

French *liaison* and segmentation of non-words by Swedish learners of French

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Due to liaison in spoken French, *son œuf* (his egg) is pronounced like *son neuf* (his nine). Yet some studies indicate that such pairs are not totally homophonous. The present study examines how Swedish learners of French segment minimally contrasting liaison and non-liaison phrases containing non-words. The results show that the learners are not able to discriminate between phrases such as *un avas – un navas*, *les avas – les zavas* and *premier uveur – premier ruveur*. They tend to segment both phrases as containing a liaison. However, the learners are sometimes able to discriminate between phrases such as *un petit uveur – un petit tuveur*.

1. Introduction

In spoken French, the phonological process of *liaison* makes syllabification override word boundaries, a fact which might complicate word recognition, especially for learners of French who are not used to this phenomenon in their native language.

Liaison consists of a word final consonant being pronounced at the attack of the following word if this word begins with a vowel. For example, *un ami* (a friend) is resyllabified [œ̃/na/mi]. The resyllabification of *un ami* thus creates the new “sound word” *nami* that does not exist in the French lexicon. However, should the second word in the sequence begin with a consonant, liaison does not occur and the word final consonant is then not realized at all. For example, *un tapis* (a carpet) is pronounced [œ̃/ta/pi].

Content, Dumay & Frauenfelder (2000) propose the Syllable Onset Segmentation Hypothesis (SOSH), which assumes that syllable onsets are locations where word boundaries are likely to occur. But, as these authors point out, such a syllable-based strategy is problematic insofar as syllable boundaries and word boundaries do not coincide, as is often the case in French, due to processes such as liaison. However, there may be a way around this problem. Content et al. point to the possible existence of acoustical differences between resyllabified consonants and normal word initial consonants, i.e. differences that listeners may be sensitive to and use as cues helping them to segment speech. Content et al. have in fact found some evidence of such word boundary cues, which allows them to challenge the traditional view of spoken French. According to them, a radical interpretation of their results would namely be that resyllabification does not occur in French.

A few previous studies had already pointed to differences between liaison consonants and word initial consonants, while others had suggested that no such differences could be found. Dejean de la Bâtie (1993) showed that the liaison consonant /t/ has shorter closure and VOT than word initial /t/. Her study also suggests that non-natives can, to some extent, discriminate between phrases like *petit ami – petit tamis* (boyfriend – small sieve) using such

durational cues (Dejean de la Bâtie & Bradley, 1995). Similarly, Wauquier-Gravelines (1996) demonstrated that liaison /t/ was shorter than word-initial /t/, but she found no such difference between liaison /n/ and word-initial /n/. Yersin-Besson & Grosjean (1996) found that the liaison consonants /n, z, t, r/ were on average 10% shorter than word-initial consonants. However, listeners did not seem to be sensitive to these cues since they were not able to discriminate between phrases that were lexically ambiguous due to liaison. Bannert (1998) examined all the five liaison consonants /n, z, t, r, p/ and their word-initial counterparts, not only in normal speaking rate but also in fast speaking rate. He found no significant difference in duration between the two types of consonants. On the contrary, Spinelli, McQueen & Cutler (2003) found that the liaison consonants /p, r, t, n/ were on average 10% shorter than the corresponding word initial consonants. They also showed, unlike Yersin-Besson & Grosjean, that French listeners are sensitive to these durational differences. Their results suggest that, thanks to such subphonemic cues, liaison does not make it difficult for French listeners to recognize vowel-initial words. The cues in question are not strong enough to completely rule out unintended interpretations, but they are sufficiently clear for the intended meaning to dominate the lexical competition process in the listener's mind (Spinelli et al., 2003).

There are thus diverging results concerning the acoustic realization of liaison consonants compared to word initial consonants and as to whether listeners are sensitive to the possible differences. The aim of this study is to examine how Swedish learners of French segment minimally contrasting liaison and non-liaison phrases containing non-words. Are the learners able to discriminate between phrases such as *un avas – un navas* and, if not, how do they segment such phrases, as containing a liaison or not? The use of non-words instead of real words might give a hint on how learners tend to segment words that they do not know. The use of non-words also prevents the learner from knowing only one of two contrasting words.

2. The experiment

For each of the liaison consonants /n/, /z/, /r/ and /t/, 12 vowel-initial non-words and 12 corresponding consonant-initial non-words were inserted after a real word that induces liaison if the following word begins with a vowel. The phrases were thus ambiguous as to the location of the word boundary. Examples:

/n/: un avas – un navas [œnavas] (*un = a/an/one*)

/z/: des avas – des zavas [dezavas] (*des* marks plural)

/r/: un premier uveur – un premier ruveur [œprəmjerɥvœ:r] (*un premier = a first*)

/t/: un petit uveur – un petit tuveur [œpətityvœ:r] (*un petit = a small*)

These phrases were all preceded by *Je vois* (I see), so that the listeners heard sentences such as *Je vois un avas*. For the consonant /n/, the following 12 non-words were developed: *avas, ésatage, ombres, ospot, ambrire, onclas, irveuil, eugard, auve, olcan, uman* and *invor*, and their consonant-initial correspondences *navas, nésatage*, etc. They were preceded by the words *un* (a), *mon* (my), *ton* (your) or *son* (his/her). For the consonant /z/, the same vowel-initial non-words in plural were used as stimuli, as well as their consonant-initial counterparts *zavas, zésatages*, etc. They were preceded by *des, ses* (his/her), *tes* (your) or *quelques* (some). For the consonant /r/, 12 other vowel-initial non-words were developed, namely *alveau, obac, uveur, éplan, orfège, utage, aclond, ivain, oplat, udon, ébère* and *amadu*, and their consonant-initial correspondences *ralveau, robac*, etc. They were preceded by *un premier* (a first), *un dernier* (a last) or *un léger* (a light). For the consonant /t/, the

same vowel-initial non-words were used as well as their consonant-initial counterparts *talveau, tobac*, etc. They were preceded by *un petit* (a small) or *un grand* (a big).

A French native speaker, male and around 25 years old, read the 96 test sentences as well as 36 distractors in randomized order. The speaker was not aware of the purpose of the experiment. The recording was made at the Department of Phonetics at Umeå University.

Twenty-four learners of French, all native speakers of Swedish, participated in the study. They studied French at the introductory level at the Universities of Umeå, Göteborg and Lund. The participants were tested individually. They were divided into four groups so that each listener heard a certain non-word only in one condition, i.e. either in the liaison condition or in the word-initial condition and either with the consonant /n/, /z/, /r/ or /t/. That means that each test sentence was heard by six listeners. Their task was to write down what they heard after the introductory words *Je vois* (I see). The listeners were told to spell the non-words as they would have done had it been real French words.

3. Results and discussion

The results are given in Table 1. The first line below information on the consonant in question shows the phrases produced by the speaker (S), with liaison and with a consonant-initial word. The next three lines show listeners' responses (R), as liaison and as a consonant-initial word, in number and percentages.

Table 1. Listeners' responses as numbers and percentages for the four consonants produced as liaison consonants and as word-initial consonants.

Consonant /n/			
S: Phrases with liaison (<i>un avas</i>)		S: Phrases with initial C (<i>un navas</i>)	
R: <i>un avas</i>	R: <i>un navas</i>	R: <i>un navas</i>	R: <i>un avas</i>
67	3	0	68
93 %	4 %	0 %	94%
Consonant /z/			
S: Phrases with liaison (<i>les avas</i>)		S: Phrases with initial C (<i>les zavas</i>)	
R: <i>les avas</i>	R: <i>les zavas</i>	R: <i>les zavas</i>	R: <i>les avas</i>
64	5	4	64
89 %	7 %	6 %	89%
Consonant /r/			
S: Phrases with liaison (<i>premier uveur</i>)		S: Phrases with initial C (<i>premier ruveur</i>)	
R: <i>premier uveur</i>	R: <i>premier ruveur</i>	R: <i>premier ruveur</i>	R: <i>premier uveur</i>
36	6	12	53
75 %	13 %	17 %	74 %
Consonant /t/			
S: Phrases with liaison (<i>petit uveur</i>)		S: Phrases with initial C (<i>petit tuveur</i>)	
R: <i>petit uveur</i>	R: <i>petit tuveur</i>	R: <i>petit tuveur</i>	R: <i>petit uveur</i>
29	15	35	35
60 %	31 %	49 %	49 %

From Table 1, we can see that for the consonants /n/ and /z/, the listeners nearly always comprehend the non-words as vowel-initial. In other words, the listeners interpret the phrases as containing a liaison, irrespectively of which of the two phrases the speaker produced. The results clearly show that the listeners are not able to discriminate between *un avas* – *un navas* or *les avas* – *les zavas*.

For the consonant /r/, around 75% of the listeners' responses are a vowel-initial word, independently of which of the phrases is intended. This suggests that listeners are not able to discriminate between phrases like *un premier uveur – un premier ruveur*.

For the consonant /t/, the results are more complicated. When the speaker produced a liaison phrase, 60% of the listeners' responses give a vowel-initial word and 31% a consonant-initial word. When the speaker produced a phrase with a /t/-initial word, half of the responses give a vowel-initial word, half a /t/-initial word. A closer look at the results for each word shows that 4 of the 12 /t/-initial words have been correctly identified by nearly all the listeners, namely *tuveur*, *téplan*, *tudon* and *tébère*, while the other 8 /t/-initial words have approximately the same proportion of listeners' responses as when the speaker produced a vowel-initial word. Thus, the listeners are sometimes able to discriminate between pairs like *petit uveur – petit tuveur*, and sometimes not. The next step will be to carry out an acoustic analysis of these pairs in order to examine if there are any differences that can be correlated with the listeners' responses.

The results of the experiment thus indicate that Swedish learners of French are not able to discriminate between minimally contrasting liaison and non-liaison phrases containing non-words, except for some cases with word-initial /t/. The listeners comprehend these ambiguous phrases as liaison phrases, irrespectively of which phrase is intended.

Interestingly, a few previous studies have shown that liaison does not delay word recognition (Matter, 1986; Wauquier-Gravelines, 1996), but that *potential* liaison does (Matter, 1986; Dejean de la Bâtie & Bradley, 1995). Potential liaison occurs when a word starts with a consonant which could be a liaison consonant but is not. Thus, all the consonant-initial non-words in the present study are examples of potential liaison.

The strong tendency of the Swedish learners to expect a liaison in these ambiguous phrases might be an effective strategy, since there are more words beginning with a vowel than with /n/, /z/, /r/ or /t/. The same experiment will be carried out with native speakers of French in order to compare their segmentations with those of the Swedish learners.

4. References

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