The Predictability of Word-Stress in Haisla

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Abstract: In this paper, I explain the overlooked, complicated, yet systematic system used to determine stress in x̄a'isela̓kala (Haisla). This analysis shows that word-stress in this language is fully predictable. As in all other North Wakashan languages, there is a strong preference for assigning word-stress to the leftmost syllable. Complicating this, however, is the presence of long vowels in x̄a'isela̓kala: /aa, uu, ii, ai, au/. A further complication to the stress system is a limited number of suffixes which seem to attract stress regardless of the syllable composition throughout the rest of the word. I assume that these suffixes are lexically stressed.

Keywords: Haisla, word-stress, Wakashan, prosody

1 Outline

In Section 2 of this paper, I first explore the word-stress interactions with the long vowels. Long vowels are heavy syllables which override the leftmost rule regardless of syllable position. In Section 3, I disambiguate an orthographic convention which obscures stress placement when words are written with two-vowel sequences, aside from long vowels. In Section 4, I present three suffixes which seem to supersede other stress rules, which I assume to be lexically stressed. Section 5 concludes.

2 General stress rules of x̄a'isela̓kala

I break the following rules into their own sections. Section 2.1 shows the normal cross-North Wakashan leftmost syllable rule,[1] without the interference of heavy syllables. Section 2.2 shows the disruptive effect of heavy syllables on word-stress assignment. Section 2.3 shows the default-to-opposite rule in effect. All x̄a'isela̓kala data and analysis provided here are original and taken from field work conducted in Kitamaat, BC during language workshops during the summers of 2020–2022 under the cooperation of the First Nations Education Foundation and the Haisla First Nation.[2] A part of this work incorporated an online corpus of data from Emmon Bach.[3] I present all data in the chosen orthography of the Haisla First Nation, and provide IPA transcriptions when appropriate in [square brackets].

There is an interesting trait in the nature of how stress is signalled in x̄a'isela̓kala not found in other North Wakashan languages. The stressed syllable appears with greater intensity than in other languages, but as *low* pitch instead of high in most contexts. In natural speech during

[1] See Kwak̓wala (Janzen 2015), Oowekyala (Howe 2000), Heiltsuk (Kortlandt 1973; Rath 1974), and Haisla (Lincoln & Rath 1986).

[2] All data represented here are done so with the foreknowledge and consent of the Haisla First Nation.

[3] Find Emmon Bach's corpus here:
https://web.archive.org/web/20160129043139/http:/people.umass.edu/ebach/haisdict.htm.

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dialogue or a narrative, the stressed syllable is lower in pitch than the surrounding syllables. In a focus context, such as in one-word citation, phrasal emphasis, or dialogue within a narrative, the stressed syllable appears with high pitch. There is no change in the location of the stressed syllable within a word in any context, so this distinction in pitch does not affect the stress-system in x̄a'iselaka̓la on the whole, only in how stress is signalled.

2.1 Stress leftmost moraic (μ) syllable

As a North Wakashan language, x̄a'iselaka̓la shows a strong tendency to stress the initial syllable. I analyse this language as being moraic based, that is, syllables with morae attract stress. The underlying vowels /a, u, i/ are moraic (μ). A schwa vowel followed by a resonant syllable coda /ən., əm., əl., əy., əw./ are also moraic. Schwa alone as a syllable nucleus is not moraic at all. The leftmost of these are assigned word-stress.

(1) Examples of leftmost moraic syllable /#μ/

a.	**'ú**kʷiyax̄si	'riverbank'
b.	gʷe**dá**x̄ud	'loosen; untie'
c.	ḡece**má**la	'rope for going around a bentwood box'
d.	meḡʷe**cí**	'onions'
e.	dexde**xús**	'rabbit'

These examples show that the regular leftmost preference for stress assignment in North Wakashan languages holds true for x̄a'iselaka̓la as well. Each example in (1) shows stress on the leftmost moraic syllable, but not necessarily the leftmost syllable of the word. When a syllable has a non-moraic schwa rhyme without a resonant coda, stress will appear on the next syllable to the right which satisfies the correct moraic conditions.

2.2 Stress leftmost heavy syllable (μμ)

I treat long vowels as *heavy* syllables, or as bimoraic (μμ). The following examples show the effect of heavy syllables on word-stress assignment in x̄a'iselaka̓la. In each case, the heavy syllable will supersede the more regular leftmost stress rule pervasive in North Wakashan languages.

(2) Examples of long /aa/

a.	**ƛ̓áa**sa	'slap'
b.	x̱̓ʷe**łáap**	'uncle'
c.	ƛ̓aƛ̓a**gáas**	'hinge/elbow'
d.	ḡenem**ḡáa**nu	'young female (little girl)'
e.	ḡʷikenx̄e**láa**	'how pretty; looking that beautiful; beautiful like that'

Here, the heavy syllables override possible stress-bearing syllables which appear to the left of it: the <a> in the first two syllables of *ƛ̓aƛ̓a**gáas*** 'hinge/elbow' do not show stress, despite being left of the heavy syllable. Likewise, the <nem> syllable in *ḡenem**ḡáa**nu* 'young female' is the

leftmost stress-bearing candidate, yet stress falls on the heavy syllable <**ḡáa**>. Likewise, *ḡʷikenx̄e**láa*** ‘how pretty’ shows two stress-bearing syllables to the left of the heavy syllable in <ḡʷi> and <ken>, yet the heavy syllable <**láa**> at the end of the word houses word-stress.

(3) Examples of long /ii/

a.	**ʼiis**	‘skin’
b.	xa**díił**	‘peek into house’
c.	yaxyaxge**níis**	‘sickly’

As in example set (2) above, the heavy syllables <**díił**> and <**níis**> supersede moraic syllables with an <a> vowel to the left of them.

(4) Examples of long /uu/

a.	**ʼuukʷ**	‘four people’
b.	**kuu**nugʷa	‘I don’t’
c.	yi**yuut**	‘get used to something’
d.	yu**dúu**xʷala	‘triplets’

Again, in the above examples, the heavy syllable <**dúu**> houses stress over the previous moraic syllable <yu> in *yu**dúu**xʷala* ‘triplets’.

(5) Examples of long /ai/

a.	**yái**cisda	‘change your life; repent; apologize’
b.	xu**láis**	‘fermented’
c.	be**kʷái**guł	‘dead body’
d.	ḡaḡabe**lái**	‘tickle’

Here, the final heavy <**lái**> syllable in *ḡaḡabe**lái*** ‘tickle’ houses word-stress over two moraic syllables to its left in <ḡaḡa>. Of note here is a phonological occurrence in x̄a’iselaḵala whereby an underlying high vowel /i, u/ will surface phonetically as [ai, au] respectively when preceded by a uvular or glottal consonant, e.g., ***ʼá**qiala* ‘uncovered’. This quality of the language becomes an important aspect of the stress system in Section 3. I highlight it here only to state that in an example like ***ʼá**qiala* ‘uncovered’, the second syllable <qi> which surfaces as [qai] does not underlyingly contain a heavy vowel (that is, only has one mora), and so does not draw stress away from the initial syllable <**ʼá**>.

(6) Examples of long /au/

a.	**yáu**xʷaci	‘place for invited guests’
b.	x̄ʷa**yáu**	‘sap of tree’
c.	pa**páu**daḡema	‘face powder’
d.	babel**gáuł**	‘bleeding that cannot stop’

Again, the heavy syllables with <**áu**> take stress over moraic syllables with <a> to their left in *pa**páu**dagēma* ‘face powder’ and *babel**gáuɬ*** ‘bleeding that cannot stop’.

(7) a. **dáa**’aiƛa ‘take into house’
b. **wái**ƛilauxʷ ‘sex abuse’
c. **hái**ɬahaus ‘house cleaning’

Finally, examples in (7) show that when there is more than one heavy syllable within the same word, the leftmost of them receives word-stress. ***dáa**’aiƛa* ‘take into house’ shows stress on the first syllable <daa>, even though the second syllable <’ai> is also heavy. Similarly, ***wái**ƛilauxʷ* ‘sex abuse’ shows stress on the leftmost syllable <wai>, while the third and final syllable <lauxʷ> is also heavy. The third example is the same, where the first syllable of ***hái**ɬahaus* ‘house cleaning’ (<hai>) is stressed, although the final syllable is also heavy (<haus>).

2.3 Stress rightmost syllable (no μ)

The default-to-opposite rule is one found across all North Wakashan languages, with xa’iselaḵala being no exception. If a word has no moraic syllables, the final syllable holds stress.

(8) Examples of default-to-opposite (rightmost) stress

a. ge**gés** ‘eye’
b. le**géx**ʷ ‘dried berries’
c. ƛe**xéxs** ‘crosspiece in a canoe’
d. texte**gék**ʷ ‘flashlight’
e. meqebe**wéɬ** ‘sheet’

Here are examples of the cross-North Wakashan default-to-opposite rule. The rhyme of each syllable in every example is a schwa, without a resonant coda. None are moraic, and so stress falls on the rightmost syllable.

3 Orthographically adjacent vowels

A potentially confusing trait of the stress system in xa’iselaḵala is shown when two adjacent vowels orthographically occur, always with stress on the second of the pair.[4] These orthographically adjacent vowels do not coalesce to form long vowels as in Section 2.2 above. On the surface, the difference appears to be the quality and order of the vowels themselves. If the vowels are the same, they surface as: [aa, ii, uu]. If the first of the two vowels is low /a/, they also surface as a heavy syllable: [ai, au]. If the first of the two vowels is high /i, u/ and the following vowel is not the same as the first, they do not form a long vowel: *[ia], *[iu], *[ua], *[ui]. (This is assuming that there are two underlying vowels in every case which then coalesce on the surface, though I do not really intend to make any such claim.) I first present the data with the current

[4] My thanks to Chuck Murphey, Brenden Yoder, and Grace Baleno for their insights on this trait.

writing convention, which indeed shows adjacent vowels with the second bearing stress. However, I argue that there is good phonological evidence that these sequences are in fact not serial vowels, but regular CVCV syllables. These then easily conform to the stress rules outlined in Section 2 above.

3.1 Examples of VV́

Each word in the following example set shows stress on the second of the two adjacent vowels. I have provided examples of these pairs appearing word initially and finally, and showing both [iá] and [iú] sequences.

(9) Examples of second adjacent stress

a.	mi**á**	'fish'
b.	hu**á**n̓iq̓ela	'tease/annoy'
c.	peci**úd**	'split dried oolichans in two'
d.	mełegi**ú**	'twelve'
e.	yu**í**sda	'windstorm'

It is very likely that these adjacent vowel (VV́) sequences are in reality a syllable with a schwa nucleus, followed by a resonant onset and a full (and stressed) vowel (ə.RV́). This can be determined without the need for an acoustic analysis because of an interesting phonotactic effect. In x̄a'iselak̓ala, the high vowels /i/ and /u/ are phonetically retracted when they follow uvular [χ, q, ɢ] or glottal [ʔ, h] consonants, including ejective consonants [t̓, ts̓, p̓, m̓, n̓, tɬ̓].[5] I discuss this briefly above in Section 2.2 when disambiguating long vowels from full (but not long) vowels that are acoustically homophonous. Crucially, this high vowel retraction does not occur on a mid-vowel like schwa [e] or the low vowel [a] in any context. There is, therefore, a phonotactic difference between /ey/ and /i/, or /ew/ and /u/, that can be preserved in the orthography, and tested for.

The examples of word-initial CVV́ do not show retraction of the first vowel when that vowel is a high one and the initial consonant is either uvular or glottal. Examples of CVCVV́ (unstressed initial high vowel /i, u/) always show the retraction effect when preceded by uvular or glottal consonants. Therefore, if there truly were VV́ sequences, we would expect to see retraction on the first (unstressed) vowel when there is a high /i, u/. Since there is no retraction on any of these CVV́ sequences, I assume that the initial vowel is in fact schwa, which does not trigger retraction, and is instead followed by either a [j] (<y>) or [w] (<w>) glide consonant. For this reason I assume all cases of VV́ sequences are actually ə.RV́. Acoustic testing would, however, be needed to verify this claim in contexts where the orthographic VV́ sequence is not preceded by a uvular or glottal consonant.

[5] [k̓] does not trigger the high vowel lowering effect. This is likely because the North Wakashan velars are articulated partially on the hard palate, giving all vowels following velar consonants a palatal feature. This raises the initial pitch of the following vowel, instead of lowering it. [q̓] causes lowering, just as its non-ejective counterpart does.

3.2 Examples of əRV́

The following examples show the same data as in example set (9), but I adjust the orthography to preserve the predictability of the stress system, and what I argue is a more accurate description of how the language behaves in the minds of speakers.

(10) Alternative orthographic representation

a.	me**yá**	‘fish’
b.	he**wá**n̓iq̓ela	‘tease/annoy’
c.	pece**yú**d	‘split dried oolichans in two’
d.	mełege**yú**	‘twelve’
e.	ye**wí**sda	‘windstorm’

In each case I have replaced the first of two-vowel sequences of <i> and <u> with either an <ey> or <ew>, respectively. This double vowel stress sequence was initially borne of an orthographic quirk, and so its solution could also be an orthographic one, as I have presented here.

In any analysis, these orthographic vowel pairs constitute separate syllables: the second being stressed. Were the original VV́ sequence to be argued for, one would have to prove somehow that this second stressed vowel is the only syllable in the language that has no onset. In fact, it would probably be the only instance in the entire language family where a syllable was open. It is, therefore, far simpler to argue that the strict onset-vowel-optional coda (cluster) CV(CC) is preserved here in x̄a’iselak̓ala, as in all other Wakashan languages. One would also have to account for stress appearing on the second of two moraic syllables, contrary to the rules outlined in Section 2.

The following example set shows more orthographic VV́ sequences, with my proposed schwa-resonant analysis and orthographic revision. These examples all have a word-initial glottal stop, which would cause high-vowel retraction if the initial vowel was indeed either /i/ or /u/.

(11) Examples of VV́ ~ əRV́

a.	’iála	’eyála	‘keep something raised with hands’
b.	’iása	’eyása	‘urinate (woman)’
c.	’uábuił	’ewábuił	‘under something in house’
d.	’uákʷeƛela	’ewákʷeƛela	‘chew tobacco’
e.	’uálazkʷíƛ	’ewálazkʷíƛ	‘thank you’
f.	’uíqa	’ewíqa	‘get devil’s club’
g.	’uísda	’ewísda	‘surroundings’
h.	’uzuá	’ewzewá	‘flat surface’

In this example set, I present first each word with a VV́ sequence in the current orthographic convention. I then give each example with my proposed orthographic revision, preserving the schwa vowel in each initial syllable. In each case, the initial vowel does not undergo vowel retraction, and therefore must be a schwa followed by a glide consonant. Note in the final

example *'uzuá* ‘flat surface’, I have made changes to the first two vowels, changing them both from <u> to <ew>: *'ewze**wá***. The first instance I can prove by citing the absence of the phonetic retraction, the second is an assumption of mine given the prevalence of the historical mis-transcription between these two vowel expressions, and an effort to preserve the otherwise robustly predictable stress system.

4 Lexical stress in x̄a'iselaḵ̓ala

Further complicating the x̄a'iselaḵ̓ala word-stress system is lexical stress. There is some strong evidence that a few suffixes appear to consistently house word-stress, superseding the moraic word-stress rules explained above. In each case, these show stress on the first syllable of the suffix instead of the predicted syllable in the root. This was first noted by Bach (1990:12–13), where he states, “It appears to me that Haisla has a system of accented and unaccented suffixes overlaid on a system perhaps of the same general sort as that posited for Kwaḵ̓wala in Bach (1975)”. This is exactly what I find here: a general North Wakashan stress system with heavy syllables (as above) and a limited number of suffixes with lexical stress.

The following are examples containing three x̄a'iselaḵ̓ala suffixes which consistently house stress. These suffixes are *-(l)ás* ‘place’, *-áyu* ‘tool’, and *-(x)íd* ‘PAST’. The following example pairs show the bare root first, then with the suffix. Note the change in the stressed syllable, highlighted in bold.

(12) *-(l)ás* ‘place’

a.	**dén**xisa	‘drag net along shore’
b.	denxa**y-ás**	‘place where you drag net along shore’
c.	**wáu**yala	‘water falling’
d.	wau**y-ás**	‘place where the water starts falling down’
e.	**há**ya	‘hide ourself’
f.	haya**'-ás**	‘hiding place’
g.	**qél**g̱ʷił	‘stay in bed (sick)’
h.	qelg̱ʷi**l-ás**	‘hospital’

In each of the example pairs above, the stress first appears on the leftmost moraic syllable of the root. When the *-(l)ás* ‘place’ suffix is added, the stress appears on that suffix instead of the root. Note this shift occurs even in the presence of a heavy syllable in the root, as seen in ***wáu**yala* ‘water falling’ ~ *wau**yás*** ‘place where water falls’. To note, *-(l)ás* is a hardening suffix (Boas 1947), as seen in the <ł> ~ <l> change in the final example pair *qélg̱ʷi**ł*** ‘stay in bed’ and *qelg̱ʷi**l**ás* ‘hospital’. As far as the data available to me, the *-(l)ás* suffix takes stress away from the root without exception.

(13) *-áyu* ‘tool’

a.	**di**ḡʷem	‘pile, stake’
b.	di**ḡʷ-á**yu	‘hammer’
c.	**’á**qela	‘open’
d.	’a**ḡ-á**yu	‘key’
e.	**łén**dex̄ʷ	‘snot’
f.	łen**d-á**yu	‘handkerchief’
g.	**páin**ta	‘to paint’
h.	pepaint**m-á**yu	‘makeup’

Here again, each example pair shows a shift in stress from the leftmost syllable in the root, to the first syllable in the suffix *-áyu* ‘tool’. To note, *-áyu* is also a weakening suffix (Boas 1947), which accounts for the phonological change in the root in *’á**q**ela* ‘open’ to *’a**ḡ**áyu* ‘key’ (<q> ~ <ḡ>). There are a few exceptions to this stress shift, which are detailed in the appendix, and account for around 7% of all recorded instances.

(14) *-(x)íd* ‘PAST’

a.	ha**wá**n̓iq̓ela	‘bother, get on someone’s nerves’
b.	hawał**íd**	‘pranked’
c.	’e**sí**x̄ʷsduił	‘opposite side of doorway’
d.	’esix**íd**	‘moved (over)’
e.	**λú**’el̓a	‘do again’
f.	λu’elx**íd**	‘did something again’

The example pairs in (14) are morphologically complex, yet each still shows stress in the root, which shifts to the suffix *-(x)íd* ‘PAST’ when it appears in the second of each example pair. This suffix has relatively few instances of stress shift. Only 13% of recorded instances showed this stress shift, while the remaining data conformed to predictable stress rules outlined above. The *-(x)íd* suffix might in fact include one (or more than one) different yet homophonous suffix in other words that do not show the stress shift. More research into this particular suffix is needed.

This is only a preliminary analysis of this stress shift in x̄a’iselak̓ala, as there are many exceptions where the stress does not shift onto the suffix. My assumption is that these three suffixes have historical lexical stress. Diachronically, often used words likely became less productive, that is, speakers stopped analyzing them as morphologically complex and treated them as entire roots. This would explain the discrepancy between some suffixes drawing stress, and others conforming to the established stress rules. I plan to more thoroughly investigate lexical stress in North Wakashan stress systems in a forthcoming paper.

5 Conclusion

x̄a'iselak̓ala shares basic word-stress system traits with other North Wakashan languages. It also shows its own unique twist on how stress is assigned within a word. As in all North Wakashan languages, x̄a'iselak̓ala stress is signalled on the rhyme of a syllable by a rise[6] in pitch (tone) and greater intensity of that rhyme. Duration is not a good acoustic correlate of stress, likely to preserve the vowel length distinction in this language. The leftmost stress-bearing syllable is, more often than not, assigned stress. I assume all moraic syllables to attract stress, the leftmost of which receives it.

(15) stress leftmost moraic syllable

In x̄a'iselak̓ala, moracity is defined as an underlying vowel, or schwa and coda reṣonant pair. Heavy syllables, which I claim contain two morae, are also present in x̄a'iselak̓ala. These syllables attract stress over syllables with one or no mora as the most moraic syllables, regardless of their position in the word. If there are two heavy syllables within the same word, the leftmost of them holds word-stress.

(16) stress the leftmost heavy (bimoraic) syllable

If there is no good candidate, that is, no moraic syllable for word-stress assignment, the final (rightmost) syllable receives stress. This is called a default-to-opposite stress-system.

(17) stress the rightmost syllable if none are moraic

This system is disrupted in x̄a'iselak̓ala by a measure of lexical stress, constrained to a few suffixes. These suffixes are *-(l)ás* 'place', *-áyu* 'tool', and *-(x)íd* 'PAST'. These suffixes draw stress to them, regardless of any syllable composition within the word root.

(18) stress appears on lexical-stress suffixes

The crucial hierarchy in applying these four rules is as follows:

(19) lexical-stress > leftmost heavy syllable > leftmost moraic syllable > rightmost syllable

The lexical stress suffixes might be a borrowing from neighbouring Haíłzaqvḷa which may have lexical stress of its own, or a relic from some ancient proto-North-Wakashan ancestor. In either case, these languages offer much for the interested researcher to discover. Personally, it is my hope that this research will inform the Haisla orthography to make learning this beautiful language simpler for learners. It is also my great hope that such research might create more interest in x̄a'iselak̓ala, Wakashan languages generally, or any indigenous language.

[6] Or lowering (see Section 2).

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Appendix

Words with unpredictable stress

(20)	a.	**λi**kú	‘borrow’
	b.	**sa**watiɡawá	‘useless/worn out’
	c.	**pu**yás	‘Labrador tea’
	d.	**’u**ɡ^{w}eméls	‘front of house’
	e.	**ɡu**láli	‘salmon berry’
	f.	**’i**bísbi	‘hold nose’

Exceptions to *-áyu* lexical stress (12 exceptions out of 85 total examples of *-áyu*)

(21)	a.	húx̄^{w}ex̄^{w}ayu	‘horn of car’
	b.	ƛíx̄ela	‘beat drum’
	c.	ƛíx̄elayu	‘drumstick’
	d.	dayáax̄dayu	‘napkin’
	e.	ɡ^{w}álemx̄λayu	‘last will, obligation’
	f.	cúcax̄sia	‘brush teeth’
	g.	cúcax̄siayu	‘toothbrush’
	h.	báx^{w}a	‘rise’
	i.	báx^{w}idayu	‘puff up’
	j.	sísax̄sia	‘have a good snack’
	k.	sísax̄siayu	‘toothpick’
	l.	łemálud	‘moored up’
	m.	łemálayu	‘mooring rope’
	n.	ciá (ceyá)	‘draw water’
	o.	ciálayu (ceyálu)	‘bucket’
	p.	ɡ̄áɡ̄ina	‘look for lice’
	q.	ɡ̄áɡ̄inayu	‘fine toothed comb’
	r.	humáx̄di (hu**má**x̄di)	‘ask for blessing (to marry a woman)’
	s.	humáx̄diayu (hu**má**x̄diayu)	‘engagement ring’
	t.	híłax̄aud	‘clean up’
	v.	híłax̄audayu	‘cleaning tool’