SHIFTY VOWELS: VARIATION IN DIALECTAL LOWERING IN GITKSAN

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1 Introduction

Gitksan is a Tsimshianic language spoken by the peoples living along the upriver areas of the Skeena river, British Columbia (Rigsby, 1986; Tarpent, 1987). The current body of research has largely identified two broad dialectal categories: 'East' and 'West' (Rigsby, 1986). There are socio-culturally distinct and linguistically variable groups within these categories, including similarity with Nisgha (Tarpent, 1987), therefore this paper will argue is a dialectal continuum.

Gitksan has a set of 5 vowels, {a, e, o, u, i}, further differentiated by a phonemic contrast in length (Rigsby, 1986). Additionally, allophonic alternations between [a] and [ɛ] have been observed such that in certain linguistic environments, where [a] is seen in the Eastern dialect, the Western dialect produces [ɛ] (Rigsby, 1986; Tarpent, 1987). Gitksan uses a rich consonant inventory including post-velar articulations. Consequently, uvular lowering effects have been observed, particularly as it pertains to [a, ɑ] in the Eastern dialect, where the vowel precedes a uvular articulation (Rigsby, 1986). The interaction of these two processes ([a, ɛ] alternation and uvular lowering) creates dialectal differences in the effects of uvular lowering, which is the topic of this paper.

The physiological characteristics of uvular articulation have been shown cross-linguistically to create lowering systems through uvular assimilation, such as this paper observes in Gitksan (Bessell, 1992; Walker & Rose, 2015). Gitksan has three uvular consonants: the voiceless stop [q] (written in the practical orthography as k̲), the voiced stop [G] (written as g̲), and the voiceless fricative [χ] (written as x̲). The effects of uvular lowering on vowels have been measured using spectrograms and formants: F1 (indicative of vowel height) and F2 (indicative of vowel backness) (Ladefoged & Johnson, 2010). Due to the shape of the vocal tract and articulation of low back vowels like [ɑ], both of these measurements are important when discussing this lowering process (Gick, Wilson, & Derrick, 2012).

2 Méthode/Method

2.1 Elicitation

Phase 1

This study has 2 phases. We conducted Phase 1 in the field with 6 participants. 4 participants (3 female, 1 male) identified as Eastern (Gigeenix) speakers, and 2 participants (2 male) identified as Western (Gyeets) speakers. All speakers in both phases were L1. Phase 1 focused exclusively on identifying and characterising patterns of uvular lowering within these dialects. The word list in this phase used 56 tokens, containing several examples of phonologically contrastive vowels (in shape and length) representing the extensive variety of the Gitksan vowel system. We focused most closely on short [a], and long {i:, e:, o:}. Each token was elicited and recorded 3 times. After elicitation this word list was narrowed to a smaller set of minimal and near-minimal pairs that best illustrated patterns of uvular lowering consistent with existing research into this process within neighbouring language families (Bessell, 1992; Walker & Rose, 2015).

Phase 2

The second phase of this study was smaller in scale and more narrow in focus. 3 participants were consulted. Phase 2 was conducted in a lab setting, using the same elicitation techniques as Phase 1. This phase consisted of 1 male participant who identified as a Western (Gyanimx̲) speaker, 1 male participant who identified as a Western (Gyeets) speaker, and one female participant who identified as an Eastern (Gigeenix) speaker. The word list in phase 2 used 36 tokens, demonstrating short [a, ɛ]. The purpose of this phase was to collect data that informed the phonetic components of the [a, ɛ] phonemes of the language as represented in the current body of research, and to determine whether there was sufficient evidence to suggest a systemic vowel shift along a dialectal continuum.

2.2 Phonetic Analysis

For both phases, we measured the tokens in Praat, using spectrograms. We measured the F1 and F2 of all vowel tokens, and in Phase 1 the Eastern and Western averages for both were compared to ascertain dialectal patterns. Where long vowels were present, start and end points were measured and compared to determine slope. Phase 2 measurements were used to plot each speakers vowel space to allow phonetic classification of tokens and interspeaker comparison

3 Résultats/Results

3.1 Phase 1

Phase 1 results are illustrated with the folowing minimal and near minimal pairs:

Table 1 : Phase 1 Token Pairs

Token	Vowel, Environment	Western Formant Average	Eastern Formant Average
ban (belly)	[a], __velar	F1: 1148 F2: 1858	F1: 792 F2: 1561
bax̲ (to run)	[a], __uvular	F1: 657 F2: 1607	F1: 813 F2: 1346

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Token	Vowel, Environment	Western Formant Slope Average	Eastern Formant Slope Average
ts'eex (to be full)	[eː], __velar	F1: -62 F2: 76	F1: 53 F2: 125
ts'eek̲ (to eat fast and a lot)	[eː], __uvular	F1: 95 F2: 18	F1: 538 F2: -317
ha'niigilbilsa (Tuesday)	[iː], __velar	F1: 24 F2: 253	F1: 41 F2: 200
ha'niigoot (to think)	[iː], __uvular	F1: 110 F2: -339	F1: 18 F2: 532
ha'niigoot (to think)	[oː], __velar	F1: 90 F2: 16	F1: 7 F2: 275
ha'niit'ook̲xw	[oː], __uvular	F1: 6 F2: 457	F1: 196 F2: 42

3.2 Phase 2

We first recorded the formant range of each speaker to plot approximate phonetic boundaries within their vowel spaces, and identified phonetically significant tokens :

Table 2: Speaker Formant Ranges

BS, Gigeenix, East, Female	HH, Gyeets, West, Male	VG, Gyanim̲x̲, West, Male
F1: 393 – 887	F1: 231 – 786	F1: 148 – 1247
F2: 1097 – 2786	F2: 1128 – 2291	F2: 702 – 2234

Table 3: Phase 2 Tokens

Token	Vowel, environmen	Speaker Formant Average, Phonetic Classification		
		BS	HH	VG
amksiwaa (driftwood; white	[aa], word final, stressed	F1: 752 F2: 1183 [ɑ]	F1: 617 F2:1191 [a]	F1: 540 F2:702 [æ]
asgi (ugly)	[i], word final, stressed	F1: 393 F2:2786 [i]	F1: 300 F2: 2291 [ɪ]	F1: 391 F2: 2067 [ɪ]
gyat (man)	[a], single closed syllable	F1: 768 F2: 1982 [æ]	F1: 454 F2: 2143 [ɛ]	F1: 409 F2:1806 [ɛ]
hat' (martin)	[a], single closed syllable	F1: 880 F2: 1604 [a]	F1: 757 F2: 2136 [ɛ]	F1: 821 F2: 1767 [ʌ]
hlap (crooked)	[a], single closed syllable	F1: 781 F2: 1502 [a]	F1: 558 F2: 2076 [ɛ]	F1: 601 F2: 1688 [ɛ]
jahl (to lose)	[a], single closed syllable	F1: 791 F2: 1425 [a]	F1: 456 F2: 1982 [ɛ]	F1: 508 F2: 1682 [ɛ]
ya' (spring salmon)	[a], single closed syllable	F1: 851 F2: 1642 [ɑ]	F1: 527 F2: 2072 [ɛ]	F1: 406 F2: 2183 [ɪ]
ye'	[ɛ], single closed syllable	F1: 571 F2: 2537 [ɛ]	F1: 567 F2: 2106 [ɛ]	F1: 399 F2: 2334 [ɪ]

4 Discussion

Previous research has asserted that the underlying vowel of the {a, ɛ} vowel set is [a] for both East and West dialects (Rigsby, 1986; Tarpent, 1987). The observed lowering in Phase 1 from [ɛ] to [a] (Western) and [a] to [ɑ] calls this into question as it has not been accounted for.

Inconsistent lowering effects are observed for the dialectal categories in the long vowels. This suggests there is a complex phonetic interaction with uvular assimilation. This may be influenced by an overall shift in the vowel space between the two dialects, causing unique positioning of the tongue root during uvular articulations, differently affecting lowering patterns. Though not attested with phonemic length contrasts, similar effects lowering effects and vowel shifts have been observed in English dialectology in pre-velar environments (Riebold, 2015).

Evidence for a systemic vowel shift is suggested by the Phase 2 results. Between our 3 speakers, BS has the lowest and most back vowels, HH has the most mid vowels, and VG has the highest vowels. With BS being the Eastern most speaker, HH falling geographically in the middle, and VG being the Western most speaker, we see a correlating geographic pattern. Within the vowel space, I suggest a continuous dialectal shift, moving forward and upward from the low back vowel, as dialectal location correlates move from East to West. I am not asserting directionality or chronology. As with our Phase 1 results, these results have parallels to current views on English dialectology (Prichard, 2015), which also presents a systemic vowel shift in low vowels along a dialectal and geographic continuum.

5 Conclusion

This study is limited most heavily by sample size. A wider range of participants in terms of sex and dialect is ideal. Future research should aim to account for the vowel system holistically, including high short vowels and more long vowel tokens. Additionally there is evidence to suggest a relationship between stress and vowel quality found in the Phase 2 results. A detailed analysis of these components may reveal additional evidence for a systemic vowel shift as suggested by this paper.

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References

Bessell, N. J. (1992). *TOWARDS A PHONETIC AND PHONOLOGICAL TYPOLOGY OF POST-VELAR ARTICULATION*. University of British Columbia.

Brown, J. (2010). *Gitksan phonotactics*. LINCOM Europa.

Gick, B., Wilson, I., & Derrick, D. (2012). *Articulatory Phonetics*. Wiley.

Ladefoged, P., & Johnson, K. (2010). *A Course in Phonetics*. Cengage Learning.

Prichard, H. (2015). The Great Vowel Shift in the North of England. In R. Hickey (Ed.), *Researching Northern English* (1st ed., pp. 51–70). Amsterdam: John Benjamins Publishing Company. http://doi.org/10.075/veaw.55

Riebold, J. M. (2015). *The Social Distribution of a Regional Change: /æg, ɛg, eg/ in Washington State*. University of Washington.

Rigsby, B. (1986). *Gitksan Grammar*. University of Queensland.

Tarpent, M.-L. (1987). *A Grammar of the Nisgha Language*. Cornell University.

Walker, R., & Rose, S. (2015). Guttural Semi-Transparency. In *Annual Meeting of Phonology* (pp. 1–16). Vancouver, BC.

Yamane-Tanaka, N. (2006). Transguttural Harmony in Gitksan: Its Development and Typological Implications *. In *Proceedings of the 21st NorthWest Linguistics Conference* (pp. 136–152). Vancouver, BC: The University of British Columbia Working Papers in Linguistics.