Vowel deletion and resyllabification in French speech: a source of perceptual difficulty for American learners of French

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1 Introduction *"Je ne pouvais pas l'entendre"*, replied the student in the French phonetics course when called upon to repeat a phrase that had just been played to the class during a practice session. Responding thus (*"I couldn't hear it*"), the student did not mean that the volume of the recording was too low, or that she was hard of hearing, but merely that she had been unable to perceive the message that the speaker intended.

One of the major problems in understanding a foreign language is the recognition of words in connected speech. Phonetic variability in speech segments and difficulties in identifying where words begin and end are the main causes. The sources of variation are numerous and may include the speech context itself, a major source, rate of speaking, rhythm, pitch, stress, as well as style. Phonetic segments that are clearly present when a word is spoken in isolation may be reduced, altered or omitted, or combined with other segments when the same word is produced in conversation. The reduced form may be insufficient for identification, and hence result in misperceptions.

Wondering if it might be possible to determine which segments or combinations of segments cause perceptual problems for American learners of French when they listen to recorded French speech, and whether their misperceptions mirror their mispronunciations, I decided to scrutinize the "hearing errors" made by my French phonetics students on a diagnostic listening test. I hypothesized that if I knew where in the signal their perception broke down then I might be able to come up with some creative ideas or remedies to ameliorate the problem. This paper looks at some of my findings.

2 Method A total of sixty-two diagnostic listening tests were scrutinized. All subjects at the time of testing were students in a French phonetics course at the University of Virginia. The procedure was uncomplicated: students were asked to listen to an excerpt (about 1.5 minutes in duration) of a professionally recorded text (Sacha Guitry's *"L'esprit de Paris"*) and to transcribe on their answer sheet (in standard French orthography, IPA notation, or a combination thereof) exactly what they heard, or thought they heard. The test took place in the language lab where students worked in booths with headsets and individual copies of the recording. They were able to control the volume (but not the speed); listen repeatedly, start, stop, or rewind the tape at will. Indeed, in order to write, they had to push the pause button, and then release it to continue listening. It was

made clear to them that I wanted to measure, not their comprehension, per se, but rather their ability to "hear" the words intended by the speaker. They were also told that the results of the test would be used for diagnostic purposes only. Although the test was not "timed", as such, most students worked on it for about thirty minutes. I inspected their completed transcripts and conferred with them individually about their responses, asking for clarification when a transcription seemed incredible. Their transcripts were then filed away.

3 Identifying the Problem The test results illustrate the underlying theme of this paper, namely, the listener's inability to recover the message intended by the speaker when phonetically reduced forms are present in the signal; or putting it differently, how the American listener compensates for sounds that are not phonetically present in French speech. Table 1 shows snippets of the listening passage in the form of a standardized transcript (the students' "input"); while Table 2 gives corresponding snippets of their actual "intake" (i.e. a transcript of what they claimed to have heard). A "hearing" error was identified as a mismatch between the two. The specific "hearing errors" shown in Table 2 are only a representative sample: no claim is being made that all listeners who misheard the five phrases in Table 1, misheard them exactly as they are presented in Table 2. However, the fact that listeners not only misheard some of the same words, but often misheard them in exactly the same wrong way (or made the same wrong matches) is pedagogically very instructive.

(1a)	*Nous **de**vons être d'accord je pense*	[*nu***dv**õzɛtrədakɔrʒ**ə**pãs]
(1b)	*il **me** paraît que c'est très juste*	[ilm**ə**parɛ**ks**ɛtrɛʒyst]
(1c)	*c**e** n'est pas y avoir vu l**e** jour…*	[**sə**nɛpaiavwarvy**lʒ**ur]
(1d)	*comme on **se**rait d'un cercle*	[kɔmõ**sr**ɛ…]
(1e)	*car il vous **de**vient à c**e** point nécessaire*	[karilvu**dv**jẽa**spw**ẽnɛsɛsɛr]

Table 1. Listeners' "input" (extracts of standardized transcript from Sacha Guitry's "*L'esprit de Paris*") – English translation given in appendix

(2a)	**Nous **a**vons être d'accord je pense*	* [nu**zav**õzɛtrədakɔrʒəpãs]
(2b)	**il **m'a** paraît (~ il **m'a**pparaît)…*	* [il**ma**parɛ …]
(2c)	**ce n'est pas y avoir **du** jour*	* [**sə**nɛpaiavwar**dy**ʒur]
(2d)	**commen**cer**ait d'un cercle*	* [kɔmã**sr**ɛ …]
(2e)	**car il vous **b**ien **d'es**poir nécessaire*	* [karilvu**bj**ẽdɛ**spw**arnɛsɛsɛr]

Table 2. Listeners' "intake" (transcript of high frequency errors)

It was not immediately apparent to me why these particular phrases (scattered throughout the recorded text), should be misperceived: the vocabulary was not unusual or difficult and the speaker's articulation was clear, though accelerated. Even less apparent still was the idea that the misperceptions might point to a

common cause. A detailed error analysis allowed me to see that the mishearings were congregating around those parts of the speech signal which contained an underlying schwa (alias '*e muet', 'e caduc*')—pronounced or not by the speaker—and to hypothesize a cause and effect relationship.

4 Discussion A very large number of listeners misheard the beginning of phrase (**1a).** As a matter of fact, 41 (out of 62) misheard it, as compared to only 21 who heard it correctly; and of the former, 14 misheard it as transcribed in **(2a)**. I theorized that the misperception occurred because the pronunciation of the verb-form '***devons'*** **[dvõ],** without the schwa, put the plosive, **[d],** in a perceptually weak position: no longer supported by a vowel, it was hence susceptible to being misperceived or disregarded altogether, especially by non-native speakers. Native speakers have the ability to "fill in the gap" by drawing on higher-level knowledge, but non-native speakers are often ill-equipped to do this. Had the syllable containing the schwa occurred phrase-initially, the speaker, most likely, would have pronounced it (*e.g.* '***De****vons-nous être'* > [**də**võnuzɛtr]) and the listeners, in all probability, would not have misperceived the word, as was the case in **(1c)**, [s**ə**nɛpa], where a phrase-initial schwa was actually pronounced by the speaker, and perceived correctly by all of the listeners; and *cf.* **(1b)**, [ilm**ə**parɛ], where a medial [**ə**] was pronounced by the speaker (owing to proper phonetic environment), and perceived by all listeners, albeit not always clearly—nearly half of them wrongly assigned the timbre to **[a]:** *[ilm**a**parɛ]. The retention of [**ə**] in this instance no doubt facilitated the listeners' ability to perceive the consonants **[lm]**, just as its deletion in **(2a)** made difficult the perception of **[dv].**

Curiously, many of the students who were unable to recognize [**dvõ**] as a variant pronunciation of [**dəvõ**] did, apparently, perceive correctly **{-ons}, [õ]** the verb-ending. In their attempt to repair the breakdown, they assigned the portion of the signal which they were able to perceive, [**võ],** to the wrong verb (***'avoir'***), knowingly, in many instances; and in so doing, they managed, in a sense, to 'recover' the deleted [**ə**] (though in a different phonetic shape), but not the **[d]** nor the 'word' intended by the speaker. The subject pronoun '***nous'*** at the beginning of the phrase may have facilitated the listeners' recognition of **[õ]**; and their knowledge of French syntax likely alerted them to the fact that ***'*** ***nous avons être'*** was a grammatically incorrect choice, but having listened numerous times, and scanned, unsuccessfully, their memories to find another match for '**devons',** they arrived at no further possibility and therefore wrote ***'avons'*** (a very familiar verb-form) on their answer sheets.

I also attribute the misperception in **(2c),** ***'vu le jour'*** **[vylʒur] > [dyʒur],** to the deletion of schwa (and to the apparently modified perceptual cues of **[l]** in this environment). Only 15 of the 62 students actually heard correctly **[vylʒur]**; the others all misperceived the **[l],** and some also misinterpreted **[v]** as **[d],** as shown in **(2c)**. The remaining sounds **[-y-ʒur]** (perhaps more salient) were perceived clearly**.** It is also interesting to compare the listeners' correct perception of **[l]** in

[ilmə] (no vowel deletion or resyllabification) and their incorrect perception of **[l]** in **[vylʒur]** (with vowel deletion and resyllabification)**.**

In **(2e)** there are two surprising misperceptions: the first occurs in the verb-form ***'devient'***, heard as ***'bien'*** by some listeners (similar to ***'devons'*** ~ ***'avons'*** discussed above); the second in ***'à ce point'***, heard by some as ***'espoir'***. In analyzing the first, I maintain once again that it is the speaker's schwa-less pronunciation, and the consequential realignment of the adjoining consonants that make it difficult for the listeners to distinguish the verb: **'*devient,'*** [**dvjẽ**] from the adverb ***'bien',*** [**bjẽ**]. Perceptually, the cues needed to identify ***'il vous devient'*** appear to have amalgamated into those of ***'il vous bien'.*** As for ***'à ce point…',*** misheard by 40 listeners (of whom 25 claimed to have heard not [**asp**wẽ], but **[ɛspw**ar], ***'espoir'***), I suggest that a perceptual breakdown occurred when the speaker pronounced the monosyllable ***'ce'*** without the schwa: **[sə] > [s].** If ***'à ce point*** had been pronounced with the schwa, [as**əpw**ẽ], it is highly unlikely that the students would have misheard it (because this pronunciation mirrors their own). The deletion of schwa in ***'ce'*** seems not to have altered the listeners' accurate perception of the fricative [**s**], suggesting its salience (at least in this environment). To speculate further about how listeners heard ***'espoir'*** instead of ***'à ce point'*** one might say that upon perceiving the cues for **[s-pw**] in the signal, they were so sure that they had found a correct match with ***'espoir'*** that they searched no further their mental lexicon, convinced that the initial sound of [**asp**wẽ] ***'à ce point…'*** was really the [**ɛ**] of ***'espoir…'***

Finally, **(1d)** offers a case differing only slightly from those already discussed. The speaker does not pronounce the underlying [**ə**] of ***'serait'*** **(**[**sə**rɛ] **>** [**s**rɛ]**),** as expected (cf. ***'devient'*****).** However, as we have just seen with ***'à ce point'*** the deleted vowel does not appear to have affected the clear perception of the surrounding consonants [**s-r]** (as was the case with **[d-v]**); nor effected any reduction in total number of vowels perceived (3 said, 3 heard). Nonetheless, the schwa-less pronunciation of '***on serait'*** **[**õ**sr**ɛ], (but cf. **'*il serait'*** [il**sə**rɛ], with the schwa), as well as French linking phenomena, have contributed to the listeners' difficulty in distinguishing word boundaries and in assigning sounds to the correct lexical items, as was also the case in **(1e)**: just as **'*à* ce point'** was perceptually amalgamated into ***'*espoir'***, for some listeners**,** so was ***'comme on serait'*** into ***'commencerait'.*** Although the theme of this paper does not deal with French vowel nasalization, these last two examples point to problems in this area.

5 Conclusion From the above examples we can infer that all cues in the speech signal are not of equal clarity or salience. The most salient ones have a greater chance of being perceived correctly, especially when the listeners are not native speakers of the language they are listening to. Many factors determine how well or how poorly listeners perceive cues in the speech signal. For non-native speakers these must include inadequate prior training in the target language and interference from their native language.

The examples discussed in this paper further suggest that the 'mute e' phenomenon constitutes a significant source of perceptual difficulty for American learners of French, particularly when learners are confronted with authentic, continuous French speech, and when the vowel is deleted. Because all students tested did not make errors—some (fewer than10%) were indeed able to "hear" the message intended by the speaker—there is reason to suggest that perceptual cues can be learnt and that, apparently, they get modified as learners progress in fluency in the target language.

One practical consequence of this finding is certainly that more attention should be devoted to this area in language teaching, e.g. in the form of more guided exposure of language learners to genuine spontaneous and recorded speech. Another is that more focused attention should be given to 'hearing' in our French phonetics courses. An excellent step in this direction is the model outlined by Ashby, Maidment and Abberton (1996), in their paper, "Analytic Listening: A New Approach to Ear-training" (http://www.phon.ucl.ac.uk/home/sh19/ashby/ma.htm). For American learners of French, listening exercises involving variable pronunciations of forms containing an underlying **"e"** may offer help. I am currently exploring this line of research.

Appendix (English equivalences of examples in Table 1)

1a. *Nous devons être d'accord je pense,*
We must agree, I think, (…)
1b. *(…), il me paraît que c'est très juste.*
(…) ,it seems to me that it is very accurate.
1c. *(…), ce n'est pas y avoir vu le jour,*
(…), it is not just having seen the light of day,
1d. *(…) comme on serait d'un cercle.*
(…) as one would belong to a private club.
1e. (…)*, car il vous devient à ce point nécessaire*
(…), because at this point it becomes a necessity to you
