The sociophonetics of /ʀ/-vocalization in Luxembourgish

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ABSTRACT

The present paper analyses the distribution of consonantal and vocalic realizations of word-final /ʀ/ (e.g. *Dier* [diːχ] vs. [diːə] 'door') in Luxembourgish, a West-Germanic language with strong contact with French and German. While the literature suspects an ongoing sound change with the consonantal realization decreasing with age, this investigation analyses /ʀ/-vocalization for the first time from a broader sociophonetic point of view. Focusing on language contact as a possible explanatory factor, it also includes gender, educational and regional factors.

The results reveal indeed a shift from consonantal to vocalic realization of /ʀ/ related to age. Significant interactions arise for education, gender, region and further factors. The highest amount of consonantal realizations appears in the speech of older male speakers living in the Centre of Luxembourg with a high education and good proficiency in both French and German, while most speakers of the young and middle generation realize /ʀ/ word-finally in most cases as a vowel.

Keywords: /ʀ/-vocalization, Luxembourgish, sociophonetics, sound change, language contact.

1. INTRODUCTION

Luxembourgish (Lux.), a small West-Germanic language of Moselle-Franconian origin spoken by approximately 400.000 speakers mainly in the Grand Duchy of Luxembourg, constitutes a very interesting research area for questions about contact-induced language variation and change. Situated between France, Belgium and Germany and thus on the border region between Romance and Germanic, the multilingual language situation and centuries-old strong language contact with French and German shaped big parts of its linguistic system [3]. Moreover, language variation is strongly linked to the socio-political situation [1]. French has a strong historical prestige and constitutes the *lingua franca* with most of the foreigners in the country. Besides, it is the language of the law. German is the language of alphabetization and is largely present in the media. Both French and German play an important role in the written domain, while the 'national' language Lux. is the most used language between native speakers of Lux., orally as well as in social media, Email etc.

Lux. /ʀ/ is realized as a consonant between short vowel and consonant and in pre-vocalic position. Depending on the phonetic surrounding, it surfaces either as the vibrant [ʀ], the voiced fricative [ʁ] or the voiceless fricative [χ] (obstruent final devoicing), e.g. *ronn* [ʀɔn] 'round', *ˈwarnen* [ˈvaʁ.nən] 'to warn', *Freed* [fʁeːt] 'joy', *fort* [fɔχt] 'away'. Word-finally, consonantal and vocalic realizations are possible, e.g. *Dier* [diːχ] vs. [diːə] 'door', *Joer* [joːχ] vs. [joːɐ].

While the neighbouring Moselle-Franconian dialects lack this word-final consonantal variant [8], the allophonic articulations have clear parallels in the contact languages French and German, with the standard French pronunciation [ʀ] [9] and the standard German pronunciation [ɐ] [7], respectively. If resyllabification takes place, /ʀ/ is always realized as a consonant ('linking-r', [3]), while additional vocalization is possible, e.g. *dës Dier ass zou* [dəs.diː(ə).ʀas.tsəʊ] 'this door is shut'.

In their phonetic-phonological description of Lux., [4] relate the choice of either possibility in word-final position to age, stating that "elder speakers pronounce [ʀ] or [ʁ] also word-finally […] whereas younger speakers often show *r*-vocalization and produce central [ə] or [ɐ] instead". While differences between elder and younger speakers are easily detectable in the speech community, the present investigation is the first attempt to describe the pattern of variation between consonantal and vocalized /ʀ/ on a broader empirical basis.

2. SAMPLE AND METHODOLOGY

2.1. Speaker sample

Table 1: Sociodemographic characteristics of the speaker sample.

Category		n
competence	German > French	13
	German = French	35
education	classique vs. technique	24/24
gender	female vs. male	24/24
generation	old: ≥ 65, Ø: 74, SD: 7.3	16
	middle: 40-64, Ø: 52, SD: 6.0	16
	young: 20-39, Ø: 27, SD: 4.6	16
region	South vs. Centre	24/24

Table 1 (above) shows the sociodemographic characteristics of the 48 speakers (cell size n=4) chosen for the investigation. They are all native speakers of Lux. and Lux. is their only native language.

The factor 'competence' refers to proficiency in German and French, languages that are both mandatory subjects in public schools. The information of self-evaluated competences in both foreign languages were gained through a written survey filled out ahead of the experiment (see [1] for details). One group declared stronger competences in German than in French (n=13), while another group indicated the same proficiency in German and in French (n=35).

The two main higher educational systems differ especially in terms of language instruction. The *classique* high school has a focus on French and generally leads to overall high proficiency also in German and English. The *technique*, labour oriented high school has a focus on German and an overall lower focus on language proficiency [5].

The region 'South' is located at the French border, while the central region has no direct border with either France, Germany or Belgium.

2.2. Word sample

The word sample consists of 13 words with word-final /ʀ/ (except *staark*), listed in table 2.

Table 2: Word sample, including vowel context.

Word	vowel context
Mier 'the see'	/iː/
Dier 'door'	
gär 'gladly'	/ɛː/
Stär 'star'	
Geˈwënner 'winner'	/ɐ/
Gare 'station'	/aː/
ˈJanuar 'january'	
staark ‚strong'	
war ‚(she/he) was'	
Cours 'lesson'	/uː/
Tour 'tour'	
Geˈfor 'danger'	/oː/
Raˈpport 'report'	

To analyse the influence of the preceding vowel, six different vowel qualities were chosen. Whenever possible, monosyllabic words were selected. The words were integrated in a written text, which the speakers were asked to read aloud. With the exception of *Gewënner*, which appears at the end of an intonational phrase, all words were sentence-final. As such, no following segment could influence the pronunciation of /ʀ/.

2.3. Measurements

Recordings were carried out in the years 2012-2013 using a SONY PCM-D50 portable recording device and a condenser microphone SENNHEISER HSP 2. Auditory measurements were done with PRAAT (5.2.01). Sounds were categorized either as consonant or as vowel, unclear sounds as 'n.a.' (not applicable) and excluded from the analysis.

First approach to /ʀ/-vocalization in Lux., the main research question is whether /ʀ/ is pronounced consonantal or vocalic. The precise articulation of the vowels or the consonants was neglected, although small-grained articulatory differences possibly carry further sociophonetic information.

2.4. Statistical analysis

Statistical analysis (mixed-effects logistic regression) was carried out using the R-based statistics software RBRUL ([6], version 3.1.2). The dependent variable is the realization of /ʀ/ as consonant or vowel, while the independent variables are competence, education, gender, generation, region, vowel context and all the possible two-way interactions. Random factors are 'words' and 'speakers'.

The coefficient of determination r^2 represents the proportion of the variance in the dependent variable explained by the model. Additional t-tests were carried out with SPSS (version 25). The alpha level for significance for all the tests was set as $p < 0.05$.

3. RESULTS

3.1. Rbrul analysis

Table 3 shows the results of the RBRUL analysis (step-down model), including p- and r^2-values. The explaining factors are discussed in decreasing order of significance in the following sections.
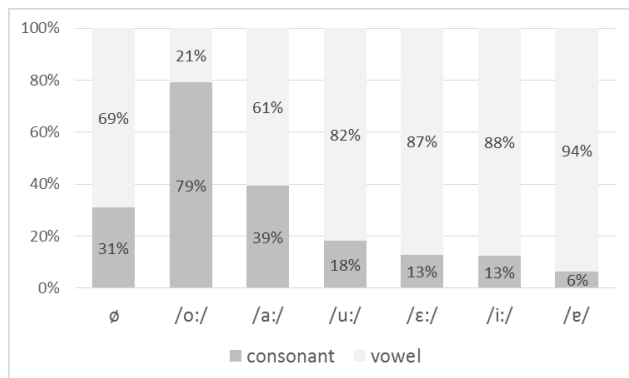
Table 3: Results of the RBRUL analysis.

factors	significant factors	p	r^2
fixed	vowel context	< 0.001	0.60
	region:gender	0.005	
	generation:education	0.015	
	region:competence	0.035	
random	speakers		0.15
	words		
total			0.75

3.2. Vowel context

Overall, only one third of word-final /ʀ/ (33%) is produced as a consonant. As visible in figure 1, the realization depends strongly on the preceding vowel.

Figure 1: Amount of consonantal/vocalic realizations for the different vowel contexts.

In the /o:/ context, 79% of all the speakers realized /ʀ/ as a consonant (*Gefor* [gəˈfoːχ]: 73%, *Rapport* [ʀɑˈpɔːχ]: 85%). These numbers strongly differ from the other contexts. The second back vowel context /u:/ shows only 18% of consonantal realizations (*Tour*: 17%, *Cours*: 20%). A clear-cut opposition between front and back vowel contexts can be excluded, as both fronted vowel contexts /ɛ:/ and /i:/ show similarly small numbers of consonantal realizations as /u:/ (between 9-17% for the different words). In all of these cases, vocalic schwa-articulation ([ə] or [ɐ]) is clearly favoured. <-er> is generally articulated as [ɐ]. A possibly added consonant only applies in 6% of the token (*Gewënn*[ɐχ]).
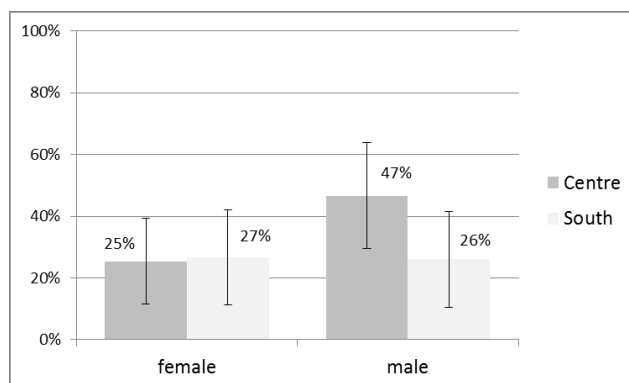
While the different words show similar amounts of consonantal articulations within all of the vowel contexts, numbers for the words for middle and open /a:/ differ: *war* (24%) and *Januar* (27%) show relatively low numbers, while *staark* (50%) and *Gare* (55%) show the second highest amounts of consonantal pronunciations. *Staark* is the only word where /ʀ/ is not word-final, but followed by the voiceless velar fricative /k/. In this context, consonantal articulation is generally frequent [4], which explains the high numbers. As for *Gare*, the frequent word is possibly still perceived as loan from French *gare* [gaʀ] and as such retains its consonantal articulation more frequently. The same line of reasoning counts for *Rapport* (see above), while *Cours* and *Tour*, on the contrary, show only small amounts of consonantal realizations. Further data is needed to clear this matter.

3.2. Sociodemographic factors

All sociodemographic factors (competence, education, gender, generation, region) interact in the Rbrul-model to explain the variation. In the following figures (including confidence intervals), the consonantal articulation is the default value represented by the percentages on the y-axis.

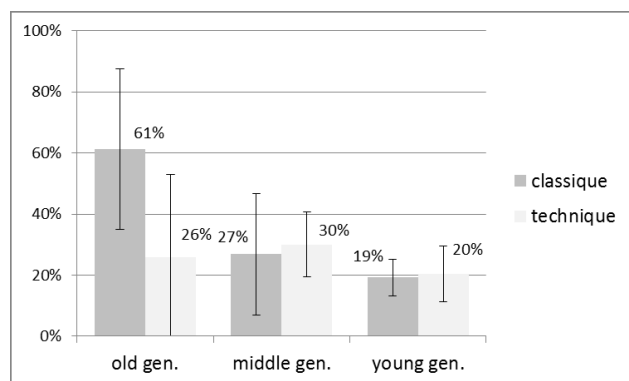Figure 2 shows the interaction between the two regions and male/female speakers.

Figure 2: Amount of consonantal realizations for gender by region.

Neighbourhood to French speaking territories in the South do not seem to play a role in the articulation of word-final /ʀ/ as a consonant. While female speakers in both regions and male speakers in the southern region realize 25-27% consonantal variants, male speakers from the Centre nearly double these numbers (47%).

The highest amounts of consonantal articulations are realized by old speakers with a classical education, articulating more than twice as many consonantal variants (61%) as the five other groups (between 19-30%, figure 3).

Figure 3: Amount of consonantal realizations for generation by education.
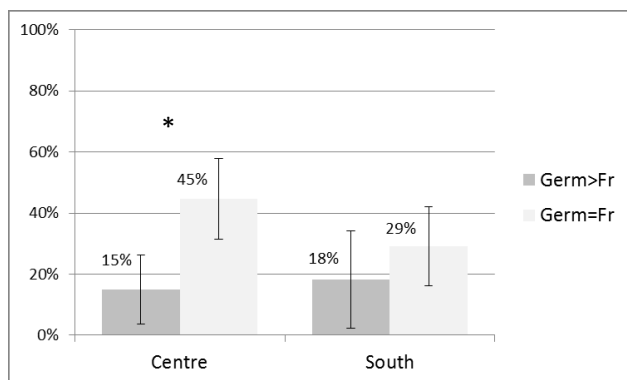

With on average only 20% consonantal realizations (most of them in the /o:/ context) and the smallest

overall variation, the young generation shows the smallest amount of consonantal variants (middle: 28%, old: 46%). These average numbers support the claim of [4] concerning a trend towards strengthening of vocalization, while a specific subgroup in the old generation accounts for strong consonantal amounts of word-final /ʀ/ in that generation.

Finally, speakers with equally good proficiency in German and in French (Germ=Fr) in the Centre have the highest amount of consonantal realizations compared to the other groups (figure 4). The sociodemographic groups with the *least* consonantal realizations (and thus the most advanced group in terms of language change) are speakers with better proficiency in German than in French (Germ>Fr, 15-18%, t-test, t(22)=-2.99, p=0.007).

Figure 4: Amount of consonantal realizations for region by competence.

4. SUMMARY AND DISCUSSION

The sociophonetic analysis of vocalization of word-final /ʀ/ in Lux. revealed some interesting dynamics. While there is a general trend towards vocalization of word-final /ʀ/ with 80% vocalic realizations in the young generation (middle: 72%, old: 54%), one specific speaker group still prefers consonantal articulations. This group consists especially of old male speakers from the Centre of Luxembourg, who are well educated and have equally good proficiency in both German and French.

These results are in line with recent sociophonetic investigations of Lux. ([1], [2]) that show that the central region of Luxembourg is generally more conservative compared to the southern region, with old and mainly male speakers constituting the most conservative speaking group. As the consonantal variant of word-final /ʀ/ is close to the French variant, the results could be analysed as indexing the historical prestige of French in Lux. While preferences are generally changing towards German(ic) variants ([1]), the present analysis possibly disclosed some relicts of French prestige at

the level of pronunciation. A correlation with data about language attitudes in Luxembourg vis-à-vis French (and German), still lacking in studies about Lux., could further clarify this point.

As for the phonological context, consonantal variants are especially strong following /o:/ in comparison to all other contexts. Additional data including spoken text is needed to further explain these values, while an analysis of the concrete articulatory shape of both consonantal and vocalic variants can add further sociophonetic and socio-indexical information to the discussion about /ʀ/-vocalization in Lux.

5. REFERENCES

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