

An OT Analysis of French Schwa Deletion *

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1 INTRODUCTION

Schwa deletion in French is a phonological pattern that has been extensively examined in phonological literature (e.g. Dell 1980, Tranel 1999, Barnes & Kavitskaya 2002). Whilst many have documented the specific phonetic environments in which schwa deletion can occur, others have argued that factors such as an individual's rate of speech can have just as a significant impact on the deletion of schwa (Barnes & Kavitskaya 2002). For instance, Tranel's (1999) analysis of French Schwa deletion not only provides an OT analysis to describe the environments where schwa deletes but also argues that a speaker's rate of speech influences their usage of schwa deletion.

This paper looks, first, to replicate Tranel's OT analysis of French, in order to determine whether his findings are characteristic of my chosen speaker's French (Tranel 1999). In addition, this paper will extend Tranel's analysis and elicit which specific consonant clusters disprefer schwa deletion, based on my observation and consultation of a French native speaker.

The data collected for this study comes from a native speaker of French. My native speaker is from Nantes, located in the Loire-Atlantic region of France. Whilst Nantes is part of the territory of the languages d'oïl, with a local dialect of Gallo, my native speaker grew up speaking standard French. The sound inventory of their standard French variety is depicted in Tables 1 and 2. My speaker, after growing up in Nantes, left to London at 19 years old. My speaker has since lived in the UK for 28 years. During this time my speaker has become fluent in English.

2 TRANEL'S (1999) INVESTIGATION OF FRENCH SCHWA DELETION

In Tranel's study, he provides examples of French words that undergo optional schwa deletion to exemplify the environment in which it can occur. Tranel's analysis determines that the deletion of schwa is optional and is often omitted when the speaker's rate of speech is fast (Tranel 1999). In Tranel's study, he refers to schwa as the rounded mid-central vowel [ə] and the rounded mid-front vowel [œ] (Tranel 1999). Similarly, for my study, I'll be using [ə] and [œ] symbols to account for schwa,

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as the exact vowel quality does not impact my investigation. Example (1), reflects the variable interconsonantal schwa \sim zero alternation in the two pronunciations of *ce panneau*.

	Labial		Coronal				Dorsal	
	Bilabial	Labiodental	Dental	Alveolar	Post Alveolar	Palatal	Velar	Uvular
Nasal	m				n	ɲ ɳ		
Plosive	p b		t		d		k g	
Fricative		f v		s z	ʃ ʒ			ʁ
Approximant					j			
Lateral approximant					l			

Table 1 French consonants (Markey 1998).

Vowels	Front	Near Front	Central	Near Back	Back
Close	i y				u
Near-Close					
Close-Mid	e ø				o
Mid			ə		
Open-Mid	ɛ œ				ɔ
Near-Open					
Open	a				

Table 2 French vowels (Markey 1998).

- (1) a. *ce panneau* [sœpano]
 ‘this panel’
 b. *c’pannaeu* [spano]
 ‘this panel’

This alternation can be accounted for by the rule in (2). Rule (2a) causes schwa to be deleted when preceded by a consonant at the beginning of a phrase, whereas, (2b) causes schwa to be deleted when preceded by a consonant with a vowel across the word boundary.

- (2) a. $\emptyset \rightarrow \emptyset \parallel C -$ (optional)
 b. $\emptyset \rightarrow \emptyset / V \# C -$ (optional) (Tranel 1999: 217)

Tranel does not provide examples of French words that showcase these environments. However, the forms *serait bien* (3) and *pas de role* (4) can be used as examples to reflect the environments of (2a) and (2b), where schwa can undergo deletion.

Environment (2a) is reflected in the French utterance *serait bien*. (3a) displays the zero alternation, whereas, (3b) displays the interconsonantal schwa in the pronunciations of *serait bien*.

- (3) a. *serait bien* [səβɛ bjɛ̃]
 ‘would be good’
 b. *s’rait bien* [søβɛ bjɛ̃]
 ‘would be good’

Environment (2b) is reflected in the French utterance *pas de role*. (4a) displays the zero alternation, whereas, (4b) displays the interconsonantal schwa in the pronunciations of *pas de role*.

- (4) a. *pas de role* [pa də ʁol]
 ‘no role’
 b. *pas d’ role* [pa dø ʁol]
 ‘no role’

Tranel couches his analysis in Optimality Theory (Prince & Smolensky 1993/2004). According to Tranel, the OT constraint that enables the deletion of schwa is SYLLABLE ECONOMY (SE), presented in (5). This constraint ‘seeks to reduce the number of syllables in an utterance’ therefore causing schwa, a ‘weaker’ vowel in French, to undergo deletion (Tranel 1999: 272). However, in order to stop the deletion of syllables, Tranel proposes a constraint to prohibit onsets having more than one consonant. This constraint is depicted in (6).

- (5) SYLLABLE ECONOMY: Assign one violation for every syllable found in an utterance.
 (6) *COMPLEX (ONSET): Assign one violation for every onset with more than one consonant.

This ranking of *COMPLEX (ONSET) \gg SYLLABLE ECONOMY is shown in Figure 1, taken from Tranel (1999).

As the process of deletion is optional, Tranel allocates a variable ranking between SE and *COMPLEX (ONSET). Tranel explains that this constraint ranking is dependent on an individual’s rate of speech or style. This change of ranking is shown in Figure 2.

Tranel proceeds to identify [lp] and [sp] as consonant clusters that do not form well in French (Tranel 1999). These two consonant clusters can be created if schwa

/sœpano/	*COMPLEX (ONSET)	SYLLABLE ECONOMY
☞ a. sœ.pa.no		***
b. spa.no	*!	**

Figure 1 Tableau depicting the impact of constraints *COMPLEX (ONSET) and SYLLABLE ECONOMY on [sœpano].

/sœpano/	SYLLABLE ECONOMY	*COMPLEX (ONSET)
a. sœ.pa.no	***!	
☞ b. spa.no	**	*

Figure 2 Tableau depicting the impact of new ranking of constraints *COMPLEX (ONSET) >> SYLLABLE ECONOMY on [sœpano].

underwent deletion, therefore, new constraints and rankings are required to block schwa deletion if the outputs present a [lp] or [sp] consonant cluster. These new constraints are identified in (7) and (8).

(7) *lp: Assign one violation for every ‘lp’ consonant cluster.

(8) *sp: Assign one violation for every ‘sp’ consonant cluster.

Tranel identified the utterances *le panneau* ‘the panel’ (9) and *ce panneau* ‘this panel’ in (10) to reflect the environments of constraints (7) and (8).

Environment (7) is reflected in the French utterance *le panneau*. (9a) displays the zero alternation, whereas, (9b) displays the interconsonantal schwa in the pronunciations of *le panneau*.

- (9) a. *le panneau* [lə.pa.no]
 ‘the panel’
 b. *le panneau* [l.pa.no]
 ‘the panel’

Environment (8) is reflected in the French utterance *ce panneau*. (10a) displays the zero alternation, whereas, (10b) displays the interconsonantal schwa in the pronunciations of *ce panneau*.

- (10) a. *ce panneau* [sə.pa.no]
 ‘this panel’
 b. *c’panneau* [spa.no]
 ‘this panel’

Tranel (1987) demonstrates the ranking of these constraints in Figure 3. These tableaux reflect the impact of the ranking, $*lp \gg SE \gg *sp$, where schwa deletion is the preferred option for *ce panneau* ‘this panel’ and not for *le panneau* ‘the panel’. Although *ce panneau* contains the consonant clusters [sp], that does not form well in French, Tranel believed the pronunciation *c’panneau* was more representative of standard French than the pronunciation *ce panneau*. This understanding is reflected in Tranel’s constraint ranking depicted in Figures 3 and 4.


/sə pano/	*lp	SE	*sp
a. sə.pa.no		***!	
 b. spa.no		**	*

Figure 3 Tableau depicting $*lp \gg SE \gg *sp$ on the word /sə pano/.


/lə pano/	*lp	SE	*sp
 a. lə.pa.no		***	
b. lpa.no	*!	**	

Figure 4 Tableau depicting $*lp \gg SE \gg *sp$ on the word /lə pano/.

In Figures 3 and 4, the ranking $*lp \gg SE \gg *sp$ is supported as produce the correct surface form ‘lə.pa.no’ and ‘spa.no’. Here an alternative ranking would not produce the correct surface form. For instance, if SE was ranked above *lp it would allow schwa deletion, creating the wrong surface form ‘lpa.no’ (Figure 5). Similarly, if SE was ranked below *sp it would once again allow schwa deletion as *sp would be violated beforehand, producing the incorrect surface form ‘səpano’ (Figure 6).


/lə pano/	*lp	SE	*sp
a. lə.pa.no	***!		
 b. lpa.no	**	*	

Figure 5 Tableau depicting $SE \gg *lp \gg *sp$ on the word /lə pano/.


/sə pano/	*lp	SE	*sp
a. sə.pa.no			***
 b. spa.no		*!	**

Figure 6 Tableau depicting $*lp \gg *sp \gg SE$ on the word /sə pano/.

After including constraints (7) and (8), Tranel does not expand his analysis to determine whether *sp and *lp are the only two consonant clusters that would prohibit the deletion of schwa. I look to further Tranel’s analysis and examine

which consonant clusters would prohibit schwa deletion in French. By doing so, I can determine whether specific manner or articulation sound combinations prohibit the deletion of schwa in certain environments.

3 FRENCH SCHWA DELETION IN MY SPEAKER'S SPEECH

Before expanding upon Tranel's study, I examined whether my speaker confirmed the generalisations made by Tranel and deleted schwa within specific word examples. As Tranel offers minimal examples to test, I tested word examples that presented the same environment where schwa deletion occurred in Tranel's study. The tested word list are exhibited in (11) and (12).

- (11) Words tested containing the environment that would be impacted by the constraint *lp and their underlying form.
- a. *le panneau* [lə.pano]
'the panel'
 - b. *le pain* [lə.pɛ̃]
'the bread'
 - c. *le papier* [lə.papje]
'the paper'
 - d. *le parc* [lə.paʁk]
'the park'
- (12) Words to test that are impacted by the *sp constraint but undergo schwa deletion according to Tranel (1999) constraint ranking.
- a. *ce panneau* [s.pano]
'this panel'
 - b. *ce pain* [s.pɛ̃]
'this bread'
 - c. *ce papier* [s.papje]
'this paper'
 - d. *ce parc* [s.paʁk]
'this park'

In order to ascertain if Tranel's analysis accounts for the patterns in my consultant's French, I conducted an observation and a consultation. My observation involved asking my consultant questions in a relaxed and conversational manner.

Carefully formed questions were used to provoke my consultant to produce an answer with words from (11) and (12). For instance, when asking my consultant *où jouent vos enfants?* ‘where do your children play?’ she replied *...dans l’ parc* ‘...in the park’. Additional questions helped provide all the tested words and utterances containing either the *lp or *sp constraint environments. Furthermore, I consulted with my speaker to determine whether alternative pronunciations were possible for her. This allowed my speaker to make well-formed judgements determining whether she would delete the schwa in specific words. For example, I would ask whether the pronunciation *l’ parc* was more natural than *le parc*.

After making a purely auditory examination of all the transcribed words within my speaker’s speech, I found contradictory findings to Tranel. My speaker’s speech demonstrated schwa deletion in all the words in (11) and (12). Tranel argued the words found in (11) would not undergo schwa deletion as would violate *lp. However, my speaker’s speech did support Tranel’s finding that schwa would be deleted in dataset (12) as *sp is ranked lower than SE. Analysis of my speaker’s French reflects an alternative constraint ranking to that of Tranel’s (1999). Figures 7 and 8 reflect my newly proposed constraint ranking of $SE \gg *lp \gg *sp$, which is characteristic of my speaker’s pronunciation. In addition, as there are other vowels, other than schwa, I assumed the deletion of other vowels is prevented due to a higher-ranked MAX constraint. This constraint targets all vowels except for schwa.


/lə pano/	SE	*lp	*sp
a. lə.pa.no	***!		
 b. lpa.no	**	*	

Figure 7 New constraint ranking based on my speaker’s pronunciation of *le panneau*.


/lə.papje/	SE	*lp	*sp
a. lə.papje	***!		
 b. l.papje	**	*	

Figure 8 New constraint ranking based on my speaker’s pronunciation of *le papier*.

Whilst there is clear evidence to show that SE is ranked higher than both the *lp and *sp constraint there is no evidence in my speaker’s speech to suggest a relative ranking of *lp and *sp. In addition to observing the specific consonant cluster constraints *lp and *sp within my speaker’s speech, I decided to examine the impact a more general constraint, like *COMPLEX (ONSET), had on their schwa deletion. For this, I observed and consulted with my speaker the same way I examined the words that presented the *lp and *sp constraint environment. In this instance, to examine the *COMPLEX (ONSET) constraint I observed and consulted how she pronounced the words *referai* (13a) and *refiler* (13b), as both words would present complex onsets if schwa underwent deletion.

(13) My speaker's production of *referai* and *refiler*.

- a. *referai* /RəfRE/ [RfRE]
 're-do'
- b. *refiler* /Rəfile/ [Rəfile]
 'pass'

Here my speaker's surface forms indicate that *referai* and *refiler* are impacted by different constraint rankings. For instance, *referai* undergoes schwa deletion and produced a complex onset. This would be created from a SE \gg *COMPLEX (ONSET) constraint ranking. In contrast, *refiler* does not undergo schwa deletion and does not display a complex onset environment. This reflects a *COMPLEX (ONSET) \gg SE constraint ranking. These two constraint rankings are shown in Figures 9 and 10.


/RəfRE/	SYLLABLE ECONOMY	*COMPLEX (ONSET)
a. RəfRE	***!	
 b. RfRE	**	*

Figure 9 Tableau depicting the impact SYLLABLE ECONOMY \gg *COMPLEX (ONSET) on [RfRE].


/Rəfile/	*COMPLEX (ONSET)	SYLLABLE ECONOMY
a. Rfile	*!	**
 b. Rəfile		***

Figure 10 Tableau depicting the impact *COMPLEX (ONSET) \gg SYLLABLE ECONOMY on [Rəfile].

These tableaux reflect that Tranel's conclusion, that the constraint ranking of *COMPLEX (ONSET) and SYLLABLE ECONOMY is based on a speaker's rate of speech and style, is clearly not the sole determinants of whether schwa is deleted or not. This is indicated as my speaker used both constraint rankings with the same rate and style of speech when producing both utterances. This in turn reflects that the *COMPLEX (ONSET) constraint is not characteristic of my speaker's speech.

Given these findings, I next expand Tranel's study by examining my speaker's speech for specific manner of articulation consonant cluster environments that prohibit deletion of schwa when in position (2a) || C or (2b) V # C.

4 PROHIBITED CONSONANT CLUSTERS

As my consultant's French did not adhere to constraints (7) and (8), I examined which environments prohibited schwa deletion within their speech. In order to discern what these environments were, I had my consultant produce a number of utterances that consisted of target forms that differed in manner of articulation

cluster combinations when schwa was deleted. For example, the utterances tested displayed a schwa between different manners of articulation combinations. Consequently, if schwa was deleted it would create a consonant cluster. Some of the environments examined were words that would produce clusters such as; Fricative-Fricative, Fricative-Plosive, Fricative-Nasal, Fricative-Approximant, etc. in an onset position. The tested word list can be found in the [Appendix](#).

When examining my consultant's responses I recognised that some consonant clusters, that prohibited schwa deletion, coincide with specific manner of articulation combinations. These articulation combinations included; Approximant-Fricative, Nasal- Nasal, Plosive-Fricative, and Plosive-Nasal. This was evident when testing the word examples in (14 - 17).

- (14) Utterances tested containing the Approximant-Fricative environment that prohibited schwa deletion and my consultant's surface form.
- a. *appareil de lavage* [apʁɛʒ də lavaʒ]
'washing machine'
 - b. *levant...* [ləvɑ̃]
'rising'
 - c. *levier* [ləvjɛ]
'lever'
- (15) Utterances tested containing the Nasal-Nasal environment that prohibited schwa deletion and my consultant's surface form.
- a. *mener a...* [mənɛ]
'lead a'
 - b. *menées...* [mənɛ]
'conducted'
 - c. *...de menace...* [mənɑs]
'threat'
- (16) Utterances tested containing the Plosive-Fricative environment that prohibited schwa deletion and my consultant's surface form.
- a. *...sa pesée ...* [sa pɛzɛ]
'weighing it in'
 - b. *pesamment...* [pɛzɑmɑ̃]
'heavily'

- c. *pesant...* [pəza]
‘heavy’
 - d. *la besogne...* [la bəzɔŋ]
‘the task’
- (17) Utterances tested containing the Plosive-Nasal environment that prohibited schwa deletion and my consultant’s surface form.
- a. *penaud...* [pəno]
‘sheepish’
 - b. *benêt...* [bənɛ]
‘fool’
 - c. *...ni tenable...* [ni tənabl]
‘neither tenable’
 - d. *tenir...* [tənir]
‘hold on’

As none of these words experience schwa deletion, it is likely to assume that if schwa was deleted the manner of articulation cluster combinations would violate a constraint. Additionally, the examples found in (14 - 17) reflect that manner of articulation cluster combinations have an impact on schwa deletion, as the words in each category often differ in their place of articulation and voicing. The consonant cluster constraints depicting the environments that prohibit schwa deletion, in my consultant’s speech, are illustrated in (18 - 21).

- (18) *APPROXIMANT-FRICATIVE (ONSET): Assign one violation for every Approximant-Fricative consonant cluster in onset position i.e. *lv.
- (19) *NASAL-NASAL (ONSET): Assign one violation for every Nasal-Nasal consonant cluster in onset position i.e. *mn.
- (20) *PLOSIVE-FRICATIVE (ONSET): Assign one violation for every Plosive-Fricative consonant cluster in onset position i.e. *ps.
- (21) *PLOSIVE-NASAL (ONSET): Assign one violation for every Plosive-Nasal consonant cluster in onset position i.e. *bn.

From the current analysis, there is no evidence to suggest there is a more general constraint that could be implemented instead of the four specific constraints; (18

- 21). One may suggest that onset clusters have to obey the sonority hierarchy, however, close inspection of the manner of articulation combinations evidence this is not clearly applicable. For instance, whilst Plosive-Fricative goes up in sonority, Approximant-Fricative goes down in sonority. This shows some cases don't conform to a sonority hierarchy constraint yet still prohibit schwa deletion. When examining constraints (18 - 21) there is no evidence to suggest a relative ranking. These constraints are depicted below in Figures 11 to 14.

5 SUMMARY

Overall, after studying schwa deletion, it is evident my speaker's French was not reflective of Tranel's specific OT constraints *lp and *sp. From examining multiple utterances, my speaker reflected that there were specific manner of articulation consonant clusters that prohibited schwa from deleting, as seen in (18 - 21). The Hasse diagram below in Figure 15 shows the final OT analysis and the constraint ranking of my speaker's speech.

The lack of comparability between my speaker's French and Tranel's OT analysis could be due to my consultant's French being 'dialectal', as opposed to a 'standard' variety of French. In a future study, to deduce whether this is the leading factor to why Tranel's (1999) analysis is not representative of my speaker's French, one could observe and examine a group of French speakers with a range of different dialects. Such a study would evidence whether the variability of French schwa deletion is influenced by an individual's French dialect. Also as schwa deletion is an optional process, it would be necessary to examine more speakers to observe what the general tendencies are.

In addition, my speaker did not present any evidence to suggest that the optionality of schwa deletion is dependent on the speaker's rate of speech. For instance, in both my observation and consultation of my speaker's French, my speaker did not omit schwa more when her rate of speech was quicker. During my observation, my speaker spoke conversationally and at a fast pace. Whereas, whilst consulting with my speaker, allowing her to make well-formed judgements about whether she would delete schwa in specific words, her speech was a lot slower. In both my observation and consultation the same words underwent schwa deletion. One could argue that, whilst my speaker's French didn't reflect schwa deletion being optional, as proposed by Tranel (1999), it is plausible other factors may make schwa deletion optional. For instance, further study of my speaker within a different setting may suggest that formality has an impact on her schwa deletion. As my observation and consultation with my speaker was conducted in an informal setting it may have led to more schwa deletion. Whereas, in a highly professional setting my speaker may delete schwa a lot less.

Whilst, I aimed to develop the most influential constraints, that cover a large majority of the environments that prohibit schwa deletion, it was apparent other consonant clusters impacted schwa deletion. My speaker's speech presented no clear constraint rankings or broad constraints that would produce the right surface form of my speaker's French. For example, /Rəfʁe/ and /Rəfile/ reflect the same

/ləvɑ/	*APP-FRIC (ONSET)	*NAS-NAS (ONSET)	*PLO-FRIC (ONSET)	*PLO-NAS (ONSET)	SE
☞ a. ləvã					**
b. lvã	*!				

Figure 11 Tableau depicting *APPROXIMANT-FRICATIVE (ONSET) on the word /ləvɑ/.

/mənɛ/	*APP-FRIC (ONSET)	*NAS-NAS (ONSET)	*PLO-FRIC (ONSET)	*PLO-NAS (ONSET)	SE
☞ a. mənɛ					**
b. /mne/		*!			

Figure 12 Tableau depicting *NASAL-NASAL (ONSET) on the word /mənɛ/.

/la bəzɔŋ/	*APP-FRIC (ONSET)	*NAS-NAS (ONSET)	*PLO-FRIC (ONSET)	*PLO-NAS (ONSET)	SE
☞ a. la.bəzɔŋ					***
b. la.bzɔŋ			*!		

Figure 13 Tableau depicting *PLOSIVE-FRICATIVE (ONSET) on the word /la bəzɔŋ/.

/pənɔ/	*APP-FRIC (ONSET)	*NAS-NAS (ONSET)	*PLO-FRIC (ONSET)	*PLO-NAS (ONSET)	SE
☞ a. pənɔ					**
b. pno				*!	

Figure 14 Tableau depicting *PLOSIVE-NASAL (ONSET) on the word /pənɔ/.

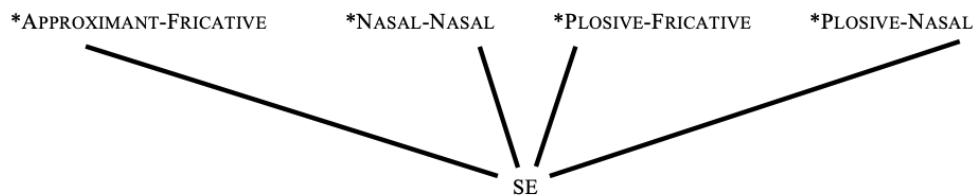


Figure 15 Hasse Diagram.

consonant cluster /ʀf/ yet only /ʀəfʀe/ experienced schwa deletion. Examination of the role the /i/ vowel preceding /ʀəf/ in /ʀəfile/ is uninformative as multiple other words such as /pəti/ show schwa deletion with this vowel following the second consonant of the consonant cluster. The lack of uniformity of schwa deletion and the consonant clusters that are prohibited in French stresses how wider studies need to be produced to account for these irregularities.

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APPENDIX

French Word	English Gloss	Underlying Form	Surface Form
bedaine	'belly'	/bədɛn/	[bədɛn]
benêt	'stupid'	/bənɛ/	[bənɛ]
besogne	'work'	/bɛzɔŋ/	[bɛzɔŋ]
dedans	'in'	/dɛdã/	[dɛdã/]
fenaison	'haymaking'	/fənɛzɔ̃/	[fənɛzɔ̃]
ferons	'will'	/fɛʀɔ/	[fɛʀɔ]
je m'appelle	'my name is'	/jə.mapɛl/	[j.mapɛl]
je taime	'I love it'	/jə.tɛmɛ/	[j.tɛmɛ]
levant	'rising'	/ləvã/	[ləvã]
lavage	'wash'	/ləvje/	[ləvje]
me lasse	'tired me'	/mə las/	[m.las]

Continued on the next page.

French Word	English Gloss	Underlying Form	Surface Form
me lave	'wash me'	/məlav/	[m.lav]
me lâche	'let me go'	/mə.laʃ/	[m.laʃ]
menacer	'threaten'	/mənase/	[mənase]
menées	'conducted'	/məne/	[məne]
me rappell	'reminds me'	/mərə'pɛl/	[mrə'pɛl]
ne pas	'do not'	/nə.pa/	[nə.pa]
neveu	'nephew'	/nəvø/	[nəvø]
pas de role	'no role'	/padərol/	[padrɔl]
penaud	'sheepish'	/pəno/	[pəno]
petite	'small'	/pəti/	[pti]
pesamment	'heavily'	/pəzamã/	[pəzamã]
pesant	'weighing'	/pəzã/	[pəzã]
pesée	'weighing'	/pəze/	[pəze]
refiler	'pass'	/Rəfile/	[Rəfile]
referai	're-do'	/Rəfre/	[Rfre]
se bagarre	'fighting'	/sə.baɾar/	[sbagar]
ce panneau	'this panel'	/sə.pano/	[spano]
cela	'this'	/səla/	[sla]
se néglige	'neglects'	/səneglizɛ/	[sneglizɛ]
serez	'be'	/səre/	[srɛ]
chelou	'weird'	/ʃəlu/	[ʃəlu]
chenal	'channel'	/ʃənal/	[ʃənal]
tenir	'hold'	/təniR/	[təniR]
vedettariat	'stardom'	/vədɛtarja/	[vədɛtarja]

Table 3 The table above provides a list of the French words that were observed. Each of these words, provided by the native French speaker, featured an environment where schwa was present in its underlying form. The underlying and surface forms of each French word observed are transcribed in the International Phonetic Alphabet. Additionally, the table includes the English translation of each French word.

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