ROUNDING PATTERNS OF DORSAL CONSONANTS IN KWAK'WALA

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1. INTRODUCTION

Dorsal consonants and round vowels show a rich interaction in Kwak'wala, a Northern Wakashan language. Some of these interactions induce changes in rounding of the consonants that are significant enough to be reflected in the orthography of the language. These rounding patterns are the focus of this paper. In particular, this study expands on findings by Grubb (1969) and Boas (1911, 1947) and shows that it is underlying /u/ that triggers regressive rounding changes, whereas it is both /u/ and /o/ that trigger progressive rounding changes.

This study is based on data obtained through elicitations conducted with Freda Shaughnessy, a native speaker of Kwak'wala.

Section 2 introduces the concept of rounding in speech sounds. Section 3.1. discusses changes in round vowels caused by dorsal consonants. Then section 3.2. analyzes the patterns of labial and palatal off-glides in velar consonants. Similarly, Section 3.3. discusses the pattern of labial off-glides in uvular consonants. Section 4 concludes this paper.

2. ROUNDING

Vowels such as 'u' and 'o' and consonants such as 'k^{w}' and 'q^{w}' are called rounded because they are pronounced with rounded lips throughout the segment. Furthermore, the consonants feature an additional labial off-glide [^{w}] at the end. This off-glide is also pronounced with rounded lips but an even tighter space between the lips than for the previous part of the consonant. In contrast, the plain velar stop 'k' is pronounced with spread lips.

Rounded dorsal consonants are contrastive with plain dorsal consonants in Kwak'wala. That is, they occur in the same environment, such as 'x' in 'xitɑ' (word 161: *to lift up your head*) and 'x^{w}' in 'x^{w}itɑ' (word 162: *deadhead, to stick up vertically*). Contrast between plain and rounded consonants only occurs at the dorsal place of articulation. Table 1 shows the Kwak'wala dorsal stops and fricatives in the orthography, following the Liq'wala writing system.

Table 1
Orthographic inventory of Kwak'wala dorsal stops and fricatives

	velar	uvular
stop	k, k^{w}	q, q^{w}
glottalized stop	k', k'^{w}	q', q'^{w}
voiced stop	g, g^{w}	ǧ, ǧ^{w}
fricative	x, x^{w}	x̌, x̌^{w}

3. DORSAL CONSONANT-VOWEL INTERACTIONS

3.1. Vowel change

The important change in vowels is the lowering of underlying /u/ to acoustic [o] when it occurs near uvulars such as in word 1 ('mix̌**u**x̌^{w}' *he/she/it is sleeping now*), which is pronounced [mix̌**o**x̌^{w}]. As the gloss for word 1 shows, this change is only in the pronunciation and is not reflected in the orthography. Rather, the orthographic form directly shows the underlying form for both 'u' and 'o'.

The vowel change has been incorporated as the second step in the flow chart for deriving uvular consonants that is provided in Appendix B. The flow chart uses the example word 2 (ƛ'ɑx̌ux̌^{w} *he/she/it is whittling wood*), which includes the vowel change.

3.2. Velar consonant changes

The contrast between plain velar consonants and velar consonants with labial off-glide, as discussed in section 2, becomes neutralized when the segment is preceded or followed by a round vowel. That is, plain /k/ is followed by an off-glide, becoming [k^{w}], when it is preceded by /u/ or /o/ (a process of progressive rounding). Furthermore, /k^{w}/ loses the labial off-glide when it is followed by /u/. Boas (1911, p. 431; 1911, p. 436; 1947, p. 214) states that /o/ and /u/ cause these neutralization patterns, whereas Grubb (1969, pp. 41-43) states that only phonetic [u]s cause them.

Grubb's observation that only phonetic [u]s trigger the consonant alternations leads to the conclusion that neither /o/s, which always surface as [o], nor /u/s that surface as [o] due to an adjacent uvular (see section 3.1.) cause the alternations. However, as stated by Boas and confirmed by Freda Shaughnessy, a native speaker of Kwak'wala, both /u/ and /o/ trigger rounding when they precede a velar consonant. Hence, the trigger is not [u] as stated by Grubb. Accordingly, the data elicited in our class does not exhibit a sequence of a preceding /u/ or /o/ with a following plain velar consonant.

This paper shows that, in contrast to both Boas's and Grubb's findings, it is underlying /u/ that triggers the loss of the off-glide in a preceding velar, disregarding whether the vowel surfaces as [u] or as [o] acoustically. Hence, although /o/ triggers progressive rounding, as discussed in the previous paragraph, it does not trigger the loss of the off-glide. When /u/ surfaces as [o] it triggers the loss of the off-glide, whereas /o/ surfacing as [o] does not, such as in word 3 (**g**^{w}ox^{w}səm' *paper bag*), which is phonetically [**g**^{w}ox^{w}səm]. This also provides the evidence that the third person suffix is /ux̌^{w}/ and not /ox̌^{w}/ since the suffix triggers the loss of the off-glide.

A further phonetic dorsal pattern involves the plain velar stops /k/ and /g/. They are generally pronounced with the palatal off-glide [^{y}] (Grubb, 1969, pp. 41-43), resulting in [k^{y}] as in word 4 (ƛ'əkɑ' *to paddle*) which is phonetically [k'ɪ**k**^{y}ɛ] (see also (1a) below). However, the palatal off-glide is not present when the consonant is followed by the vowel 'i' (Grubb, 1969, pp. 41-43) as in word 5 (ƛ'əki dɑ bəg^{w}ɑnəm' *the man is paddling*) in which it is phonetically [k'ɪ**k**i].

Furthermore, the palatal off-glide is not present when the velar stop is underlyingly round, such as /k^{w}/ surfaces as [k] and not [k^{y}] in front of /u/ in word 6 in (1b) below. That is, the presence of the palatal off-glide identifies 'g' in word 7 (**g**uk^{w} *house*, which is phonetically [**g**^{y}uk^{w}]) as underlyingly plain, i.e. /g/. In contrast, the absence of the palatal off-glide as part of 'k' in word 6 identifies the 'k' in this word as underlyingly /k^{w}/. The contrast becomes particularly clear when comparing [n'i**k**^{y}ox̌^{w}], the pronunciation of word 8 with underlying /k/ (see (1a)), to [yəl**k**ox̌^{w}], the pronunciation of word 6 with underlying /k^{w}/ (see (1b)), because both words involve the same suffix /ux̌^{w}/ that follows the velar stop.

The process of labial off-glide loss can be seen in (1) by comparing the same words with different suffixes. In each case the underlying form of the consonant is indicated by the letter in single quotes and exemplified by the form that the top arrow points to. These forms involve suffixes with an initial vowel that is not /u/. Thus, they show the unchanged, underlying form of the consonant with respect to rounding.

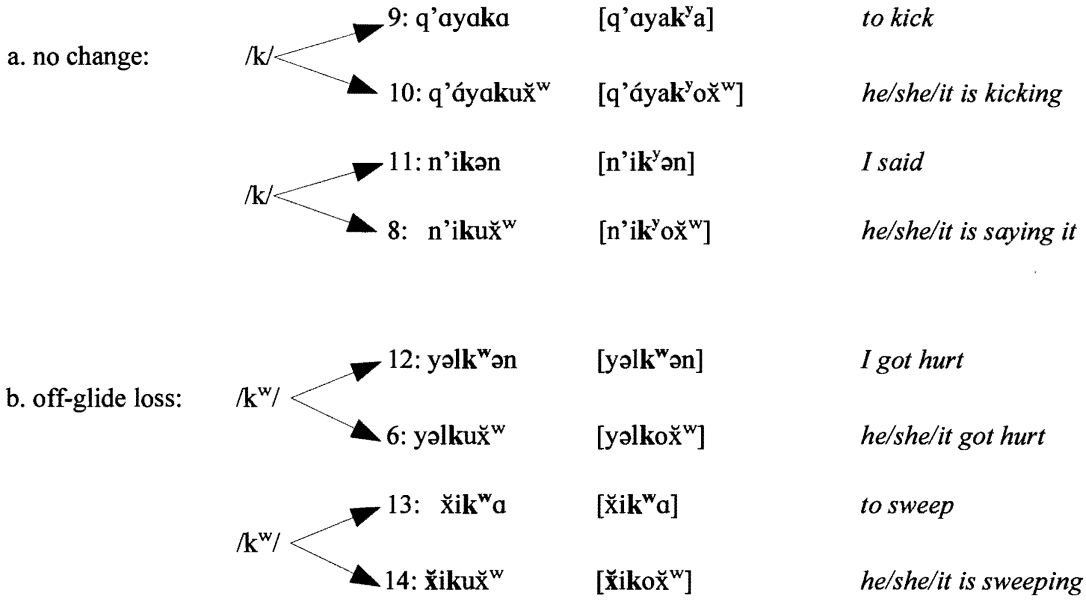
The forms at the top are contrasted to the forms that the bottom arrows point to. The bottom forms involve suffix-initial /u/, which triggers labial off-glide loss in the preceding velars when the velars in question are underlyingly round (see (1b)).

Each example consists of the underlying consonant in question, a word number, the orthographic form, the

1 These patterns have also been observed in many neighboring languages, such as progressive rounding in Oowekyala (Howe, 2000) and loss of the labial off-glide in Mainland Comox (Bodenbender, 2001; Davis, 1970).

phonetic form and the English translation of the word.

(1) Velar consonant patterns



These data show that it is not the surface vowel that triggers the loss of the labial off-glide but the underlying /u/ as reflected in the orthography. This has not been identified in previous research.

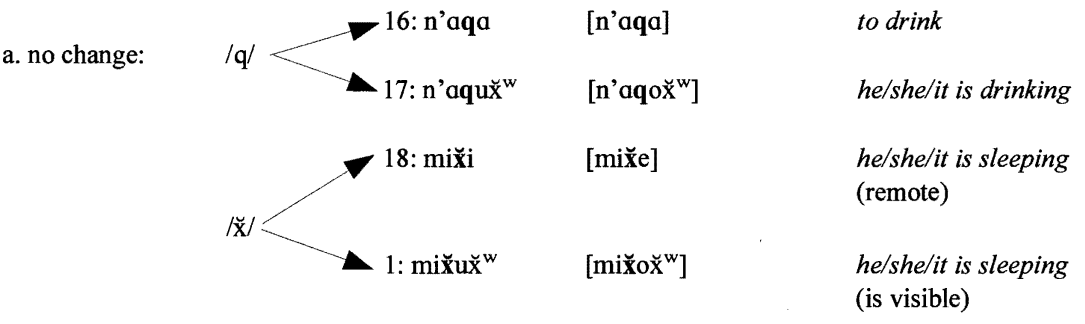
The flow chart in Appendix A translates the findings of this study with respect to velar consonants into procedural steps and provides a tool to determine the pronunciation of any velar stop or fricative input. The flow chart uses the example words 6 ('yəlkuxʷ' *he got hurt*) and 7 ('gukʷ' *house*), which includes processes with respect to labial and palatal off-glides.

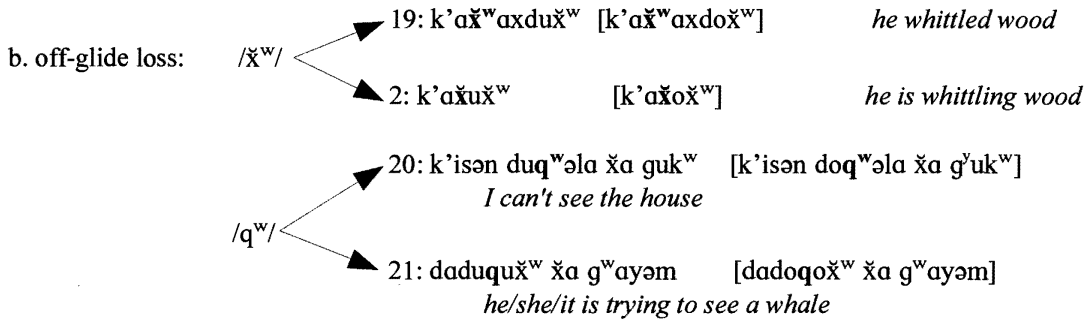
3.3. Uvular consonant changes

Similarly to velar consonants, the contrast between /q/ and /qʷ/ becomes neutralized when the segment is followed by /u/. That is, rounded /qʷ/ loses the labial off-glide and becomes [q] when it is followed by /u/. However, preceding /u/ or /o/ do not trigger rounding as with the velars, such as in word 15 (ẖ'oqe' *heart*) which is phonetically [n'oqe] and therefore features a non-round [q] following /o/.

Neither Boas (1911, 1947) nor Grubb (1969) reported on the loss of the labial off-glide for uvulars when they are followed by /u/. However, like for the velars this pattern can be clearly seen in the data in (2).

(2) Uvular consonant patterns





The flow chart in Appendix B translates the findings of this study with respect to uvular consonants into procedural steps and provides a tool to determine the pronunciation of any uvular stop or fricative input as well as adjacent round vowels. The flow chart uses the example word 2 (*k'aɫ̌uǩʷ' he/she/it is whittling wood*), which includes processes with respect to labial off-glide and round vowel.

4. CONCLUSION

This paper discusses rounding patterns of dorsal stops and fricatives in Kwak'wala. It shows that both /u/ and /o/ trigger rounding of a following velar consonant, as stated by Boas (1947). Furthermore, it shows that it is not the surfacing phonetic form of the vowel that triggers the loss of the labial off-glide but the underlying form, /u/. Hence, when /u/ surfaces as [o] it triggers the loss of the off-glide, whereas /o/ surfacing as [o] does not. This has not been identified in previous research. It is possible that this detail simply had not been noticed. However, it has to be noted that previous research has been conducted on different dialects of Kwak'wala than this study. This might explain some of the differences in the nature of the vowels that trigger rounding changes.

Additionally, this study found that the presence or absence of the palatal off-glide [ʸ] in velar stops that are followed by /u/ can distinguish underlying rounded velar stops, such as /kʷ/ from underlyingly plain velar stops, such as /k/.

This study adds to our knowledge about Kwak'wala and provides the necessary insight to derive the phonetic forms of Kwak'wala words involving dorsal stops and fricatives correctly. Two flow charts have been developed as part of this study to aid in the derivation of the surfacing phonetic forms.

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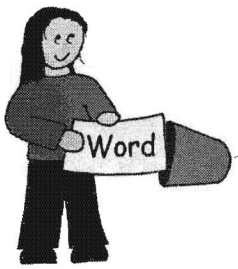
APPENDIX A

Flow chart for deriving the pronunciation of velar consonants (K = {k, k^{w}, k', k'^{w}, g, g^{w}, x, x^{w}}) with respect to rounding and palatalization from their contexts.



are you [k] or [g] without [^{w}]?
yes *no*

add [^{y}] to yourself
k, g => **k^{y}, g^{y}**

e.g.: (a) yəl**k^{w}** + uxˇ^{w}
to get hurt + he/she/it

(b) **guk^{w}**
house

are you followed by 'i'?
yes *no*

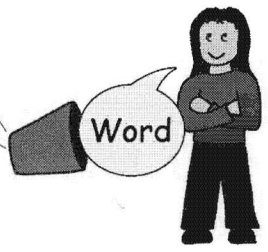
lose [^{y}]
k^{y}i, g^{y}i => **ki, gi**

are you without [^{w}] and preceded by 'u' or 'o'?
yes *no*

(lose [^{y}] and) add [^{w}] to yourself
uK, uk^{y}, ug^{y} => **uK^{w}**

are you followed by 'u'?
yes *no*

lose [^{w}]
K^{w} => **K**

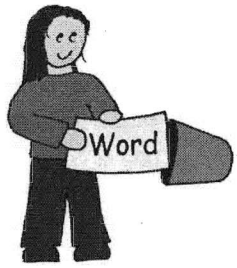


6: [yəlkoxˇ^{w}]
he got hurt

7: [**g^{y}uk^{w}**]
house

APPENDIX B

Flow chart for deriving the pronunciation of uvular consonants (Q = {q, qʷ, q', qʼʷ, ǧ, ǧʷ, x̌, x̌ʷ}) with respect to rounding and palatalization from their contexts.



are you followed by 'u'?

yes *no*

lose [ʷ]

Qʷ --> **Q**

e.g.: k'ɑx̌ʷ + ux̌ʷ

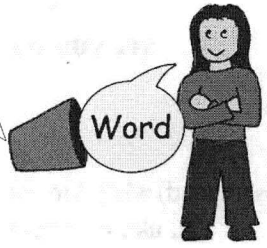
to whittle wood + he/she/it

are you preceded or followed by 'u'?

yes *no*

change adjacent 'u's into [o]s

uQu --> **oQo**



2: [k'ɑx̌ox̌ʷ]

he is whittling wood