

PREDICTABLE AND UNPREDICTABLE TONES IN HEILTSUK WAKASHAN

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As first reported by Frits Kortlandt (1975), the phonemes of Heiltsuk Wakashan include a high tone /' and a low tone /˘/. Illustrative are pairs such as /k'as/ "mussels" and /k˘as/ "sit outside", /yimas/ "chief" and its plural /yimas/. Nevertheless, most instances of the Heiltsuk tones have turned out to be predictable in terms of phonotactic and morphophonemic parameters, a brief account of which follows. I shall use the following abbreviations and special terms,

T	any obstruent
R	any unglottalized resonant (i.e., any one of /m,n,l,y,w,h/)
Ṛ	any glottalized resonant (i.e., any one of /ṃ,ṇ,ḷ,ỵ,ẉ,ḥ/)
V	any unglottalized vowel (i.e., any one of /ɪ,ɛ,ɔ,ɪ,i,u,a/)
Ṽ	any glottalized vowel (i.e., any one of /ɪ̣,ɛ̣,ɔ̣,ɪ̣,ị,ụ,ạ/)
◻	"disregarding tone"
#	word boundary
(T/Ṛ/Ṽ/...)	T or R or Ṽ or ...
singleton	any V in the environments (T/Ṛ/Ṽ/#R) __ (T/Ṛ/#), in other words, any V not adjacent to another V or an R, not counting a word-initial R
doubleton	any sequence VV in the environments (T/Ṛ/Ṽ/#R) __
tripleton	any sequence VRV in the environments (T/Ṛ/Ṽ/#R) __
HA	Haisla
HE	Heiltsuk
OO	Oowekyala

Actually, the distinction between a resonant and its corresponding vowel (e.g. between /m/ and /ṃ/, /y/ and /ỵ/, /u/ and /ụ/) is not phonemic in Heiltsuk, each pair consisting of allophones of one phoneme. This matter, for details on which I refer to Rath (1981: 59-63), would however unnecessarily complicate the following discussion. Note that only with unglottalized vowels are the Heiltsuk tones distinctive, glottalized vowels always having an automatic low tone. Also,

glottalized vowels occur only in the environments (T/Ṛ/Ṽ/#R) __ V .

By 1974, when Heiltsuk research was still in its earliest stage, I had become aware of the following phonotactic rules. Rules whose number features an asterisk will below be replaced by other versions.

- (1) No Heiltsuk word, lexical or combined with clitics, features more than 3 high tones;
- (2) If there are 3 high tones, the last two occur in a tripleton, as e.g. in /zazik'asila/ "operate an engine, engineer", /lawini/ "difficult, valued", /papuayú/ "halibut skate";
- (3a) A doubleton never features more than one high tone. Thus, /guy/ "female", /tuí/ "road", /nai/ "snow", /wuk'pa/ "body"; 1)
- (3b*) Aside from vocatives, if the first /V/ in a doubleton is also the first /V/ of the whole word, the doubleton must feature a high tone. In other words, the tones in /guy/, /tuí/, /nai/ are predictable;
- (3b-1*) Doubletons beginning in /a/ always feature a high tone. Thus, the second high tone in e.g. /g'uk'ai/ "float house" is predictable. This rule 3b-1* also predicts the high tone of /nai/ independently of rule 3b*. Exempt from this rule 3b-1* are vocatives, songs, onomatopoeias, and cases of complete root reduplication, e.g. /paipaipa/ "eat flounders", /daqdaq/ "bell";
- (3c) In addition to doubletons, sequences of three V-s are possible but must feature /a/ in the middle. This pattern VaV, like a doubleton, never features more than a single high tone. Thus, /apai/ "anchor the boat", /wuk'paipa/ "sandpit". Rule 3b-1* also applies to the part /aV/ of VaV, so the tones in /apai/ and /...paipa/ are predictable;
- (4a*) The possible tone configurations in a tripleton are as in the following, /VRV/, /VRV/, /VRV/. Only in vocatives does one find /VRV/;
- (4b*) If the initial /V/ of a tripleton is the first /V/ of the whole word, it has high tone (cf. /múla/ "elder brother or sister"), except in vocatives (cf. /múlaí/ "Oh elder brother/sister");
- (5) No /V/ can have high tone after a doubleton, sequence /VaV/, or tripleton.

In the course of time the application of rule 5 was widened morphophonemically. Included in the definition of a doubleton were cases of a singleton resulting from the telescoping of two identical V-s. For example, the low tone in /yimas/, plural of /yimas/ (see above), is predictable by rule 5 because /yimas/ derives from */yimas/, in which */i/ is an inserted phonetically modified reduplicate

of initial /y/. This interpretation was corroborated (and historically speaking inspired) by the cognates of /yimas/ and /yimas/ in the closely related Oowekyala language, sc. OO /yimas/ and /yimas/, respectively. Oowekyala has accent instead of tones. In the large majority of words the accent is predictable at the phonemic level (and therefore not written by me) on the basis of the following rule, "The first /V/ of the phonemic word bears accent, allowing for some phonetic complications if the first /V/ is part of a doubleton (e.g. OO /tuigila/ "build a road") and/or if the first /V/ is preceded by a /V/ (e.g. OO /maluk'ila/ "create two")." The exceptions to this rule are practically all cases where the first /V/ of the word is a ^{root-final} singleton deriving morphophonemically from */V/; see the example of OO /tun'ak'ja/ mentioned below. Practically only under the accent does Oowekyala have opposition between /V/ and two consecutive instances of this same /V/, as illustrated by OO /yimas/ and /yimas/. The comparison with Oowekyala has also suggested assuming telescoping in Heiltsuk in cases where Heiltsuk itself does not provide direct morphophonemic clues. For example, clitics attached to /tasut/ "press together with both hands", always feature low tones only; compare /tasutsu/ "You press together ..." (and other meanings), and /casutsu/ "You pour water out" (idem). It is demonstrable that /a/ in /tasut/ is an insertion in /ts/ "push" required whenever the suffix -u "together" is joined to a root with the structure TT, RT, or RT. However, that this /a/ is etymologically */aa/, is not demonstrable for Heiltsuk otherwise than by a circular reasoning: "Following tones are low because /a/ derives from */aa/. And /a/ stems from */aa/ because following tones are low." The real evidence that /a/ in /tasut/ derives from */aa/, is the Oowekyala cognate of the word, sc. OO /taasut/. Another example is HE /k'as/ mentioned above. Following clitics feature low tones only. Reason: the item derives from */k'aa/, see OO /k'aaas/.

New rules detected after 1974 concerned singletons. Instrumental in the detection were morphophonemics and the comparison with Oowekyala and, through the cooperation with Neville Lincoln in a North Wakashan comparative project, Kwakwala. (Information on Haisla, the fourth North Wakashan language, remained scarce until 1983.) Consider the above mentioned item /k'as/. It contains a root allomorph /k'a/ "sit" which alternates with /k'a/ and /k'a/, see e.g. /k'aii/ "sit/stay/be present indoors", /k'axdqa/ "chair". Inspired by the fact that /k'as/ corresponds to OO /k'as/ 2), and knowing that in Heiltsuk no /V/ ever occurs in the positions _ (#/T/R/R), the Heiltsuk item /k'as/ can be assumed to derive from HE */k'as/. Other examples following this pattern are HE /i/ "dead" (from HE */i/, see OO /i/), HE /tx'ja/ "jump up on ground out-

side (from HE */tx'ja/, see OO /tx'ja/), HE /tunak'ja/ "proceed on foot" (from HE */tunak'ja/). The Oowekyala counterpart to the latter item is OO /tun'ak'ja/ in which the accent (indicated by /' before the accented /V/) is written because it is not predictable by the rule given earlier, namely that the first /V/ of an Oowekyala phonemic word bears accent. The accent in OO /tun'ak'ja/ is nevertheless governed by the following clause to the rule, "unless the first /V/ is followed by /V/ and derives morphophonemically from */V/, in which case the second /V/ of the phonemic word bears accent." What has just been said about certain Heiltsuk low tone singletons, is summed up in the following provisional rule,

- (6a*) If the first /V/ of a Heiltsuk phonemic word is a singleton deriving from */V/, it has low tone.

By implication,

- (6b*) If the first /V/ of a Heiltsuk phonemic word is both phonemically and morphophonemically a singleton, it has high tone, as e.g. in /k'aii/, /k'axdqa/, /tunak'ja/, /zasik'asila/, /awini/, /papuayu/, /wuk'pa/ (see above).

To rule 6a* can be added the following,

- (6a-1*) If both the first and the second /V/ of a Heiltsuk phonemic word are singletons deriving from */V/, they both have low tone.

An example of the latter is /maspa/ "two big and/or round things on the ground outside (e.g. houses)". It derives from */maspa/; note that final /s/ is the same suffix allomorph meaning "on the ground outside, on dry land", which one has in /k'as/ "sit outside". The availability of Kwakwala data has been particularly important in the discovery of rule 6a-1* because the Oowekyala cognate of HE /maspa/ is not OO */maspa/ but OO /maspa/. Practically only in the first syllable of a word does Oowekyala, unlike Heiltsuk, allow /V/ in the positions _ (#/T); the exceptions to this Oowekyala rule are caused by one particular suffix. The following additional tone rule predicts the second high tone in HE /aisai/ and /titx'ja/, which are the plural forms of /ai/ and /tx'ja/ mentioned above,

- (6c) If the first /V/ of a Heiltsuk phonemic word is both phonemically and morphophonemically a singleton, and consequently has high tone by rule 6b*, while another /V/ is phonemically a singleton but morphophonemically a /V/, this other /V/ also has high tone provided this

does not violate rules 1, 2, or 5.

This rule is also illustrated by e.g. /i/ in /kág^opuzi/ "hand flat on one's hip", /múk^oi/ "knot (in rope)", /qáxsi/ "half". Again, alternation of a singleton with /V/, as illustrated above by /a/ of /k^oas/ and /á/ of /k^oáia/, diagnoses the singleton as deriving from */V/. To give a few more examples, /i/ in /tx^ojs/ (see above), which is governed by rule 6a*, alternates with /í/ in /tx^oíias/ "place or time of jumping up on the ground outside". The /i/ in /titx^oias/ (plural of /tx^ojs/) alternates with /í/ in /titx^oíias/ (plural of /tx^oíias/). Joining certain enclitics, e.g. -ñx^o "the one there with you", to /kág^opuzi/, /múk^oi/, /qáxsi/ results in /kág^opuziñx^o/, /múk^oiñx^o/, /qáxsiñx^o/. The high tone of /ú/ in these latter three cases is discussed further below. However, there are exceptions to rules 6a* and 6a-1*. Final /i/ of, for example, /wksi/ "split in two (log, canoe)" and /maasi/ "halved, divided in two", derives from */i/ as can be diagnosed by joining the enclitic -ñx^o; cf. /wksiñx^o/, /maasiñx^o/. Then why do /wksi/ and /maasi/ not follow rules 6a* and 6a-1*, respectively? This problem of Heiltsuk morphophonemics has never really been solved but can be avoided by giving rules 6a* and 6a-1* their following final versions,

- (6a) If the first /V/ of a phonemic word is a singleton deriving from */V/, it has low tone (as in /i/ deriving from */i/, /tynák^oias/ deriving from */tynák^oias/), except when it is suffix-final and either the last phoneme of the word or followed by an enclitic beginning in T or R, in which case it has high tone (as in /wksi/ and its diminutive-hypocoristic plural /wksiñpíx^o/;
- (6a-1) If both the first and the second /V/ of a phonemic word are singletons deriving from */V/, they both have low tone (as in /masms/ deriving from */masms/), except when the second /V/ is suffix-final and either the last phoneme of the word or followed by an enclitic beginning in T or R, in which case the second /V/ has high tone (as in /maasi/ and its diminutive-hypocoristic plural /maasiñpíx^o/.

As the reader may have noticed already, final /si/ in /wksi/ and /maasi/ is the same suffix allomorph meaning "apart" that occurs in /qáxsi/. Rule 6b* can now be given the following final version,

- (6b) The first /V/ that is both phonemically and morphophonemically a singleton, has high tone (provided rules 1, 2, and 5 are not violated), whereas following V-s satisfying the same condition, have low tone.

Rules 6a, 6a-1, 6b, and 6c predict the tones of practically all singletons in Heiltsuk lexical words, disregarding singletons that are telescoped identical V-s. The cases where these rules fail are discussed below.

Turning now first to doubletons, the following rule, which replaces 3b* and 3b-1*, predicts their tones exhaustively,

- (3b) A doubleton, including the case of a singleton resulting from the telescoping of two consecutive identical V-s, always has a high tone if this does not violate rules 1, 2, or 5. Exempt from this rule are vocatives, interjections, foreign words (borrowings), songs, onomatopoeias, and cases of complete root reduplication (e.g. /dapdap/ "bell").

The tones in tripletons are governed by the following rule which replaces nos. 4a* and 4b*,

- (4) In a tripleton V₁RV₂ both V₁ and V₂ have high tone except in the following cases,
- (a) If two high tones in V₁RV₂ would violate rules 1, 2, or 5, both V₁ and V₂ have low tone, as in /papayug^oila/ "make a halibut skate", /múk^oigila/ "create a knot", /tuigila/ "build a road";
- (b) If V₁ stems from telescoping of *V₁V₁, the tone of V₁ follows rule 3b as if V₁ were a doubleton, whereas V₂ has low tone, as in /pala/ "crew (etc.)", which stems from */paala/, cf. OO /paala/;
- (c) If V₁ is not the first /V/ of the whole phonemic word, and stems from */V/, the tone of V₁ follows rule 6c as if V₁ were a singleton, whereas V₂ has low tone, as in /múk^oilism/ "a knot not long ago".

Vocatives are exempt from this rule no. 4.

Together, the various rules without an asterisk would predict the tones in both lexical words and their combinations with enclitics (proclitics always have low tone(s)), if it were not for the following complication. A word may contain a singleton with a high tone that is governed only by the limitative rules 1, 2, and 5. The cases concerned are either (1) allomorphs, or parts of allomorphs, of certain suffixes and enclitics, including some of the most frequent grammatical enclitics. These are cases of a lexical high tone; (2) original word-final singletons not derivable from */V/ or telescoped identical V-s, which have become followed by initial /s/, /k/, or /x/ of certain allomorphs of enclitics. These are cases of an unpredictable morphophonemically caused high tone, the unpredict-

ability obviously being relative to the preceding tone rules. One example of a lexical high tone is the suffix allomorph /bá/ "point or end of something long" (and other meanings) in for instance /kásbá/ "seaward end/point". Whereas joining the above mentioned enclitic -hí° to e.g. /múk°í/ results in /múk°íúx°/, thus revealing that /í/ alternates with /i/ and that tone rule 6c applies, joining this same -hí° to /kásbá/ does not result in */kásbauí°/ but in /kásbauúx°/, which reveals that final /á/ in /kásbá/ is not governed by rule 6c. Nor can the final /á/ result from */á/ so that rule 3b applies, because one has /hsbámúg°à yis.../ "I (/núg°á) am the namesake (/hsbá/) of (yis) ..." and not */hsbamúg°à yis.../. The Owekyala counterpart of the latter is OO /hsbamúg°a yis.../, with single /a/. Another example of a lexical high tone is the allomorph /úx°/ of the enclitic to which I refer in this paper as -hí°. Attaching the clitic to, for example, /yák/ "bad" and /qáxsi/ (see above) gives /yákuúx°/ and /qáxsiúx°/, in which the second high tone is not predictable by the preceding rules because /úx°/ is not derivable from */úx°/ or */úúx°/. One cannot posit */úx°/ because attaching the clitic to /čk°/ "short" should then result in */čk°úx°/ (with low tone by rule 6a); the Owekyala counterpart would be OO */čk°úx°/. The attested forms are, however, HE /čk°úx°/, OO /čk°uúx°/. This latter Owekyala form also rules out positing */úúx°/. Direct Heiltsuk evidence against */úúx°/ is not available because the allomorph /úx°/ is incompatible with further high tones. An example of an unpredictable morphophonemically caused high tone, is /á/ in /čutáxsilá/ "too fresh (food)", which derives from /čutá/ "fresh (food)". The high tone of /á/ in /čutáxsilá/ could not be subsumed under rule 3b (by interpreting /á/ as */á/ because /ksá/ "slippery" plus the same enclitic as in /čutáxsilá/, results in /ksáxsilá/. If /á/ resulted from */á/, it would be */ksáxsilá/. The Owekyala counterpart to HE /ksáxsilá/ is OO /ksaxsila/, with single /a/ after /s/. Admittedly, it is technically possible to subsume /á/ of /čutáxsilá/, and the first /á/ of /ksáxsilá/, under rules 6c and 6a, respectively, because /á/ is a suffix allomorph in both cases (see the stipulations in rules 6a and 6c). However, the implied assumption that the /á/ derives from */á/ is not supported by Owekyala or Kwakwala evidence, and the preceding tone rules are partly based on this support. More important, the comparison with Haisla suggests a connection between the unpredictable high tone in /čutáxsilá/ and the Haisla segmental element /ə/. For example, whereas from HE /kák/ "rigid" one derives HE /kákxsilá/ "too rigid" (without the epenthetic element /x/ present in HE /čutáxsilá/), from HA /kák/ "rigid" one derives HA /kákxsil'a/ "too rigid".

As mentioned in passing, the study of Haisla is very young and it is not real-

ly known yet what relevance Haisla morphophonemics has for a possible interpretation of the unpredictable Heiltsuk high tones. In any event, the existence of unpredictable high tones in Heiltsuk, does not necessarily imply that there were tones in ancestral North Wakashan. The problematic high tones may have developed from one or more ancient segmental phonemes, or perhaps all Heiltsuk high tones have developed from a pitch accent, with some morphemes having lexical accent. Thus, in words with several high tones, the last high tone may originally have been a distinctive accent, all other cases of high tone having developed through regressive assimilation and/or analogy. For example, /ksáxsilá/, /čutáxsilá/, /čutá/, /yákuúx°/ might have developed from */ksaxsil'a/, */čut'axsila/, */č'uta/, */yák'uúx°/. It should however also be pointed out that if such a development did take place, the supposed ancient Heiltsuk accent does not correspond in any simple way to the accent in contemporary Haisla. Haisla has free accent; compare HA /mał'a/ "operating as a pair, both ... and ..." and HA /m'alə/ "to swim (animate beings)". In dictated words the Haisla accent can be actualized phonetically as stress, but otherwise it is a pitch accent consisting in a musical word contour. For full details I refer to Lincoln and Rath (1985: 39-42). The following chart gives some comparative Heiltsuk, Owekyala, and Haisla data. The tones in all Heiltsuk words are predictable, except for the suffix allomorph /bá/ in the last four examples.

	Heiltsuk	Owekyala	Haisla	
1	yímas	yimas	h'imas	"chief"
2	yímas	yiimas	him'as	"chiefs"
3	zázik°asíla	zazik°asila	zazik°'asila	"operate engine, engineer"
4	masqs	masqs	mas'qs	"two big and/or round things on the ground outside"
5	qáxsi	qaxsi	q'axsi	"half"
6	małsi	małsi	małs'i	"split in two"
7	k°as	k°as	k°as	"mussels"
8	k°as	k°as	k°as	"sit on ground outside"
9	k°aił	k°aił	k°a'ıł	"sit/stay/be present indoors"
10	k°aiłas	k°aiłas	k°aił'as	"place where one sits"
11	k°axdqa	k°axdqa	k°'axdqa	"chair"
12	k°ısgııı	k°ısgııı	k°ısgııı	"lie on top of big thing indoors"
13	k°ı	k°ı	k°ı	"lie on ground outside"
14	k°ısu°	kıısu°	k°ısu	"the-one-there-with-you lies on the ground outside"

15	k ^o ʔsá	k ^o ʔsa	k ^o ʔs'a	"put (animate being) in lying position on ground outside"
16	k ^o ʔzú	k ^o ʔzu	k ^o ʔzu	"mat to lie on"
17	k ^o ʔzúa	k ^o ʔzua	k ^o ʔzu'a	"put mat down and lie on it"
18	k ^o ʔiá	k ^o ʔiá	k ^o ʔiá	"lie in bed"
19	k ^o ʔilás	k ^o ʔilas	k ^o ʔil'as	"bed, bedroom"
20	k ^o ʔxdǫá	k ^o ʔxdǫa	k ^o ʔxdǫa	"bed, surface to lie on"
21	k ^o ʔáá	k ^o ʔáa	k ^o ʔ'áa	"lying at some place"
22	kádáyú	kadayu	kád'ayu	"pencil"
23	kádiáa	kadiáa	k'adiáa	"register something"
24	kátí	kati	kát'i	"writing paper"
25	kátinúa	katinúa	k'atinúa	"bookkeeper (etc.)"
26	káták ^o	katak ^o	k'atak ^o	"petroglyph"
27	ʔúba	ʔuba	ʔúb'a	"point or end of something long"
28	ʔásba	ʔasba	ʔ'asəba	"seaward end"
29	ʔsbá	ʔsba	ʔsəba	"the other end; be someone's namesake"
30	ʔíkba	ʔikba	ʔ'íkba	"upper end"

To conclude this paper I should like to point out that the morphophonemic analysis of a singleton /V/ as *V/, which analysis is the basis of rules 6a, 6a-1, and 6c, does not imply that *V/ has to be the end point of the analysis. Take Heiltsuk examples nos. 13-17, in all of which /i/ derives from *i/ by tone rule 6a. Both this *i/, and phonemic /i/ of examples 18 and 19, can be understood as due to unglottalized *i/ coalescing with some morphophoneme, let us indicate it as "i". Thus, for instance,

13	k ^o ʔs	<	*k ^o ʔs	<	*k ^o ʔs
16	k ^o ʔzú	<	*k ^o ʔzu	<	*k ^o ʔzu
18	k ^o ʔiá	<	*k ^o ʔiá		

This analysis reduces the variety of root allomorphs in examples 12-21 (sc. /k^oʔi/, /k^oʔi/, /k^oʔi/, meaning "to lie (said of animate beings)") to just the one canonical form k^oʔ-. Obviously this type of analysis presupposes that there is a way of proving that /i/ in /k^oʔisǫiá/ (no. 12) and /k^oʔixdǫa/ (no. 20), and /k^oʔi/ in /k^oʔiá/ (no. 21), are not the result of *i/ losing its glottalization due to coalescence with some morphophoneme other than i. As obviously, the proof consists of two parts, (1) a procedure to diagnose which one of a set of allomorphs of the same morpheme, e.g. the root allomorphs /k^oʔi/, /k^oʔi/, /k^oʔi/ in examples

12-21, reveals the canonical form of the morpheme, and (2) a method to predict into which particular allomorph a canonical form will change if a particular affix follows. As far as diagnosing canonical forms is concerned, I refer to Lincoln and Rath 1980 (37-43). For present purposes let it suffice to say that the example of /k^oʔiá/ (no. 18) demonstrates that the canonical form of /k^oʔi/, /k^oʔi/, and /k^oʔi/, is in any event not *k^oʔi-. To predict the allomorphs of a morpheme in Heiltsuk, a complicated system of morphophonemes is required, each and every canonical form of an affix beginning in some morphophoneme, and in addition the tone rules presented in this paper. The Heiltsuk system of morphophonemes, which I shall not try to detail, includes no morphophoneme that coalesces with *V/ into /V/. Therefore, aside from the predictable high tone, /k^oʔi/ in /k^oʔisǫiá/ and /k^oʔixdǫa/ represents the canonical form k^oʔ- of the words' root. Ultimately, then, the Heiltsuk predictable tones, and also those unpredictable high tones that are caused morphophonemically, are a matter of morphophonemes and phonotactics.

NOTES

- 1 This rule makes the orthographic placement of a doubleton's one possible high tone phonemically non-distinctive. My policy is to write a high tone over the second /V/ in a doubleton if the latter is usually pronounced as a rising diphthong, as in /ǫpá/, but otherwise over the first /V/, as in /náí/. It is only for the purpose of this paper that I use / / to indicate low tone. The absence of high tone is sufficient indication of low tone. Thus, /ǫpá/ can as well be written /ǫpá/, and /zázik'asíá/, for example, can be replaced by /zázik'asíá/.
- 2 In the transcriptional system of Lincoln and Rath 1980, this Oowekyala item /k^oʔas/ is written /k^oa's/. Phonetically it corresponds to [k^oa's], with an occasional free variant [k^oas].

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