What is the Difference between Alveolar Stops and Retroflex Stops in Nepali?

DongYun Kwak

Sogang University

1 INTRODUCTION

In the class Field Methods opened in the 2019 Spring Semester, Nepali had been studied. Among various aspects of Nepali, in this paper, retroflex consonants of Nepali will be covered. In both English and Korean, there is no retroflex sound. According to Khatiwada (2009), however, there are four types of retroflex stops: [ɖ], [ɖʰ], [ʈ], and [ʈʰ]. These new sounds are intriguing because the Nepali can distinguish retroflex stops from alveolar stops such as [d] or [t]. In this paper, therefore, the difference between retroflex stops and alveolar stops in Nepali is to be analyzed through spectrograms.

2 LITERATURE REVIEW

According to Ladefoged (2001), retroflex sounds can be defined as "the sound in which the tongue is curled up and back to touch the roof of the mouth behind the alveolar ridge" (p. 142). Although some authors do not use the term, retroflexion, in the case of Nepali because of a lesser degree of retroflexion (Pokharel, 1989), Khatiwada (2007) shows "that the tongue tip is curled back for some speakers after /a/ and /u/."

3 METHODS

The participant is an exchange student from Hong Kong who can speak both Nepali and English. During 16 weeks of the classes, elicitation sessions were held repetitively in the medium of English. To get more accurate voice recordings by the speaker, however, the recording session was conducted in Linguistic Lab 1 in J building. Before starting to record, with the help of the speaker, the four sets of the sentences, which contain [d], [ɖ], [t], and [ʈ] respectively, were made to be analyzed. Certain words got from the elicitation session during the classes could not be verified as alveolar stops or retroflex stops; therefore, a few words which contain retroflex sounds were chosen from the article by Khatiwada (2009). The problem was that the Nepali speaker did not know some of the words in the article, so it has to be considered that the number of data sets was limited. After the recording session was finished, the sound files were analyzed by the software Praat.

4 ANALYSIS OF THE DATA

The first pair to be analyzed is [mati] and [muʈu]. The sound [mati] means *to fly*, and [muʈu] means *heart*. Here are the sentences used for the recording:

(1) bɔ:l **mati** gojo (The ball flew.)

(2) bad͡ze lai **muʈu** kobi mari͡tse (Grandfather has heart disease.)

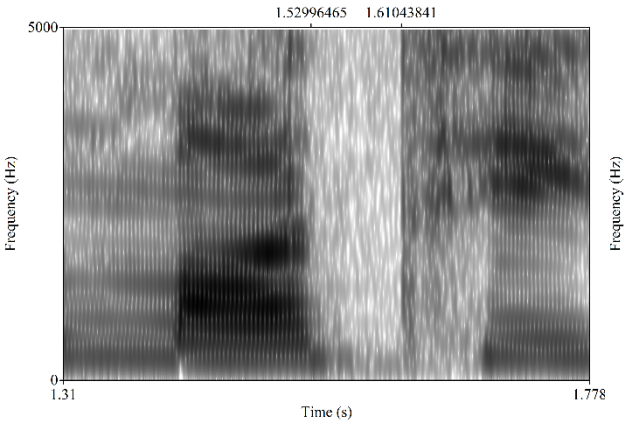

Figure 1. Spectrogram of **mati**

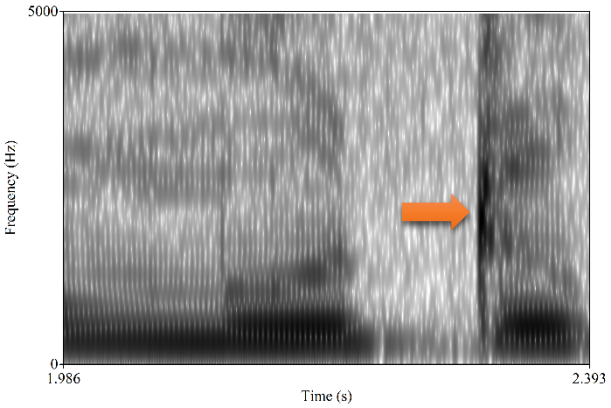

Figure 2. Spectrogram of **muʈu**

At first, the length of the stop closure of [ʈ], which is around 0.075, is slightly longer than that of [t], which is

about 0.062. However, the most distinctive feature is that there are no evident parts of the burst in the case of [t], while retroflex [ʈ] has at the point of around 2159 Hz. That is, in Figure 2, the area, which is marked with a yellow arrow marker, is darker than others.

The second pair to be analyzed is [tal] and [ʈumlet]. The sound [tal] means *plate*, and [ʈumlet] means *a water bottle*. Here are the sentences used for the recording:

(3) mʌl lai **tal** dionʌ (Can you give a plate?)

(4) mʌi le bairʌ d͡zʌ dal d͡zʌi le **ʈumlet** leo t͡su (I always bring a water bottle when I go out.)

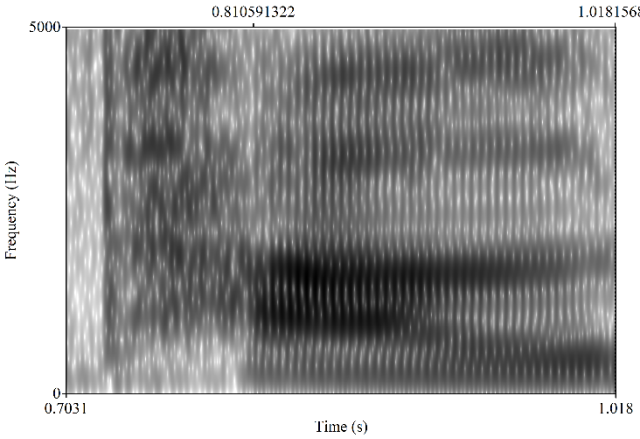

Figure 3. Spectrogram of **tal**

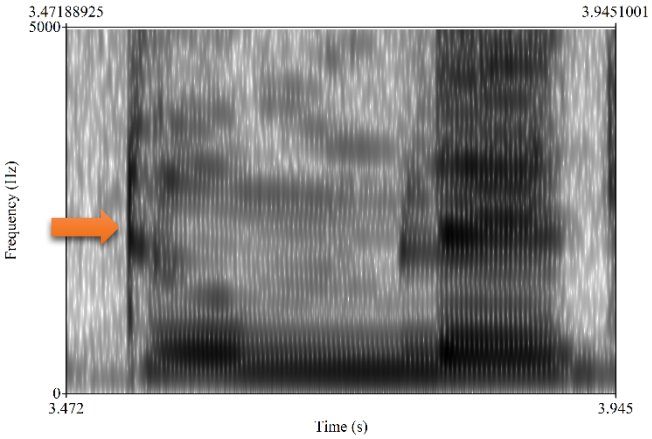

Figure 4. Spectrogram of **ʈumlet**

In this case, the length of the stop closure of [ʈ], which is around 0.062, is slightly longer than that of [t], which is about 0.049. Then, as similar to the previous sets, there are no evident parts of the burst in the case of [t], while retroflex [ʈ] has at the point of around 2882 Hz.

The third pair to be analyzed is [doga] and [ɖoga]. The sound [doga] means *betrayal*, and [ɖoga] means *a door*. Here are the sentences used for the recording:

(5) dimile mʌl lai **doga** dijo (You betrayed me.)

(6) **ɖoga** kolʌ ne (Open the door.)

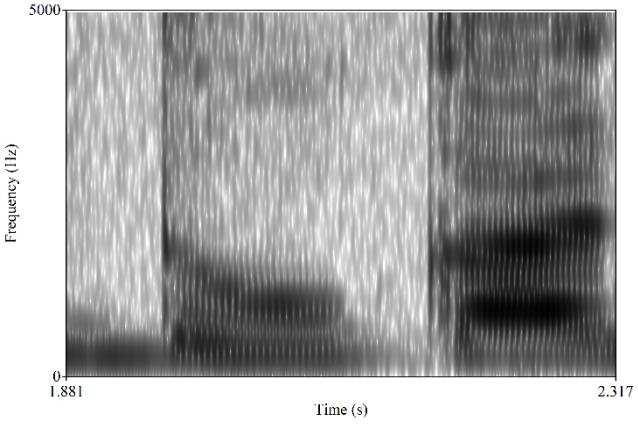

Figure 5. Spectrogram of **doga**

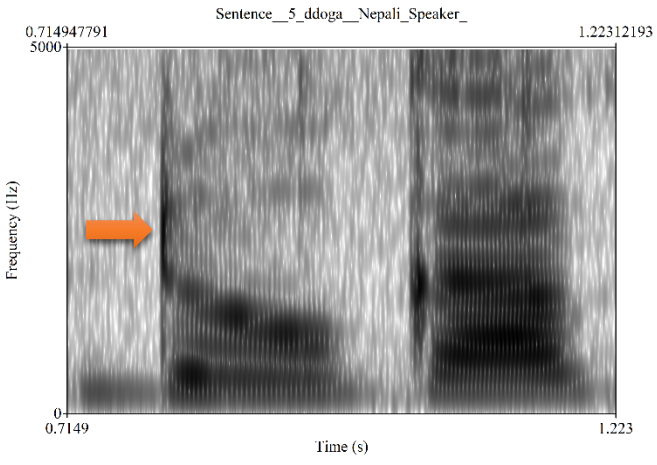

Figure 6. Spectrogram of **ɖoga**

In this case, the length of the stop closure of [d], which is around 0.087, is slightly longer than that of [ɖ], which is about 0.072. Then, the evident part of the burst of [d] is at around 1849 Hz, while retroflex [ɖ] has at around 2596 Hz. Though the alveolar stop [d] has the evident part of the burst compared to previous [t] sounds, its thickness is less evident than that of retroflex [ɖ].

5. INTERPRETATION AND CONCLUSION

According to the analysis, the length of the stop closure does not affect the difference between alveolar stops and retroflex stops. However, regarding the evident part of the burst, there seems to be a difference between them. Both retroflex [ɖ] and [ʈ] have more evident parts than alveolar stop [d] and [t].

In one elicitation session, there was a controversy about whether the word meaning *to see* has retroflex or not. Here is the problematic sentence and the spectrogram of it:

(7) mʌl le dimi lai **deke** or mʌl le dimi lai **ɖeke** (I see you.)

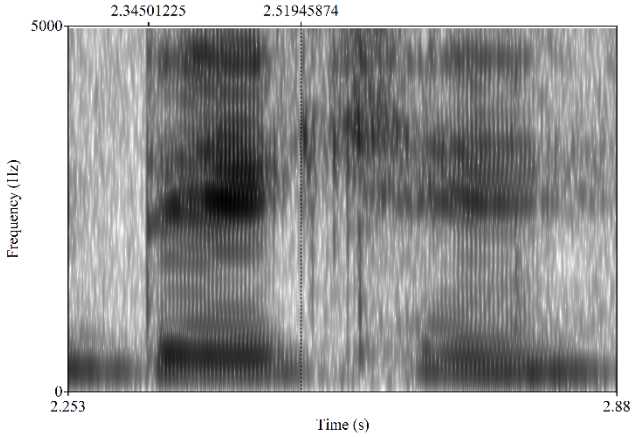

Figure 7. Spectrogram of **deke**

As this spectrogram does not have an evident part of the burst, such as [ɖoga], it seems reasonable to say the correct phonetic transcription of the word *to see* is [deke].

Because samples acquired from the sessions were not enough, the word pairs used in the research were not 100% minimal pairs. Nevertheless, the spectrograms show the difference between alveolar stops and retroflex stops, which means retroflex stops have more evident burst than alveolar stops. Therefore, it is acceptable to argue that there is a retroflex sound in Nepali.

References

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