SCHWA BEHAVIOUR IN FORMAL AND INFORMAL LOUISIANA REGIONAL FRENCH[1]

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This study examines schwa deletion and insertion in the Louisiana Regional French (LRF) spoken in Ville Platte, Evangeline Parish, Louisiana. Since stylistic range tends to contract towards an informal register in dying languages (Dressler 1972, Dorian 1977), and other varieties of LRF exhibit reduced register differentiation (Rottet 2001), the investigation tests whether or not there is a relationship between the formality of the speech event and schwa behaviour. The analysis shows that schwa has a highly variable phonetic realization in LRF. Furthermore, instances of deletion reveal that speech register and a word's status (root or clitic) play a role in schwa deletion. Moreover, environments encouraging schwa epenthesis underline this vowel's interaction with morpho-syntactic, syllabic and pronunciation constraints. A quantitative analysis of these processes is complemented by an Optimality Theory (Prince & Smolensky 1993, McCarthy & Prince 1994) analysis.

1.1 Evangeline Parish

Evangeline parish is one of 22 parishes clustered in southern Louisiana and commonly referred to as the French Triangle of Acadiana (Estaville 1988: 347). These parishes are identified as having a higher-than-average level of French language and/or culture. According to the 2000 US Census data, 26.61% of the polled residents of Evangeline parish self-identified as Francophone, compared to 3.86% state-wide (http://www.mla.org/map_data). LRF has been in a linguistic minority situation in Louisiana for over a hundred years, since English has long been promoted as the language of education, news and politics (Estaville 1990: 110-12). This enclave dialect is now "threatened with contraction to the point of extinction" (Picone 1997: 118). Thus, LRF is no longer being actively transmitted to children.

1.2 Phonemic Inventory

Lyche (1996) remarks that the consonant phonemes of Standard French (SF) and LRF differ by only two sounds, since LRF has the two affricates [ʧ] and [ʤ] while SF does not (Lyche 1996: 34). Therefore, the phonemic consonants of LRF are as follows: /p, b, m, t, d, n, k, g, ŋ, f, v, s, z, ʃ, ʒ, ɲ, ʧ, ʤ, l, r, j, w, ɥ/. LRF has the same vowels as SF, and while /œ̃/ does not appear in many lexical items, it is still contrastive, as evidenced by the minimal pair *brun* 'brown' /brœ̃/ and *brin* 'a bit' /brɛ̃/. Thus, the present study adds /œ̃/ to the vocalic inventory of LRF as identified by Lyche (1996): /i, y, u, e, ø, o, ɛ, œ, ɔ, a, ɛ̃, ɑ̃, ɔ̃/ (Lyche 1996: 34).

[1] Research supported by SSHRC Doctoral Fellowship # 752-07-1462

Actes du congrès annuel de l'Association canadienne de linguistique 2009.
Proceedings of the 2009 annual conference of the Canadian Linguistic Association.

1.3 Prosodic System

Languages vary in terms of stress placement. For example, the final syllable of a prosodic unit is accented in SF (Jun & Fougeron 2002), whereas in English, stress is assigned lexically. LRF allows the option of accenting each word in a phrase, which distinguishes it from SF and reveals its prosodic similarity to English (Lyche 1996: 42). Lyche (1995) associates LRF with Québec French (QF), quoting Paradis and Deshaies' (1990) work on stress assignment in the latter variety, and showing that LRF is quantity-sensitive (Lyche 1995: 376). Based on stress accent evidence, Lyche (1995) concludes that the LRF prosodic foot is an iamb, in other words, it is maximally binary, right dominant, and quantity-sensitive (Lyche 1995: 377). Furthermore, eurhythmy is permitted in LRF, and the phonological word determines stress placement (Lyche 1999).

2. Speakers

Since LRF is an endangered language variety, the four speakers (two male, two female) from Ville Platte, Louisiana who provide the linguistic data for the present study are all at least 60 years old. Relevant sociolinguistic information is summarized in the table below, and demonstrates that the male speakers have had considerably more contact with English. However, the table also reveals that with such a small number of speakers, sociolinguistic factors are not reliable for this analysis.

(1) Speaker Information

Code	Age	English	Education	Spouse	Career
M2	60	Home	MA	ENG	Teacher
M1	69	Home	12 yrs	ENG	Radio
F1	76	School	11 yrs	FR	Cafeteria
F2	87	School	3 yrs	FR/ENG	Factory

3. Methodology

The speakers form part of the Louisiana contribution (Klingler & LaFleur 2007) to the international French phonology corpus *la Phonologie du Français Contemporain* (PFC, Durand, Laks and Lyche 2002, 2005). Two linguists carried out interviews in November 2007 using digital recording equipment. Each speaker completed translation exercises at the word and sentence level, and then engaged in semi-directed and free conversation with the interviewers. The translation exercises and free conversation form the corpus for this study, and are respectively coded as formal and informal speech. Since the formal register increases the stability of unaccented syllables in other varieties of French (Ostiguy & Tousignant, 1993 : 227), it will potentially maximize the appearance of schwa in lexical items spoken in a formal setting.

The corpus is coded phonemically using PRAAT software (Boersma & Weenink 2008) based on perceptual and spectrographic cues. Allophonic variants are not recorded in PRAAT. For instance, /ʀ/ has a variable phonetic realization in LRF (Lyche 1996: 34); any of the variants [r, ɹ, ɾ] are possible.

However, rhotic allophones are considered and coded as the archiphoneme [r], since they do not exhibit contrastive behaviour. A separate Excel spreadsheet contains observations of pertinent segment variation, phonetic environment, and syllable structure for each lexeme. Altogether, 984 cases of potential schwa insertion (697 cases) and schwa deletion (287 cases) are identified and coded.

4. Results

4.1 Variable Realization of Schwa

In SF, schwa surfaces as either of the mid front rounded vowels [ø] or [œ]. In addition to these phonetic variants, LRF speakers can realize schwa as [i, I] due to assimilatory effects (Lyche 1996), or [ɛ, a], pronunciations which are potentially related to the prefix *re-* 'again'. The underlying representations (UR) given below are from SF; future perceptual tests with LRF speakers will be necessary to confirm that these are accurate for LRF. As noted in the methodology, variable schwa is coded [ə] in the corpus regardless of its phonetic realization (shown in the left-hand column under 'Schwa'), following Flemming (2007):

(2)		Schwa	Lexeme	Translation	UR	SR
	a.	[ø]	blanc	'white'	/blɑ̃/	[bə.lɑ̃]
	b.	[œ]	rond	'round'	/rõ/	[ə.rõ]
	c.	[ɛ]	revenant	'ghost'	/rə.və.nɑ̃/	[ər.və.nɑ̃]
	d.	[i]	petit	'small'	/pə.ti/	[pə.ti]
	e.	[I]	petit	'small'	/pə.ti/	[pə.ti]
	f.	[a]	repousser	'grow again'	/rə.pu.se/	[rə.pu.se]

4.2 Schwa Metathesis

Schwa metathesis with /r/ has been identified as a common phonetic process in LRF (Lyche 1995), but it is very seldom found in the corpus used for the current study. There are seventeen cases of possible schwa metathesis in the corpus; of these, fifteen are produced by one speaker (M2) and thirteen of these are from one repeated lexical item (*revenant(s)* 'ghost(s)', /rəvənɑ̃/ → [ərvənɑ̃]). Given the rarity of these occurrences in the corpus (2.9%), they are coded instead as cases of combined schwa deletion and schwa insertion.

4.3 Schwa Deletion

The status of a word plays an important role in the maintenance or deletion of schwa in the formal register. In this speech style, while 76 cases of successful schwa deletion take place in roots, all of the schwas occurring in clitics in the corpus are deleted (32 cases). As a result, none of the maintained schwas are in clitics.

(3)		LRF	Translation	UR	SR
	a.	de la pâte	'(some) pasta'	/də.la.pat/	[dla.pat] ~ [da.pat]
	b.	me donner	'(to) give to me'	/mə.dɔ.ne/	[m.dõ.ne]

Thus, in the formal register, a word's morphological status as a clitic or a root can determine schwa behaviour in a deletion environment. In (4a), *petit* 'small' functions as a clitic in the rhythmic group *un petit arbre* 'a little tree', and is reduced to one syllable. However, when *petit* functions as a root in (4b), the schwa is maintained, assimilating to the following high front unrounded vowel.

(4)		LRF	Translation	UR	SR
	a.	un petit arbre	'a little tree'	/œ̃.pə.ti.arbr/	[ẽ.ti.ab]
	b.	petit	'small; child'	/pə.ti/	[pə.ti]

The informal register does not show such a clear pattern. Of 107 cases of successful schwa deletion, 30 are in roots and 77 are in clitics. There are 43 cases of unsuccessful schwa deletion in formal speech, with 15 maintained schwas in roots and 28 in clitics. This suggests that there may still be a differentiation between speech styles in LRF that is reflected in schwa deletion and maintenance.

4.4 Word-initial Schwa Insertion

Normally in French, nouns are preceded by clitics such as prepositions, articles or pronouns, forming a noun phrase (NP). As a consequence of this structure, it is difficult to elicit nouns in isolation. However, all four speakers provide the corpus with many roots without clitics. Generally, two conditions are necessary for word-initial schwa insertion to take place. First, the isolated root must follow a pause or consonant, and second, the root must begin with the phoneme /r/. The data sets below illustrate the contrast between non-isolated and bare roots.

(5)		NP	Translation	UR	SR
	a.	un rang	'a row'	/œ̃ + rɑ̃/	[ẽ.rɑ̃]
	b.	est rond	'is round'	/e + rõ/	[e.rõ]
	c.	au ras	'close to'	/o + ra/	[o.ra]
	d.	un rat	'a rat'	/œ̃ + ra/	[ẽ.ra]
	e.	de respect	'(some) respect'	/də + rə.spe/	[də.rə.spe]

(6)		NP	Translation	UR	SR
	a.	rang	'row'	/rɑ̃/	[ə.rɑ̃]
	b.	rond	'round'	/rõ/	[ə.rõ]
	c.	rat	'rat'	/ra/	[ə.ra]
	d.	respect	'respect'	/rə.spe/	[ə.rə.spe]
	e.	ratelier	'rack'	/ra.tɛ.lje/	[ə.ra.tɛ.li.je]

One possible account for this data is morpho-syntactic in nature. When the requirement for a clitic is not met in the NP, schwa is inserted as the dummy placeholder for the absent clitic. While this explanation is attractive, it cannot explain alternations such as (5b) ~ (6b), where the unit in question is a verb phrase (VP) that does not originally contain a clitic. Another account is phonological in nature. The phoneme /r/ is difficult to pronounce, as evidenced by its late appearance in child language acquisition. In LRF, /r/ often occurs

intervocalically, indicating that schwa insertion may be used to facilitate articulation of a difficult phoneme. The case of (5b) ~ (6b) provides support for a phonological approach. When *rond* is not said in isolation, it is preceded by the verb *est* 'is' (from the original sentence, *la pelotte est rond* 'the ball is round'). The verb *est* is not a clitic, and yet its absence prompts schwa insertion. The inserted schwa thus potentially performs two functions: it acts as the default placeholder for an absent clitic, and as an articulatory aid for /r/.

There are six exceptional cases in the corpus where word-initial schwa insertion involves a bare root not beginning with /r/, listed in (7). Given that (7a) is attested both with and without schwa insertion, and (7c) could potentially be the verb *élevé* 'lifted' ([ɛ.lə.ve]), these cases represent a very small percentage of the total coded cases of potential word-initial schwa insertion (6/134 = 4.5%). They are therefore excluded from statistical analyses of word-initial schwa insertion, in order to isolate the more general pattern of schwa insertion before /r/-initial words.

(7)

	Lexeme	Translation	UR	SR
a.	jeune	'young'	/ʒœn/	[ə.ʒœn] ~ [ʒœn]
b.	huit	'eight'	/ɥit/	[ə.wit] ~ [ə.ɥit]
c.	levé	'lifted'	/lə.ve/	[ə.lə.ve]
d.	l'étriller	'stirrup'	/le.tri.je/	[ə.le.tə.ri.je]

(8) Chi-Square test of independence for word-initial schwa insertion

X^2 (1, n = 128) = 111.3, p < 0.0001			Presence of Schwa		Total
			Absent	Present	
Preceding Vowel	Yes	Count (n)	81	1	82
		%	98.8%	1.2%	100.0%
	No	Count (n)	3	43	46
		%	6.5%	93.5%	100.0%
Total		Count (n)	84	44	128
		%	65.6%	34.4%	100.0%

The table in (8) shows that for /r/-initial words, there is a highly significant correlation between the presence or absence of a preceding vowel and whether or not word-initial schwa insertion takes place. There is a particularly strong tendency for schwa to be absent if a vowel precedes the /r/-initial word. This supports the analysis that schwa insertion occurs to aid in the articulation of /r/.

4.5 Schwa Insertion in Obstruent + /r/ (OR) Clusters

There are 446 cases of potential schwa insertion in OR clusters coded in the corpus. Schwa appears in 269 of the identified OR clusters. Schwa insertion necessarily creates forms composed of at least two syllables, thereby satisfying binarity. It also ensures that /r/ is intervocalic, thus aiding articulation. Examples are given below to demonstrate the range of obstruents occurring with /r/, as well as the range of syllabic positions that are possible insertion sites. If more than one possible pronunciation is given, the first is more prevalent.

(9)	Lexeme(s)	Translation	UR	SR
a.	brun	brown	/brœ̃/	[bə.rœ̃] ~ [bə.rœ]
b.	brin	thread (n.)	/brɛ̃/	[bə.rɛ̃] ~ [brɛ̃]
c.	prends	take (2psg)	/prɑ̃/	[prɑ̃] ~ [pə.rɑ̃]
d.	drôle	funny/bizarre	/drol/	[də.rol] ~ [drol]
e.	quatre ans	four years	/katr + ɑ̃/	[kɑ.tə.rɑ̃]
f.	creux	hollow (m.)	/krø/	[kə.rø] ~ [krø]
g.	grand	tall	/grɑ̃/	[gə.rɑ̃]
h.	avril	April	/a.vri/	[a.və.ri]
i.	emprunter	to borrow	/ɑ̃.prœ̃.te/	[ɑ̃.pə.rɛ̃.te] ~ [ɑ̃.prɛ̃.te] ~ [ɑ̃.prœ̃.te]
j.	croquesignole	doughnut	/krɔk.si.ɲɔl/	[krɔk.si.jɔl] ~ [kə.rɔk.si.jɔl]

Phonological trends become apparent when the frequency of schwa insertion is organized by the obstruent that precedes /r/, as in (10).

(10) Schwa insertion in OR clusters

Context	Presence of Schwa				Total	
	Absent		Present			
	Count (n)	%	Count (n)	%	Count (n)	%
p_r	49	79.0%	13	21.0%	62	100%
b_r	5	12.5%	35	87.5%	40	100%
f_r	28	73.7%	10	26.3%	38	100%
v_r	1	9.1%	10	90.9%	11	100%
t_r	40	38.5%	64	61.5%	104	100%
d_r	4	25.0%	12	75.0%	16	100%
k_r	27	45.0%	33	55.0%	60	100%
g_r	23	20.0%	92	80.0%	115	100%
Total	177	39.7%	269	60.3%	446	100%

It is clear that there is a higher rate of schwa insertion following voiced obstruents rather than voiceless obstruents. Performance of a Chi-Square test of independence confirms that there is a statistically significant correlation between obstruent voicing and the rate of OR schwa insertion (X^2 (1, n = 446) = 59.6, $p < 0.0001$). However, due to the nature of the corpus and the relative infrequency of some consonant clusters, certain sequences have very few tokens. It will therefore be essential to expand the database in order to incorporate more clusters such as [fr, vr, dr].

The formality of the speech event is also significantly correlated with the rate of OR schwa insertion. Specifically, the results from the Chi-Square test, summarized in (11), suggest a tendency for more of this type of schwa insertion in formal speech than in informal speech.

(11) Chi-Square test of independence for OR schwa insertion

X^2 (1, n = 446) = 45.7, p < 0.0001			Presence of Schwa		Total
			Absent	Present	
Speech Register	Informal	Count (n)	117	90	207
		%	56.5%	43.5%	100.0%
	Formal	Count (n)	60	179	239
		%	25.1%	74.9%	100.0%
Total		Count (n)	177	269	446
		%	39.7%	60.3%	100.0%

5. Optimality Theory Account

In this section, the processes of schwa deletion and insertion will be analyzed within the Optimality Theory framework, a theory of constraints and constraint ranking (Prince & Smolensky 1993, McCarthy & Prince 1994). If more than one output is attested in the corpus for a given input, frequency will determine the relative ranking among candidates. The analysis will first consider schwa deletion, before examining schwa insertion phenomena.

As mentioned earlier, schwa deletion is common in LRF, since it is the weak vowel, occurring in unstressed syllables. This tendency is reflected in the constraint *SCHWA:

(12) *SCHWA schwa is prohibited

Segment deletion also requires a closer look at maximality constraints, since they block deletion. In LRF, there is a distinction between the retention of schwa in roots and in clitics, which is reflected in the following constraints:

(13) MAX-IO-V-ROOT every input root vowel must appear in the output

(14) MAX-IO-V-CLITIC every input clitic vowel must appear in the output

MAX-IO-V-ROOT crucially dominates MAX-IO-V-CLITIC, as will become apparent in the following tableaux[2].

[2] Optimality Theory tableaux are a visual representation of constraint hierarchies. The constraints are ranked from strongest to weakest, left to right, along the top of the tableau. If a constraint does not crucially dominate the constraint to its right, they are separated by a dotted line. The UR appears in the top-left corner; potential candidates created by GEN are listed below the UR. The optimal candidate, signaled by ☞, violates as few low-ranking constraints as possible; ✌ indicates a less-optimal but attested alternative. Constraint violations are marked with an asterisk; fatal violations also receive an exclamation point.

(15) gêlée ‘frost’

/ʒəle/	*SCHWA	MAX-IO-V-ROOT
☝ [ʒle]		*
☝ [ʒə.le]	*	

Since the four speakers considered in this analysis are evenly divided by their pronunciation of *gêlée*, *SCHWA does not dominate MAX-IO-V-ROOT. Consequently, both candidates are acceptable outputs of tableau (15). The situation is different in the case of clitics and schwa deletion. Retention of schwa in clitics is not common, especially in the formal register. So, *SCHWA must crucially dominate MAX-IO-V-CLITIC, since schwa deletion is the preferred process, and by extension, MAX-IO-V-ROOT must also dominate MAX-IO-V-CLITIC, as demonstrated in tabeau (17). One additional low-ranking maximality constraint for clitic consonants is necessary to account for the surface realizations in (17):

(16) MAX-IO-C-CLITIC every input clitic consonant must appear in the output

(17) de la pâte ‘some pasta’

/də+la+pat/	*SCHWA	MAX-IO-V-ROOT	MAX-IO-C-CLITIC	MAX-IO-V-CLITIC
☞[dla.pat]				*
☝ [da.pat]			*	*
[də.la.pat]	*			

All three candidates are attested, but with the least and lowest-ranking constraint violations, [dla.pat] emerges the winner. The ranking thus far is therefore *SCHWA, MAX-IO-V-ROOT » MAX-IO-V-CLITIC, MAX-IO-C-CLITIC.

The word-initial schwa insertion data require four additional constraints:

(18) *#r word-initial [r] is prohibited
(19) MAX-IO-C-ROOT every input root consonant must appear in the output
(20) ONSET syllables must have an onset
(21) DEP-IO-V every output vowel must appear in the input

The constraint in (18), which disallows word-initial [r], is undominated, and the second, prohibiting root consonant deletion, is very high-ranking. ONSET is low-ranking in this system of constraints. The case of the noun phrase *un rang* ‘a row’ lays out the ranking of these constraints in (22).

(22) un rang ‘a row’

/œ̃ + rɑ̃/	*#r	MAX-IO-C-ROOT	MAX-IO-V-CL	ONSET
[rɑ̃]	*!		*	
☞[ɛ̃.rɑ̃]				*
[ɑ̃]		*!	*	*

The first candidate fatally violates no word-initial [r], and is immediately discarded. The optimal candidate, [ẽ.rɑ̃], obeys the faithfulness constraints and high-ranking *#r, and only violates low-ranking ONSET. The third candidate is problematic for several reasons, but it is the violation of MAX-IO-C-ROOT that is fatal.

When *rang* is said in isolation, the same constraint hierarchy operates; since this case involves schwa insertion, DEP-IO-V replaces MAX-IO-V-CL as the relevant low-ranking constraint in (23).

(23) rang 'row'

/rɑ̃/	*#r	MAX-IO-C-ROOT	DEP-IO-V	ONSET
[rɑ̃]	*!			
☞[ə.rɑ̃]			*	*
[ɑ̃]		*!		*

The otherwise optimal output, *[rɑ̃], is nevertheless discarded because it fatally violates *#r. As in the last example, *[ɑ̃] is rejected because it involves the deletion of a root consonant. The optimal candidate, [ə.rɑ̃], inserts word-initial schwa, thereby violating low-ranking DEP-IO-V and ONSET, but satisfying high-ranking *#r and MAX-IO-C-ROOT.

Tableau (24), for the noun *remède* 'remedy' said in isolation, reveals that MAX-IO-V-ROOT must outrank DEP-IO-V because of the latter's equal standing with ONSET, and because of the preference for [ə.rə.mɛd] over [ər.mɛd].

(24) remède 'remedy'

/rəmɛd/	*#r	MAX-C-ROOT	MAX-V-ROOT	DEP-IO-V	ONS
[rə.mɛd]	*!				
[rmɛd]	*!		*		
☝ [ər.mɛd]			*	*	*
☞[ə.rə.mɛd]				*	*
[ə.mɛd]		*!	*	*	*

The first two candidates fail because they fatally violate *#r. The last candidate fatally violates MAX-IO-C-ROOT by deleting [r]. The possible, but less frequent form, [ər.mɛd], violates MAX-IO-V-ROOT due to schwa deletion, and also violates DEP-IO-V and ONSET because of word-initial schwa insertion. The winner keeps all original root segments, violating DEP-IO-V and ONSET in order to satisfy *#r.

These tableaux have demonstrated that the following constraint hierarchy is in place: *#r » MAX-IO-C-ROOT » *SCHWA, MAX-IO-V-ROOT » MAX-IO-V-CLITIC, MAX-IO-C-CLITIC » ONSET, DEP-IO-V.

Cases of schwa insertion in OR clusters require the addition of one constraint to the hierarchy, extending constraint (20):

(25) *COMPLEX ONSET onsets cannot contain more than one segment

Tableau (26) considers candidates for the noun *brin* ‘bit’, which has two attested realizations in the current corpus and employs *COMPLEX-ONSET.

(26) *brin* ‘bit’

/brɛ̃/	*#r	MAX-C-ROOT	*SCHWA	DEP-IO-V	*COMPLEX-ONSET
☝ [brɛ̃]					*
☞[bə.rɛ̃]			*	*	
[ə.brɛ̃]			*	*	*!
[bɛ̃]		*!			
[rɛ̃]	*!	*			

Beginning with the unsuccessful candidates, *#r and MAX-IO-C-ROOT are maintained as highly powerful constraints in LRF, since it is violation of these constraints that eliminates *[bɛ̃] and *[rɛ̃]. Also, the rejection of the candidate *[ə.brɛ̃] demonstrates that forms cannot violate both of low-ranking COMPLEX-ONSET and DEP-IO-V: schwa must be inserted in the correct position. The winner is therefore [bə.rɛ̃], because it does not contain any complex onsets, but as with other words containing OR clusters, [brɛ̃] is also an accepted, less frequent form that obeys all faithfulness constraints.

The situation is more complicated with words that have multiple attested pronunciations. The lexeme *trois* ‘three’ has five surface forms in the corpus; tableau (26) attempts to account for this variation.

(26) trois ‘three’

/trwa/	*#r	MAX-C-ROOT	*SCHWA	*COMPL-ONS	DEP-IO-V
☞ [tər.wa]			*		*
☝ [tə.ra]		*	*		*
☝ [tə.rə.wa]			**		**
☝ [trwa]				**	
[tra]		*		*	
[ə.tra]		*	*	*	*!
[ta]		**!			
[ra]	*!	**			

The optimal candidate is attested ten times in the corpus, whereas [tə.ra] is said seven times. Even though sub-optimal [tə.ra] provides a bisyllabic word with no complex onsets, it requires the deletion of the root consonant [w], whereas [tər.wa] crucially respects MAX-IO-C-ROOT, making it the winner. The other two sub-optimal candidates, [tə.rə.wa] and [trwa], are each found six times in the corpus. The form [tra] appears once in the corpus, and is not marked with a fatal violation because it only violates MAX-IO-C-ROOT once, in contrast with unattested *[ta]. The candidate *[ə.tra] confirms that schwa must be inserted in the correct position, and that forms cannot violate all of the low-ranking constraints. Finally, *[ra] demonstrates the importance of high-ranking *#r, which it fatally violates.

This representation is problematic for two reasons. First, even though *SCHWA is relatively highly ranked in the constraint hierarchy based on earlier tableaux, none of the examined violations of *SCHWA are fatal. In tableaux (25) and (26), it seems that *SCHWA should at least be equally ranked with *COMPLEX-ONSET and DEP-IO-V, since it is a violation of these two constraints that causes a candidate in each tableau to be discarded. Moreover, in (26), sub-optimal [tə.rə.wa] violates higher-ranking *SCHWA twice, but is still one of the preferred outputs. The second problem is especially relevant to tableau (26), because it gives the impression that there are three equally-ranked sub-optimal candidates. The tableau cannot transmit important frequency information that explains why [tə.ra] is slightly more optimal than [trwa], even though the latter has less and lower-ranked violations. As more speakers and attestations are added to the corpus, the frequency patterns will be more reliable, but tableau (26) does signal two potential shortcomings of Optimality Theory as a theoretical framework for such variable data.

6. Conclusions

This analysis has examined the frequency and distribution of two main phenomena involving schwa, deletion and insertion, in different phonetic environments. The examination has underlined several important distinctions that play a role in whether or not insertion or deletion occurs, such as the lexical item's status (clitic or root), the speech register (formal or informal), and the surrounding phonetic environment. Specifically, the clitic status of a word results in systematic schwa deletion in the formal register, but not the informal register; word-initial schwa insertion almost always occurs when the word in question is [r]-initial and does not follow a word ending in a vowel sound; and OR schwa insertion takes place more often when the obstruent is voiced and the word is spoken in a formal speech style. These results suggest that schwa behaviour is differentiated by the formality of the speech event in the LRF spoken in Ville Platte, Louisiana.

The consideration of the linguistic facts has allowed for an Optimality Theory account, whose constraint hierarchy is summarized in (27):

(27) *#r » MAX-IO-C-ROOT » *SCHWA, MAX-IO-V-ROOT » MAX-IO-V-CLITIC, MAX-IO-C-CLITIC » ONSET, DEP-IO-V, *COMPLEX-ONSET.

While this hierarchy functions for most of the examples given in this study, it has nevertheless been shown to be problematic, because it cannot reflect frequency information or the variable nature of the LRF data. Multiple factors can influence the variable phonetic realizations of lexical items in LRF, and are difficult to tease apart. Since LRF is an endangered language, contact with English, natural development, and attrition are all potentially relevant factors to linguistic changes within this language variety (Rottet 2005: 245-246). Another crucial factor to consider is the low rate of French literacy among LRF speakers, who are thus free to pronounce lexical items however it best suits their communicative needs, leading to less restricted phonetic variation. Diminishing use and transmission of LRF also entail that LRF

speakers do not necessarily form part of an active linguistic community any longer. When this fact is taken into consideration, along with the small number of speakers analysed for the present study, it is evident that sociolinguistic factors such as age, sex, and education are not reliable for the current analysis of schwa behaviour. Furthermore, the problems encountered when attempting to translate data from LRF speakers into Optimality Theory tableaux indicate that more speakers are necessary in order to properly test whether or not there is a surviving cohesive constraint hierarchy for LRF.

Further development of this research will therefore include the incorporation of more LRF speakers, as well as the consideration that each speaker may potentially have his or her own constraint hierarchy. Perceptual studies with LRF speakers will help to clarify whether or not the variable surface forms of schwa are underlying. Finally, following Poiré and Chow (2007), future research will take account of the different /r/ allophones in order to explore the relationship between this phoneme and schwa insertion patterns in OR clusters.

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