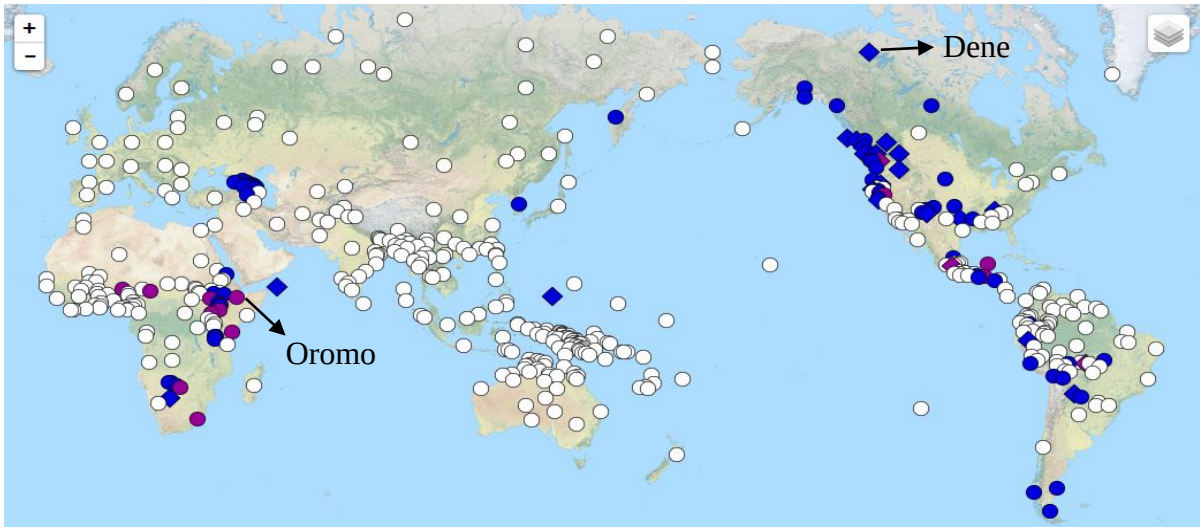
LEARNING ABOUT GLOTTALS IN DÉLĮNĘGOT'ĮNĘ KEDƎ AND OROMO LANGUAGES



Languages with glottalized consonants: blue/purple; languages without glottalized consonants: white

A report based on graduate research by Maida Percival involving the community of Délįnę

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Introduction

Dene is one of the many languages that have "glottalized consonants", or what are often call "clicks" in the Sahtú Region. These are consonants with a popping-sound, spelled with an apostrophe in Dene language, such as t’ (as in *t'a* for greyling) or ts’ (as in *ts'oh* for fly), ch' (as in *ch’ǫh* for porcupine), k’ (as in *k'ai* for willow). My research investigates glottalized consonants in two languages, Dene and Oromo, and has two main goals or research questions:

1. To learn how glottalized consonants differ from similar regular consonants (e.g. how t’ is different from t and d).

2. To learn what kind of differences can exist in how glottalized consonants are pronounced in different languages and within different speakers and different words in the same language.

How was this research carried out?

My first step was to record people who speak languages with glottalized consonants. Glottalized consonants occur in 17% of the world’s languages, but the languages in which they occur are spoken in very specific regions: the north and west coasts of the Americas, northeast Africa, south Africa, and the Caucasus mountains between Europe and Asia. I was therefore fortunate to be able to work with speakers of Dene in Délı̨nę for this project and also with speakers of Oromo, another language with glottalized consonants.

Oromo is a language spoken by more than 30 million people in northeastern Africa (Ethiopia, Somalia and Kenya). In Toronto, there is a community of Oromo speakers who have all immigrated to Canada from Ethiopia. Therefore, last winter I set up interviews at the University of Toronto’s Phonetics Lab with 8 speakers of Oromo. They read through a list of Oromo words, some with glottalized consonants and some with regular consonants.

In Délı̨nę, 8 men and women from different families were interviewed by Deborah Simmons and Michael Neyelle last February, and asked to pronounce Dene words. Like the Oromo words, some had glottalized consonants and some had regular consonants.

From the Oromo and Dene interviews, I was able to use a computer to analyze the sound waves of the words people recorded. This took several months, but the results were worth the wait!

What did the research find out?

I’ll provide a brief overview of what I found out in answer to my two research questions, and discuss some of the implications of these findings.

1. How glottalized consonants differ from similar regular consonants

To test this, the Dene words people recorded contained sets of three similar or related sounds such as t, t’, and d. These sounds are related because when people make these sounds, they put their tongue in the same place: try pronouncing t, t’, and d and you’ll notice that your tongue touches the same spot on the roof of the mouth, just behind the teeth. Because these sets of

consonants are pronounced so similarly with the tongue in the same position, I wanted to learn what it is about them that makes them sound different from one another.

To compare the sounds, I looked at pictures of them, and measured how long the sounds were, how loud they were, and what effect they had on the vowel immediately following them.

Length

The pictures below show the sound waves of the words *té* ‘blanket, mat’, *t’é* ‘charcoal’, and *de* ‘river’, spoken by the late Denise Bayha. These pictures can be read like graphs, with time along the horizontal axis. The t, t’, and d are highlighted in yellow. You can see that t’ and t are much longer than d. t’ and t both have a delay between them and the following vowel (é).

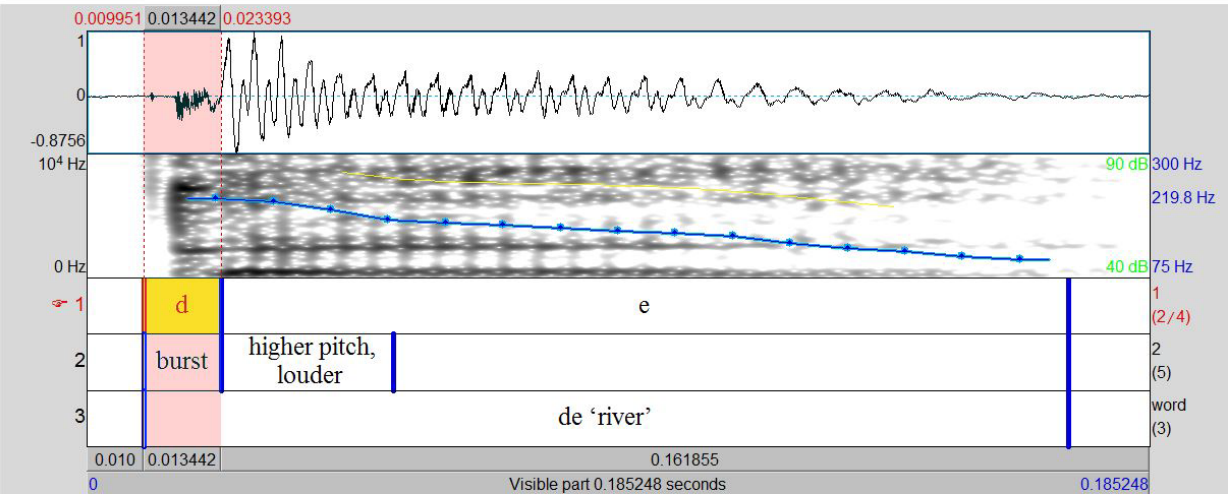
For t’, this delay is filled up by silence (whiteness in the picture), but for t, the delay is filled by what is called "aspiration" (the fuzzy greyness in the picture of té, which sounds like a puff of air).

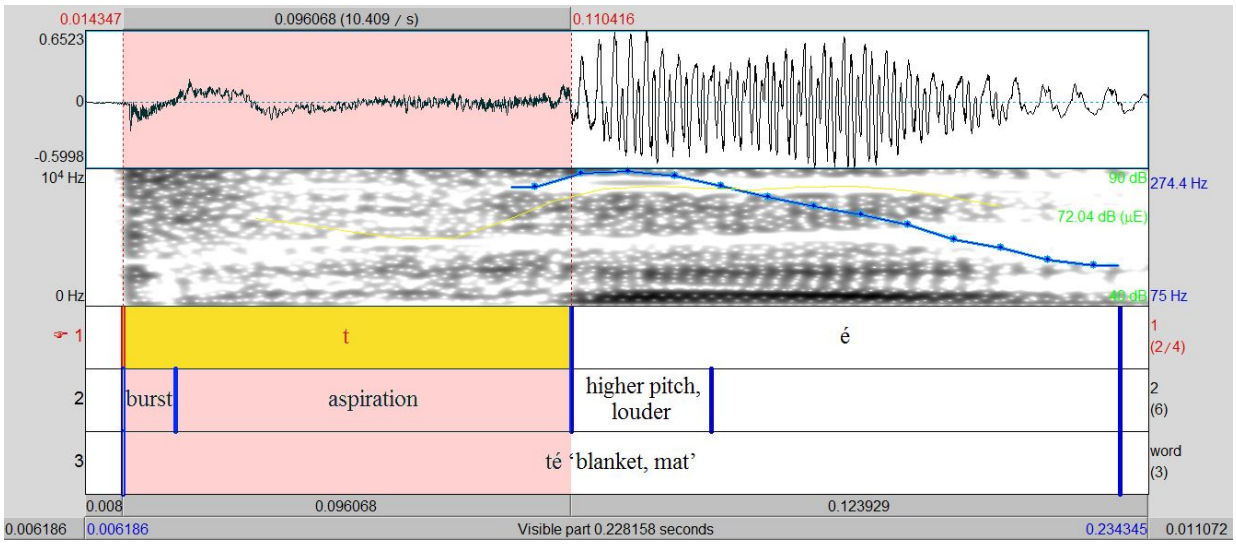
There are differences in how different Délı̨nę̨got'ı̨nę̨ pronounce the aspiration. To people who don’t speak Dene, the aspiration can sometimes make Dene t sound quite similar to k, like *ke* (foot).

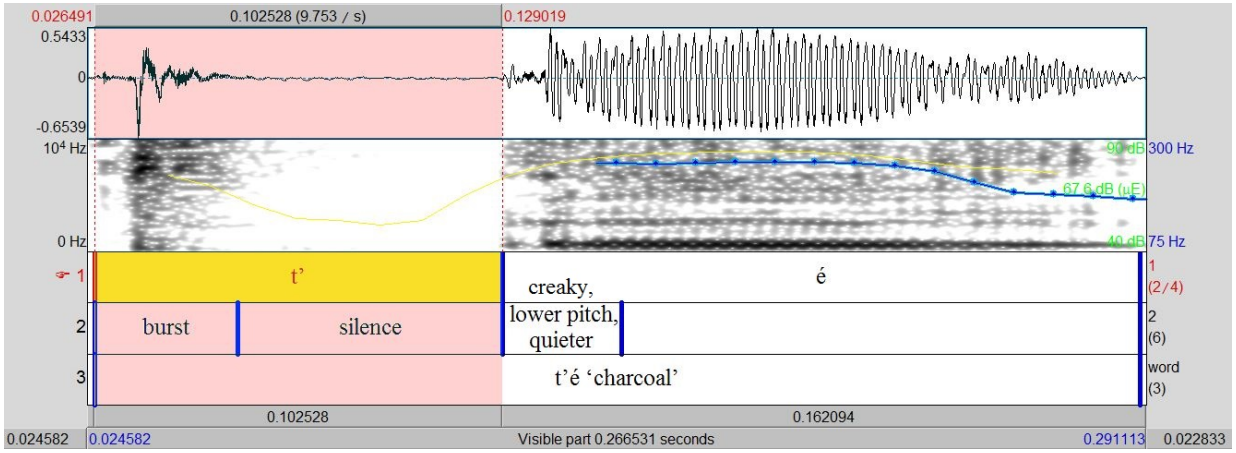
So being able to hear and speak the length and aspiration differences between Dene sounds can make a big difference in what words mean, as we can see with words like *t'é*, *deh*, *ke*, and *té*.

Loudness

In terms of how loud the consonants were, I found that consonants with aspiration like t were quieter than those without like t’ and d, and that those without were about equally loud. You can see this in the pictures below by looking at the sections labelled “burst”. The “burst” section is darker and more spiky for t’ and d than for t.







Effect on following vowels

One thing you might not think about is that when people talk, they slur all their sounds together: speech is not really as separate as it looks in written form, where sounds are sectioned off into their own distinct letters. Because sounds flow together in speech, consonants and vowels can affect how each other are pronounced.

In my study, I found that the glottalized consonants affect how the beginnings of the vowels immediately following them are pronounced. Glottalized consonants like t' make the beginning of the vowel after them sound quieter, have a slightly lower pitch, and have more of something called 'creaky voice' than regular consonants like t and d.

By pitch, I mean the same type of pitch you use when singing different musical notes and the same type of pitch that you use to make high and low tones in Dene. Lower pitch happens when your vocal cords vibrate less quickly while you talk. The pictures of *t'é*, *té*, and *de* above show pitch represented on the vowel by a blue line. The blue line is higher at the beginning of the

vowels in *té* and *de* and falls towards the middle whereas the blue line in *t'é* is quite flat and doesn't start out higher at the beginning of the vowel than in the middle.

Creaky voice is hard to explain–it is made when the vocal chords are a bit tight and vibrating irregularly. I've heard it likened to frog croaking or sheep baaing. Dene words with glottalized consonants do not sound like this, but they do have a very little bit of creakiness on the vowels right after the glottalized consonant, such as in the é in the picture of the word *t'é*. You cannot really hear the creakiness because it is so short–in Dene words, the creakiness is basically just part of what your ear associates with the sound of the glottalized consonant.

2. Different languages, different speakers, and different words

Across languages

I found that there are some differences in how glottalized consonants are pronounced by speakers of different languages.

For example, t' and k' as in the Dene words t'é (ashes, charcoal) and k'ái (willow) are sounds that are also found in Oromo. But in Oromo, I found that t' and k' are shorter than in Dene and are followed by vowels with slightly lower pitch.

Previous research also found differences in the glottalized consonants of different languages. One study suggested there are two types: languages with "strong" glottalized consonants like those of Navajo (another Dene language), and languages with "weak" glottalized consonants like those of Tigrinya (another language of Ethiopia). But I found that both Oromo and Dene glottalized consonants were not like those of Navajo or Tigrinya, suggesting that glottalized consonants differ too much across languages to be classified into two types.

One interesting thing that I noticed is that although glottalized consonants are known to differ across languages, when comparing Dene glottalized consonants to glottalized consonants in three other Dene languages (Witsuwit'en, Deg Xinag, and Tsilhqut'in), there are actually a number of similarities in how these sounds are pronounced. This reflects how closely related many Dene languages are. Long ago, Dene languages all originated from the same language, and this seems to be reflected in the languages, even in how speakers of them make their sounds.

Across speakers and words in Dene

Overall, Délı̨nę̨got'ı̨nę̨ are pretty consistent in how they pronounce sounds like t'.

One interesting finding is that everybody except for one person pronounced glottalized consonants like t' longer when they were at the beginning of a word (as in *t'é*) than when they were in the middle of a word (as in ǫt'é 'it is').

Another interesting finding is that there was a difference between men and women when it came to how glottalized consonants affected the pitch of the vowels following them. For women, pitch was clearly higher at the beginning of words starting with regular consonants like *té* than at the beginning of words starting with glottalized consonants like *t'é*. But for men, there was less of a pitch difference and for some speakers, there was no pitch difference.

What can be drawn from these findings is that even if people think of sounds as the same within and across languages, there are slight differences in pronunciation that fluent speakers are unaware of. These differences can be important when teaching and learning a language. If learners are exposed to samples of sounds by many different speakers of a language in many different words, they will subconsciously get a grasp of not only the ideal versions of sounds but also the variations on what these sounds can be.

Acknowledgements

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