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Phonological domains in Luxembourgish and their relevance for the phonological system¹

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1. Introduction

Inspired by recent work on the phonological system of Luxembourgish by Nübling (2005) and Szczepaniak (2009), in this paper I shall address the relevance of two phonological domains, i.e. the syllable and the phonological word, for the phonological system of Luxembourgish. Following the proposal initiated by Donegan/Stampe (1983) and elaborated by Auer (1993, 1994, 2001) and Szczepaniak (2007), languages can be classified typologically according to the relevance of the prosodic domains of the syllable or the phonological word, respectively. Specifically, a language ‘favors’ either the syllable or the phonological word in sound change or synchronic phonological rules, processes or alternations, i.e. the phonology of a given language is organized around one main prosodic domain. Several features of this well-known typological distinction have been established, some of which are listed in table 1 (see Auer 1993).

Table 1: Central characteristics of word languages and syllable languages

Word languages	Syllable languages
complex syllable structure; sonority hierarchy partially not respected	simple syllable structure (preferably CV); sonority hierarchy respected
differences between accented and unaccented syllables	only minor differences between accented and unaccented syllables
central vowel phonemes possible	no central vowels
phonetically strong word accent	phonetically weak word accent
reduction of non-accented syllables	no accent-dependent reduction
vowel deletion leading to complex clusters	vowel epenthesis to achieve CV structure
resyllabification only within a phonological word	resyllabification across word boundaries
external sandhi ≠ internal sandhi	external sandhi = internal sandhi
no geminates	geminates possible
frequent assimilations	few assimilations

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A prototypical syllable language fulfills as many as possible of the criteria given on the right hand side of the table. Italian, for example, is characterized by a simple syllable structure (alongside phonological processes aiming at the dominance of CV syllables), geminates and a phonetically rather weak word accent. German or Danish, on the other hand, represent word languages, because they have, inter alia, developed a complex syllable structure and a phonetically strong word accent. It has to be emphasized that this typological distinction is organized as a continuum with ideal(ized) endpoints, allowing several intermediate steps. Conceptualized as a direct opposition, a feature which strengthens the phonological domain of the word may weaken the domain of the syllable (and vice-versa). How a variety can be located on this continuum is shown by Caro Reina (*this volume*) for various Catalan varieties.

Here, the phonology of Luxembourgish is tested against some of these criteria in order to assign the language a place on the continuum of the syllable language/word language distinction. The analysis of the structural distance between Luxembourgish and the closely related Standard German as a prototypical word language will also be of particular interest. Whereas differences between the two languages with regard to segmental phonetics and the impact of language contact have previously been analyzed, prosodic differences have only been addressed rarely.

2. Luxembourgish

Luxembourgish ('Lëtzebuergesch') is a small West Germanic language (approx. 300.000 speakers) of Central Franconian origin and today the national language of the Grand-Duchy of Luxembourg.² It is used mainly as a spoken language for a wide range of situations, both formal and informal. In this multilingual society Standard German and Standard French also form part of a complex triglossic situation with a high degree of language contact. For Luxembourgish the contact with German and French has resulted in numerous lexical borrowings with various degrees of phonological integration. Language standardization is at a medium level for Luxembourgish: Language codices like dictionaries and grammars exist, but Luxembourgish is still not taught in a serious way in the educational system. As most written domains are occupied by French or German, the status of Luxembourgish as a written language is still weak. In contrast with fully-fledged standard languages like French or German, Luxembourgish phonology has therefore been less influenced by written language to date. This has led to a situation where considerable regional and individual variation is preserved. Nevertheless, the variety spoken in the geographical center of the country ('Zentralluxemburgisch') functions more and more as an emerging standard variety. The data to be presented in the following also comes from this variety. In this scenario Luxembourgish is an ideal candidate to test how a phonological system develops when it is not subject to strong standardization.

With regard to the dichotomy of word and syllables, Nübling (2005) and Szczepaniak (2009) discuss in a contrastive way several phonological features of German and Luxembourgish. In her analysis of several sound changes, Szczepaniak identifies both syllable language and word language-related traits in Luxembourgish. Among the syllable-related features are schwa epenthesis, Umlaut, resyllabification, the *n*-rule, voice assimilation and the presence of schwa in stressed syllables (in addition to

² For an overview of the phonetics/phonology of Luxembourgish see Keller (1961), Newton (1990), Gilles (1999, 2009), Gilles/Trouvain (*under review*).

its presence in unstressed syllables). On the other hand, the author also presents several features relating to a word language (e.g. final obstruent devoicing, development of ambisyllabic consonants, complete apocope of final schwa, decrease of schwa epenthesis, dissimilation of [st], [sp] > [ʃt], [ʃp] to indicate the beginning of a phonological word). These findings suggest that Luxembourgish exhibits typological characteristics of both language types and it is consequently classified as ‘phonologically mixed’.

The present study will partly re-discuss Szczepaniak’s findings, but will also bring further data and phonological argumentation into the debate. In order to answer the far-reaching question of the typological status of Luxembourgish, it would be crucial to take the whole phonological system into account. However, this study will only concentrate on aspects of syllable and word structure, word stress and external sandhi. This ensures that the most pertinent aspects of the phonological system are dealt with. It will turn out that the Luxembourgish data represent an interesting test case in the discussion of how preferences for a phonological domain like the syllable or the phonological word shape the phonology of a language. On the other hand, the discussion will also reveal that an unambiguous attribution of certain phonological processes to either the syllable or the word ‘pole’ of the continuum is not always straightforward and requires careful consideration of several facets.

The following sections will discuss features of Luxembourgish phonology that clearly relate to the syllable (section 3) or the phonological word, respectively (section 4). Section 5 presents two cases of external sandhi that pose certain problems, as they call for the relevance of the two phonological domains at the same time. In the final section 6 the results will be summarized.

3. (Potential) syllable language traits

The following critical discussion will be devoted to the distribution of schwa and schwa-epenthesis as potential traits to classify Luxembourgish as a syllable language.

3.1 Distribution of schwa

The distribution of schwa in Luxembourgish is not restricted to unaccented syllables, but schwa can also occur in accented syllables (see also Szczepaniak 2009). In other words, it is not the domain of the phonological word that is relevant for the distribution of schwa, but rather the syllable. Following van Oostendrop (1998), this kind of schwa can be labeled ‘stable schwa’ as it forms part of the underlying representation of the word and cannot be regarded as the result of vowel reduction or epenthetic processes to facilitate syllabification. As with all central vowels, its phonetic realization varies according to contextual influences. In most cases, it can be perceived as a slightly fronted or rounded central vowel, but the articulatory difference to a schwa in unaccented syllables remains hardly noticeable. In Luxembourgish orthography, this stressed schwa is written with <ë> (see examples in 1).

(1) *Schwa in stressed syllables*

<i>Zëmmer</i>	[ˈt͡səmɐ]	‘room’
<i>sëtzen</i>	[ˈzət͡sən]	‘to sit-INF’

<i>Lëtzebuerg</i>	[ˈlətsəbuəʃ]	‘Luxembourg’
<i>ënner</i>	[ˈənən]	‘below’
<i>schëdden</i>	[ˈʃədən]	‘to pour-INF’
<i>këddelen</i>	[ˈkədələn]	‘to tickle-INF’

If Luxembourgish belonged to the word language type, the phonology would strive to maximize the contrast between the vowel inventory of accented and unaccented syllables by avoiding schwa (as the most important vowel of unstressed syllables) in stressed syllables. Since this is not the case with regard to schwa, one could argue that this feature characterizes Luxembourgish as belonging more to the syllable language type. Despite the fact that schwa can occur in stressed and unstressed syllables one has to keep in mind that the two vowel inventories still remain rather different: The vowel inventory for unstressed syllables³ is much more restricted compared to the stressed syllables – which is a feature of a word language. Thus, the described distribution of schwa is probably only a weak indicator towards a syllable language.

This claim finds further support if the sound history of the ‘stressed’ schwa is taken into account. Historically, schwa here originates from Westgermanic /i/ or (subsequently unrounded) /y/, which were affected by a general and regular sound change of vowel lowering ([i] > [e] > [ə]). In this general and regular sound change not only polysyllabic words like the ones in (1) but also monosyllabic words like *Fësch* ‘fish’, *well* ‘wild’ or *Kënn* ‘chin’ were affected (see Keller 1961: 257, Sturm 1988: 69ff.). It can be concluded that the evolution of this schwa and word stress are not related. That this schwa is found in stressed syllables seems thus a mere by-product of an unrelated segmental sound change.⁴

This partial special status of schwa is further supported by the phonological integration of French loans, which are in general very frequent in Luxembourgish. The words in (2) demonstrate that after phonological integration a former full vowel [e] is reduced to schwa and this syllable also carries the word accent.

(2) *Schwa in stressed syllables*

<i>French</i>			<i>Luxembourgish</i>	
<i>télé</i>	[teˈle]	>	<i>Tëlee</i>	[ˈtʰələ:] ‘TV’
<i>vélo</i>	[veˈlo]	>	<i>Vëlo</i>	[ˈvələ:] ‘bike’
<i>mélasse</i>	[meˈlas]	>	<i>Mëllass</i>	[ˈməlas] ‘molasses’
<i>béton</i>	[beˈtɔ̃]	>	<i>Bëtong</i>	[ˈbətɔŋ] ‘concrete’
<i>pétrole</i>	[peˈtʁol]	>	<i>Pëtrol</i>	[ˈpʰətʁol] ‘petrol’

In the course of the phonological integration of these words, the word accent jumps to the first syllable to comply with the general tendency for trochaic word accent (Gilles 2009) and at the same time the former full vowel of the stressed syllable undergoes

³ This only holds true for the Germanic part of the Luxembourgish lexicon. The numerous loan words from French allow a wide range of vowels in unstressed syllables even after phonological integration (e.g. *Premier* [ˈpʁəmje:] ,prime minister’, *Bopa* [ˈboːpa:] ,grand-father’ (< bon-père), *Poteau* [ˈpɔtə:] ,pillar’, *Bijou* [ˈbiʒu:] ,jewellery’) and remain excluded from this discussion.

⁴ To complicate this aspect even further, in segmental-phonological terms this schwa can be regarded as an allophone of the phoneme /e/: while [e] is realized only before velar consonants, [ə] is realized in all other contexts (see Gilles/Trouvain *under review*). In present-day phonology, however, this allophony tends increasingly to be abandoned.

vowel reduction to schwa. These words thus again clearly demonstrate that schwa is not sensitive to word accent, which can be regarded as a characteristic of a syllable language.

The next feature to be discussed concerns the schwa vowel in unaccented syllables (see also Krier 2008: 104, Conrad 2010). Contrary to e.g. Standard German, schwa here shows a strong resistance against syncope in word-final unaccented syllables (3). Even in faster speaking styles, schwa in word-final syllables (in most cases morphological endings like *-en*) is phonetically realized. Reducing these syllables to syllabic sonorants (often with subsequent assimilation of place of articulation), quite frequent in Standard German, is not possible at all in Luxembourgish.

(3) *Schwa resisting syncope in final unaccented syllables*

<i>Ënnen</i>	[ˈənən]	*[ˈən:]	‘onions’
<i>baken</i>	[ˈba:kən]	*[ˈba:kŋ]	‘to bake’
<i>kommen</i>	[ˈkɔmən]	*[ˈkɔm]	‘to come’
<i>gleewen</i>	[ˈgle:vən]	*[ˈgle:vŋ]	‘to believe’
<i>Fuedem</i>	[ˈfuədəm]	*[ˈfuədŋ]	‘wire’
<i>Kärel</i>	[ˈkɛ:rəl]	*[ˈkɛ:r]	‘guy’

In terms of the syllable language/word language dichotomy the resistance of syncope can be regarded as a syllable language feature, as every syllable in a word retains its own vocalic nucleus (Nübling 2005). However, as will be shown in section 5, not all schwas are resistant against syncope.

3.2 Schwa epenthesis

The process of schwa epenthesis can be regarded as a classic feature of syllable languages. Hall (2010: 1576) notes that “in most cases, the function of vowel epenthesis is to repair an input that does not meet a language’s structural requirements.” In Luxembourgish, schwa epenthesis takes place to break up coda clusters consisting of a sonorant and an obstruent or certain sonorant-sonorant combinations. The process originated in certain Old High German dialects, but in Luxembourgish epenthesis has been active for a longer period and has developed a greater number of instances than comparable German dialects (Nübling 2005: 149ff.). In words like e.g. *Kallef* ‘calf’, originating from a monosyllabic form **kalf* (< Germanic root **kalbaz-*), an intrusive schwa-like vowel could arise due to a mistiming of articulatory gestures of the sonorant *l* and the following obstruent *f* (Auer 1997). By turning a formerly monosyllabic word into a disyllabic one, the syllable structure gets optimized according to the preferences of a syllable language: A former CVCC sequence changes into a more preferred CVCVC sequence (probably with an ambisyllabic consonant).

The list in (4) contains the most common words (in orthographical form) of present-day Luxembourgish that still show epenthesis (see also Krier 2008, Szczepaniak 2009, Conrad 2010).

(4) *Schwa epenthesis in present-day Luxembourgish*

/lf/ > [lɔf]	<i>Kallef</i> ‘calf’, <i>hallef</i> ‘half’, <i>Hëllef</i> ‘help’, <i>eelef</i> ‘eleven’, <i>zwielef</i> ‘twelve’, <i>Wollef</i> ‘wolf’, <i>Folleg</i> ‘episode’, <i>Sallef</i> ‘salve’
/lɛ/ > [lɛə]	<i>Mëllech</i> ‘milk’, <i>wellech</i> ‘whichever’, <i>sëllech</i> ‘several’

/lk/ >	[lək]	<i>Wollek</i> 'cloud', <i>Kallek</i> 'lime', <i>Vollek</i> 'people'
/lm/ >	[ləm]	<i>Hallem</i> 'culm'
/nf/ >	[nəf]	<i>fënnef</i> 'five'
/rl/ >	[rəl]	<i>Kärel</i> 'guy', <i>Pärel</i> 'pearl', <i>Märel</i> 'blackbird', <i>Charel</i> 'Charles'

Epenthesis takes place in coda clusters consisting of a sonorant and either an obstruent or a second sonorant. As in various Central-German dialects exhibiting epenthesis, the process is blocked if the second member of the coda is a sibilant. Hence, the final clusters *-ls*, *-lj*, *-ns*, *-mf*, *-nf*, *-rf* have hardly developed epenthesis. Sibilant obstruents are regarded as extrasyllabic consonants (in this position they violate the sonority hierarchy) and thus cannot trigger epenthesis (Auer 1997: 61).

In Luxembourgish the coda cluster *-rn* is also unaffected, but for different reasons. Forms with epenthesis like **gären* (< OGH *gern*) seem conceivable, but here the final *-n* undergoes deletion to avoid the dispreferred coda cluster and the *r*-final forms in (5) emerge.

(5) *Non-application of schwa epenthesis due to final n-deletion*

<i>OHG</i>	>	<i>Luxembourgish</i>		
<i>gern</i>		<i>gär</i>	<i>*gären</i>	'gladly' (cf. Germ. <i>gern</i>)
<i>dorn</i>		<i>Dar</i>	<i>*Daren</i>	'thorn' (cf. Germ. <i>Dorn</i>)
<i>horn</i>		<i>Har</i>	<i>*Haren</i>	'horn' (cf. Germ. <i>Horn</i>)
<i>kern</i>		<i>Kär</i>	<i>*Kären</i>	'core' (cf. Germ. <i>Kern</i>)

In general, schwa epenthesis seems to have affected all words meeting the described coda structure. Nevertheless, a decrease of it in present-day Luxembourgish is noticeable. Firstly, several possible contexts, which are documented in older dictionaries, no longer exhibit epenthesis (6).⁵ Interestingly, most instances have an /r/ as the first member of the cluster.⁶

(6) *Loss of former epenthesis*

/nç/	[ˈmunəç]	>	[munç]	<i>munch</i>	'some'
	[ˈmənəç]	>	[mənç]	<i>Mënch</i>	'monk'
/lp/	[ˈtuləp]	>	[tulp]	<i>Tulp</i>	'tulip'
/lm/	[ˈpaləm]	>	[palm]	<i>Palm</i>	'palm'
	[ˈgaləm]	>	[galm]	<i>Galm</i>	'stench'
/rm/	[ˈa:rəm]	>	[a:ɾm]	<i>aarm/Aarm</i>	'poor'/'arm'
	[ˈvu:rəm]	>	[vuəm]	<i>Wuerm</i>	'worm'
	[ˈtu:rəm]	>	[tuəm]	<i>Tuerm</i>	'tower'
/rf/	[ˈdu:rəf]	>	[duəf]	<i>Duerf</i>	'village'
	[ˈfa:rəf]	>	[fa:əf]	<i>Faarf</i>	'color'

⁵ Older dictionaries until the mid of the 20th century list a far greater number of words with epenthesis (cf. LWB, WLM). The WLM of 1906 contains e.g. the loan *Ongeren* < *Ungarn* 'Hungary', where schwa epenthesis took place during phonological integration.

⁶ After the loss of the schwa the former syllable-initial [r] moved into the coda, which in turn led to *r*-vocalization (e.g. *Wuerm* [ˈvu:rəm] > [vu:ɾm] > [vu:əm] > [vuəm] 'worm'). Whether *r*-vocalization was a consequence of the loss of schwa epenthesis or an independent process in the restructuring of the syllable coda still remains an open research question.

	['ku:Rəf]	>	[kuəf]	<i>Kuerf</i>	'basket'
	['mi:Rəf]	>	[mi:əf]	<i>mierf</i>	'crumbly'
/rç/	['ki:Rəç]	>	[kiəç]	<i>Kierch</i>	'church'
	['du:Rəç]	>	[duəç]	<i>duerch</i>	'through'
	['mu:Rəç]	>	[muəç]	<i>Muerch</i>	'marrow'

Secondly, new words entering the language, mostly as loans from Standard German, are no longer subject to epenthesis, giving strong evidence that the process is no longer active (7).

(7) *New loans without epenthesis*

/lm/	<i>Golf, Film, Alm</i> ,alp', <i>Helm</i> ,helmet', <i>Palm</i> ,palm', <i>calm</i> 'quiet'
/lç/	<i>Elch</i> 'elk', <i>Molch</i> 'newt', <i>Mulch</i> 'mulch', <i>Clinch</i>
/rf/	<i>Worf</i> 'throw', <i>Harf</i> 'harp'
/rm/	<i>Daarm</i> 'intestine', <i>Schierm</i> 'umbrella', <i>ferm</i> 'strong', <i>Form, Norm, enorm</i>
/rn/	<i>extern, intern, modern, Fernseh</i> 'TV'

Although the rise of schwa epenthesis in OHG has to be seen as an optimization of the syllable structure, this process could not find its continuation into present-day phonology. Instead, the word language feature of a more complex syllable coda is gaining ground. Today, schwa forms part of the lexical representation of the few words in (4) above, or, in other words, schwa epenthesis has been lexicalized. From the perspective of the syllable language/word language dichotomy it can be concluded that a syllable language feature has been lost in the course of language history.

The discussion so far has shown that Luxembourgish offers a few features that could be attributed to a syllable language. However, the evidence is either weak (for schwa in stressed or root syllables) or disappearing (schwa epenthesis). It seems justified to classify the features discussed only as potential syllable language features instead. In order to characterize Luxembourgish appropriately, the next section will explore the word language traits.

4. Word language traits

Luxembourgish presents several processes related to the word language type, which have not yet fully figured in the discussion. The syllable structure, especially of the onset, shows great accordance with Standard German. Consonant clusters with up to three elements in the word-initial onset (*Sproch* 'saying', *Strof* 'punishment') or the word-final coda (*buets* 'you bath', *Uebst* 'fruits', *Stëbs* 'dust', *(hien) gaapst* '(he) yawns') form an integral part of the system (see Bertram 2011). These complex coda clusters can adequately be analyzed as containing extrasyllabic consonants, which are allowed only at the edges of phonological words (see Wiese 2000 for German). It is their function to render the boundaries of the word more prominent. Thus, the word language criterion of a complex syllable structure is met.

Word stress plays a crucial role in Luxembourgish and falls in most cases on the penultimate syllable (cf. Gilles 2009). By rendering the stressed syllable articulatory and perceptively more prominent, surrounding unstressed syllables are accordingly more vulnerable for various kinds of reduction processes. This holds true for the native lexicon, where reduction of vowels in unstressed syllables is frequently observable,

especially in the speech of the younger generation (e.g. *kanneresch* ['kanɐʀɛʃ] > ['kanɐʀəʃ] 'childish', *wichtig* ['vistɛç] > ['vistæç] 'important', *Samschdeg* ['zamʃdɛç] > ['zamʃdæç] 'saturday').

The same holds partially true for the integration of loan words. While the French loans in (2) keep the full vowel in the final open syllable after the word stress has moved to the penultimate syllable, the examples in (8) show that under the same circumstances a now unstressed closed syllable is reduced to an open central vowel [ɐ]. When the plural suffix *-en* is attached to these words the *r*-vocalization is cancelled and [ɐ] turns up as schwa.

(8)	<i>French</i>		<i>Luxembourgish Singular</i>	<i>Plural</i>	
	chauffeur	>	Chauffer(en) [ˈʃoːfɛ]	[ˈʃoːfɛrən]	'driver-SG/-PL'
	coiffeur	>	Coiffer(en) [ˈkwafɛ]	[ˈkwafɛrən]	'hairdresser-SG/-PL'
	tracteur	>	Trakter (en) [ˈtraktɛ]	[ˈtraktɛrən]	'tractor-SG/-PL'
	docteur	>	Dokter(en) [ˈdɔktɛ]	[ˈdɔktɛrən]	'doctor-SG/-PL'
<i>but:</i>	auteur	>	Auteur(en) [ˈoːtɛr]	[ˈoːtɛrən]	'author-SG/-PL'

The last example in (8), however, shows that the integration process of French loans has not reached its endpoint yet. Some words may retain the original French syllable structure.

These examples from loan phonology demonstrate how the preferred trochaic word stress may favor vowel reduction in unstressed syllables. These processes taken together, Luxembourgish strives to render the domain of the phonological word more prominent (at the expense of the syllable).

Vowels in pretonic syllables may undergo deletion and the remaining consonantal material be moved to the onset of the stressed syllable where the complexity of the onset cluster is increased. As can be seen from (9), vowel loss affects not only inherently weak schwas but also full vowels. Given that all resulting clusters consist of 'obstruent' + 'sonorant', they are all characterized by an increase in sonority and comply consequently with the Sonority Sequencing Generalization (cf. Blevins 1996). Except the 'affricate' + 'vibrant' cluster in [tsɾɛk] 'backwards', all clusters are allowed in Luxembourgish.

(9)	<i>villäicht</i> [fil'æɪɛt]	>	<i>vläicht</i> [flæɪɛt]	'perhaps'
	<i>zeréck</i> [tsə'rek]	>	<i>zréck</i> [tsɾɛk]	'backwards'
	<i>virun</i> [fi'rʊn]	>	<i>vrun</i> [frʊn]	'ahead'
	<i>dorun</i> [do:rʊn]	>	<i>drun</i> [drʊn]	'at it'
	<i>doran</i> [do:rʌn]	>	<i>dran</i> [drʌn]	'in that'
	<i>duerop</i> [duə'rɔp]	>	<i>drop</i> [drɔp]	'on it'

In most cases, the previous structure with a CV syllable was more optimal in terms of a syllable language, which normally would impede such a reduction. Consequently, this process strengthens the domain of the phonological word. This process supposedly has been active in Luxembourgish phonology for a long time, as it is also found in certain derivations in family names, e.g. the family name *Mréches* derives from the diminutive form of *Mariachen* 'little Mary'.

Further complex onset clusters arise in the interplay of the proclitic definite article. When immediately adjacent to the noun, the form for Fem. Sg. /dei/, Neut. Sg. /da:t/ and Pl. /da:t/ is pronounced [t] or [d], resp. (depending on the following context). Orthographically the clitic is spelled as *d'*. The examples in (10) show that the clitic is incorporated in the following syllable onset.

(10)	Fem. Sg.	/dei/	[tʃra:]	<i>d’Fra</i>	‘the women’
	Fem. Sg.	/dei/	[d̥mam]	<i>d’Mamm</i>	‘the mother’
	Fem. Sg.	/dei/	[d̥banan]	<i>d’Banann</i>	‘the banana’
	Neut. Sg.	/da:t/	[d̥r̥ai]	<i>d’Réi</i>	‘the deer’
	Neut. Sg.	/da:t/	[tkant]	<i>d’Kand</i>	‘the child’
	Pl.	/dei/	[tkriɛv]	<i>d’Kricher</i>	‘the wars’
	Pl.	/dei/	[tpl̥ai]	<i>d’Pléi</i>	‘the ploughs’

Contrary to the examples in (9) this condition of external sandhi give rise to several otherwise not allowed syllable onsets like *tʃR-, *tk-, which violate the sonority hierarchy. Again, the most important result of this process is to profile the left-hand side of the phonological word. Thus, in Luxembourgish rendering the left boundary of the word seems to be preferable to sticking to the principle of keeping syllable structures as simple as possible. If the domain of the syllable were the guiding phonological category in this sandhi, then one would expect some kind of repair to take place. However, a possible vowel insertion to remedy this violation is not attested.

Comparable developments have taken place for the syllable coda. In line with several Central Franconian dialects, Luxembourgish was subject to an unexceptional apocope of word-final schwa, which turned former Middle High German CVCV-words into CVC-words (MHG *mitte* > *Mëtt* ‘center’, *wuche* > *Woch* ‘week’, *suoche* > *Sich* ‘search’, *hecke* > *Heck* ‘hedge’, *seife* > *Seef* ‘soap’). By this development, a previously open syllable was changed into a closed one, which is dispreferred in syllable languages.

Several contexts are traceable where complex word-final codas arose after the schwa was syncopeated in a morphological suffix *-es* (11).

(11)	[gə'kaɪməs]	<i>Gekeimes</i>	>	[gə'kaɪms]	<i>Gekeims</i>	‘germination’
	[gə'træɪpəs]	<i>Geträipes</i>	>	[gə'træɪps]	<i>Geträips</i>	‘bowel’
	[ænəs]	<i>(leschten) Endes</i>	>	[æns]	<i>Enns</i>	‘after all’

The superlative suffix *-st* is invariably attached to all adjectives even when highly marked codas are the consequence (12). Whereas even a word language like Standard German has developed a phonologically conditioned allomorph containing schwa to facilitate syllabification (*-st* ~ *-est*), Luxembourgish accepts coda clusters with three elements.

(12)	<i>Luxembourgish</i>	<i>German</i>		
	[ʃəɪnst] <i>schéinst</i>	[ʃø:ns.tə]	<i>schönste</i>	‘the most beautiful’
	[bre:tst] <i>breetst</i>	[braɪ.təs.tə]	<i>breiteste</i>	‘widest’

When also taking fast speech forms into account, even more complex codas may turn up (cf. variants like *zwanzeg* [ˈtswantsəɛ] > [ˈtswantsɛ] ‘twenty’, *fofzeg* [foftsəɛ] > [foftsɛ] ‘fifty’).

Furthermore, Luxembourgish has developed a pseudo-suffix *-s* (with yet unclear semantics and morphological function), which is quite frequently added to function words. Again, this consonant amounts to the complexity of the coda (13).

(13)	<i>an engem</i>	>	<i>an engems</i>	‘into one’
	<i>schonn</i>	>	<i>schonns</i>	‘already’
	<i>obschonn</i>	>	<i>obschonns</i>	‘although’
	<i>nodeem</i>	>	<i>nodeems</i>	‘after’

duerop > *drops* 'afterward'

A peculiar case of schwa loss is observable in polysyllabic, inflected words containing two unstressed syllables following the stressed initial syllable. While the full form, which is also the orthographically correct form, retains all syllables and exhibits a fairly simple syllable structure, a new and very frequent variant has emerged in which the penultimate syllable is syncopated (14); the syllable boundary is indicated by '·'.

(14)	<i>Fensteren</i>	[ˈfɛns.tə.rən]	>	[ˈfɛns.trən]	'windows'
	<i>Eemeren</i>	[ˈe:.mɛ.rən]	>	[ˈe:m.rən]	'buckets'
	<i>dréchenen</i>	[ˈdre.ɛə.nən]	>	[ˈdree.nən]	'dry'
	<i>wichtegen</i>	[ˈviç.tə.zən]	>	[ˈviçt.zən]	'important'
	<i>trëppelen</i>	[ˈtrə.pə.lən]	>	[ˈtrəp.lən]	'to trip'

Conrad (2010) has shown that the disyllabic form already dominates for certain words and this underlines the importance of the trochee for Luxembourgish. Again, we are confronted with the abandonment of a syllable language feature (CV syllable structure) in favor of a word language feature (more complex syllable structure). What is instructive here is that it is always the syllable immediately adjacent to the stressed syllable that gets reduced, while the final syllable always stays intact. Two word-related aspects are responsible for this asymmetry. Firstly, due to the preference for trochees, pre-tonic or post-tonic syllables are affected first. Syllables that are further away are protected. Secondly, the final syllable carries important morphological information (e.g. number, case or person), which in Luxembourgish seems to be protected from reduction. It should have become clear with these examples that word-related aspects like morphological structure shape the phonological form. If Luxembourgish were to belong to the syllable language type, one would expect a stronger tendency to protect unstressed syllables as well as to avoid complex onsets or codas. Instead, one finds a partial increase in syllabic complexity.

The last feature to be discussed in this section refers to the linking-element *-s*, which has been analyzed by Nübling/Szczepaniak (2008) as a means of optimizing the phonological word in Standard German. More specifically, the linking *-s* enables clearer rendering of the juncture in compounds. It turns out that the linking *-s* in Luxembourgish affects even more compounds than in German (15a). Furthermore, while in Standard German a linking *-s* is not allowed when the first word of the compound ends with an open syllable, this blocking does not exist in Luxembourgish (15b).

(15)	<i>Luxembourgish</i>	<i>German</i>	
a.	<i>Äerdbeer-s-kuch</i>	<i>Erdbeer-kuchen</i>	'strawberry cake'
	<i>Fussball-s-terrain</i>	<i>Fussball-platz</i>	'football ground'
b.	<i>Vodka-s-glas</i>	<i>Vodka-glas</i>	'glas for vodka'
	<i>Büro-s-artikel</i>	<i>Büro-artikel</i>	'office supplies'
	<i>Konto-s-stand</i>	<i>Konto-stand</i>	'account balance'
	<i>Auto-s-assurance</i>	<i>Auto-versicherung</i>	'car insurance'
	<i>Auto-s-steier</i>	<i>Auto-steuer</i>	'car tax'
	<i>Allé-s-match</i>	<i>n.a.</i>	'first leg'

This indicates that Luxembourgish takes greater benefit from the linking *-s*, which brings it closer to a word language.

5. Phenomena related to the syllable and the phonological word at the same time

This section is devoted to two prominent cases of external sandhi, which demonstrate the relevance of the domains of the syllable and the phonological word at the same time. It will be discussed how these features could be related to the syllable language/word language dichotomy. Both phenomena are rather frequent and therefore pertinent and important features of Luxembourgish phonology.

5.1 *n*-rule

The first feature concerns the final alveolar nasal, which is deleted according to the structure of the onset of the following word (so called *n*-rule or *n*-deletion). In a simplified version of this phonological rule every word-final *-n* is protected from deletion only if the following word starts either with a vowel or with the consonants *t*, *d*, *ts*, *n* or *h*. If this criterion is not met, the nasal gets deleted. Some examples of preservation (bold face) and deletion (underscore) are given in (16).

(16) *n*-rule in Luxembourgish

	<i>Preservation</i>		<i>Deletion</i>	
a.	den <i>Auto</i>	'the car'	<u>de_</u> <i>Patron</i>	'the employer'
	den <i>Dëlpes</i>	'the idiot'	<u>de_</u> <i>Bauer</i>	'the farmer'
	klengen <i>Tuerm</i>	'small tower'	<u>klenge_</u> <i>Kueb</i>	'small raven'
	en <i>Zuch</i>	'a train'	<u>e_</u> <i>Land</i>	'a country'
	en <i>Haus</i>	'a house'	<u>e_</u> <i>Kaffi</i>	'a coffee'
b.	Frittend <i>ëppen</i>	'chip pan'	<u>Fritte_</u> <i>bud</i>	'snack bar'
	Zoppent <i>teller</i>	'soup plate'	<u>Zoppe_</u> <i>läffel</i>	'soup spoon'
c.	Wäin <i>drénken</i>	'to drink wine'	<u>Wäi_</u> <i>sichen</i>	'to get wine'
	(si) ginn <i>heem</i>	'(they) go home'	<u>gi_</u> <i>virun</i>	'move on'
	kann <i>drénken</i>	'can drink'	<u>ka_</u> <i>maachen</i>	'can do'
	hunn <i>ugefaangen</i>	'have started'	<u>hu_</u> <i>gesicht</i>	'have searched'
	unzef <i>änken</i> ⁷	'to order to start'	<u>u_</u> <i>fänken</i>	'to start'

This phonological rule applies across the board to all word classes and affects in most cases the morphological suffix *-en* (16a). Additionally the *n*-rule is also found in compounds (16b) and in syllables containing vowels other than schwa (16c). It is thus always the right-hand context that determines preservation or deletion of the nasal. Although this is an (early) postlexical rule, speakers adhere to this rule almost without fail. Given that *-en* belongs to the most frequent syllable types, the *n*-rule operates quite frequently.

The phonological explanation given in Gilles (2006) assumes that all final *-n* are extrasyllabic in Luxembourgish, i.e. the nasal is realized phonetically only if it can be phonologically integrated into a syllable. In order to render this phonological licensing possible, various conditions have to be taken into account:

⁷ Form of the so-called ,extended infinitive' used in infinitive clauses.

- The following word begins with a vowel: In cases like *en Apel* ‘an apple’, the extrasyllabic nasal can be integrated into the following syllable due to postlexical resyllabification ([ən] + [a:.pəl] > [ə.na:.pəl]), a feature similar to the *liaison* in French. This is possible because Luxembourgish, in contrast e.g. to Standard German, lacks the glottal stop in vowel initial syllables. After resyllabification the nasal forms part of the onset of the following syllable. It is not regarded as extrasyllabic anymore and is therefore protected from deletion. A similar effect occurs when the word at the right-hand side begins with the fricative [h], which is phonetically weak in Luxembourgish and phonologically transparent for resyllabification.
- The following word begins with a homorganic obstruent [t, d, ts]: In combinations like *den Tuerm* ‘the tower’, the nasal is retained because together with the following alveolar obstruent it constitutes a partial ambisyllabic geminate [nt]. This is possible because [n] and [t] share all C-place features (cf. Clements/Hume 1996 for the discussion of the relevant feature geometries). Thereby the nasal is at least partially part of the following syllable and this is sufficient to syllabify this former extrasyllabic consonant. Deletion is again blocked.
- The following syllable begins with a heterorganic consonant, e.g. [p, k, ʃ]: In instances like *de_ Chauffer* ‘the driver’, the following onset is occupied by a consonant, which does not allow the formation of a partial geminate, because its C-place features are different. Therefore resyllabification is impossible and the nasal retains the status of an extrasyllabic consonant. In the phonological representation the nasal is thus not licensed and gets deleted subsequently as stray material.

This phonological description focuses extensively on the structural notion of the syllable, i.e. on syllabic licensing and resyllabification. In fact, the *n*-rule cannot be described properly without crucial reference to the phonological properties of the syllable. It seems logically consistent to assume that the *n*-rule is thus an example of the particular importance of the syllable in Luxembourgish.

Nevertheless, if one takes a closer look at the domain of application, the predominant importance of the syllable becomes less obvious. Of course, this external sandhi takes place at a syllable boundary, but this boundary is always a word boundary, too. In order to attribute the *n*-rule to the domain of the syllable only, one has to find contexts without an interfering word boundary. Word-internal combinations of ‘-n + heterorganic, heterosyllabic consonant’ are limited to the coronal consonants, i.e. *z, ʃ, l, ɛ*, because word-internal clusters of nasal and non-coronal consonants are always homorganic (*Bank* [baŋk] ‘bank’, *pompelen* [pompələn] ‘to pump’, *Wimper* [vimpe] ‘eyelash’). In the coronal context, it turns out that the nasal is always retained word-internally regardless of the consonant the next syllables begins with. A form like *Ronschel* [ron.ʃəl] ‘pucker’ is correct although the *n*-rule is violated, *[ro_ʃəl] is clearly ungrammatical. The further examples in (17) demonstrate that the *n*-rule is not applicable at word-internal syllable boundaries.

(17) *Blocking of n-rule inside of the phonological word*

<i>Zënsen</i>	[[tsə \mathbf{n}] _σ [zən] _σ] _ω	*[[tsə_] _σ [zən] _σ] _ω	,interest rate‘
<i>Bensin</i>	[[bæ \mathbf{n}] _σ [zin] _σ] _ω	*[[bæ_] _σ [zin] _σ] _ω	,fuel‘
<i>Ronschel</i>	[[ron \mathbf{n}] _σ [ʃəl] _σ] _ω	*[[ro_] _σ [ʃəl] _σ] _ω	,pucker‘
<i>klunschen</i>	[[klun \mathbf{n}] _σ [ʃən] _σ] _ω	*[[klu_] _σ [ʃən] _σ] _ω	,to sway‘
<i>perséinlech</i>	[[pæ \mathbf{v}] _σ [zəin] _σ [ləɛ] _σ] _ω	*[[pæ \mathbf{v}] _σ [zəi_] _σ [ləɛ] _σ] _ω	,personally‘
<i>Weenchen</i>	[[ve: \mathbf{n}] _σ [ɛən] _σ] _ω	*[[ve:_] _σ [ɛən] _σ] _ω	,cart (Dim.)‘

These word-internal contexts indeed have the most descriptive power to determine the domain of application of the *n*-rule: this phonological rule is susceptible only for the right edge of the phonological word, which, of course, always coalesces with the syllable boundary too. Furthermore, for this phonological analysis one has to keep in mind the crucial assumption of this phonological analysis that final *-n* in Luxembourgish is extrasyllabic. According to the assumptions of Lexical Phonology those extrasyllabic segments can only be attributed to the edges of words and are not permitted word-internally (Wiese 2000: 47f). Hence, the word-internal nasals in (17) cannot be subject to the *n*-rule anyway.

The evidence that the *n*-rule does not exclusively depend on the presence of any syllable boundary is further supported by its partial sensitivity to morphological factors. Words ending with the feminine suffix *-in* (18a), the negation prefix *on-* (18b) or the word formation suffix *-ioun* (18c) block the *n*-rule. Here, regardless of the following context, the nasal is retained. If the syllable was the decisive domain of application, then this dependence on morphological factors would not be relevant for the *n*-rule.

(18) *Blocking of n-rule for word formation affixes -in, on-, -ioun*

a.	<i>Léierin geschwat</i>	* <i>Léieri_ geschwat</i>	‘talked to the teacher-FEM’
	<i>Mangerin verluer</i>	* <i>Manageri_ verluer</i>	‘lost the manager-FEM’
b.	<i>onméiglech</i>	* <i>o_méiglech</i>	‘impossible’
	<i>ongerecht</i>	* <i>o_gerecht</i>	‘unjust’
c.	<i>Natioun gegrënnt</i>	* <i>Natiou_ gegrënnt</i>	‘foundation of nation’
	<i>Regioun verloossen</i>	* <i>Regiou_ verloossen</i>	‘leaving the region’

In concluding this discussion on the *n*-rule, we are left with an intricate interwovenness of the domains of the syllable and the word. Without any doubt, deletion or preservation of final *-n* has to be explained with regard to the notion of the syllable, because it simplifies the syllable coda. As for the domain of application, however, the *n*-rule is categorically blocked within phonological words and occurs only across the boundaries of phonological words. Although syllable structure is optimized by the *n*-rule, it cannot unambiguously be described as a syllable-related feature only. Thus, for the discussion here, the *n*-rule cannot be considered as a typological feature of a syllable language or a word language, respectively.

5.2 Resyllabification and voicing assimilation

The next feature relates to resyllabification from a broader point of view. Resyllabification can occur on different levels of the phonological system (lexical and postlexical), whenever the syllable structure of the base form is restructured due to affixation or in external sandhi. This form of ‘continuous syllabification’ (Kenstowicz 1994: 269ff.) is dealt with here under the umbrella term ‘resyllabification’. Luxembourgish allows resyllabification in many more cases than e.g. Standard German. Similar to Standard German, resyllabification takes place within the phonological word, when a schwa-initial, inflectional or derivational suffix is added. As shown in (19), a syllable-final consonant moves into the onset of the following syllable (or forms an ambisyllabic consonant, if the preceding syllable ends with a short vowel). (19b) also

shows that obstruent final devoicing ('Auslautverhärtung') is cancelled after resyllabification and the underlying voiced consonant shows up.

(19) *Word-internal resyllabification*

a.

<i>Kraaft</i>	/kra:ft/ [kra:ft]	+ /-en/ <i>Kräften</i>	[kræf.tən]	'power-SG/-PL'
<i>Sprooch</i>	/ʃpro:x/[ʃpro:x]	+ /-en/ <i>Sproochen</i>	[ʃpro:xən]	'language-SG/-PL'
<i>Reef</i>	/re:f/ [re:f]	+ /-er/ <i>Reefer</i>	[re:.fə]	'circle-SG/-PL'
<i>Präis</i>	/præ:ʃ/[præ:ʃ]	+ /-er/ <i>Präisser</i>	[præ:ʃə]	'price-SG/-PL'
<i>op</i>	/op/ [op]	+ /-en/ <i>open</i>	[opən]	'open'

b.

<i>Scheif</i>	/ʃa:v/[ʃa:v]	+ /-en/ <i>Scheiwen</i>	[ʃa:vən]	'pad-SG/-PL'
<i>Kees</i>	/ke:z/[ke:s]	+ /-en/ <i>Keesen</i>	[ke:.zən]	'cash register-SG/-PL'
<i>Blat</i>	/bla:d/[bla:t]	+ /-er/ <i>Blieder</i>	[bliə.də]	'leave-SG/-PL'
<i>héich</i>	/heiz/[həi:ç]	+ /-en/ <i>héijen</i>	[həi.zən]	'high-INFL'

Due to the absence of a syllable-initial glottal stop – and contrary, e.g. to Standard German –, Luxembourgish also shows across-word resyllabification, which is almost compulsory when the following syllable begins with a vowel (cf. an older account in Goudaillier 1987). This kind of resyllabification is known in several languages, e.g. French and English (see Gussenhoven/Jacobs 1998: 167, where the process is called 'Liaison').

(20) presents examples where the final consonants move *across* the word boundary into the empty syllable onset of the following word. This modification leads eventually to a misalignment of the syllable and the phonological word. Resyllabification is indicated with '☐', the boundary of a phonological word with '#'.

(20) *Resyllabification across word boundaries*

a.	<i>Sprooch ausbauen</i>	[ʃpro:..☐#æʊs.baʊ.ən]	'to elaborate a language'
	<i>Reefapaken</i>	[re:..☐#a.pa:kən]	'to wrap a circle'
	<i>Scheif ausmolen</i>	[ʃa:v..☐#æʊs.mo:lən]	'to color a pad'
	<i>Kees opmaachen</i>	[ke:..☐#op.ma:xən]	'to open a cash register'
	<i>Kraaft ubidden</i>	[kra:v..☐#u.biðən]	'to offer power'
b.	<i>war och</i>	[va:..☐R#ox]	'was also'
	<i>gëschter Owend</i>	[gəʃ.ta..☐R#o:vənt]	'yesterday evening'
	<i>awer ech</i>	[a:..və..☐R#əç]	'but I'

The instances in (20b) are decisive in showing that it is indeed resyllabification that is occurring here: The vibrant *r* has (at least) two allophones depending on the position in the syllable. When syllable-final, *r* is vocalized to [ə], when syllable initial, it is realized as a vibrant [R]. The non-vocalized realizations in (20b) thus clearly indicate that *r* here is no longer part of the preceding syllable but rather forms part of the syllable onset, i.e. it has resyllabified.⁹

Although clearly a postlexical process, this resyllabification is almost obligatory in Luxembourgish. The filling of otherwise empty onsets demonstrates that syllable

⁹ This process is similar to the so-called 'linking *r*' of some varieties of English (see Wells 1982).

structure is optimized at the expense of marking the word boundary, which is blurred instead. This type of resyllabification can thus be regarded as a feature of a syllable language.

However, as can already be seen in the examples in (20a), resyllabification is always associated with the concomitant process of voicing assimilation (see Zsiga 2011 for a general discussion). And as the further examples in (21) show, every resyllabified consonant undergoes voicing in external sandhi at the same time. The left-most column in (21) contains the phonological forms with the underlying coda consonants. The phonetic transcription in the second to last column then shows the resyllabified and voiced consonant when a vowel-initial phonological word is directly adjacent.

(21)

a.	/tsæɪt/	<i>Zäit a Raum</i>	[tsæɪ.ɫd#a ræʊm]	‘time and space’
	/vælt/	<i>Weltall</i>	[væɫ.ɫd#al]	‘universe’
	/kux/	<i>Kuch iessen</i>	[ku.ɫ#iə.sən]	‘to eat a cake’
	/ka:f/	<i>kaf Äppel</i>	[ka:ɫv#æ.pəl]	‘buy apples’
b.	/kle:d/	<i>Kleed undoen</i>	[kle:ɫd#un.do:ən]	‘to put on a dress’
	/ʃʀaʊv/	<i>Schrauf andréien</i>	[ʃʀaʊ.ɫv#an.drəi.ən]	‘to turn in a screw’
	/ta:z/	<i>Taass eidel</i>	[ta:ɫz#aɪ.dəl]	‘cup empty’

From (21b) it also becomes obvious that final underlying voiced obstruents, which otherwise were subject to final devoicing, regain (or rather keep) voicing in this context (/kle:d/ + /undo:ən/ > [kle:t] + [un.do:ən] > [kle:ɫd#un.do:ən]). The process of voicing assimilation consequently overrides the effect of final devoicing.¹⁰ Voicing assimilation itself has a natural phonetic basis, because voicing can be easily maintained between two vowels. Voicing assimilation of this kind occurs across the board and can be found for all syllable types, between words of all word classes and also within compounds. Similar patterns of resyllabification combined with voicing assimilation have been discussed for Dutch, Flemish and Limbourgish (Grijzenhout/Krämer 2000, Ernestus 2003, Hinskens 2007, Mascaró/Wetzels 2008, Noske 2008), as well as for Catalan (Caro Reina *this volume*, Lloret/Jiménez 2009). What is peculiar for Luxembourgish is that the joining of two phonological words always has to be marked by voicing assimilation (plus resyllabification).

Furthermore, if the syllable coda contains more than one obstruent or an affricate, all sounds are affected by voicing assimilation by creating a fully voiced intervocalic sequence stretching over a word boundary (22).

(22) *Resyllabification and voicing assimilation in complex coda clusters*

<i>aacht</i>	[a:xt]	‘eight’	>	<i>aachtanachzeg</i>	[a:ɣ.ɫdan.ax.tsəe]	,88’ (‘eight and eighty’)
<i>Gesiicht</i>	[gə.zi:ɛt]	‘face’	>	<i>Gesiicht ukucken</i>	[gə.zi:z.ɫdu.ku.kən]	‘watch into face’
<i>bleifs</i>	[blaɪfs]	‘you stay’	>	<i>bleifs op</i>	[blaɪv.ɫzop]	‘you stay up’
<i>Uebst</i>	[uəpst]	‘fruits’	>	<i>Uebst a Geméis</i>	[uəbz.ɫda.gə.məis]	‘fruits and vegetables’
<i>ganz</i>	[gants]	‘whole’	>	<i>ganz elleng</i>	[gan.ɫdzə.læŋ]	‘all alone’

As far as resyllabification is concerned, it is interestingly only the last one consonant of the coda that moves into the next syllable, while the remaining consonant(s) stay in

¹⁰ Note that, in most cases, final devoicing is also part of the spelling rules of Luxembourgish (hence *Schrauf* ‘screw’ in contrast to *Schrauwen* ‘screws’), whereas cross-word voicing is not marked in spelling.

their original syllabic slot. This behavior provides important evidence that voicing assimilation in fact operates independent of resyllabification. If resyllabification created the input for voicing assimilation, it would be impossible to explain why the whole coda is voiced and not only the resyllabified consonant.

By analyzing the behavior of obstruents word-internally, though, it becomes evident that voicing is not possible under this condition. In a word like *déck* /dek/ ‘thick’, the voiceless consonant is retained in the inflected form *décken* [dekən], although a vowel-initial syllable follows, but gets voiced when followed by a vowel-initial phonological word as in *déck an dënn* [de.ɹgan.dən] ‘thick and thin’. This contrast is demonstrated in (23). Phonologically speaking, the feature ‘voice’ is neutralized across words (external sandhi), but it is preserved word-internally (internal sandhi). This incongruity of internal and external sandhi can be seen, according to Szczepaniak (2007), as indicative of a word language.

(23) *Resyllabification without and with voicing assimilation*

<i>word-internally</i>		<i>across words</i>			
<i>deck-en</i>	[de.kən]	‘think-PL’	<i>déck an dënn</i>	[de.ɹgan.dən]	‘thick and thin’
<i>Equip-en</i>	[e.ki.pən]	‘team-PL’	<i>Equipe ass do</i>	[e.ki.ɹbas.do:]	‘team is there’
<i>Strooss-en</i>	[ʃtRO:ːsən]	‘streets-PL’	<i>Strooss an Haus</i>	[ʃtRO:ːzan.hæʊs]	‘street and house’

It can be concluded that voicing assimilation is prone to the phonological word. Only when two phonological words join in external sandhi, voicing can take place. The identical word-internal context, on the other hand, does not trigger voicing. Resyllabification on the other hand can occur at every syllable boundary. Like in the case of the *n*-rule discussed above, we are confronted with two different phonological domains of application. Voicing assimilation thus would be attributed as a feature of a word language, while resyllabification can be regarded as a syllable language feature.

It has yet to be clarified how the two processes are related to each other. Since voicing is involved, the effect of final devoicing has to be taken into account as well. The derivations in (24a) present two sandhi constellations and illustrate the sequential order of the processes involved.

(24) *Phonological derivations of two sandhi sequences*

		<i>bleif op</i>	<i>bleifs op</i>
		‘stay up!-IMP SG’	‘you stay up-2ND SG’
		/blaɪv/+/op/	/blaɪvs/+/op/
a.	1. Final Devoicing	[blaɪf]+[op]	[blaɪfs]+[op]
	2. Voicing Assimilation	[blaɪv.op]	[blaɪvz.op]
	3. Resyllabification	[blaɪ.ɹvop]	[blaɪv.ɹzop]
b.	1. Final Devoicing	[blaɪf]+[op]	[blaɪfs]+[op]
	2. Resyllabification	[blaɪ.ɹfop]	[blaɪf.ɹsop]
	3. Voicing Assimilation	[blaɪ.ɹvop]	<i>n.a.</i> → *[blaɪf.ɹsop]

First of all, final obstruent devoicing (1) as a process of the lexical stratum clearly has to apply before all postlexical processes. Next, voicing assimilation (2) takes places by voicing *all* obstruents before a vowel-initial word boundary. After that resyllabification (3) moves the last obstruent into the onset of the following syllable. That voicing

assimilation applies before resyllabification follows from the behavior of the complex coda clusters in cases like *bleifs op* ‘you stay up-2NDSG’: as becomes evident from (24b) voicing assimilation cannot apply in a resyllabified sequence like [blaɪf.ˌsop] because the condition of a vowel-initial phonological word is not met. Hence, this possible output form *[blaɪf.ˌsop] would be ungrammatical.

Resyllabification in Luxembourgish at first glance resembles *liaison* in French (see e.g. Côté 2011) and one could arguably evaluate the Luxembourgish case as a language contact feature. However, resyllabification in French has no influence on the voicing of the *liaison* consonant. In a compound like *sens unique* ‘one-way road’, the final *s* remains voiceless in French, despite the voicing-favoring context of the following vowel (i.e. [sɑ̃.ˌsy.ˈnik]). However, when this loan gets integrated into Luxembourgish voicing assimilation takes place (i.e. [sɑ̃.ˌzy.ˈnik]; see also Schanen 2006: 513). Thus, the similarity between French and Luxembourgish is only superficial and the phonological processes in the two languages are different. Rather, for the various kinds of voicing processes Luxembourgish shows striking resemblances to certain varieties of Dutch (Booij 1999, Ernestus 2003). Such a kind of relationship with Germanic varieties north of Luxembourg are much more sound from a point of view of language history and deserve further investigation.

6. Discussion

In this paper, central aspects of Luxembourgish phonology have been investigated with regard to the typological distinction between syllable languages and word languages. Summarizing the results, it is possible to complement the findings of Szczepaniak (2007) in several ways (table 2).

Table 2: Traits for syllable language and word language in Luxembourgish

Traits of a syllable language	Traits of a word language
<ul style="list-style-type: none"> • schwa in stressed syllables (native and loan lexicon) • resistance to delete schwa in unstressed final syllables • schwa epenthesis (decreasing, not productive any more) 	<ul style="list-style-type: none"> • complex syllable structure • apocope of final schwa has closed previously open syllables, thus reducing the amount of CV-syllables • cliticization leading to additional complex onset clusters • non-syllabic suffixes creating complex coda clusters • reduction or deletion of pretonic and posttonic syllables • schwa deletion in non-final unstressed syllables • increased use of linking -s

It becomes obvious that in present-day Luxembourgish pertinent features pointing towards a syllable language are few in number or are decreasing (schwa epenthesis). In contrast, this survey reveals far more evidence of word language features. It thus seems that the phonology of Luxembourgish is on the same track as German, where Szczepaniak (2007) convincingly showed the historic development from a syllable language in Old High German towards a word language nowadays. Considering this overwhelming evidence, one could classify Luxembourgish as a word language as well.

As has already been indicated by Szczepaniak (2009), some features exhibit an even stronger orientation towards the word language type than is the case for Standard German (e.g. increased use of clitics, linking -s or non-syllabic suffixes).

However, at least two of the phenomena of external sandhi discussed in 5.3 above pose serious challenges to the application of the typological parameter under discussion. The *n*-rule and resyllabification/voicing assimilation both exemplify how the phonological domains of the syllable and the phonological word interact with and rely on each other at the same time. While these two phenomena are clearly related to syllable structure and weaken boundaries of two adjacent syllables by resyllabification, the domain of application brings the relevance of the phonological word into play again, as both processes apply at the boundaries of phonological words only. Thus, at least for these two, quite frequent, processes, both domains are needed to capture the phonological structure adequately. In consequence, unambiguous attribution to either the syllable language or word language type seems unfeasible.

It has to remain an open issue for further discussion how the mismatch encountered in the Luxembourgish data could be reconciled with the typological differentiation of syllable languages and word languages. At least four options seem conceivable: (1) It has been proposed in Szczepaniak (2009) that Luxembourgish represents a hybrid type ('Mischtyp'), where both phonological categories are crucially relevant. Although appealing, this solution would imply a revision of the current theory which consists basically of *one* continuum with the prototypical syllable language and the prototypical word language as the respective end-poles. Instead, two typological continua would be necessary, one to determine the syllable language features and another one for the word language features. A language then would be classified typologically with regard to these two continua. (2) For certain languages, i.e. Luxembourgish, the typological parameter of word language/syllable language is not applicable. (3) Individual features are weighted according to how prototypical they appear for either a syllable language or a word language. (4) If a process is attributed to more than one domain, the higher domain in the prosodic hierarchy would overrule the lower domains. In the present case, both processes of external sandhi would then be classified as word languages features. Further phonological as well as cross-linguistic research is needed to determine the interrelatedness of the syllable and the phonological word and the relevance of this interrelatedness for the phonological architecture as a whole.

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