiserrock*, *himllaudon*^{F} < Ger. *Himmel, Laudon*) or (c) 3P.SG.MASC verbal forms with the clitic *-li*, which constitutes a single phonological word with the verbal forms (*řekl-li* /-kl̩lɪ/ "if he said"). One might be tempted to interpret the liquid sequences as boundary signals in the sense of Trubetzkoy (1939), but such an analysis cannot apply to the (b) class because these items are, from the synchronic perspective, morphologically non-compound in Czech. Yet the fact that such sequences occur only at morphological boundaries, whether actual or original, cannot be ignored.

The other possible combinations of two liquids involve non-same liquids. The two-liquid combinations are of two kinds: (i) a trill plus a lateral (= *rl*) and (ii) a lateral plus a trill (= *lr*). More than two liquids in a row do not occur. The *lr* sequence is rare in Czech, irrespective of the syllabicity of the liquids. In the native words it is found only at morphological boundaries (e.g. *půlrok* "half-year", *bělrouchý* "white-garment$_{ADJ}$") or in positions that were originally such boundaries (*velryba* "whale", originally *vel-ryba* "big-fish"). Otherwise, the *lr* sequence occurs in the loanwords, some of which are compounds in donor languages (*allroad*^{F}, *milreis*^{F} < Port. *mil-réis* "thousand réis"). In such words both of the liquids are non-syllabic because they are flanked by a vowel from both sides. However, there

are several Anglicisms in which, in the *lr* sequence, the trill is syllabic (see below examples (8b)).

On the other hand, the *rl* sequence is much better attested. It occurs between two vowels (e.g. *berla* "crutch", *perla*[F] "pearl"), but also next to at least one consonant. The latter situation is relevant for our discussion because if a consonant flanks the *rl* sequence, then one of the liquid happens to stand between two consonants, which is a potentially syllabic context. If a consonant precedes the sequence, it is the trill that finds itself in such a context (C*rl*). If a consonant follows, it is the lateral (*rl*C). What is more, if the sequence stands at the end of words, the lateral occurs between a consonant and a word boundary, which is again a potentially syllabic context (*rl*#). Finally, if the sequence is preceded as well as followed by a consonant, both of the liquids happen to stand in a potentially syllabic context (C*rl*C). There exist examples for all of these cases, but the interpretation of the liquid syllabicity is problematic. They are discussed in turn.

To repeat, potentially syllabic is such a context in which a liquid stands between two consonants (C_C) or between a consonant and a word boundary (C_#). Since the liquids (L) are classified among consonants, the standard view predicts that a liquid is syllabic in the contexts C_LC, C_LV, CL_C, VL_C, CL_# and VL_#. This prediction turns to be correct only for the context C_LV. In such examples as *chrlit* "to spout", *brloh* "lair", *kamrlík*[F] "cubbyhole" or *pimprle*[F] "puppet", the trill is indeed syllabic. The other contexts are ambiguous.

Let us consider particular examples. Since they are not very numerous, we mention all relevant examples we are aware of irrespective of whether they are included in the PCC. We will start with contexts VL_C and VL_#:

(6)	**Native**	**Foreign-origin**
VL_C	(not found)	*marlborky*[F] "Marlboro cigarettes", *charlston*[F] "Charleston", *whirlpool*[F] *Karlštejn*[F] (place name)
VL_#	*stárl*, *zestárl*	*callgirl*[F], *earl* (*grey*)[F], *jarl*[F], *perl*[F] (typographical measure) *Karl*[F], *Tyrl*[F], *Šírl*[F] (proper names)

The examples come mostly from Czech words of foreign origin. There are only two native examples for the VL_# context, related to one another. One is *stárl*, the 3P.SG.MASC form of the verb *stárnout* "to get old"; the other is its perfective form *zestárl*. The base *stárl* is dissyllabic, which means that the final /l/ is syllabic. This is in accord with the traditional prediction about liquid syllabicity. It is further corroborated by the way the words *stárl* and *zestárl* are treated in verse (checked against the Corpus of Czech Verse) as well as by the way native speakers judge

the words (Bičan 2014). The syllabic nature of the final /l/ is no doubt influenced, or perhaps even determined, by the fact it is a form of the 3P.SG.MASC verbal suffix.

The interpretation of the remaining examples is far from being so obvious. Such foreign-origin words as *Tyrl*[F] and *Karl*[F] are viewed by some Czechs as monosyllabic and by others as dissyllabic (Bičan 2014). Thus, the final lateral is either non-syllabic or syllabic. Secondly, as evidenced by the Corpus of Czech Verse, the word *jarl*[F] may be, in verse that relies on the same number of syllables per line, counted as a monosyllable or as a dissyllable. This twofold treatment is instantiated in the same poem, as evidenced by the following two excerpts from the collection *K západu* (1911) by František Leubner (syllable nuclei underlined):

(7)	**Dissyllabic *jarl***		**Monosyllabic *jarl***
(a)	*Stín u kormidla – jarl sám* *se vzdává boje vzpomínkám.*	(b)	*Jarl těžkou hlavou pokynul* *sen pominul a rozplynul.*

The same ambiguity also concerns the words in which a lateral stands in the CL_C context, that is, words like *Karlštejn*[F] or *marlborky*[F]. Again, the native speakers have different judgments about the syllabicity of the lateral (Bičan 2014). And as the Corpus of Czech Verse shows, in such words the lateral is sometimes counted, in syllable-counting verse, as syllabic and sometimes as non-syllabic.

In short, there are words for which the syllabicity of a lateral is ambiguous in the contexts VL_C and VL_#, and words for which the lateral is unambiguously syllabic in the context VL_#. This has two possible explanations. One possibility is that the lateral is by default syllabic in the sequences V*rl*C, V*rl*#, which makes it syllabic in the native word *zestárl*. The fact that the other words, all of which are of foreign-origin, show ambiguity in the lateral syllabicity can be attributed to their origin. First, foreign-origin words may be subject to other phonological rules than native words. That this is often the case has been suggested by many studies (e.g. Mathesius 1931; Fries & Pike 1949; Henderson 1951; Kučera 1958). A difference between the core, to which most native words belong, and the periphery, to which most loanwords belong, may also play a role (cf. Itô & Mester 1999; Uffmann 2015). Second, the syllabicity of the lateral in the sequence /rl/ can even be ambiguous in the source words of the foreign-origin words listed under (6). Such ambiguity has at least been reported for *pearl* in American English, which is, according to Bell & Hooper (1978: 17), viewed both as monosyllabic and dissyllabic. The word is comparable to Czech *perl*[F], which is also ambiguous.

Yet there is another explanation for the status of the lateral in the contexts VL_C and VL_#: The lateral is by default non-syllabic here. The ambiguity in the treatment of such sequences may again be a consequence of the foreign-origin or marginal status of the respective words. The reason the lateral is viewed as sylla-

bic in *zestárl* can then be an "illusion" created by the fact that it corresponds to an easily identifiable morpheme. To put it otherwise, what the native speakers identify as a syllable in *zestárl* is actually a morpheme. No such identification is possible in the other foreign-origin words. However, since there are no other native examples than *zestárl*, it is hard to find further support for this explanation in order to see how the native speakers treat native words with the given two-liquid sequence in which the lateral is not a form of a morpheme.

The problem of the liquid syllabicity in two-liquid sequences is further complicated by another set of loanwords, this time all from English:

(8)	**English variation**	**Czech variation**	**Examples**
(a)	/rəl/ ~ /r̩l̩/ *ral*	/r̩l̩/ ~ /ral/	*coralwood*[F]
(b)	/ləʳ/ *lor*	/lr̩/ ~ /lor/	*bachelor*[F], *tailor*[F]
	/ləʳ/ *ler*	/lr̩/ ~ /lɛr/	*trawler*[F], *traveller's cheque*[F]
	/ləʳ/ *lar*	/lr̩/ ~ /lar/	*circular pitch*[F]

The examples belong to two groups. In the first we see a syllabic lateral preceded by a trill and followed by a consonant, for which we have only one example (*coralwood*[F]). In the second group there is a syllabic trill that is preceded by a lateral and followed either by a word boundary or by a consonant. Unlike the previously discussed foreign-origin words, there does not appear to be any ambiguity as to the syllabicity of these liquids.

To begin with, the syllabic pronunciation is recorded by the Phonological Database of Czech Anglicisms, which reflects the use and judgment of native speakers of Czech. What is more, the syllabicity of /r/ is explicitly marked for *trawler* in VSČ. Unfortunately, the other words are not included in that dictionary. They are recorded in other dictionaries, but these dictionaries do not mark consonant syllabicity in any word. That the liquids are syllabic in the words under (8) is further supported by the existence of the variation in pronunciation. In all the words the potentially SylL freely alternates with a sequence of a vowel and a non-syllabic liquid, that is, with something that is syllabic.

Finally, there is one other fact that suggests that the liquids are syllabic in the Anglicisms under (8). It also explains the syllabicity. In (8a) the syllabic lateral corresponds to the English sequence /əl/, which may be freely replaced by /l̩/ in some styles (according to LPD). In (8b) the syllabic trill corresponds to the original schwa (or a schwa plus /r/ in rhotic varieties) spelled with *r*. We showed in section 5.4 that such donor segments are adapted to Czech as syllabic trills. In both cases the SylLs in the Anglicisms correspond to syllabic segments or segment combinations in the donor language. The syllabic constituency of the original words has therefore been preserved. It is hence another example of Structure Preservation.

To summarize the discussion so far, the foreign-origin words allow for two types of combination of two liquids not attested in the native words. First, they allow for a syllabically ambiguous sequence of a trill and a lateral followed by a consonant or a word boundary (cf. *Karlštejn*^{F}, *jarl*^{F}). Although such sequences occur in native words, the lateral is always syllabic there (cf. *stárl*). Second, they allow for a sequence of a non-syllabic lateral and a syllabic trill (cf. *trawler*^{F}). Such a sequence is not found in the native words at all, and it is therefore an innovation introduced by English loanwords. However, it should be noted that the sequence falls into an attested pattern, namely to LL̩ (cf. *zestárl*)

So far we have dealt with words with a two-liquid sequence in which only one of the liquids is potentially syllabic. However, Czech has several examples of words in which both of the liquids are potentially syllabic due to their presence in a potentially syllabic context. The examples are given under (9). They instantiate the occurrence of the sequence of a trill and a lateral between two consonants (C_ _C). The reverse sequence is not attested in the PCC.

(9)	**Native**	**Foreign-origin**
C_ _C	*umrlčí* “dead man’s”	*štamprlka*^{F} “little jigger”
	kotrlcovati “to do somersaults”	
	povrlský “Povrly$_{\text{ADJ}}$ (place name)”	
	Nevrlka (surname)	

Let us take *umrlčí* as the word representing all the examples. The standard account of liquid syllabicity predicts that both /r/ and /l/ should be syllabic here because both stand between two consonants, one of which is the other liquid (/r/ between /m/ and /l/, and /l/ between /r/ and /t͡ʃ/). However, this prediction does not agree with how the word is perceived by Czechs. The same experiment referred to above (Bičan 2014) has shown that *umrlčí* is trisyllabic for the native speakers. Furthermore, the word is counted as three syllables in syllable-counting verse (again evidenced by the Corpus of Czech Verse). It means that only one of the liquids is syllabic.

Now, the obvious question is which of the liquids it is. Taking the phonotactics of Czech into account, Bičan (2013) argues that the syllabicity is acquired by the trill, that is, the word *umrlčí* contains the syllable /mr̩l/ rather than /mrl̩:/. The first syllabification (CL̩L) assumes a syllabic trill preceded by a nasal (which is attested, cf. *mrkat* “to blink”) and followed by a non-syllabic lateral (which is not otherwise attested). On the other hand, the latter syllabification (CLL̩) assumes a syllable-final syllabic lateral (which is attested, cf. *mysl* “mind”) preceded by a consonant-plus-trill sequence (which is not attested). Although both syllabifications introduce unattested patterns, the first lays the weight of novelty (and irre-

gularity) on the coda, and the second on the onset. We have argued that the set of consonants following a SylL is less restricted than the set of consonants that precede it, and thus the first solution is more in accord with this restriction. What is more, the irregularity in syllabification is often attributed to codas rather than onsets (Pulgram 1970).

There is one last set of examples for two-liquid sequences:

(10)	**Native**	**Foreign-origin**
C_ _#	*chrl*, *vychrl*, *výchrl*	*čokrl*^{F} "dog"

We see here the *rl* sequence between a consonant and a word boundary. The first two items are derivatives from the same verb *chrlit* "to eruct" or its imperfective form *vychrlit*. The word *vychrl* is the 2P.SG imperative, derived from the bare stem like other verbs of this class.[13] The word *výchrl* is a nominal derivative of the same verb with the meaning "something eructed". It is a very rare word. Finally, the last item, *čokrl*, is also quite rare, probably a hapax legomenon, though recorded in the dictionary PSJČ.

In all these words both of the liquids should be syllabic; /r/ because it stands between two consonants, and /l/ because it stands between a consonant and a word boundary. However, once again only one of the liquids is actually syllabic. In the case of the imperative *chrl*, the evidence comes from its treatment in syllable-counting verse, in which it is treated as a monosyllable. It is in accord with the other verbs of this kind. For example, the imperatives of dissyllabic verbs such as *holit* "to shave", *svačit* "to have a snack" are all monosyllabic: *hol*, *boř* and *svač*. Moreover, they are all of the structure (C)CVC. The same syllabic structure can be assumed for *chrl*, that is, C$\underset{\cdot}{\text{L}}$L. Recall also that the same syllabic template was recognized in the word *umrlčí* above.

In contrast to *vychrl* or *chrl*, the syllabicity of the nouns *výchrl* and *čokrl*^{F} cannot be confirmed in verse because they are not included in the Corpus of Czech Verse. Yet it is interesting that for *výchrl* the dictionary PSJČ states that it should be pronounced as *-chr-l*. The transcription is not easy to interpret, though. It may mean either that *chrl* is to be pronounced as two syllables or that /r/ is syllabic rather than /l/. The latter is more likely because the former interpretation would mean that *výchrl* differs from *vychrl* only in the syllabicity of the final lateral (leaving aside the vowel length). There is no other evidence that consonant syllabicity

13 There are other verbs, all of them archaisms, that could have a similar imperative form like *vychrlit*: *cvrliti* "to reel", *kudrliti* "to twine", *trliti* "to barely stick together", *znevrliti* "to make someone snappy". The imperatives *cvrl*, *kudrl*, *trl*, *znevrl* do not seem to be attested, though.

is a distinctive feature in the native words. On the other hand, if in the PSJČ's transcription *-chr-l* is understood as implying that the /r/ is syllabic and that the /l/ is non-syllabic, then *výchrl* contains the same syllable type CL̩L as the other words with a two-liquid sequence in the contexts under consideration.

In short, if a liquid happens to stand in the contexts C_LC and C_L#, it is syllabic, but if it stands in the contexts CL_C and CL_#, it is non-syllabic. The syllabicity of a liquid is here again dependent more on the consonant that precedes the liquid rather than on the consonant that follows it.

6 Conclusion

One of the basic assumptions of loanword adaptation is that other-language words introduced to some language are adjusted to that language, i.e. changed in order to fit its orthographic, phonological, morphosyntactic and other rules (Kang 2011). Though this seems to rule out the possibility that loanwords may change the recipient language, their innovative potential has been accepted as a fact at least since the seminal Haugen (1950). For phonological adaptation, Haugen recognizes two types of loanword-induced innovation. Loanwords may introduce wholly new phonological elements, which he calls *phonemic importation*. Examples are well documented in literature (e.g. Filipović 1960; Paradis & LaCharité 2011: 1805–1806). In Czech the velar stop /g/ and the diphthong /ɛu̯/ have been imported via loanword adaptation (cf. *guma*^{F} "gum", *euro*^{F}).

The other type of loanword-induced phonological innovation involves changes of the pattern of the occurrence of phonological elements, which Haugen calls *phonemic redistribution*. Rather than importing new phonological elements from a donor language, loanwords extent the range of occurrence of the existing recipient-language elements. Donor-language segments are identified with recipient-language segments, but since the former may have a quite different occurrence than the latter, the distribution of the recipient-language segments changes. A case in point is the English affricate /d͡ʒ/ (Filipović 1960). In the native words it occurs only word-medially (cf. *vision*, *measure*), but thanks to the introduction of many French loanwords, its occurrence has been extended to word-initial and word-final position (cf. *gigue*, *mirage*).

Phonemic redistribution concerns combinability of segments. Loanwords may introduce phoneme combinations previously not attested in native words. Two types of unattested phoneme combination must be recognized (and in general, two types of relation between phonemes). First, combinations that are not actually occurrent but that are latently possible in some language. Second, combinations that are also not occurrent but that are *not* possible in that language. In other words, the

phonological grammar of a language must allow for more structures than those overtly manifested, but at the same time it restricts the range of possible structures (Hervey 1978; Algeo 1978), even though the boundary between the two types may be gradual rather than sharp (Scholes 1966). Yet the existence of these two types is supported by the fact that other-language forms are sometimes introduced to a language without much phonological modification, while other forms are subject to various changes such as epenthesis or deletion that modify them in order to fit the recipient-language phonology (often called *repair strategy*, cf. Paradis & LaCharité 1997). For example, English words containing consonant clusters are modified by vowel epenthesis when adapted to languages such as Hawaiian, which does not allow consonant clusters (e.g. Eng. *grip* > Haw. *kəlípe*, Adler 2006).

Both kinds of unattested combinations are introduced by loanwords. It is generally recognized that loanwords may contain combinations that, as it were, fill in structural gaps for latently possible combinations (Weinreich 1953: 22; van Coetsem 1988: ch. 10). However, they may also change the phonotactics of phonemes by introducing previously impossible phoneme combinations. The latter must, then, also be a case of phonological importation, bringing forth new structural relations between phonemes rather than new phonemes. While the former case leads only to the enrichment of possible phonotactic patterns, the latter engenders new patterns, thereby reshaping the language, in fact giving rise to a new linguistic system.

Our analysis provides evidence that the phonotactics of the Czech SylLs have been enriched in both ways thanks to the import of loanwords. Most of the innovations are instantiations of latent patterns that are unattested but arguably possible in the native words, but some examples of possible reshaping of the native phonology have also emerged.

First of all, the loanwords have changed the frequency of the occurrence of the SylLs in certain word position. The SylLs have become more common in word-final syllables, which is a position where their occurrence is very limited in the native words. Interestingly, in word-initial syllables the occurrence of the SylLs has hardly been influenced because the loanwords contain very few instances of these segments in such a position, all being very old borrowings.

Furthermore, the loanwords attest many combinations of a consonant and a SylL (C$\underset{\cdot}{\text{L}}$) that are not found, especially in word-final position, in the native words at all or that are found only in one class of the native words, namely in verbs. Since combinations of the same patterns do occur in the native words, these loanword-introduced combinations are in fact further instantiations of these patterns. Table 4 lists attested C$\underset{\cdot}{\text{L}}$ combinations. The shading shows which combinations occur only in the foreign-origin words, that is, these are the filled-in gaps in the Czech phonotactics. The table makes it obvious how they fall into the possible combinational patterns. The existence of these patterns furthermore explains why

the donor-language combinations have not been modified by some phonological repair strategy such as epenthesis or deletion.

Table 4: Attested combinations of a consonant and a SylL (unshaded combinations are found both in the native and foreign-origin words, shaded combinations only in the foreign-origin words; parentheses mark combinations with highly restricted occurrence in the native words; empty cells stand for unattested combinations; × stands for impossible combinations)

	Labial		Alveolar		Palatal		Velar	
Stop	pr̩	br̩	tr̩	dr̩	×	×	kr̩	gr̩
	pl̩	bl̩	tl̩	dl̩	×	×	kl̩	gl̩
Fric.	fr̩	vr̩	sr̩	zr̩	ʃr̩	ʒr̩	xr̩	ɦr̩
	fl̩	vl̩	sl̩	zl̩	ʃl̩	ʒl̩	xl̩	ɦl̩
Affr.			t͡sr̩		(t͡ʃr̩)	d͡ʒr̩		
			t͡sl̩		(t͡ʃl̩)			
Nas.	mr̩		nr̩		×			
	ml̩				×			
Son.			× (i.e. */rr̩/)					
			rl̩					
			lr̩					
			× (i.e. */ll̩/)					

Yet not all of the loanword-imported phoneme combinations are just gap fillers. The Anglicisms, most of which entered Czech in the past few decades, contain combinations with a potential to change native phonotactic rules. The most notable instance of this is the occurrence of a syllabic trill after the approximant /j/ and after the diphthongs /oʊ̯/ and /aʊ̯/. In the native words and in most loanwords, the trill is uniformly non-syllabic in these situations. As a consequence of this, the non-syllabic trill /r/ has become opposed to the syllabic trill /r̩/ in the same phonotactic contexts:[14]

(11)	**Non-syllabic /r/**		**Syllabic /r̩/**	
j_#	/-jr/	*vejr*, *chejr*^{F}	/-jr̩/	*multiplayer*^{F}, *spitfire*^{F}
j_C	/-jr-/	*zairský*^{F}, *madeirský*^{F}	/-jr̩-/	*byronismus*^{F}

14 *vejr* "eagle owl", *chejr*^{F} "wallflower", *zairský*^{F} "Zairian", *madeirský*^{F} "Madeiran", *kocour* "tomcat", *žentour*^{F} "whim", *haur*^{F} "braggard", *centaur*^{F} "centaur", *maurský*^{F} "Moors$_{ADJ}$".

o͡u_#	/-o͡ur/	*kocour*, *žentour*^{F}	/-o͡u̯/	*follower*^{F}, *whistleblower*^{F}
a͡u_#	/-a͡ur/	*haur*^{F}, *centaur*^{F}	/-a͡u̯/	*tower*^{F}
a͡u_C	/-a͡ur-/	*maurský*^{F}	/-a͡u̯-/	*powerplay*^{F}

The Anglicisms have introduced a paradigmatic difference between the syllabic and non-syllabic trill, and the syllabicity of the trill has ceased to be wholly contextually predictable. Thus, one may conclude from this that the difference between [r] and [r̩], which is otherwise merely allophonic in the native words, has become phonemicized. Loanword-induced phonemicization of allophonic variants is well attested across languages (Thomason & Kaufmann 1988). However, since the distinctiveness of /r̩/ would manifest itself only in the Anglicisms, most of which are recent borrowings, it is more reasonable to say that the phonemization does not apply to the phonology of Czech as a whole, but only to a certain class of words, namely the Anglicisms (or the loanwords). In line with Fries & Pike's (1949) proposal, the class could be viewed as constituting a phonological system co-existent with the primary or core native system of Czech, that is, a system that is subject to slightly different phonological rules. In fact, there are probably more secondary phonological systems of this kind. Evidence shows that phonological properties are not uniformly distributed among loanwords (Holden 1976), that there is a hierarchy from less to more phonologically adapted words (Mathesius 1932; Itô & Mester 1999), and that there is even a difference between how bilingual and monolingual speakers treat the same loanwords (Batibo 1996).

Although the syllabicity of the Czech trill is at least potentially distinctive, the distinctiveness is downplayed by the fact that all of the Anglicisms with /r̩/ after a semivowel have alternative pronunciations with a non-syllabic trill that may be accompanied by a vowel. For instance, *multiplayer*^{F} can also be realized with /-plɛjɛr/ instead of /-plɛjr̩/, *byronismus*^{F} with /-jron-/ instead of /-jr̩n-/ or *spitfire*^{F} with /-fajr/ instead of /-fajr̩/. This brings us to another important fact, already mentioned in passing in our analysis. In a great many loanwords (but not in all!), the SylLs are in free variation with non-SylLs usually accompanied by a vowel. The variation is a result of an alternative loanword adaptation strategy: spelling pronunciation. In standard, non-dialectal Czech such variation is impossible in native words. In effect, there is a difference, which may also be regarded as paradigmatic, between non-variable and variable SylLs. Examples of the commonest types of variation are as follows (most take place in the Anglicisms, but the variation occurs in other loanwords as well):[15]

15 It is not always recorded in dictionaries, though.

(12)	**Variation**	**Examples**
(a)	/r̩/ ~ /ɛr/	*tester*[F], *biker*[F], *over*[F]
	/r̩/ ~ /or/	*twistor*[F], *bachelor*[F], *tailor*[F]
	/r̩/ ~ /ar/	*circular pitch*[F]
	/r̩/ ~ /ro/	*byronismus*[F]
	/r̩/ ~ /r/	*spitfire*[F], *umpire*[F], *esquire*[F]
(b)	/l̩/ ~ /ɛl/	*hostel*[F], *pixel*[F]
	/l̩/ ~ /al/	*coralwood*[F]

The variation is virtually always between a SylL and the sequence of a vowel plus the non-syllabic variant of the liquid (i.e. L̩ ~ VL). The quality of the vowel is as a rule determined by the original spelling (cf. /a/ in *coralwood*, /ɛ/ in *tester*[F], /o/ in *twistor*[F]). Two other types of variation are found for the syllabic trill. First, it may be freely replaced by a sequence of a non-syllabic trill plus a vowel, the quality of which is again determined by spelling (i.e. L̩ ~ LV). The Anglicism *byronismus*[F] is the only example of this. Second, /r̩/ varies with a non-syllabic trill, without any vocalic accompaniment (i.e. L̩ ~ L). Examples are again found among the Anglicisms (*spitfire*[F], *umpire*[F], *esquire*[F]).

We have provided plenty of evidence that words imported from other languages have considerably influenced and even modified the use, the distribution and the combinability of the SylLs in Czech. However they are analyzed or whatever status they are given, one fact can hardly be denied: Even though taken from other languages, loanwords are part of the vocabulary of Czech (or for that matter, of any other language with loanwords), and their phonology must be accounted for. This is crucial not only for the development of phonological theory and its testing (Paradis & LaCharité 2005), but for our understanding of language and languages.

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