

ON THE PRESENCE OF /ɬ/ IN THE HURON LANGUAGE

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ABSTRACT

The aim of this paper is the study of a particular point of the Huron, a language of the Iroquoian family spoken in the village of Wendake (or Lorette), near Quebec City, Canada, and in the State of Oklahoma. In 1904, it was noted that the Huron-Wendats of Lorette had introduced the letter 'L' in their proper names at the places where the comma was found of the old documents. Now, in the Huron-Wyandot spoken in Oklahoma, the same comma has been replaced by the letter 'Y', pronounced /j/ by the actual speakers. So, the same sound seems to have evolved differently in the two communities. This led us to make the hypothesis that the unknown sound that gave origin to the two actual phonetic realizations was a palatal lateral, a hypothesis that our findings tend to confirm.

1. INTRODUCTION

The descendants of the Huron nation live in Wendake, formerly known as Lorette, near Quebec City, Canada, and in

the State of Oklahoma. The Hurons of Oklahoma are now known as Wyandots, whereas those of Wendake are known as Wendates. The problem in describing the language is due to the fact that the last subjects who spoke it as a mother tongue died at the beginning of this century. The French missionaries who transcribed the language in the XVIIth Century, using the Latin alphabet, lacked symbols to note phonemes that were not used in French. They compensated by using various graphic signs, such as the comma, the theta, the subscribed iota or the apostrophe, and provided a summary explanation of them. Therefore it is very difficult to get an exact idea of the pronunciation of Huron spoken in the XVIIth, XVIIIth and XIXth Centuries on the sole basis of these documents.

During the XIXth Century, the letter 'L' began to appear in the Wendate dialect, especially in topographic names, but also in the current vocabulary. It seems that the pronunciation had evolved, and at that time the Hurons themselves were the writers. Table 1 shows examples of this evolution.

XVIIIth Century	Wendat	Wyandot	Glosis
,arha	larha	yarha	forest
,anochia	lanochia	yanonshia	house
,andi,onra	landilonra	yadironra	thought
,aronia,re	laronhiale	yaronya'ye	in heaven

Table 1, Evolution of the pronunciation in the Wendat and Wyandot dialects.

As for the Wyandots, who migrated to Ohio, Detroit and Kansas before settling definitely in Oklahoma, they used systematically the letter 'Y' where the comma was used in older documents. Marius Barbeau [1], who made the recordings that we used for our study, says that the sound corresponding to this letter is the semivowel /j/ as in the English word 'yes'. The aim of our work is to find out the characteristics of a sound that is now written with the letter 'L' in Wendat and with the letter 'Y' in Wyandot, our hypothesis being that the exact sound is a palatal lateral /ɬ/. On that respect, Lounsbury [2] questions the phonetic value of the letter 'Y' used by the Wyandots: « The exact pronunciation of Huron 'Y' is open to question, since it is no longer possible to consult speakers of the language, but Potier described it as a 'semi-letter' equivalent to 'i', and the other French writers noted it as a subscribed iota ». In other words, is it a /j/, an /l/ or a third sound that takes some characteristics of the first two? We intend to answer this question on the basis of acoustic analyses of wax cylinder recordings made at the beginning of the century from last native speakers of Wyandot.

2. METHOD

2.1. Summary

The wax cylinder recordings were digitized and analyzed. The formant frequencies and the duration of the consonant and its adjacent vowels were measured. The measurements were compared to the data available on palatal glides and laterals as described in section 2.3. and then they were used to synthesize the sounds thus eliminating the surface noise of the wax cylinder recordings and restoring a part of their acoustic quality. These synthesized stimuli were submitted to the judgment of French and Spanish language speakers, the former language not having /ɬ/ as a phoneme, the latter having it. The listeners were asked to tell what sound they heard. Then in order to find out the exact nature of the analyzed segment, we synthesized the sequence /ala/ in which we assigned different F1 and F2 frequencies to the /l/ portion.

2.2 The corpus

The corpus we worked on comes from the Huron dialect of Oklahoma. It was recorded on wax cylinders by the anthropologist Marius Barbeau for the Canadian Museum of

Civilization during the summers of 1911 and 1912. It goes without saying that the quality of these recordings is very poor. The frequencies higher than 2000 Hz are lost and so is the fundamental frequency. Moreover, there is a strong background noise that prevents from identifying the sounds with precision. On the other hand, these are the only existing audio documents on the Huron language. Figure 1 shows a sample of a sonagram

made from these recordings. The corpus contains no more than 40 Huron words, and only a few of them can give information on the phoneme that is the object of our study. Nevertheless, we got good examples of the segment in initial and intervocalic positions, most of them preceded and followed by vowel /a/. For our analysis, we retained 10 words in the context of this vowel.

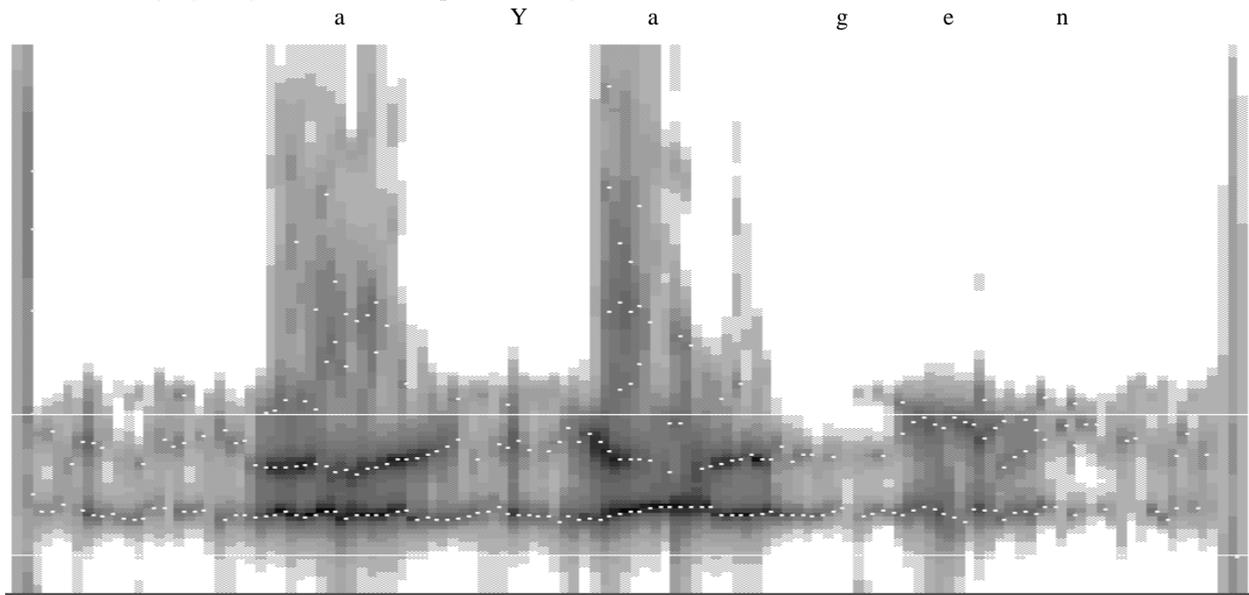


Fig. 1. Sonagram of the word 'aYagen'.

2.3 Identification criteria

2.3.1. /j/. According to Chafcoulof [3], the palatal glide /j/ is characterized by the following formant structure: F1 = 250~275 Hz, F2= 2500~2700 Hz, F3= 3000~3100 Hz.

It is to be noted that a glide has seldom a long steady state, and, in the case of /j/, important CV transitions can be seen.

2.3.2 The lateral. According to the same author, the duration is what allows to distinguish in a definite manner a lateral consonant from a glide, García Jurado *et al.* [4] emphasize as well the duration as a parameter for identifying a lateral. Furthermore, O'Connor *et al.* [5] and Lisker [6] consider a steady state duration of 50 ms. as a minimum for /l/ to be accurately identified. Of course /j/ may also be that long, but it is seldom longer. Generally speaking, a lateral has long steady states and short CV transitions. But the transitions of a palatal lateral may be a little longer because it is articulated with the tongue body, a rather big organ. O'Connor *et al.* [5] mention that the F2 of a lateral may vary between 840 and 1700 Hz in

the context of vowel /a/. They add that the closer to 1800 Hz F2 is, the more palatal the consonant is. For Chafcoulof [7], however, F1 may be high, but it is important to put F2 no higher than 1900 Hz, so that it could not be confused with /j/. Finally, according to Recasens *et al.* [8], « German speakers exhibiting a high F2 frequency at about 1800~1900 Hz present maximum dorsopalatal contact ». F3 is around 3000 Hz, but it is not relevant in our analysis, because it did not appear on the spectrograms.

3. FINDINGS

3.1 Formant frequencies and durations

Tables 2 and 3 show the formant frequencies and steady state durations for the occurrences of the sound corresponding to the letter 'Y' in the Oklahoma dialect. There is still one unknown meaning, since Barbeau did not provide any of them. Some meanings are even lost by the Hurons themselves.

Words	Meaning	F1 (Hz)	F2 (Hz)	Steady state duration (ms)
ayataste	I am heavy	762	1667	67
ayaden	(meaning unknown)	763	1752	111
ayagen	I am seeing it	763	1611	141
ayaraskua	I am leaving	763	1611	113
yayatha	pupil (of the eye)	1015	2028	174

Table 2. F1, F2 and duration of the sound corresponding to the letter 'Y' in Oklahoma dialect, intervocalic position.

Words	Meaning	F1 (Hz)	F2 (Hz)	Steady state duration (ms)
yaa 'ta	Body	1017	1582	119
yadakia	(meaning unknown)	763	1724	126
yaton	I am lost	819	1526	90
yagwenda	eye	840	1950	48
yayatha	pupil (of the eye)	1044	1623	91

Table 3. F1, F2 and duration of the sound corresponding to the letter 'Y' in Oklahoma dialect, word initial position.

As it can be seen on the tables, the F1 frequencies measured on the occurrences of the Wyandot 'Y' are much higher than those of the corresponding formant of a palatal glide and even higher than those usually found in alveolar laterals. In fact, F1 frequency is the same as F1 frequency of the adjoining vowel /a/. This gives a good cue concerning the nature of the phoneme. In intervocalic position F1 is lower than in initial position, but still much higher than the F1 of a /j/ or a /l/. As for F2, in both positions, it is lower than the corresponding formant of the palatal glide, the mean frequency obtained from the measurements of the ten words is around 1700 Hz. Some of the F2's respond to O'Connor's and Recasen's definition of a palatal formant, but some others do not. The mean frequency of the vowel F2 is 1300 Hz, therefore a positive transition is observed for this formant, but the difference between the F2 frequency at the onset of the vowel and the frequency of the same stabilized formant within the vowel does not exceed 400 Hz except for two cases. As for the duration, it is longer than 100 ms. in all intervocalic positions but one. As normally expected, there are shorter steady state durations in word initial position. The 174 ms. duration observed in the word 'yayatha' (Table 2), may be due to gemination. These results are far from the acoustic parameters of a palatal glide,

3.2 Checking with synthesis. To find out the real nature of the phoneme, we synthesized the words with a Sinpar synthesizer. This software is a Klatt cascade formant synthesizer, using the mouse for the tracing of some parameters, such as the formants, the bandwidths, the intensity of voicing and noise and the fundamental frequency. So we could copy the parameters that were visible on the spectrograms, thus eliminating the noise and keeping only the relevant features. The 10 stimuli were submitted to the judgement of Canadian French and Spanish speakers, the former not having palatal /ɲ/ as a phoneme in their own language, the latter having such a phoneme as we said earlier. Yet the palatal glide exists in both languages. The results were the following: According to the French speakers, the consonant was neither /l/, nor /j/. On the other hand, the Spanish speakers identified the consonant as a /ɲ/ slightly different from the consonant they used to pronounce, but a palatal /ɲ/ anyway.

3.3 Cues for identification. We carried out a last experiment in order to find out which were the cues that made us identify a /ɲ/. To that end, we drew on the synthesizer a /aCa/

sequence, where 'C' is a consonantal segment, using only F1 and F2, the only visible formants on the spectrograms. In the steady state portion of the consonant, F1 and F2 frequencies were set at 400 Hz and 1650 Hz respectively, consequently with positive F2 transitions. This gave a /ala/ sequence with an alveolar clear /l/. Raising F2 up to 1800 Hz gave a palatal lateral, as expected. Now, putting back F2 to 1650 Hz and gradually raising F1 up to the values that were measured on the spectrograms (762 Hz and more) also changed the lateral from alveolar to palatal. Most of the consonants 'Y' of our sample, although they did not have very acute F2's, had nevertheless high F1's and were recognized as palatal laterals. With F1's that high, one should hear 'r' sounds [7], but the positive F2 transitions seem to prevent such auditory perceptions.

4. CONCLUSION

Our experiments tend to confirm our hypothesis: The last individuals who spoke Huron as a mother tongue in Oklahoma used a /ɲ/, and not a /j/ as Barbeau thought. This can explain why the same phoneme evolved in two different ways in actual Huron what is an alveolar lateral in Wendat and a palatal glide in Wyandot. The main cues for the identification of the said consonant are a high F1, together with positive transitions and long steady state duration. We do not consider these results as definitive, but they make up an interesting path for further research.

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