METHODOLOGICAL TRADE-OFFS FOR DUAL-PURPOSE PHONETIC FIELDWORK

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1   Introduction

This paper discusses dual-purpose phonetic fieldwork in Hän (Dene/Athabaskan), where ultrasound overlay videos for instructional and cultural purposes could also be important from a linguistic point of view even though they do not follow the standards in the field for ultrasound work. The ideal standard often taught to aim towards has a number of features which can be impossible in many field situations, and by necessity and design were not adhered to very much for the Hän recordings. But we argue that it is important to challenge the rules for what science has to be in order for this kind of work to happen.

2   Context

2.1   Ultrasound Overlay

Ultrasound overlay videos involve the superposition of ultrasound imaging of the tongue onto facial profile videos in order to serve as instructional materials [1]. Bliss et al. [2] used this technique to develop instructional and cultural materials for Indigenous communities by creating custom overlay videos of community members which highlight difficult sound contrasts in the languages for learners.

Figure 1 shows an example from a previously made overlay video. These videos show the movement of the tongue (the ultrasound video) superimposed over video of the speaker's profile. Previous work on different languages [3] has found that use of these videos improves students' production and perception of certain sound in Cantonese.

2.2   Hän

Hän is a Dene/Athabaskan language spoken in Eagle, AK and Dawson City, YK with 6-7 native speakers remaining. Revitalization efforts are currently underway. For example, there is a teacher certificate program offered through the Yukon Native Language Centre and Hän language and culture classes taught in the school system. A priority for the communities is to develop new language curriculum and materials to further the language teaching efforts.

Some acoustic work has been done on Hän [5], but there have been no systematic articulatory studies to date. As Hän is known for its large phonemic inventory, being tied for first as the language with the most affricates and containing a 5-6 way contrast in the coronal region [5], articulatory work on the language is of interest for

phonetic and phonological theory.

Figure 1: Screenshot from Ultrasound Overlay Video

2.3   Challenges

Ultrasound work has quite strict methodological standards such as precise head and probe stabilization, and fully controlled phonological environments and speaker groups. These can prove to be impractical to include in many field situations. These standards by necessity and design could not be fully adhered to for the Hän recordings.

3   Procedure

Fieldwork for the creation of the Hän overlay videos took place in a small, quiet room at the Tr'ondëk Hwëch'in Government building in Dawson City during a language curriculum development workshop. Four Elders (3 female, 1 male) who were native speakers of Hän aged 60-90 were recorded. Three spoke the Eagle dialect of Alaska and one spoke the Tr'ondëk Hwëch'in dialect of Dawson City.

An EchoB portable ultrasound was set up on a table in front of the speakers and connected to a laptop where ultrasound and audio could be recorded in Articulate Assistant Advanced (AAA), a software for recording and analyzing ultrasound. Audio was recorded using an AudioTechnica AT831b lapel microphone, pinned to the speakers' shirts. Audio and ultrasound video were synced with an Articulate Instruments Pstretch 1.1 and ClimaxDigital USB 2.0 Audio Capture. Facial profile video was recorded on a Canon ZR950 camcorder and is to be synced with the ultrasound using Adobe Premiere, where the two will be edited into overlay videos.

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During the recording procedure, the Elders were seated at a chair in front of a blue screen and instructed to hold the ultrasound probe very steadily under their chin. The word list was presented on a computer screen in front of them. The camcorder and AAA were set to record and a clapper was clapped, signaling that the speaker could start reading. Two speakers who could not read Hän very well were usually prompted with the words' English meanings, and words were adjusted or switched for other words when speakers were unfamiliar with them. They repeated each word at least twice per recording. The word list was divided into sections by manner of articulation so that there were 6-12 words per section and recorded section by section. Each section was repeated twice for a total of at least 4 repetitions per sound. If the probe shifted during recording, the investigator adjusted the speaker's grip and re-recorded from prior to the shift.

Words were selected such that target consonants were root-initial, followed by a low vowel, [ɑ] or [æ], and wherever possible preceded by the prefix [wə-] 'his/her/its'. Target vowels occurred as the sole vowel of the root, and whenever possible were preceded by post-alveolar onsets.

4   Discussion

A number of adaptations from the "ideal" set up were necessary in this particular fieldwork situation.

Head stabilization can be very tricky when dealing with older subjects in the field. Standard ultrasound headsets are not appropriate with elders while probe holding devices and the head resting against a surface, as recommended in [4], are not very effective, obstructing the facial profile video. Further complications arise as the participants often turn or move to look at the investigator any time they forget or can't read a word or don't recognize a word. It was found that this movement could be somewhat mitigated by the investigator standing in front the speaker. The solution chosen here was the have the elder hold the probe – the method was the best choice but it must be noted that it is also not very effective as the speakers are not used to the rigour of keeping still for so long.

Target word choice is, of course, limited by the language. Words with target consonant sounds in low-vowel environments where the nearest consonants are labial consonants are the ideal but not always available in the language. Hän and other Dene/Athabaskan languages have an abundance of low vowels but very few bilabials. There is, however, a prefix with a labiovelar approximate – [wə-] 'his/her' – so the words chosen employed this prefix.

The age of the participants precluded collecting large numbers of repetitions. The ideal number is usually about 6-10 but this number can easily prove taxing to older participants. This study aimed for a minimum of 4 instances of each word per speaker, which was found to be an appropriate number.

Field work in a language with a tiny number of speakers often may not, by necessity, allow for control of dialect. The language studied here has only 6-7 speakers left and the 4 recorded included 3 speakers of one dialect and one from another. Speakers also knew words that others didn't know, meaning that the wordlist had to be adjusted somewhat depending on the speaker.

Figure 2: Hän Overlay Videos Recording Set-up

5   Conclusions

Despite the methodological limitations involved in dual-purpose fieldwork, we argue that it is important to consider the possibility of drawing linguistic insights from data collected for instructional purposes. Otherwise, these insights simply wouldn't exist as work with these communities is limited.

Acknowledgments

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