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Prosodic Word Structure in Kashaya Reduplication*

Eugene Buckley

I argue in this paper that in Kashaya (Pomoan: N. California), the base and the reduplicant are separate prosodic words, leading to a bracketing mismatch between the phonology and morphology. In particular, most of the morphology is suffixing and the suffixes join in the prosodic word headed by the reduplicant, excluding the base.

(1) a. *morphology* `[ [ base + reduplicant ] suffixes ]`
b. *prosody* `[ ] [ ]`

I first describe the two types of verbal reduplication, the iterative and the frequentative (§1). I then show how foot structure is constructed separately for the reduplicant and all that follows it (§2). Next I present the three processes that are sensitive to this foot structure, as well as the location of the foot relative to the edge of the prosodic word: the outcome of elision (§3), the choice of Durative allomorphs (§4), and the distribution of laryngeal increments (§5). A summary and conclusion are given in §6.

1 Reduplication

There are two basic reduplicative patterns in Kashaya verbs. (Reduplication in Kashaya nouns is lexicalized and does not lead to two prosodic words; for analysis, see Buckley 1994a.) Many verbs include instrumental prefixes; they interact with reduplication in ways identical to a syllable in the same position which is part of the root (shown in bold).

The first type of reduplication forms the ITERATIVE, "meaning that the action is repeated a few times" (Oswalt 1961: 155). The final syllable is copied, including any laryngeal increment /ʔ, h/ that precedes the onset. (For more on increments, see §5.)

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(2)	a.	ha-**ʔlu**-	haʔlu + ʔlu-	‘wrap’
	b.	da-**ʔṗo**-	daʔṗo + ʔṗo-	‘clean out’
	c.	pu-**hṭ^{h}e**-	puhṭ^{h}e + hṭ^{h}e-	‘spread out in wind’
	d.	cu-**hyu**-	cuhyu + hyu-	‘smash to pieces’

Any final consonant or vowel length present in the reduplicated syllable is eliminated (in both the base and the reduplicant). No formal analysis of this fact is given here, but see Buckley (1994a).

(3)	a.	ha-**hšol^h**-	hahšo + hšo-	‘shake loose’
	b.	šu-**hwe:n**-	šuhwe + hwe-	‘shake’

For some verbs the reduplication is obligatory, i.e. the unreduplicated root does not occur; such roots are cited in braces.

(4)	a.	{**šuhla**-}	šuhla + hla-	‘be shiny’
	b.	{**ṡoʔyo**-}	ṡoʔyo + ʔyo-	‘tickle’
	c.	{ba-**šo**-}	bašo + šo-	‘echo’
	d.	{ba-**ʔlo**-}	baʔlo + ʔlo-	‘talk brokenly’

The claim of two prosodic words predicts structures like the following (cf. (20a)).

(5)	a.	*morphology*	[[[cuhyu + hyu] cid] u]
	b.	*prosody*	[cuhyu][hyucidu]

We will see evidence for this structure below.

The other type of reduplication is the FREQUENTATIVE, which “means that the action is repeated in quick succession” (Oswalt 1961: 156). This copies the final two syllables (or foot) of the stem, often including a prefix.[1]

(6)	a.	**huʔḱulu**-	huʔḱulu + ʔḱulu-	‘cough up’
	b.	**ḱopoš**-	ḱopoš + ḱopoš-	‘bob up and down’
	c.	ma-**ne**-	mane + mane-	‘dance, stamp feet’
	d.	**kumu**-	kumu + kumu-	‘clump up’

[1] In almost every case this is equivalent to copying the entire prefix + root complex; thus (6a) is not typical (see Buckley 1994a: 367).

In the case of an unprefixed monosyllabic root, the copied foot is monosyllabic.

(7)	a.	**kel**-	kel + kel-	‘peek’
	b.	**hc^{h}il**-	hc^{h}il + hc^{h}il-	‘hang’

As with Iterative (syllable) reduplication, some examples of Frequentative (foot) reduplication are obligatory, and the simple root does not occur independently.

(8)	a.	{**ṣiṭi**-}	ṣiṭi + ṣiṭi-	‘twinkle, glitter’
	b.	{**ṭolo**-}	ṭolo + ṭolo-	‘rattle’
	c.	{ba-**ʔlo**-}	baʔlo + baʔlo-	‘talk brokenly (pl)’

Comparison of *baʔlo-baʔlo-* (8c) with *baʔlo-ʔlo-* (4d) shows that the posited abstract stem {ba-**ʔlo**-} is well-motivated, even though this stem never surfaces without some form of reduplication.

The claim of two prosodic words predicts structures like the following (cf. (12a)).

(9)	a.	*morphology*	[[[ḳopoš + ḳopoš] adad] u]
	b.	*prosody*	[ḳopoš][ḳopošadadu]

We now turn to evidence for the proposed mismatch between morphological and prosodic structure in Kashaya reduplication.

2 Foot Structure

The main consequence of the two prosodic words in reduplicated verbs is that foot structure is created separately for each word. Foot construction in Kashaya occurs as follows, assuming a traditional derivational approach for expository purposes (cf. Oswalt 1961, 1988, Buckley 1994a,b, 1997):

(10) a. iambs from left to right
b. iambic lengthening (though not word-finally)

c. initial-syllable extrametricality as long as this does not exclude the root from foot structure[2]

The following simple examples do not include reduplication, and serve to illustrate basic foot structure.

(11) a. **mac**-id-uced-u → (maci:)(duce:)du
'keep going in there'
b. **w**-ala-bi-na → (wala:)(bina)
'had gone down'
c. **bimucid**-uced-u → bi(muci:)(duce:)du
'used to eat'
d. ca-**qʰam**-ala-w-ibic-ʔ → ca(qʰama:)(lawi:)(biʔ)
'start to cut downward'

In reduplicated verbs, the location of iambic lengthening seems to shift. It occurs according to the normal principles, but only within the second prosodic word, following the "+" in these examples. Here boldface is used to indicate the root in the base as well as in the reduplicant.

(12) a. **ḱopoš+ḱopoš**-adad-u → ḱo(poš) + ḱo(poša:)(dadu)
'bob along up and down'
b. **tili+tili**-mac-i → ti(li) + ti(lima:)ci
'roll in there'
c. **ṡiṭi+ṡiṭi**-hqa-in → ṡi(ṭi) + ṡi(ṭih)(qan)
'glittering'
d. ma-**ne+ma-ne**-mul-iċ-me-ʔ → ma(ne) + ma(nemu:)(liċ)(meʔ)
'dance around it! (pl)'

The first prosodic word (preceding the "+") is never long enough for iambic lengthening. The analysis here predicts that the feet on the first prosodic word would induce lengthening if that string were long enough, but the prediction is untestable given the morphological limitations of the language.[3]

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[2] While some sources have suggested that left-edge extrametricality is highly marked or even unattested (cf. Hayes 1995), the evidence strongly supports it for Kashaya (cf. Buckley 1994a,b, 1997).

[3] Stress placement in Kashaya is phrasal, and these two prosodic words form one stress domain (Buckley 1994b, 1997).

A single foot structure constructed over the base and reduplicant would yield the following incorrect results.

(13) a. *ḱo(poš) + (ḱopo:)(šada:)du
b. *ti(li + ti:)(lima:)ci
c. *ṡi(ṭi + ṡi:)(ṭih)(qan)

Thus we require the dual prosodic word structure — a new word starting with the reduplicant — to ensure correct foot structure, and with it correct distribution of vowel length. Example (13a) shows that it is not siimply a matter of aligning foot boundaries with the base-reduplicant boundary: rather, we need a new prosodic word, and with it whatever extrametricality is independently motivated (see (12a)).

3 Elision

When two vowels come together across a morpheme boundary, the features of the second vowel are always lost, but the features of the first vowel might surface as long or short. Specifically, the single output vowel is long when it occurs in the first foot of the word (14), but short later in the word (15) (Buckley 1998).

(14) a. **da**-ibic-qa-w → (da:)(bic^{h})(qaw)
'go away'
b. c^{h}i-**de**-ibic-ʔ → c^{h}i(de:)(biʔ)
'lift up'
c. **šohko**-ad-u → šo(ko:)du
'be sitting'

(15) a. **q̇a:**-hqa-ibic-ʔ → (q̇ah)(qabiʔ)
'rescue'
b. ba-**hqoṭol**-qa-iċ-ed-u → bah(qoṭol)(qaċe:)du
'failed to heed'
c. **malucma**-ibic-ʔ → ma(luc^{h})(mabiʔ)
'start to bake (pl)'

The following examples show that the same generalization regarding "first" or "later" foot can be maintained only if the reduplicant begins a new word for the purposes of defining the initial foot. Because the laryngeal increment

ultimately syllabifies as the coda of the preceding syllable, it is treated as being outside the following foot structure (see also §5 below).

(16) a. **hihla**+**hla**-ad-u → hihla + h(la:)du
'be gossiping'
b. da-**hwe**+**hwe**-ad-u → dahwe + h(we:)du
'push over and over'
c. **ṡohyo**+**hyo**-ad-u → ṡohyo + h(yo:)du
'be tickling'

(17) a. **ṡili**+**ṡili**-ad-em → ṡi(li) + ṡi(li:)(dem)
'jingling along'
b. du-**hc^{h}u**+du-**hc^{h}u**-ala-w → duh(c^{h}u) + du(c^{h}u:)law
'sprinkle (down)'
c. si-**hqa**+si-**hqa**-ad-u → sih(qa) + si(qa:)du
'slide along'

See (28) for further examples. The solution, of course, is that the "initial foot" that is relevant is the first one within the prosodic word, not within the morphological word. By this criterion, all the long vowels in (16) and (17) are comparable to those in (14), and the outcome exactly what we should expect.

4 Durative Allomorphy

After a vowel-final stem, two allomorphs of the Durative occur, *-cid* and *-med*. As the following examples show, *-cid* occurs in the first foot of the word (18), and *-med* elsewhere (19) (Buckley 1998).

(18) a. **wa**-cid-uwad-u → (waci:)(duwa:)du
'keep coming'
b. **cahno**-cid-u → cah(noci:)du
'talk'
c. ba-**hye**-cid-un → bah(yeci:)(dun)
'whenever he stopped'

(19) a. **w**-ala-med-em → (wala:)(medem)
'come down'

b. **ʔihyu**-m-ci-med-u → ʔih(yum)(cime:)du
'when it grows cold'
c. šu-**ṡaẏṭa**-med-ʔ → šu(ṡaẏ)(ṭame ʔ)
'they whipped'

The allomorph immediately after a reduplicated syllable or foot is the "initial foot" allomorph ***-cid***, as guaranteed by regular footing. This can be explained easily if the reduplicant begins a new prosodic word, and defines a new initial foot.

(20) a. cu-**hyu**+**hyu**-cid-u → cuh(yu) + h(yuci:)du
'it was smashed to pieces'
b. da-**hmo**+**hmo**-cid-u → dah(mo) + h(moci:)du
'keep breaking up by hand'
c. **sime**+**sime**-cid-u → si(me) + si(meci:)du
'keep on sprinkling'

The wrong result would be predicted if just a single foot domain were present.

(21) a. *cuh(yuh)(yume:)du
b. *si(mesi)(meme:)du

As the analysis predicts, later than the first foot the alternant *-med* is found, even in the second prosodic word.

(22) ba-**šo**+**šo-**m-ci-med-u → ba(šo) + (šom)(cime:)du
're-echoed'

No special statement is required for the allomorphs if it is a general property of Kashaya reduplication that two prosodic words, and therefore two footing domains, are present.

5 Laryngeal Increments

Many roots in Kashaya (and related languages) have consonants with so-called laryngeal increments, a glottal element /h/ or /ʔ/ intimately connected to the following consonant (Oswalt 1961, 1998, Buckley 1992, 1994a,

Steriade 1994). Kashaya increments always occur immediately before the first foot of the word (Buckley 1998).

(23) a. **hce**-m-ʔ → h(ceṁ)
'lies open'
b. **ʔda**-mac-qa-w → ʔ(damac^{h})(qaw)
'go southeast'
c. **bahc^{h}ital**-ʔ → bah(c^{h}itaḷ)
'string meat'
d. mu-**hk^{h}uy**-ba → muh(k^{h}uẏ)ba
'after it burned up'
e. du-**ʔḳu**-w → duʔ(ḳuw)
'finish working'

Extrametricality is blocked when a word begins with an increment, even if the root is polysyllabic. (As seen in (11) above, extrametricality is normally expected with polysyllabic roots.)

(24) a. **hqowic**-iċ-ed-em → h(qowi:)(ciċe:)(dem)
'whenever he came home'
b. **ʔḳulu**-med-u → ʔ(ḳulu:)(medu)
'be coughing'
c. **ʔdabane**-ba → ʔ(daba:)(neba)
'after throwing away'

This blocking occurs because increments must align with the left edge of the initial foot (cf. (23)): rather than deleting the increment, the foot is kept in a position where it serves to license the increment.

As seen already above, in reduplication the increment occurs in both the base and the reduplicant. Licensing is by the initial foot, one for each of the two prosodic words.

(25) a. **huʔḳulu+ʔḳulu**-w → huʔ(ḳulu) + ʔ(ḳuluw)
'cough rapidly'
b. **dohqo+dohqo**-m-ʔ → doh(qo) + doh(qoṁ)
'trot'
c. da-**ʔṗo+ʔṗo**-c-ʔ → daʔ(ṗo) + ʔ(ṗoʔ)
'clean out'

In the Correspondence Theory of McCarthy and Prince (1995), this non-deletion could be treated as underapplication of the distributional constraint on laryngeal increments, due to base-reduplicant faithfulness; but the word structure proposed makes that step unnecessary (though the general approach is still, of course, compatible with Correspondence Theory).[4]

Further evidence for two prosodic words is found in the application of the Decrement, a morphologically triggered rule that deletes an increment. Simple examples, without reduplication, are given first.

(26) a. du-**hqoṭol**-ya-e: hni: → doh(qoṭol)(yeh)(ni:)
'didn't he help?'
b. da-**hqoṭol**-ta-w → da_(qoṭol)(taw)
'fail to do (pl)'

(27) a. du-**ʔkʼu**-w → duʔ(kʼúw)
'finish working'
b. du-**ʔkʼu**-t-ʔ → du_(kʼúʔ)
'finish working (pl)'

Here it is the plural morpheme that triggers the Decrement.

When the Decrement applies to a reduplicated stem, it removes the increment only from the reduplicant, i.e. within the same prosodic word. This fact can also be observed in (17).

(28) a. **dohqo+dohqo**-ad-u → doh(qo) + do_(qo:)du
'trot along'

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[4] In representations up to this point, I have included foot structure on the base, even though this often requires a degenerate foot due to the small size of the unsuffixed stem, e.g. *doh(qo)* in (25b). While degenerate feet are disfavored cross-linguistically, some languages do allow such feet for the purpose of providing minimal structure on a word (cf. Hayes 1995). Kashaya is clearly such a language, since it permits monomoraic words, as in *cá* 'stay!', and will even stress a degenerate foot in order to have syllable or foot extrametricality, as in *cah(nó)* 'speak!'; see Buckley (1994a). Since the base functions as an independent prosodic word, it is reasonable to expect that it should require this minimal foot structure. If that structure is present, it also serves to license the increment in the base, since it is the first foot of that word.

b. pʰa-**ʔṭ̊e**+pʰa-**ʔṭ̊e**-ht-aq-in → pʰaʔ(ṭ̊e) + pʰa_(ṭ̊eh)(taqan)
'pound lightly (pl)'

c. du-**hcʰu**+du-**hcʰu**-ala-w → duh(cʰu) + du_(cʰu:)(law)
'sprinkle'

d. **bahqʰa**+**bahqʰa**-aduʔ → bah(qʰa) + ba_(qʰa:)(duʔ)
'fading away'

e. ba-**ʔba**+ba-**ʔba**-t-ad-i → baʔ(ba) + ba_(bata:)du
'bother by talking (pl)'

Without the bipartite structure, some other mechanism would be necessary to exclude the base. But by assuming two prosodic words, the result follows from an independent generalization.

6 Conclusion

To sum up, evidence for two prosodic words in Kashaya reduplicated structures comes from a number of sources:

(29) a. iambic lengthening: new foot structure begins with the reduplicant
b. elision: depends on the location of the new initial foot
c. Durative allomorphy: also depends on the location of the new initial foot
d. distribution of laryngeal increments: depends on two prosodic words, each with an initial foot
e. Decrement: deletes the increment within the second prosodic word

The creation of a second prosodic word leads not only to the creation of a particular foot structure, but also defines a new initial foot within that word, to which several of these processes refer. While quite diverse in their nature, ranging from simple foot-based lengthening to allomorph selection, they all point toward a mismatched structure in which two prosodic words correspond to a single morphological word.

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Department of Linguistics
619 Williams Hall
University of Pennsylvania
Philadelphia, PA 19104-6305
gene@unagi.cis.upenn.edu