Seeing speech: Teaching and learning Hul’q’umi’num’ pronunciation with Praat

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1. Introduction

Our project focuses on the Hul’q’umi’num’ language (Coast Salish, BC Canada). As is typical in this area, the Hul’q’umi’num’ language revitalization movement is being carried out by adult second language learners, who have taken on the task of transmitting their language to future generations, as teachers, researchers, and parents. These learners have very high standards when it comes to pronunciation, knowing that if they do not ‘get it right’, their language will be changed forever (see Bird & Kell 2017). Achieving ‘accent-free’ pronunciation is challenging though (Derwing 2018): Hul'q'umi'num' has 37 consonants, 21 of which do not occur in English. Very few Elders are available to provide learners with one-on-one support to master the unfamiliar sounds, and existing descriptions of these sounds are generally written for linguists and relatively inaccessible for community members.

To support pronunciation work, we have recently begun using speech visualization, which is emerging as an effective way of learning pronunciation in the broader field of second language acquisition (Olson 2014). The context for the work reported on here was a Masters’ level Hul’q’umi’num’ Phonetics and Phonology course offered in the summer of 2018, in which we participated as instructors (author, author) and students (author, author, author, author). Together, we worked with the freely downloadable speech analysis program Praat (www.praat.org) to visualize the acoustic properties of a range of Hul’q’umi’num’ sounds, with the goal of increasing our understanding of what to pay attention to in pronouncing and listening to Hul’q’umi’num’. In this paper, we describe our work, and what we gained from it. We first introduce the Hul’q’umi’num’ language context (Section 2) and some of the pronunciation challenges identified by teachers and learners (Section 3). We then summarize how we have been using speech visualization in Praat to overcome these challenges (Section 4). We end with a discussion of the value of this technique for Indigenous language learning (Section 5). Our goal is to share what we are doing to fine-tune our pronunciation, so that others may learn from it, and can feel comfortable incorporating similar work within their own language learning community.
2. Hul’q’umi’num’ language background
Hul’q’umi’num’ (Island Halkomelem) is the language spoken by the people whose territory extends along the Western Salish Sea, from Malahat to Nanoose on Vancouver Island, BC Canada and the neighbouring islands in the Strait of Georgia (see Figure 1). Hul’q’umi’num’ is one of three closely related dialects of what is often called the Halkomelem language, the other two being Hən̓ q̓ əmin̓ əm̓ (Downriver Halkomelem), spoken at the mouth of the Fraser River in the Lower Mainland and Halq’eméylem (Upriver Halkomelem), spoken further up the river in the Fraser Valley, on mainland British Columbia.

![Figure 1. Map of Hul’q’umi’num’ territory.](image)

According to Dunlop et al. (2018), in 2018 there were just under 100 fluent speakers and 1,238 active language learners across the three dialects. We estimate that there are currently 30-40 fluent first language Hul’q’umi’num’ speakers, over 200 fluent second language speakers, and over 1,000 learners of all ages. While the number of mother-tongue (first language; L1) speakers is in decline, the number of second language (L2) speakers is growing rapidly. Many L2 speakers - young adults in particular - are currently at intermediate to high levels of proficiency; they are leaders in their communities in terms of Hul’q’umi’num’ language revitalization, working as linguists, teachers, and parents to pass on their language to future generations.

To support new speakers of all ages, many new programs have been and continue to be created across Hul’q’umi’num’ territory. The work we describe below was done through the Hul’q’umi’num’ Language Academy (HLA), a partnership between Simon Fraser University (SFU) and the Hul’q’umi’num’ Language and Culture Society (HLCS), facilitated by SFU linguist Dr. Donna Gerdts. The HLA offers SFU undergraduate and Master’s level Linguistics...
programs in-community, at the Shhwulmuwqun (sh-: ‘place’; hwulmuw: ‘Indigenous person’; -qun: ‘throat/speaking’ = ‘our language place’), home of the HLCS. HLA programming includes courses on all aspects of Hul’q’umi’num’ linguistics, including Phonetics - the study of speech sounds.

Our project was conducted as part of a Masters’ level course in Hul’q’umi’num’ Phonetics and Phonology, offered in the summer 2018 by SFU and through the HLA. The project itself was funded through a SSHRC Partnership Development Grant, Hul’q’umi’num’ Phonetics Structures: Exploring Paths Towards Fluent Pronunciation, the goal of which is to support adult L2 learners in achieving oral proficiency. The research program as a whole involves (1) documenting the pronunciation of L1 and L2 speakers, (2) working with elders, teachers, and learners to identify challenges for learners, and (3) assessing teaching methods to overcome these challenges. The current project falls under (3). Specifically, we set out to assess the potential benefit of speech visualization using Praat to raise awareness among learners about the details of speech sounds across speakers (L1 and L2), and to help them understand how their speech might differ from that of their mentors.

3. Hul’q’umi’num’ pronunciation - challenges

In the field of Second Language Acquisition (SLA), it is widely accepted that the goal in teaching and learning pronunciation ought to be comprehensibility and intelligibility rather than native-like accent (Thompson & Derwing 2015). Nonetheless, learning to speak in an ‘authentic’ way, including mastering the details of pronunciation, is something that many learners of Indigenous languages take very seriously, as a way of honouring their language and their elders (Bird & Kell 2017). Also, learners recognize that hearing and articulating these sounds can open up their ability to expand their vocabulary, helping make sense of words they may have never heard before. For Hul’q’umi’num’ (and other Salish language) learners, this means learning to articulate many sounds and sound sequences that are not present in English, most learners’ L1 (Bird, Leonard, & Gerdts 2016). One of the biggest challenges is the consonant system: Hul’q’umi’num’ has 37 consonants, 21 of which are not in English (Table 1); these include ejective stops p’ t’ kw’ qw’ (/p’ t’ kʷw’ qʷw’/), glottalized resonants m’ n’ l’ y’ w’ (/m’ n’ l’ y’ w’/), uvular sounds q qw’ qw’ x xw (/q qʷ qʷ x xw/), and an extensive set of coronal fricatives th s lh sh (/θ s lʃ/) and affricates tth tth’ ts ts’ tl ch ch’ (/tθ tθ’ ts ts’ tʃ tʃ’/).

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1 Here and throughout the paper, italics are used for Hul’q’umi’num’ orthographic forms; angle brackets (/…/) indicate phonemic transcription (expected pronunciation based on the spelling), and square brackets […] indicate phonetic transcription (actual pronunciation).
Table 1. Hul’q’umi’num’ consonants (using the Hul’q’umi’num’ alphabet).

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Glottalization is marked by an apostrophe in Table 1. Two sets of sounds involve glottalization: ejective stops \(p’ t’ kw’ q’ qw’\) and affricates \(tth’ ts’ tl’ ch’\), and glottalized resonants \(m’ n’ l’ y’ w’\). Ejectives can be tricky for learners to produce consistently, with learners replacing plain stops or affricates with glottalized ones or vice versa (Bird, Leonard & Gerdts 2016), and pronouncing ejectives with slightly different phonetic properties than elders/teachers (Percival & Bird 2018). Glottalized resonants are also difficult in that the timing of the glottal articulation can vary based on phonological environment, and also in that the realization of glottalization can sometimes be quite subtle, as in word-final (post-)glottalized resonants.

Consonants with place of articulations that are similar to a single English place of articulation also present challenges, especially the uvular \(q q’ x qw qw’\) vs. velar \(k kw kw’ hw\) series; learners sometimes confuse these sounds, and have difficulty pronouncing the right sound in a given word. It is also not uncommon for students to mix up non-English sounds such as the lateral \(lh\) and dental \(th\) fricatives (Bird et al. 2016).

Another aspect of the Hul’q’umi’num’ consonant inventory that is interesting to consider in the context of language learning are the contrasts between dental \(tth tth’\) vs. alveolar \(s ts ts’\) series, and alveolar \(ts ts’\) vs. post-alveolar \(ch ch’\). These sounds involve substantial dialectal variation in terms of how salient the contrast is, which has yet to be documented thoroughly (though see Elmendorf & Suttles 1960). For some speakers, these sounds (e.g. \(th\)) are pronounced quite differently than they are in English, and as a result the key phonetic correlates of the related contrast (e.g. \(th\) vs. \(s\)) differ from what they are in English. Our impression is that learners who grew up hearing Hul’q’umi’num’ at home and/or in the community pronounce the dental and alveolar fricatives and affricates the way they heard them growing up. Learners who were not exposed to the language growing up tend to fall back on their English (L1) pronunciation.

Finally, a big aspect of Hul’q’umi’num’ pronunciation that is challenging for learners is the timing and spacing of individual sounds. Hul’q’umi’num’ words often feature long strings of
consonants. Onset consonant clusters can have up to 5 consonants in a row (e.g. *hwhtiwn /xʷtʰtiwən/ ‘think’; *hwθxwuwitst /xʷtθʷəwˈiːtst/ ‘washing someone’s back’). When some of these consonants are already challenging on their own, stringing them together is extra challenging. Unlike in English, each consonant needs to be given its own space and must be fully released before transitioning to the next sound, in order for the words to sound natural. Within the velar and uvular labialized series, timing of labialization can also be an issue, with learners preemptively rounding their lips and shifting labialization onto preceding vowels.

As mentioned above, learners of Hul’q’umi’num’ have very high standards with respect to pronunciation, but little by way of resources to support them when working on their own speech. For one thing, they have few opportunities to hear natural spoken language. They might hear speech in their communities; not all families have language speakers to hear and join in conversations in the home. Pedagogically, many of the more popular teaching methods for Hul’q’umi’num’ and other indigenous languages (e.g. TPR (Total Physical Response, Asher 1977), TPR-Storytelling (Cantoni 1999), and Greymorning’s (2011) Accelerated Second Language Learning Approach) de-emphasize pronunciation, assuming that learners can improve their pronunciation over time through hearing and modelling elders. Other methods, such as the Where Are Your Keys’ (WAYK, https://whereareyourkeys.org) program do incorporate some pronunciation techniques, but still do not provide much support in terms of concrete strategies to master pronunciation.

Until recent years, work on Hul’q’umi’num’, both linguistic and pedagogical, was done primarily through collaborations between elders and linguistics (e.g., Hukari & Peter, 1995; Gerds & Peter, 2011; Gerds & Hinkson, 1996). While the materials produced are of great value to language learners now and many of them do target pronunciation, they do not necessarily concentrate on the fine phonetic details of pronunciation. It is only since 2016 that HLCS and HLA programming has focused on pronunciation, as part of developing oral proficiency among new speakers. Starting in 2018, learners have been training to do pronunciation work themselves, on their own speech and in collaboration with their language mentors and with phonetics experts partnering on various projects and courses at the HLCS/HLA.

4. Hul’q’umi’num’ pronunciation - solution: speech visualization in Praat

To address the pronunciation challenges described above, and as part of continued training for Hul’q’umi’num’ learners, we explored the potential of Praat (www.praat.org), a free speech analysis software that is used by phoneticians and other speech scientists around the world to examine the details of speech sounds. In the following paragraphs, we introduce who we are (4.1), what context we were working in (4.2), and what we did (4.3).

4.1 Who we are

At the time we collaborated on this project, we were Masters students (4 of 15 total) and instructors in SFU’s Masters in Linguistics of a First Nations Language - Hul’q’umi’num’,
offered through the Hul’q’umi’num’ Language Academy (HLA) - see Section 2 above. Our project took place in the context of one of the required MA courses, Linguistics 830: Phonetics and Phonology of a First Nation’s Language: Hul’q’umi’num’.

Rae Anne Claxton Baker

I am an indigenous language learner and Master's student studying the linguistics of Hul'q'umi'num' at SFU. I am starting a PhD in Linguistics at the University of Alberta in September 2020. I grew up between both of my communities, Quw'utsun' and StÁUTW, currently living with my family in Quw'utsun'. I began actively learning Hul'q'umi'num' in 2018; I am working towards fluency.

Sonya Luschiimtunaat Charlie

Harvey S-hwutstus George

George Sq’utxulenuhw Seymour

Sonya Bird

I am a Linguistics professor at the University of Victoria, which sits on the territories of the Lekwungen and SENÇOTEN speaking peoples at the southern tip of Vancouver Island. I specialize in the sounds of Coast Salish languages. Recently, much of my research has focused on supporting learners of these languages, as they work towards oral proficiency and fluency. In 2018, I began working in collaboration with the HLCS, through a Partnership Development Grant from the Social Sciences and Humanities Research Council of Canada (SSHRC). I have felt very fortunate to continue to work with members of the HLCS and HLA on pronunciation matters, including teaching LING 830 in the summer of 2018.

Maida Percival

I am a PhD student in Linguistics at the University of Toronto. I first became involved with Hul’q’umi’num’ through a Field Linguistics class taught by Prof. Donna Gerdts and Elder Eugene Harry at SFU (where I did my BA) in 2012. Since then I have been involved in various workshops, classes, and research projects through Donna, Sonya, and HLCS. It has been a valuable experience and shaped a lot of my life over the past years, solidifying my interests in phonetics (particularly of glottalization) and language revitalization, and encouraging my pursuit of a PhD. For LING 830, I worked as a research assistant, mostly in a support role which involved giving students one-on-one help, and doing various tasks to make things run smoothly.

4.2 The context for our work
As mentioned above, our project was embedded in a Masters level course on Hul’q’umi’num’ Phonetics and Phonology. As part of the course requirements, students were required to pick a sound or set of sounds that they found challenging, put together a list of words illustrating the sound(s), record themselves, other learners, and one of their elders pronouncing the words, and do a comparative analysis of pronunciation across speakers, using Praat as an aid in their analysis. Praat is speech analysis software (Boersma & Weenink 2019; www.praat.org) that is widely used by linguists for analyzing the sound waves associated with speech. Although it is designed to allow for highly detailed quantitative speech analysis, it can also be used for much less technical applications, namely for inspecting speech visually, as part of pronunciation work in a pedagogical context (see examples in Section 4.3). In our experience, learners of all levels can quickly learn to see the details of speech using Praat’s spectrogram display. This kind of visualization is particularly useful for seeing aspects of pronunciation that are difficult to hear, and/or to describe in words.

Figure 2 provides an example of a typical Praat display, including a waveform (top panel), a spectrogram (middle panel), and two annotation tiers (the ‘textgrid’). The recording is of a learner pronouncing the Hul’q’umi’num’ phrase kwthunu men /kʷθənə men/ (‘my father’). You can see that they have inserted a vowel between [kʷ] and [θ] (see highlighting) in kwthunu. This adjustment is typical among learners: consonants within clusters are not released as fully as they are by elders and, instead, vowels are inserted to ease articulation. Seeing their pronunciation visually can help raise learners’ awareness about their own speech in comparison to their elders, and can give them a visual as well as auditory target to aim for. Although not displayed here, Praat also allows for displaying the pitch and intensity contours, which are useful for stress and intonation work.

![Figure 2](image-url). Typical Praat display, showing a recording of a learner pronouncing kwthunu men /kʷθənə men/ (‘my father’) with an extra vowel in kwthunu (highlighted).
Although each student focused on a single (set of) sound(s), the class overall examined a wide range of sounds, including the $kw \sim qw$ (/kw ~ qw/) contrast (velar vs. uvular labialized stops), the $hw \sim xw$ (/xw ~ χw/) contrast (velar vs. uvular labialized fricatives), the $ts \sim tth$ (/ts ~ tθ/) and $ts' \sim tth'$ (/ts' ~ tθ'/) contrast (dental and alveolar, plain and ejective affricates), $tl'$ (/tl'/) (lateral release ejective affricate), $lh$ (/l/) and $th$ (/θ/) (dental and lateral fricatives), $l'y'w'm'n'$ (/l’ y’ w’ m’ n/) (glottalized resonants, including their timing across positions), $e$ (/e/) (across segmental environments, and clusters. Using Praat, students set out to analyze their chosen sound (set), aiming to determine how their pronunciation might differ from that of their mentors (teachers, elders), and coming up with ways of fixing up their pronunciation, if need be.

4.3 What we did

The process began with students downloading Praat software to their personal computers, which most students had (some students shared). We set lab time to sit together as a group, becoming familiar with the program. We - teachers - also prepared a basic guide that students followed to begin their projects.

![Figure 3. Doing Praat work together in class.](image)

Before any analysis could be done, audio files needed to be created. Students chose which aspects of their pronunciation they were going to focus on - primarily single or small sets of closely related consonants (see Section 4.2) and got to work with elders to record a wordlist targeting these sounds. We - students - were in charge of making our recordings, which we did directly in Praat or Audacity$^2$ using a Yeti USB microphone plugged directly into our computers (https://www.bluedesigns.com/products/yeti/). Within Praat, we opened our audio file, created a textgrid for it (see Figure 2), and went about segmenting both our own speech and the speech of the elder we worked with.

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$^2$ Another popular, freely accessible recording tool (https://www.audacityteam.org/).
By segmenting sounds and seeing our speech in Praat, we were able to recognize how we were pronouncing sounds and words, and to identify differences between elders’ and our speech that we had not noticed before. For example, students tended to “over-ejectivize” sounds, e.g. saying [muk’ut] instead of [mukwut] for mukwut /məkwət/ (‘hit one’s opponent with a ball’) (see Figure 6). More generally, we found that being able to see the acoustic characteristics of our speech (consonants in particular) was highly beneficial for increasing our awareness and understanding of pronunciation. With this knowledge, we were able to come up with a plan for fine-tuning our pronunciation.

**Figure 4.** Co-author George Sq’utxulenuhw Seymour reporting on his Praat work.

By working individually or in small groups (Figure 3), and then reporting back to the whole class (Figure 4), and by covering different aspects of pronunciation that students struggled with, the class as a whole benefited from what was uncovered about L2 Hul’q’umi’num’ speech challenges.

**Examples**

One common mispronunciation for L2 learners is to insert sounds that should not be there. In some cases, as in Figure 2 above, the extra sound is a vowel, which eases the transition between consonants. In other cases though, the extra sound is a consonant, which leads to overcomplicating a word that is already not easy to pronounce. An example of this is presented in Figure 5, with the word *tth’utth’sh* /tθ’ʌtθ’ʃ/ (‘dragonfly’). In this case, I - Rae Anne - am
inserting a third consonant into the final sequence of consonants in the word, pronouncing *tth’sh* as *tth’ts’sh* (*ts’* is highlighted in Figure 5). Once I was able to visualize this insertion, I was able to work towards eliminating it, creating further audio files for further analysis to see whether I was successful at pronouncing the word. Isolating and pronouncing each sound in a word is something that Hul’q’umi’num’ elders teach learners to do; visualizing the exact position of each sound within the word helps learners to do this.

![Figure 5](https://example.com/Figure5.png)

**Figure 5.** Praat display of a recording of *tth’utth’sh* (‘dragonfly’), pronounced by an elder and repeated by a learner (Rae Anne). Highlighting indicates an extra *ts’* inserted by the learner into an already challenging consonant cluster.

As mentioned above, another common mispronunciation among L2 Hul’q’umi’num learners is to over-ejectivize, both phonetically by making ejectives sound more “poppy” than Elders do and by using ejectives instead of plain stops (see also authors 2016). Figure 6 illustrates an example of the latter: I - Harvey - ejectivize the *kw* in the word *mukwut* /məkwət/ (‘hit one’s opponent with a ball’), pronouncing it as [kw’] instead of [kw]. We can see that, in the elder’s speech, the [kw] does not have a very strong (dark) release, although it is quite long in this case (longer than usual) because she is emphasizing the softness of the release for me; in contrast, in my speech, the [kw’] has a more intense release (dark vertical band in the highlighted section) that is also shorter. These visual features of my [kw’] are the ‘trademark’ of strong (‘poppy’) ejective stops.

Over-ejectivizing consonants in Hul’q’umi’num’ is problematic because it can change the meaning of words, e.g. *mukwut* means ‘hit one’s opponent with a ball, in a traditional ball game’, whereas *mukw’ut* means ‘pick it up off the ground’. Learning not to overuse ejectives is a big focus for learners, and seeing the visual manifestation of ejectivization in Praat can help raise their awareness of this error.

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3 This strategy is also used by other Salish language teachers and learners, e.g. Skwxwú7mesh language expert and teacher Khelsilem Dustin Rivers encourages learners to start at end of clusters (and words) and work their way back one sound at a time (e.g. [https://www.youtube.com/watch?v=ykmnzeZPZRU&feature=youtu.be](https://www.youtube.com/watch?v=ykmnzeZPZRU&feature=youtu.be)).
Figure 6. Praat display showing an example of ‘over-ejectivizing’ /kw/ in the word mukwut /məkwət/ (‘hit one’s opponent with a ball’). Highlighting shows the consonant /kʷ/, which the learner pronounces as [kʷ'], with a stronger release than the Elder.

In Hul’q’umi’num’, velar and uvular sounds $kw$ $kw'$ $qw$ $qw'$ $xw$ $χv$ ($/k^w k'^w q^w q'^w x^w χ^w$/) have what linguists call ‘secondary labialization’, a [w] gesture associated with them. How this [w] gesture is timed with respect to the primary sound, and how prominent it is, can vary across speakers. Figure 7 compares $th’eyukw$ /tθ’ejəkʷ/ (‘to startle’), as pronounced by an elder (left) and a learner (right). In this example, we can see that the learner has a full [w] sound between $u$ and $kw$, which is absent from the elder’s speech. Although not as easy to see, the learner’s $kw$ has only a weak voiceless [w] component itself, whereas the elder has a much more audible [w] at the end of $kw$. Timing differences between components of a sound can be difficult to pinpoint by ear, so seeing them can help learners notice subtle differences that they might not otherwise be aware of.
Figure 7. Praat display showing an example of differences in [w] timing and prominence in kw between an Elder and a learner, in the word *tθ’eyukw* /tθ’ejəkʷ/ (‘***’). The learner has a [w] preceding the final kw (highlighted), which the Elder does not have.

Another type of secondary articulation is found in *l’ w’ y’ m’ n’*/l’ w’ j’ m’ n’/). These sound all have secondary glottalization, marked by the apostrophe adjacent to the primary sound. Glottalization refers to a ‘catch in the throat’. Sometimes it is quite strong, and sounds like the glottal stop in the middle of the English word *uh-oh*. Other times, it is more subtle, and sounds like a short period of creakiness (or vocal fry). Glottalization is one of the trickiest features for learner to master, partly because it tends to come and go even for mother-tongue speakers. It is nonetheless a very important feature of the language, because it changes the meaning of words, e.g. *‘imush* (walk) vs. *‘i’mush* (walking). Although learners sometimes have difficulty hearing glottalization, is generally fairly easy to see on a spectrogram. Figure 8 shows the *ul’u*/ul’u/* portion of *shqa’ul’uqw*/ʃqaʔul’uqw/* (‘soft spot on baby’s head’). In the elder’s pronunciation (left) we see that the vertical lines (reflecting the pitch pulses of the vocal folds in the glottis) become quite spread out and a bit irregular in the second half of the l sound, and into the following u. This is a clear marker of glottalization, which is absent in the learner’s speech. Again, seeing glottalization can help learners notice where it should be pronounced.

Figure 8. Praat display of /ul’u/ in *shqa’ul’uqw*/ʃqaʔul’uqw/* (‘xxx’). The Elder’s pronunciation includes a clear glottalized [l’] (highlighted), which is missing in learner’s pronunciation.

The examples so far have shown learners pronouncing some feature of a sound in a way that is different from their Elder’s pronunciation. In some cases though, the whole sound is replaced by another one. Figure 9 provides an example of this ‘whole-sale’ replacement. The word *sulixw* /solixʷ/ (‘covered’) ends in the voiceless labialized fricative *xw*. This sound is challenging for some learners, and is sometimes replaced by the more familiar kw, as in Figure 9.
The difference between \( xw \) and \( kw \) is relatively easy to see: in \( xw \) the whole sound is associated with noise (like snow on a TV); in \( kw \), the first portion of the sound is silent (see highlighting), corresponding to the complete stop in airflow during the time the tongue body is up against the palate for \([k]\) before releasing into \([w]\). Learners do not need to understand the details of articulatory and acoustic phonetics to see the differences between sounds, and to use this information to help with their pronunciation.

In addition to seeing characteristics of individual sounds and sound clusters, Praat also lets us see rhythmic features of language. Figure 10 provides an example of differences in the duration of sounds within a word, which affects the rhythm of the word. The word here is \( kweyul \) /\( kwe\)j\( a\)/ (‘day’). In the elder’s pronunciation (left), we can see that, aside from the long (heavily aspirated) \([kw]\), the sounds are all quite similar in duration, each one having its own, relatively equal space. In the learner’s pronunciation (right), the sequence \( eyu \) is quite short, and sounds more like a single, transitional vowel; the \([l]\) (highlighted) is much longer than any sound in the \( eyu \) sequence. Auditorily, these durational differences affect the rhythm of the word: in the elder’s pronunciation, \( kweyul \) clearly has two, relatively equally weighted syllables (though the first has primary stress); in the learner’s pronunciation, \( kweyul \) does not clearly have two syllables; it sounds similar to the English word \( quail \). It is tricky to teach the rhythm of a language, but focusing on duration, which is relatively easy to do with the help of Praat, can help a lot with rhythm as a whole.
Figure 10. Praat display showing an example of rhythmic differences between an Elder (left) and learner (right), in the word *kweyul* /kʷe⁠jəl/ (‘day’).

The figures above provide examples of what we can see within words: individual sound insertion (Figures 2 and 5), over-ejectivization (Figure 6), timing differences (Figure 7), missing glottalization (Figure 8), sound replacement (Figure 9), and rhythmic differences (Figure 10). While we did not explore pronunciation challenges above the word level, we have done this outside of the coursework we are reporting on here. Praat allows us to see pitch and loudness as well, providing us with valuable information about sentence level intonation patterns.

Once students had identified the differences between their speech and that of L1 speakers, the final piece of the project was to come up with (and present) a plan for addressing these differences, i.e., their pronunciation challenge(s). They worked with their elders to create strategies and plans for how to improve their speech, and for how to assess their progress. Specific plans varied depending on the challenges being addressed. One particular tip given by elder Sti’tum’at (Dr. Ruby Peter) for learning to pronounce a difficult sound was to do it incrementally: start by finding a word with the target (difficult) sound that you find less challenging; you can do this by sitting with a fluent speaker who can give you different words to try to pronounce, and listen to you saying them to determine if you are saying any correctly. Once you find a word you can pronounce well, practice it until you are comfortable with it and then transition into the more challenging word(s), the one(s) you are having trouble with. In the case of *tth’uth’sh* (Figure 5), this approach worked well, to help with the two *tth’* (tθ′) sounds: Sti’tum’at had me - Rae Anne - repeat a number of words that had *tth’* in them. Of these words, I was able to pronounce the word *stth’am’/stth’am'/ (‘bone’) well. After saying *stth’am’* a number of times, Sti’tum’at re-introduced the more challenging word: *tth’uth’sh*. I was able to pronounce the *tth’*! I was advised to keep using *stth’am’* to set myself up for success with other *tth’* words.

Throughout the project, students were required to really think about their pronunciation, using their ears and their eyes as well. While not all students identified the same things in their speech that phoneticians would, or talked about them in the way that phoneticians would, it was
clear that this level of engagement with speech was beneficial in terms of increasing their awareness of pronunciation, and in terms of giving them the confidence to work on their own speech.

5. Discussion - WRITE COLLABORATIVELY

Through this experience of teaching and learning pronunciation through a combination of both audio and visual feedback, we have identified a number of advantages, strengths, and positive outcomes of this method from both a pedagogical and language documentation standpoint. We will discuss these further in this section, highlighting in particular our experiences as Hul’q’umi’num’ learners.

Pedagogically, working with Praat has helped in our focused pronunciation work, for a number of reasons. Being able to zoom into small segments of speech and listen to them over and over, and look at them as well, helps increase our awareness of the details of pronunciation. This fine-grained work helps us in our speaking skills, but also in our listening skills, which then feed back into our speaking skills.

Rae Anne: Using Praat takes the guess work out of pronunciation, because Praat shows you exactly what you have said, and how it compares to your elders’ way of speaking.

Rae Anne, at recent SWG meeting: it allows us to learn pronunciation without our mistakes being pointed out to us; instead we can focus on the elders’ speech and trying to match it. This is a more positive way to learn, and one that is more culturally appropriate.

Praat also allows us to work on our pronunciation on our own, in the comfort of our own spaces. This is often more comfortable for learners, who can feel put on the spot working on pronunciation in front of others. It also means we can spend our time with elders doing more valuable things than grilling pronunciation.

In terms of documenting language, Praat also lets us describe the details of speech in much more detail than has been done before, and using language that is accessible to us, because we create it. Praat also facilitates transcription work, because we can listen to the same chunks of speech over and over again, and use our eyes to help us decipher what we are hearing, e.g. whether or not a consonant is glottalized. On a broader level, now that we know how to use Praat, we can use it in our language work ourselves, contributing to developing capacity within our community for oral-based work, and for sharing it with others without relying on outsider experts to do this for us.

6. Conclusion
It can be a difficult task for learners to hear, differentiate between, and produce Hul’q’umi’num’ sounds that are not found in English. For us teachers, Praat allowed us to visually pinpoint exact pronunciation challenges for learners, without having to use a lot of technical (linguistic) jargon to describe them. For us students, even those of us with limited computer/technology background were able to pick up the basics of Praat relatively quickly, and visualizing and segmenting our speech gave us something tangible to analyze. This made assessment of our own speech more objective (see Section 5 for further discussion). Throughout the project/course, our hands-on involvement with pronunciation through Praat visualization proved to be an effective (and fun) way to approach pronunciation.

We hope that, by sharing our experiences, we might encourage others to incorporate speech visualization technology in pronunciation teaching and learning, especially in contexts where resources that support pronunciation work are sparse. So far, we have used Praat to document the speech of elders and learners, and to compare the two. We would like to also use it to compare elders from different communities, and speaking in different contexts (e.g. casually with each other vs. ceremonially). We have found that Praat is an effective tool for our own language learning journey and also for documenting the language for future generations. We hope to keep using Praat as teachers as well, to help other learners with their pronunciation.

Acknowledgments

References


