Reduplication multiplication in Yaqui: meaning x form[*]

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Reduplication in Yaqui (Hiaki) has many phonological
instantiations, and several semantic reflexes. We present data showing
that all of the phonological shapes of reduplication may convey each of
its meanings, suggesting that no particular shape carries a particular
meaning; apparently, reduplication seems to be a single 'morpheme' with
several allomorphs in Hiaki; it mostly has predictable semantic effects,
whatever form it takes Stative verbs, when reduplicated, may become
'change of state' verbs, and semelfactive (punctual) verbs, when
reduplicated, often end up with a progressive meaning. We sketch a
treatment of the semantics of reduplication on states and punctual events
that suggests why that might be so, following Jelinek (1997)'s treatment
of reduplication as a type-independent pluralizer. Finally, we consider the
interaction of reduplication with compounding. Semantically idiomatic
compounds reduplicate 'inside' the compound, on its head. We suggest
that a non-lexicalist approach to morphology is best able to accommodate
such phenomena.

1.   Introduction

Yaqui is a Uto-Aztecan language spoken in Sonora, Mexico and by an
increasingly small proportion of the Yaqui tribe in southern Arizona. As the
pronunciation of this name for the language is closer to /hʸaki/ than /yaki/, and it
is spelled "Hiaki" in Hiaki, we will refer to the language henceforth as Hiaki. It
is also known as Yoeme (Molina, Valenzuela and Shaul, 1999).

Hiaki has an extremely rich system of verbal affixation, including
argument-structure-changing affixes, tense/aspect markers, and a complex set of
reduplication patterns. It is the latter which will concern us here. The data in this
paper, except where noted, comes from a large corpus of examples constructed
by Amarillas, a speaker of Arizona Hiaki, in consultation with Rosario
Amarillas Buitimea, a Sonoran Hiaki speaker, as part of the Hiaki Reduplication
Project and the On-Line Dictionaries for Native American Languages project at
the University of Arizona. It contains examples of 354 Hiaki verbs beginning
with letters from A-M; the project had not progressed farther in the alphabet at

the time of writing. For each verb, a reduplicated form and example sentence illustrating the use of that form are given. The form and example sentence given in the corpus are intended to represent the most natural shape and meaning of reduplication for that verb. This paper, very much in the spirit of a working paper, surveys the materials in the corpus, draws some conclusions about the form/meaning relationship in reduplication in Hiaki, investigates the interaction of reduplication with other semantic and morphological elements, and sketches an approach to the semantics of reduplication.

2. Preliminary observations

2.1 Previous discussions

Dedrick and Casad 1999 catalogue three primary meanings of reduplication in Hiaki, all three of which are cross-linguistically fairly typical of reduplicative morphology. They say, "generally [reduplication] serves one of at least three functions: to indicate multiple occurrences of an entity, i.e. a plural subject or object [we will term this 'plural argument reduplication']; to signal repeated occurrences of an event; or to attribute intensity to an event or process." They give the following examples of each of these three types.[1]

(1)   Repeated occurrences of an event

    a. *unreduplicated*
        tomi-ta   'a'a   miika-k
        money-ACC him   give.PERF
        "(He) gave him money"

    b. *reduplicated*
        'abai-m   'am   mi-mik-sime
        roasting.ear.PL   them   RED-give-go
        "(She) went on giving roasting ears to them"

(2)   Plural argument

    a. *unreduplicated*
        huu'u Juan   kari-po   koche
        that Juan   house- in   sleep
        "John is sleeping in that house"

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[1] Dedrick and Casad give pitch-accent markings for these examples. As the data we collected did not include reliable pitch-accent information, and as it is generally predictable at least for words in isolation, we do not include pitch-accent diacritics here. In addition, it's worth noting the difference in spelling conventions: in Sonora Hiaki the bilabial fricative is written 'b'; in Arizona Hiaki it is written 'v'. Dedrick and Casad employ the former convention; our data are written using the latter.

b. *reduplicated*

ketuni   ko-koche   hume'e maomeeo-m
still   RED-sleep   those acrobat-PL
"The acrobats were still sleeping"

(3)   Intensification

kia 'itom   bai-tat-ta'aa[2]
only us   fresh-RED-know
"It was nothing but a big deception."

In a general way, it's easy to see how these three uses are related. The first two, in fact, can be seen as instances of the same semantic notion: plurality of events. Whether an event is plural because it is repeated by the same actor, or because it is a single event performed once each by multiple actors, is irrelevant; in both cases, reduplication marks multiple events. Jelinek 1997 argues that a general 'plural' semantics for reduplication can also explain a distributive plural meaning for *entities* which is marked by reduplication on some nouns in Hiaki.[3] The intensification use of reduplication may be understood as a metaphoric extension of the notion of plurality, similar in kind to the use of plural forms as singular respect markers in languages like French.

Dedrick and Casad do not try to distinguish between 'repetitive' and 'habitual' interpretations of reduplicated verbs; a habitual action is, after all, one which is often repeated. They do, however, note the existence of distinct reduplicated forms where the reduplicant is a heavy syllable created by geminating the first consonant of the base. According to them, reduplication with gemination conveys the 'intensification' meaning; they give the following set of forms in illustration:

(4)   a.   single subject   koche   'sleep'
       b.   plural subject   ko-koche   'sleep (pl)'
       c.   intense   'kok-koche'   'very sleepy'

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[2] This is an instance of an interesting morphological phenomenon as well; when a compound verb or idiom is made up of a nonverbal stem bound to a verb root, as here, it is only the verb root which reduplicates, much the way that only the verb in idioms like *kick the bucket* is inflected for tense. These Hiaki cases are more puzzling than the English idioms, however, since they are clearly morphologically compounds. It is generally accepted that inflectional morphology should not occur "inside" compounds (DiSciullo and Williams 1987:28); this is inflectional morphology linearly 'inside' but structurally on the head of the compound. This phenomenon has many implications for the relationship of the lexicon to the phonology, and merits further investigation (cf. further discussion in section 4.5 below).

[3] The interaction of verb reduplication with distributive vs. collective readings of, say, quantified objects in sentences like *John broke three dishes*, is a topic which merits further investigation.

(5) a. single subject   nooka   'talk'
    b. plural subject   no-noka   'talk repeatedly'
    c. intense   non-noka   'talk too much'

(6) a. single subject   teebe   'tall'
    b. plural subject   te-tebe   'tall (pl)'
    c. intense   tet-tebe   'very tall'

(7) a. single subject   naako   'drunk'
    b. plural subject   na-naako   'repeatedly drunk'
    c. intense   nan-naako   'very drunk'

       Another account of Hiaki reduplication is provided in Escalante 1990. He notes that habitual aspect is the most frequent interpretation of reduplicated forms, but that there is also an 'iterative' or 'punctive' interpretation, which he glosses as 'from time to time…'; thirdly he notes a 'process' or 'continuative' interpretation, meaning, more or less, 'in the process of.' (We will call this latter 'progressive', and it seems likely that it is the same reading that Dedrick and Casad label 'repetitive').

       Escalante proposes a different form-meaning relation than Dedrick and Casad. He argues that reduplication with gemination, which he terms 'secondary reduplication', can convey the 'process' or 'continuative' interpretation as well as the 'iterative' one; further, he notes that secondary reduplication is more likely to have an idiosyncratic idiomatic reading. In Escalante's terminology, secondary reduplication contrasts with the more common 'primary' reduplication, which conveys habitual aspect. He characterizes primary reduplication as 'syllable copying', which in his examples mostly involves reduplicating the initial CV syllable of a root, giving a CV-CV… pattern; secondary reduplication is described as primary reduplication plus gemination of the initial consonant of the root, giving the CVC-CV… pattern. He gives the following examples:

(8)   Habitual aspect, primary reduplication

     a.   Aapo bwiika   →   Aapo   bwi-bwika
           he   sing   he   RED-sing
           "He is singing"   "He sings"

     b.   Aapo yena   →   Aapo   ye-yena
           he   smoke   he   RED-smoke
           "He is smoking"   "He smokes"

     c.   Aapo vahume   →   Aapo   va-vahume
           he   swim   he   RED-swim
           "He is swimming"   "He swims"

    d.   Aapo bwaana   →   Aapo   bwa-bwana
          he   cry   he   RED-cry
          "He is crying"   "He cries"

(9)   Secondary reduplication, iterative aspect

    a.   bwiika   → bwib-bwika   'from time to time he sings'
    b.   yena   → yey-yena   'from time to time he smokes'
    c.   vahume   → vav-vahume   'from time to time he swims'
    d.   bwaana   → bwab-bwana   'from time to time he cries'

(10)   Secondary reduplication, process/continuative aspect

    a.   tuuke   → tut-tuke
          go.out (of light) RED-go.out
                           'flickering out'

    b.   teeka   → tet-teka
          lay (sthg.)   RED-lay.down
                          'laying (something) down'

      As noted in Haugen (this volume), this classification, while suggestive, is problematic. The proposed correlation between morphological reduplication type and semantic interpretation seems to be looser than Escalante suggested when we consider a broader range of data. In the next section, we look at the relationship between reduplicant shape and meaning in detail.

2.2   New observations about reduplicant meaning

      In our corpus there are two interpretations given for reduplication that have not been mentioned in the previous literature. We briefly document these below.

      We have found that for some verbs, the most natural setting for the reduplicated form is an imperative sentence. Some examples are given below:

(11) a.   kuvia, 'twist'
          Kat   uunna   uka taparea-ta   uunna ku-kuvia
          don't   too.much   that.ACC lid.ACC too.much RED-twist
          "Don't twist that lid too much!"

      b.   chapta, 'cut'
          Katee   hiosia-ta   chap-chapta
          don't   paper-ACC   RED-cut
          "Don't cut the paper!"

c.   chiiwe, 'hull'
      Uka vachi-ta   chi-chiwe
      that.ACC corn-ACC   RED-hull
      "Hull the corn!"

d.   ko'a, 'chew'
      Tu'isi'e   bwa'am-ta   ko-ko'oa
      well   food-ACC   RED-chew
      "Chew the food thoroughly!"

     In Molina, Valenzuela et al. 1999, the only extant dictionary of Hiaki, although they don't comment on the use of reduplication in imperatives, under the entry for the negative imperative form *kat* 'don't', they give two example sentences with reduplicated verbs: *Kat televisionta vivitchu* 'Don't watch so much television', and *Kat sisime* 'Don't be going (there)'. It seems likely that this use is a subcase of the emphatic or intensive function of reduplication noted by Dedrick and Casad.

     Finally, for some verbs, reduplication seems to contribute a 'change-of-state' interpretation, applying to a stative verb root and resulting an eventive, change-of-state reading. Some examples of this are below:

(12) a.   ta'a 'know'
            Uka   uusi-ta   ne   ta'a
            that.ACC   child-ACC   I   know
            "I know that child."

      b.   Ama   ne   a   ta-ta'a-k
            over.there   I   him   RED-know-PERF
            "Over there, I got/came to know him."

      c.   omte '(be) angry'
            U'u uusi   omte
            that child   angry.INTR
            "That child is angry"

      d.   U'u uusi   o-'omte-k
            that child   RED-angry.INTR-PERF
            "That child got/became angry."

      e.   omta 'dislike'
            U'u uusi   uka chu'u-ta   omta
            that child   that.ACC dog-ACC   angry.TRANS
            "That child hates that dog."

      f.   U'u uusi   uka   chu'u-ta   o-'omta-k
            that child   that.ACC dog-ACC   RED-angry.TRANS-PERF
            "That child scolded that dog."

    For further discussion of these unusual cases, see section 4.3 below.

3.   Reduplicant shape and reduplicant meaning

In Hiaki, the 'habitual' interpretation occurs with a great majority of reduplicated verbs; approximately 70 per cent of the approximately 350 verb forms in our corpus receive a habitual interpretation. The other interpretations occur with about 20-30 per cent of verb roots (see section 3.9 for more detailed discussion of the numerical breakdown). For each reduplicant shape that occurs in our materials, we give examples of verbs occurring in sentences below that get each of the interpretations that we have come across. (Unfortunately, the corpus doesn't contain examples that reliably disambiguate plural-argument reduplication from the progressive, so plural-argument reduplication is absent from the possible meanings listed below, and will have to await further investigation. Jelinek, p.c., remarks that examples of this type are likely rare in any case. See the discussion of reduplication in posessives in section 4.2 below, however.) For nearly all the reduplicant shapes, we find that they instantiate more than one meaning.

3.1   Light syllable: V reduplicant

When a word begins with a vowel-initial open syllable, the usual reduplicant is a short vowel, with a glottal stop between the reduplicant and the base.

(13)   *Habitual*

    a.   Aapo   hiva   yee   a-'ania   >ania, 'help'
           S/healways   people.ACC   RED-help
           "S/he always helps people"

    b.   Vempo   si   emo   i-'ii'aa   >ii'aa, 'mean'
           they   very   themselves RED-mean
           "They tend to be very mean"

    c.   Aapo   si   kusisi   e-'eteho >eteho, 'talk, speak'
           3sg.NOM   very   loud   RED-talk
           "S/he talks very loudly"

(14)   *Progressive*

           U uusi   papa-m   e-'eete   >eete, 'burp'
           That child   potato-PL RED-burp
           "That child is burping the potatoes"

(15)   *Imperative*

    a.   Katee unna kusisi   aa   e-'eta   >eta, 'close'
           Don't too loudly   it   RED-close
           "Don't close it (door) too loudly"

      b.   Kat   uusi-ta   e-'eetua   >ee-tua, 'tease'

           Don't child-ACC   RED-tease   feel-CAUS

           "Don't tease the child"

(Note that the reduplications resulting in a change-of-state meaning discussed above in (12d,f) also are of this shape).

3.2   Light syllable: CV reduplicant

(16)   *Habitual*

      a.   Aapo si uhyoisi   hi-hi'ika   >hi'ika, 'sew'

           3sg   very beautifully   RED-sew

           "S/he sews very beautifully."

      b.   Heripe hinko'olaatek hiva   ko-kovawa   >kova'awa, 'lose'

           Felipe when.racing   always RED-lose

           "Felipe always loses when racing"

(17)   *Progressive*

      a.   Uu semalulukut sewa-ta   hikat   ko-kowe >koowe, 'hover'

           The hummingbird flower-ACC above   RED.hover

           "The hummingbird is hovering above the flower."

      b.   Uu hamut   vanae-ta   bwa-bwaata   >bwaata, 'mix'

           The woman porridge-ACC   RED-mix

           "The woman is mixing the porridge"

      c.   Ume yo'otuliume ili paanim kia   ku-kume   >kuume, 'gum'

           The old one the little bread just   RED-gum

           "The old one is just gumming the little piece of bread"

(18)   *Imperative* (cf. also 5a,c,d)

      a.   Katee   ameu hi-hikkuubwa   >hikkuubwa, 'point at'

           Don't   them   RED-point.at

           "Don't point at them"

      b.   Katee   hunum ke-keka   >keka, 'stand (person)'

           Don't   there   RED-stand

           "Don't stand there"

Example (2b) above is a CV reduplicant expressing a plural subject. The 'change-of-state' meaning discussed in (12b) above is also a CV reduplicant.

3.3 Heavy syllable: VC reduplicant

(19) *Habitual*

    Aapo   si   hita   at-atbwa   >atbwa, 'laugh'
    3sg.NOM   very   something RED-laugh
    "S/he laughs at everything"

Unfortunately we don't have verbs showing the other meanings occurring with this shape, due to the smallish number of roots beginning with a VC syllable in the first place.

3.4 Heavy syllable: CVC reduplicant

(20) *Habitual*

    a.   Aapo pahkowau   hiva   kit-kitte   >kitte, 'knead'
            S/he fiesta.at   always   RED-knead
            "She always makes dough at fiestas"

    b.   Inim ume va'am kom   chak-chakte   >chakte, 'drip'
            Here that.PL water down   RED-drip
            "Here the water drips down."

(21) *Progressive*

    a.   Aapo papa-m bwia-po yeu   bwak-bwakta   >bwakta, 'pluck'
            S/he potato-PL earth-in out   RED-pluck
            "S/he is plucking potatoes out of the soil"

    b.   Uu ili hiosia supem et si   nee   hut-hutta   >hutta, 'chafe'
            The little paper shirt on very   1.SG RED-chafe
            "The label on my shirt is really chafing me."

(22) *Imperative*

    a.   Kat   aet   chep-chepte   >chepte, 'step'
            Don't   on.it   RED-step
            "Don't step on it."

    b.   Katee   kik-kikte   >kikte, 'start to
            Don't   RED-start.to.stand   stand'
            "Don't start to stand up!"

    c.   Katee hunuka kuta-ta   kot-kotta   >kotta, 'break,
            Don't   that.ACC lumber-ACC   RED-break   snap'
            "Don't break that lumber"

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3.5 Heavy syllable: CVV reduplicant[4]

(23) *Habitual*
a. Hunume vem bwia-m sep   moi-moita   >moita, 'plow'
    That.PL   their land-PL right.away   RED-plow
    "They plow their lands right away"

b. Empo   kia   hiva   koa-koakte   >koakte, 'turn
    You   just   always   RED-turn.over   over'
    "You just always keep turning over."

c. Ian inim   vichauvicha   veha   >kutsaite, 'get
    now here   in.the.future   already   dark'

    luati   kut-sai-saite
    early   dark-RED-V
    "From now on, it will become dusk earlier"

(24) *Progressive*
a. Uu uusi   vea-ta   heo-heokta   >heokta, 'peel'
    The child   skin-ACC   RED-peel
    "The child is peeling off the burnt skin"

b. Ume wahreo-m vem bwia-m   moi-moite   >moite, 'plow'
    The farmer-PL their land-PL   RED-plow
    "The farmers are plowing their lands"

(25) *Imperative*
    Katee vat   uusi-ta   kua-kuakta   >kuakta, 'turn
    Don't yet   child-ACC RED-turn.over   over (tr)'
    "Don't turn the child over yet"

3.6 Bisyllablic reduplication: CVCV and VCV reduplicants

(26) *Habitual*
a. Empo si manteka-ta tata-ta chiha-chihakta >chihakta,'splash
    You very lard-ACC hot-ACC   RED-splash   (tr)'
    "You splash the hot lard too much"

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[4] The editors note that it is possible that at least some of these are not instances of heavy-syllable reduplication, but rather bisyllabic reduplication, if these VV sequences are not dipthongs but rather a two-syllable sequence CV.V. We'll investigate the syllabification of these VV sequences more thoroughly in future work.

b.   Neesi   lauti   icha-'ichakte   >ichakte, 'get
      I   very   early   RED-get.bored   bored'
      "I get bored very quickly"

c.   Havesa humak   inim   moha-mohakte   >mohakte,
      who   maybe   here   RED-rummage   'rummage'
      "(I don't know) who rummages through here."

(27) *Progressive*
      a.   Ume va'am   kala-kalakte   >kalakte, 'clear,
          those ?   RED-clear   clean'
          "She is piling up/gathering dirty laundry"

      b.   Uu uushi   muni-m chive-chivehta   >chivehta, 'spread
          The child   bean-PL RED-spread.out   out'
          "The child is spreading out the beans"

      c.   Uu yeni'ichi kia   hala-halahte   >halahte, 'breathe
          The smoker just   RED-breathe.hard   laboriously'
          "The smoker is breathing with great difficulty."

(28) *Imperative*
            Kat   aa   kamu-kamukta   >kamukta, 'hold
            Don't it   RED-hold.in.mouth   in mouth'
            "Don't keep it in your mouth"

3.7   "Secondary" reduplication: $CVC_i\text{-}C_iV\ldots$

The following are all cases where the secondary reduplication pattern seems to have applied, in which the CV of the base is copied into the reduplicant and in addition the initial C of the base is geminated. These data need to be double-checked, as the gemination of secondary reduplication is not always easy to hear; however, they are written with double consonants in the corpus, and they contrast with verbs whose otherwise similar reduplicants are written without the geminated consonants.

(29) *Habitual*
      a.   Si   nee   kowi-m hah-haita   >haita, 'hate,
          Very I   pig-PL RED-hate   despise'
          "I get very disgusted with pigs."

      b.   Uu miisi   hiva   kari-po kik-kivake   >kivake, 'enter'
          The cat   always house-in RED-enter
          "The cat keeps entering the house."

    c.   Aapo kaa   kusim   chach-chae[5]   >chae, 'call'
           He   NEG   loudly   RED-call
           "He does not call loudly"

(30)   *Progressive*
    a.   Uu uusi   kittim-et   mam-mamte   >mamte, 'touch'
           The child   dough-on   RED-touch
           "The child is putting his hands on the dough."

    b.   Vempo huunum hoh-hoteka-su   saha-k >hoteka, "sit (pl)"
           They there   RED-sit.PL-COMPL   go-PERF
           "They started to sit there and finally left"

(31)   *Imperative*
    a.   Kat   a'avo am   kik-kima   >kiima, 'bring in'
           Don't there them   RED-bring.in
           "Don't bring them in"

    b.   Katee uka chu'u   huunum chach-chaa   >chaya, 'tether'
           Don't the.ACC dog   there   RED-tether
           "Don't tie the dog there"

It may be worth noting that the *k* examples with gemination are nearly all for roots that begin with *ki-*. There are some fairly similar pairs, one with and one without gemination, indicating a genuine contrast, however; consider *hota* ← *hota*, 'grind finely' vs. *hoteka* ← *hhoteka*, 'sit (pl)',

The form *koche*, 'sleep', is documented with both primary and secondary reduplication in Jelinek 1997; as Dedrick and Casad also note (see example (2) above), In this case, primary reduplication marks plurality of subject. Jelinek gives the meaning of the secondary reduplication as involving 'iterative' aspect; her examples are in (32) below.

(32) a.   Koche
         sleep
         "He sleeps"

    b.   Ko-koche
         RED-sleep
         "They sleep"

    c.   Kok-koche
         RED-sleep
         "He nods off/falls asleep from time to time"

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[5] Of course, since 'ch' is an affricate, under gemination it's not literally 'ch-ch' but rather /ttʃ/.

Koche only occurs in our corpus with the secondary reduplication form (33), and the translation suggests that it just has a general habitual meaning, or possibly an intensive meaning:

(33)   Aapo si   kok-koche
        He   veryRED-sleep
        "He sleeps a lot"

The distinction between a lot of (*si* 'very') habitual sleeping and a lot of nodding off, however, seems rather subtle, so perhaps this example is not the ideal one to allow us to tease the distinction apart.

3.8   Gemination

Haugen 2000 provides a formal treatment of secondary reduplication according to which it made up of primary reduplication plus a separate process of gemination, which can apply independently of primary reduplication (Dedrick and Casad also describe the existence of gemination as an independent morphological process). Some forms are given in the corpus which contain only gemination, yet have typical reduplicated meanings, suggesting that indeed, gemination is a form of reduplication. Examples are given below.

(34)   *Habitual*
        a.   Aapo   veseo-m kapponte   >kaponte,
                He   calf-PL   castrate+GEM   'castrate'
                "He castrates calves."

        b.   Hunume chuu'u-m si   yee   hahhase   >hahase, 'chase'
                Those   dog-PL verypeople   chase+GEM
                "Those dogs sure chase people"

(35)   *Imperative*
        a.   Katee tahoori-m   mekka   himma   >hima, 'discard'
                Don't cloth-PL   far   discard+GEM
                "Don't throw away the cloth"

        b.   Kat   uusi   mahhaitua   >mahaitua,
                Don't child   frighten+GEM   'frighten'
                "Don't frighten the child"

No case of gemination with a progressive meaning occurs in our data. One particular close-to-minimal pair merits mention: *komona* ('dampen, soak') and *komonia* ('dampen, soak'); they both reduplicate with gemination, but the examples given correspond to different meanings (imperative and habitual, respectively):

(36) a. *komona*
Katee soto'i-m hunum va'a haiti-machim-po   kommona
Don't pot-PL   that   water dirty-appear-in   soak+GEM
Don't soak the pots in the dirty water.

     b.   *komonia*
Nee   ume kaavansa-m   hunum soito'i-po kommonia
1.SG chick.pea-PL   that pot-in   soak+GEM
"I soak the chickpeas in that pot."

3.9   Overview

Our collection of reduplicated forms and example sentences contains examples of each of the previously described reduplication shapes and meanings (modulo plural argument agreement), and we have seen that all of the meanings are attested with nearly all of the shapes. Below we give a breakdown of the percentages of particular reduplication types per meaning. We have broken the reduplication forms down as follows: "S(yllable)" reduplication indicates cases where all or part of the first syllable of the base forms the reduplicant, whether that syllable is light or heavy. "SS" indicates cases where two syllables of the base are reduplicated. "2(ndary)" indicates "secondary" reduplication, where the first reduplicated syllable is made heavy by gemination of the following consonant. "Gem" indicates cases where the 'reduplication' consists solely of geminating the onset of the second syllable of the word. Of course, HAB = "Habitual" interpretation, PROG = "Progressive" and "IMP" = "Imperative":

(37)

	S		SS		2		Gem		Total	
	#	%	#	%	#	%	#	%	#	%$_{\text{of tot.}}$
HAB	214	84$_{\%\text{ofH}}$	13	5$_{\%\text{ofH}}$	15	6$_{\%\text{ofH}}$	12	5$_{\%\text{ofH}}$	254	72%
PROG	47	74$_{\%\text{ofP}}$	13	20$_{\%\text{ofP}}$	4	6$_{\%\text{ofP}}$	0	0$_{\%\text{ofP}}$	64	18%
IMP	24	67$_{\%\text{ofI}}$	3	8$_{\%\text{ofI}}$	5	14$_{\%\text{ofI}}$	4	11$_{\%\text{ofI}}$	36	10%
									354	100%

      Two things become immediately apparent. First, unsurprisingly, single-syllable reduplication resulting in a habitual interpretation is by far the most common pattern. Second, comparing the progressive and imperative meanings, there is a marked difference in the prevalence of the less-standard patterns. Secondary reduplication and gemination together make up 25% of the imperative examples, while they make up only 6 per cent of the progressive examples. Further, there is no case of progressive meaning expressed by gemination alone. If imperative reduplication is really a subcase of Dedrick and Casad's "intensification" meaning, then the correlation between imperative forms and secondary reduplication fits with their observations.

      If the imperative (or 'intense') interpretation is an 'extended' meaning for reduplicative morphology in Hiaki, and if secondary reduplication and

14

gemination are irregular forms of reduplication, this correlation seems natural: it has been widely claimed that more irregular forms tend to have more 'irregular' or non-compositional meanings (compare English *brothers*, which is compositional, with *brethren*, which has a specialized, albeit still plural, meaning). Since the preliminary data on secondary reduplication and gemination in the corpus still need to be re-checked, we cannot draw firm conclusions concerning secondary reduplication and gemination, but the results here seem to bear out Escalante's initial impressions of irregularity and semi-productivity for these processes.

4.   Reduplication and other morphological processes

Although there are non-verbal uses of reduplication in Hiaki,, the only reduplication discussed in this study is verbal. Hiaki has a number of morphological processes that may construct verbs or apply to verbs to alter their morphology or semantics; we will consider a few of them and their interaction with reduplication below. First we look at the interaction of reduplication and perfective marking, then reduplication in possessive constructions, then reduplication of stative and semelfactive verbs, and finally reduplication and compound verbs.

4.1   Co-occurrence with the perfective marker -k

As noted, reduplication commonly induces a habitual or progressive reading for the verb. It is generally incompatible with the 'perfective' suffix *-k*; see the example below:

(38)   a.   Sara hiva   uhyoi   supem   hi-hinu
              Saraalways   beautiful dress   RED-buy
              "Sara always buys beautiful dresses"

        b.   *Sara   hiva   uhyoi   supem   hi-hinu-k
              Sara   always   beautiful dresses   RED-buy-PERF

        c.   Sara uhyoi supem   hinu-k
              Sara beautiful dresses buy-PERF
              "Sara bought beautiful dresses"

What is the source of this incompatibility? Just about any English tense/aspect is compatible with a habitual meaning, as shown by the sentences below.

(39)   a.   *future*   Sara will sell dresses for a living.
        b.   *present* Sara sells dresses for a living.
        c.   *progr.*   Sara is selling dresses for a living.
        d.   *past*   Sara sold dresses for a living until she got her degree.
        e.   *perfect* Sara has sold dresses for a living, among other occupations.
        f.   *p. perf.* Sara had sold dresses for a living before she got her degree.

The general incompatibility of reduplication and the *-k* marker, then, may not be ascribable to some incompatibility between the perfect and habitual aspects generally. Rather, we propose the preliminary hypothesis that Hiaki *-k* crucially applies to *eventive* verbs, not to states. In (40) below, we see that *-k* is incompatible with the stative adjectival predicate *omta*, 'dislike, hate*'* or *omte* 'angry':

(40) a. *Uu uusi chuu'u-ta omta-k
     The child dog-ACC hate-PERF

   b. *Uu uusi omte-k
     The child angry-PERF

(In Molina et al., a list of verbs which do not accept *-k* is provided as well; it includes stative verbs meaning 'feel cold', 'be sick' and 'be lying down'.) Since the result of reduplication is generally a stative (habitual) or continuative (progressive) aspect, it is not surprising that *-k* can't co-occur with reduplication in the general case. Certain verbs in our corpus, however, did allow *-k* to occur on their reduplicated forms. Below we consider a few of the particular subcases, and draw some more specific conclusions about the meanings of both *-k* and reduplication.

4.2 Possessed N incorporation

Jelinek and Escalante 1993, Jelinek 1997, and Jelinek (this volume) discuss a type of noun incorporation unique to Hiaki. In it, a noun stem with some overt verbal inflection is interpreted as the Theme of a possession construction. A typical example with *-k* functioning as the verbalizing suffix is represented below, from Jelinek 1997:

(41) Aapo livrom-ek
   he book-PERF
   "He has a book"

Since possession constructions are inevitably stative, this may seem to be a counterexample to our claim above that the perfective marker applies only to events. However, we can see a crucial difference between the semantic contribution of this *-k* and the canonical perfective *-k* discussed above: the sentence is in the present tense, despite the normally completive semantics of *-k*.

As Jelinek notes, any verbal affix will suffice to license the possessive interpretation, including habitual reduplication. An example from our corpus is below:

(42) Vempo hiva yu si vu'um ko-kowe   >koowi, 'pig'
   They always INT verymany RED-pig
   "They always have a lot of pigs"

Notice the characteristic 'stranding' of a quantificational element (*vu'um*, 'many') that modifies the possessed incorporated noun. Note also that this example has the usual habitual meaning associated with verbal reduplication.

In these possessives, reduplication *can* combine with the -*k* suffix. In that case, however, it produces a *non*-habitual meaning. This reduplication is probably an instance of 'plural-argument' reduplication, where the plural meaning of reduplication takes scope over individual pigs, not over pig-owning events. Contrast the meaning of (42) with that of (43):

(43) Hunume vato'i-m   vu'um   ko-kowe-k
      Those   people   many   RED-pig-PERF
      "Those people have a lot of pigs"

The incompatibility of habitual reduplication and -*k* marking thus carries over to the possessive construction, even though -*k* in the possessive doesn't seem to be contributing a perfective meaning. In section 4.3 below we provide an analysis which shows why perfective -*k* is incompatible with habitual reduplication, but since possessive-marking -*k* seems to have a different meaning, our account cannot be extended to these cases. We leave this problem for future research.

Two more examples of reduplicated denominal constructions with and without -*k* from our corpus are given in (44) below. The first one is a 'use' construction, which Jelinek (1997) terms the 'classificatory' bahuvrihi construction; this particular example has an extended idiomatic interpretation. The second is the usual possessive interpretation, again where the reduplication indicates plurality of the object, rather than the habitual possession.

(44) a.   Aapo   uka vanko-ta   kia   ka-kava'e
           He   the bench-ACC   just   RED-horse
           "He just straddles the bench" ("He uses that bench as a horse")

      b.   Vempo si uhyoim   ka-kava'e-k
           They very beautiful RED-horse-PERF
           "They have beautiful horses."

In (45) below, we seem to have another somewhat idiomatic version of the construction; rather than simply indicating 'possession,' the result of incorporating *kook-* 'necklace' is a verb meaning 'to wear a necklace'. However, the fundamental identity of this construction with the possessive construction is evidenced by the stranded modifier *uhyoim* 'pretty, beautiful' in these examples, and by the contrasting interpretation of a) and b): when the perfective marker is present, the sentence is interpreted as a present tense event of wearing plural necklaces, rather than as a habitual necklace-wearing state.

(45) a.   Aapo hiva   si uhyoim   ko-koka
           She always   very pretty   RED-necklace
           "She always wears very pretty necklaces"

b.　Vempo　　si uhyoim　　　ko-koka-k
　　They　　　very pretty　　RED-necklace-PERF
　　"They are wearing very pretty necklaces"

　　There are a few other verbs with apparently nominal roots that also may co-occur with *-k* when they are reduplicated. One is *asoa* 'give birth', from *asoa* 'child'; when reduplicated with *-k* it means "(s/he) has children", as expected. Another pair is *huuve*, 'get married (masculine)' from *huuvi*, 'wife', and *kuuna*, 'get married (feminine), from *kuuna*, 'husband'. These do not have the expected "have husbands" or "have wives" interpretation when reduplicated; rather they denote a change of state — something like 'get wived (pl)' and 'get husbanded (pl)'. Judging from our data set, however, reduplication of these verbs in the perfective is due to plural agreement; however, the example sentences we have make it clear that the perfective marker with these reduplicated verbs at least involves a past event, not a present event as with the other examples of reduplicated possessives with *-k*.

　　A final example is the verb *kova*, 'put (clothes) on over the head', derived from *kova* 'head'. Here again, we seem to have plural argument reduplication when it co-occurs with *-k*, like the 'use' or 'possession' constructions above. The relevant example sentence, *Vempo si hunnera moove'impo kokovak*, "They are wearing ugly hats", despite being marked with *-k*, is glossed in the present tense.

4.3　　State-to-event reduplication

　　Another case of reduplicated forms which permit the *-k* perfective suffix has already been given: the examples in (12) above showing a case where reduplication seems to change a stem from a simple stative/adjectival verb into an eventive verb (those examples are repeated below). With these verbs we see a similar pattern to the possessed N incorporation cases above: when the *-k* suffix is absent, reduplication contributes its usual habitual meaning, but when the *-k* suffix is present, a distinct, non-habitual interpretation of the reduplicated verb arises. That is, again, we see that *-k* is incompatible with a habitual interpretation. These cases are somewhat different from the possession cases, however, in that the *-k* suffix is not compatible with the unreduplicated stative verb (see example (33) above) — unlike the N-incorporation case, the stative verb stem must stand on its own in the present tense.

(46)　*Omte* 'be angry'

　　a.　U'u uusi　　　omte
　　　　That child　　angry
　　　　"That child is angry"

　　b.　U'u uusi　　　o-'omte
　　　　That child　　RED-angry
　　　　"That child is usually angry/an angry person"

c.   U'u uusi   o-'omte-k
          that child   RED-angry.INTR-PERF
          "That child got/became angry."

(47)   *omta* 'hate, dislike'

     a.   U'u uusi   uka chu'u-ta   omta
          That child   that dog-ACC   dislike
          "That child dislikes that dog"

     b.   U'u uusi   ko'oko'i-ta   o'omta
          That child   pepper-ACC   RED-dislike
          "That child usually dislikes peppers"

     c.   U'u uusi   uka   chu'u-ta o-'omta-k
          that child   that.ACC dog-ACCRED-angry.TRANS-PERF
          "That child scolded that dog."

(48)   *hovoi*, 'full, satiated with food'
     a.   Ume ili chuu'u-m   si   ho-hovoi
          The.PL little dog-PL   very   RED-full
          "The pups are very full"

     b.   Ume miisim kaa   ho-hovoa
          Those cats   NEG   RED-full
          "The cats don't/never get full"

     c.   Ume ili miisim vesa-su   ho-hovoa-k
          Those little cats already-EMPH   RED-full-PERF
          "Those kittens finally got full"

     Here, reduplication seems to change a stative verb, incompatible with -*k*, into an eventive one compatible with it.[6] On the hypothesis that reduplication

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[6] A similar pair occurs with the change-of-state verb *awiria* 'to fatten (tr)':

     (i)   Aapo   kowi-m   a-'awi-ria
            he   pig-PL   RED-fat-APPL
            "He fattens pigs"   (habitual)
     (ii)   Aapo   wakast-ta a-'awi-ria-k
            he   cow-ACC RED-fat-APPL-PERF
            "He fattened the cow"   (perfective)

and also with *ine'ete*, 'get well'

     (i)   aapo   lauti   au   i-'ine'ete
            He   quickly   self   RED-get.well
            "He gets well very quickly"

produces a multiple event interpretation when attached to eventive verbs, the effect of reduplication in these cases must be to produce a reading where there are multiple occurrences of the same state.

Let us consider what happens when we reduplicate a stative verb like *omte* in Hiaki. We adopt Jelinek's hypothesis that the fundamental meaning of reduplication is 'plurality': it is a function which maps single instances to multiple instances of the thing to which it is applied. When applied to a stative verb, then, it will produce multiple states holding at multiple times:

(49) a.   *Hoan omte*   'John (is) angry'

$S @ t_1$ =   S of John being angry at t_1.
                     In the present tense, t_1 = right now.

    b.   *Hoan o'omte* "John is habitually/often/usually angry"

$$\left.\begin{array}{l} S @ t_1 \\ S @ t_{30} \\ S @ t_{22} \\ S @ t_6 \\ S\ldots \end{array}\right\} \quad = \quad \begin{array}{l}\text{John experiences multiple states} \\ \text{of being angry at various times} \\ \text{i.e. John is habitually angry}\end{array}$$

(ii)   vempo lauti emo   i-'ine'ete-k,   hunak veha saka'a-kame
           They quickly selves   RED-get.well-PERF then already leave.PL-NOM
           "They got well quickly, then they left"

and also with *kookte* and *kookta*, 'loosen' (intr. and tr.):

(i)   Hunu'u tapla   si   koo-kookte
          That   lumber   very   RED-loosen
          "That (kind of) lumber really comes unglued"
(ii)   Si'ime ume taplam   koo-kookte-k   into nasontu-k
          all.of the lumber   RED-loosen-PERF   and wear.down.PERF
          "All the lumber became undone and was damaged"

Finally, the same phenomenon seems to occur with the stative intransitive verb *kupek*, 'be closed' (of eyes):

(i)   Puusi-m-po nee ko'okoleka kia nee   hiva   ku-kupe
          eye-PL-in my be.in.pain just I always RED-closed
          "Since my eyes hurt, I keep closing them.
(ii)   Ume ili uusi-m   si'ime   ku-kupe-k
          The little child-PL all RED-closed.PERF
          "The little children all have their eyes closed."

This latter case, however, is somewhat difficult to classify; while it looks like a deadjectival change-of-state verb, albeit a very specialized one, the translation of the sentence with *-k* and reduplication is in the present tense, not the expected perfective (compare the other deadjectival change-of-state verbs with *-k* above). This is then either an example of a plural-agreement reduplication (which, at least in possessives, as we have seen, does not receive a perfective interpretation with *-k*), or, possibly, the translation provided in the corpus is misleading.

By hypothesis, the reduplication of [S @ t] doesn't specify which times t S holds at, just that there are multiple instants at which S holds. Another way of viewing this is that reduplication creates a set of state/temporal instant pairs and randomly assigns particular indices to the temporal instants[7].

In many treatments of events (e.g. Bennett 1977, as described by Parsons 1990), a durative event can be understood as a series of states occurring at a sequential set of times (the 'time-slice' approach to eventiveness). A version of this idea is illustrated below:

(50)   "John sat" describes an event composed of a series of states

S_1 @ t_1 : John standing
S_2 @ t_2 : John is bent a little bit, back towards chair
S_3 @ t_3 : John bent a little bit more, back towards chair   = e of John
S_4 @ t_4 : John bent a little bit more, back towards chair   sitting,
S…   taking place
S_n @ t_n : John's weight rests in chair, i.e. John is seated   from t_1 → t_n

In English, the past tense tells us that the times, t_1 → t_n at which the event e took place all occur before time t_{pres} , the present moment.

How does this help us with the change from a stative to an eventive reading when a stative verb is reduplicated and affixed with -*k*? Since a series of states can make up a durative event, if it happened that all the indices assigned to the distinct instants in a reduplicated stative verb turned out to be contiguous, rather than scattered, *o'omte* 'RED.angry' could be interpreted as an *event* of being angry. Since the reduplication itself does not impose any structure on the assignment of indices to times *t*, this is not the usual interpretation of *o'omte*. However, what happens if we modify something with a semantics like (49b) with a suffix which *does* impose structure on an event — like completive -*k*?
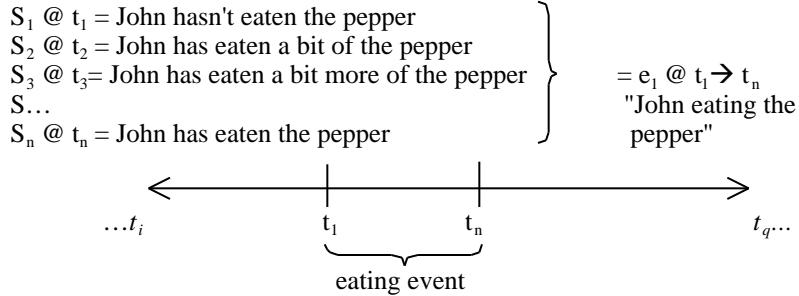
Let's assume that what -*k* does is assert that all the temporal instants *t* which go into making up a single event *e* were over before some given reference time — that is, that *e* is completed (a naïve Reichenbachian approach to perfectivity). Applied to a regular durative eventive v like *hi'ibwa,* 'eat', then, we get a picture like the following:

(51)   Hoan uka ko'oko'i-ta hi'ibwa-k
          John that pepper-ACC eat-PERF
   "John ate that pepper"

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[7] The set of possible temporal instants ('time-slices') from which the indices are selected for a given reduplication will be the instants of the life or existence of the entity of which the reduplicated verb is predicated. We could say that reduplication selects a large enough proportion of those indices, relativized to the predicate involved, that the action can be characterized as 'typical' of the entity.

a. Interpretation of *uka ko'oko'i-ta hi'ibwa*, 'eat the pepper'

S_1 @ t_1 = John hasn't eaten the pepper
S_2 @ t_2 = John has eaten a bit of the pepper
S_3 @ t_3 = John has eaten a bit more of the pepper
S…
S_n @ t_n = John has eaten the pepper

$= e_1$ @ $t_1 \rightarrow t_n$
"John eating the pepper"

$$\xleftarrow{\hspace{2cm}} \quad \overset{|}{t_1} \quad \overset{|}{t_n} \quad \xrightarrow{\hspace{2cm}}$$

…t_i t_1 t_n t_q…

eating event

b. Interpretation of *uka ko'oko'i-t hi'ibwa-k* , 'eat-PERF the pepper'

$[e_1$ @ $t_1 \rightarrow t_n] + $ *-k* $=$ There was an eating event, $[e_1$ @ $t_1 \rightarrow t_n]$
and the time of the whole thing, $t_1 \rightarrow t_n$,
was before $t_{reference}$

…t_i t_1 t_n $t_{reference}$ t_q…

eating event   reference time
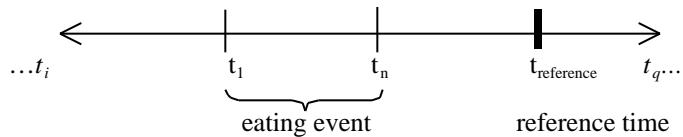
What happens if we apply *-k* to a reduplicated stative verb like *o'omte*? Since reduplication produces multiple states which hold at a random selection of temporal instants, one of the interpretations out of an infinite number of possible assignments of indices to the temporal instants is that *o'omte* corresponds to a set of individual states of being angry that occur at a *sequence* of temporal instants — i.e. *o'omte* can correspond to an event of being angry. This will happen if the assignment of indicies to instants happens to be contiguous. *That* assignment of instants t to the multiple states S of *o'omte*, out of all the possibilities, is compatible with the meaning of *-k*, which describes the state of completion of a single event.
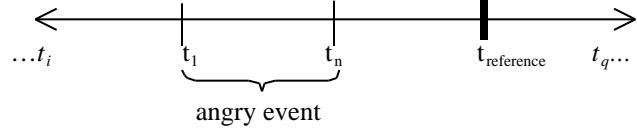
(52) Interpretation of *Hoan o'omte-k*, "John RED-angry-PERF"

a. The meaning of *o'omte* on a sequential assignment of temporal instants

S_1 @ t_1 = John is angry
S_2 @ t_2 = John is angry
S_3 @ t_3 = John is angry
…
S_n @ t_n = John is angry

$= e_1$ @ $t_1 \rightarrow t_n$ "John being/getting angry"
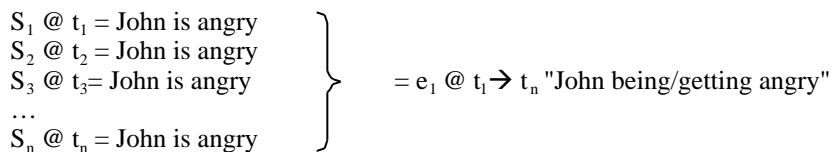
b.   The meaning of *o'omte + k*

$[e_1 @ t_1 \rightarrow t_n] + \textit{-k} =$ There was an angry event,$[e_1 @ t_1 \rightarrow t_n]$
                            and $t_1 \rightarrow t_n$, occurred before $t_{reference}$

angry event

      Now we can begin to understand why *-k* isn't generally compatible with reduplicated eventive verbs like *hi'ibwa*, 'eat'. These verbs themselves denote events made up of *multiple* temporal instants, that is, taking up a stretch of time. When they are reduplicated, what results is not a 'multiple-temporal-instant' interpretation, but a 'multiple-*event*' interpretation, as illustrated below.

(53)   *hi-hi'ibwa* 'RED-eat'

$S_i @ t_i$ = John hasn't eaten the pepper
$S_j @ t_j$ = John has eaten a bit of the pepper
$S_k @ t_k$ = John has eaten a bit more of the pepper   = $e_1 @ t_{i1} \rightarrow t_{n1}$ of eating
$S...$
$S_n @ t_n$ = John has eaten the pepper

$S_i @ t_i$ = John hasn't eaten the pepper
$S_j @ t_j$ = John has eaten a bit of the pepper
$S_k @ t_k$ = John has eaten a bit more of the pepper   = $e_{23} @ t_{i23} \rightarrow t_{n23}$ of eating
$S...$
$S_n @ t_n$ = John has eaten the pepper

$S_i @ t_i$ = John hasn't eaten the pepper
$S_j @ t_j$ = John has eaten a bit of the pepper
$S_k @ t_k$ = John has eaten a bit more of the pepper   = $e_{17} @ t_{i17} \rightarrow t_{n17}$ of eating
$S...$
$S_n @ t_n$ = John has eaten the pepper

The assignment of indices to the temporal instants at which a particular sub-State of an event of eating holds is necessarily relativized to the temporal index assigned to the whole event; a given state doesn't count as part of an eating event unless it occurs in the proper sequence, i.e. is flanked on both sides by the sequence of states that makes an eating event an eating event. Since the-*k* operator applies to an ordered set of temporal instants (an event), not to an ordered set of ordered sets of temporal instants (a bunch of events), it can't attach to the reduplicated form of an eventive verb.[8] However, if this proposal is

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[8] Recall, however, that this doesn't help us with the incompatibility of habitual reduplication and *-k* in possessive sentences, noted above.

on the right track, we have an idea of why it *can* attach to the reduplicated form of a stative verb.

4.4   Semelfactives, *-k* and progressive reduplication

In general, as just noted, *-k* may not co-occur with reduplication on eventive verbs. There are several exceptions in our corpus, however. The examples below represent all the verbs in our corpus that do not fall into either the incorporated-noun class or the change-of-state class but do still allow their reduplicated form to co-occur with *-k*.

(54)   a.   Aapo   si   a-'ache   >aache, 'laugh'
            He   very   RED-laugh
            "He laughs loudly"

       b.   Aapo   si   a-'ache-k
            He   very   RED-laugh-PERF
            "He really laughed out loud"

(55)   a.   Aapo   kaa   kusim   cha-chae>chae, 'yell, call'
            he   not   loudly   RED-call
            "He does not yell loudly"

       b.   Aapo   ameu   cha-chae-k
            he   to.them   RED-call-PERF
            "He called them"

(56)   a.   Uka   kuta-ta   cha-chahe   >chahe, 'scrape'
            That.ACC   wood-ACC   RED-scrape
            "Scrape the piece of wood!"

       b.   Aapo   uka hu'up-ta   cha-chahe-k
            He   that mesquite-ACC RED-scrape-PERF
            "He scraped the mesquite"

(57)   a.   Haso-hasohte   >hasohte, 'breathe hard,
            RED-pant   pant'
            "He is panting"

       b.   Uu yoeme   si   haso-hasote-k   vuiti-sukai
            The man   very   RED-pant-PERF   run-warm
            "The man was breathing hard after running"

(58) a.　　Uu yoeme　tiikom　haru-haruta　　　　　>haruhta, 'winnow'
　　　　　　The man　　wheat　RED-winnow
　　　　　　"The man is winnowing the wheat"

　　　b.　　Uu yoeme　tiikom　haru-haruta-k
　　　　　　The man　　wheat　RED-winnow-PERF
　　　　　　"The man winnowed the wheat"

(59) a.　　Vaa'a sevem hiva　nee he'ohe'okti-tua　　　　　　>'he'okte,
　　　　　　water cold　always me RED-hiccup-CAUS　　　　　'hiccup'
　　　　　　"Cold water always makes me hiccup"

　　　b　　Aapo　　　si　　ko'okomaisi　　he'ohe'okte-k
　　　　　　He　　　　very　pain-seeming　　RED-hiccup-PERF
　　　　　　"He has hiccupped very painfully"

(60) a.　　Uu hamut　lauti　hi-hiavihte　　　　　>hiavihte,
　　　　　　The woman　slowly　RED-breathe　　　　'breathe'
　　　　　　"The woman is breathing slowly"

　　　b.　　Uu yoeme　uchi　hi-hiavihte-k
　　　　　　The man　　again　RED-breathe-PERF
　　　　　　"The man breathed again / started to breathe again"

(61) a.　　Sevoim mekka a　　hi-hihha'aria a hi'ibwau　>hihha'aria, 'fan,
　　　　　　Flies　away him　　RED-guard　　him eat　　　　　　　　guard'
　　　　　　"Shoo the flies away as he eats"

　　　b.　　vempo　　　am　　hi-hihharia-k
　　　　　　They　　　　them　RED-guard-PERF
　　　　　　"They guarded them"

(62) a.　　Waehma-tuk ume hurasi-m iniat kon-konte　　　>konte, 'march in
　　　　　　Lent-during　the Pharisee-PLthis.on RED-circle.march　　circle,
　　　　　　"During Lent, the Pharisees march on this (road)"　　procession

　　　b.　　Wamewasuktia-m-po itepo　iniat　kon-konte-k
　　　　　　Those year-PL-in　　we　　　this.on　RED-circle.march-PERF
　　　　　　"In those years, we marched on this (road)."

(63) a.　　Uu semalulukut　　sewam vepa　ko-kowe　　　　>koowe,
　　　　　　The hummingbird　flowers over　RED-hover　　　'hover'
　　　　　　"The hummingbird is hovering over the flowers"

b. Uu semalulukut   hunuum ko-kowe-k
    The hummingbird   there   RED-hover-PERF
    "The hummingbird hovered over there"

(64) a. Ume uusi-m kulumpam-po   emo   ko-kouria   >kouria,
         The child-PL swings-on   selves RED-swing   'swing'
         "The children are swinging each other on the swings"

     b. Aapo   uka uusi-ta   si ousi ko-kouria-k,
         He   the child-ACC   very hard RED-swing-PERF,

         ian into   uu uusi tom-po-wante
         now   and   the childstomach-in-ache
         "He swung the child very hard, and now the child is
         sick to his stomach"

(65) a. hitasa humaksi   iva'ivakte   uu hamut   >ivakte, 'bunch
         what maybe very RED-bunch&grab the woman   up and
         "(I don't know) what the woman is really bunching up   pick up'
         and grabbing"

     b. Uu hamut   si hita   iva-'ivakte-k,   hunak veha siika
         The woman   very something RED-bunch-PERF, then already left
         "The woman bunched up and picked up something, then she left"

(66) a. hunum kari-po weamateko nee hita   ama i-'ine'a   ine'a
         That house-in walking   I something there RED-feel   'feel,
         "When I am in that house, I sense something"   sense'

     b. Aapo hitasa   humak   ama   i-'ine'a-k
         He   something unknown   there   RED-feel-PERF
         "He felt something unknown there"

(67) a. Vempo im taiwa-m-po hi-hioria   >hioria, '1. diet,
         They these day-PL-on RED-fast   2. take it easy,
         "They fast on these days"   3. fast ritually'

     b. aapo kaa au hi-hioria-k   ka   uchi ko'okoe weche-k
         she NEG self RED-diet-PERF   xx   next sick   fall-PERF
         "She didn't take care of herself so she got sick."

       All of these verbs have a something in common except the last three;
they all involve repetitive activity of one kind or another. That is, they belong to
the aspectual class that Smith 1991 terms 'semelfactives'; which denote events
which themselves are generally punctual. Unlike Accomplishments or

Achievements, they do not involve any change of state; conceivably, each individual instance of repetition takes up only one instant of time. These events, unlike durative events, cannot be analyzed as two or more sequential instants of time at which some state holds; rather, they involve sequential instants of time each of which represents a non-complex event that is usually repeated more than once. If that's the case, then the representation of *aache* 'laugh' and *a'ache* 'RED-laugh' is something like the following:

(68) a. *aache*, 'laugh'

e @ t_1 =   e of a single event of laughing, one laugh

    b. *a'ache,* 'RED-laugh'

$$\left.\begin{array}{l} e_1 \text{ @ } t_1 \\ e_2 \text{ @ } t_{31} \\ e_3 \text{ @ } t_{258} \\ e_4 \text{ @ } t_3 \\ e\dots \\ e_n \text{ @ } t_n \end{array}\right\} = \quad \begin{array}{l}\text{many events of laughing over}\\ \text{time, e.g. habitual laughing}\\ \text{or (when sequential) progressive laughing}\end{array}$$

Since the indices of instants are, as usual, randomly assigned, there will be some assignment on which they are sequential; such an assignment, without -*k*, should produce a progressive reading (note that many of the verbs above *do* preferentially receive a progressive, rather than a habitual, interpretation when reduplicated; Escalante's "continuative" reading). If all that is required for the application of -*k* to a verb is a sequence of temporal instants, these reduplicated verbs should qualify when they receive sequential assignments of indices, as each individual event takes up only a single temporal instant. The addition of -*k*, then, should produce an unremarkable perfective reading, where there was a sequence of individual laughing events, each taking an instant, which gives the interpretation of a normal repetitive event of laughing which occurred at some point prior to a given reference time. In the cases above, this is indeed the reading that occurs when reduplication and -*k* co-occur.

Of course, the representation in (68a) for *aache* 'laugh', and in (68b) for *a'ache*, 'RED.laugh', are not adequate to describe the actual interpretation of *aache* (or "laugh) as it is generally used. *Aache* "He (is) laughing" does not generally give the impression of a single bark of laughter, (one 'ha'); rather it describes a repetitive event ('ha ha ha'). Nor does the reduplicated form mean that the person has a habit of giving a single laugh at irregular intervals, but rather is interpreted to mean that the person is regularly involved in entire sequences of repetitive laughing events. I wish to contend, following Jackendoff 1991, that the repeated-event reading that is usual with semelfactive verbs is not their 'basic' meaning (after all, even if you give just one 'ha', you *have* laughed), but a 'coerced' meaning, where the event is understood, for pragmatic reasons, to probably repeat for an arbitrary amount of time. This pragmatic coercion to a repetitive reading, however, is not part of the semantic representation of the semelfactive verb.

On this approach, Hiaki has both the coercion process for regular uses of *aache*, *and* an actual morphosemantic mechanism for producing a repetitive reading, reduplication. It is significant that most of the verbs above do take a progressive reading in their reduplicated form. In fact, *most* of the verbs in the corpus which are given an unambiguously progressive gloss when reduplicated belong to this class. Consider the list of semelfactive vs. non-semelfactive verbs below which have a progressive reading when reduplicated. These lists do not include the verbs given in examples (54-67) above; inclusion of those verbs would only increase the disparity between the semelfactive and non-semelfactive side. We have marked the cases where the progressive reduplicated verb in our example occurs with a plural subject by placing an asterisk next to the verb; this is intended to indicate that the reduplication may be due to plural-argument agreement, rather than marking a plurality of events. Note that there are significantly more plural subjects among the non-semelfactive progressives than with the semelfactive ones:

(69) Progressive-reduplication   Prog. reduplication but
      and semelfactive   not semelfactive

      bwakta, 'pluck'   aakte   'placing on head, goring'
      cha'asime 'hover'   chivehta 'spreading'
      chamta 'mash (tr)'   eiya 'care for, expect, predict'
      chamte 'mash (intr)'   *-saka, 'go (pl)'
      eete 'burp, belch'   heokta 'peel off' (e.g. burnt skin)
      ha'achite 'sneeze'   hiove, 'try on, make a mistake'
      heuta 'wipe'   *hoote, 'starting to sit'
      *hia 'make noise'   *huiwa, 'sense, premonition'
      hiavihhmuuke 'choke, gasp'   *konta, 'circle around, surround'
      hiko'a 'chew'   kovate 'retaining in memory'
      *hihsoa, 'jab, poke'   kuria 'get tangled in'
      hiusaka 'make noise,   *kutte, 'tuning (e.g. violin)'
                 as geese honking'   *moite, 'plowing'
      hukta 'sniff, smell'   muuke, 'in the final throes of death'
      huukte 'choke'   *naate, 'beginning'
      kalahko 'clear, pile up'
      kohakte 'chip off, crack'
      kovate 'wag head about'
      kupikte, 'blinking'
      kuume 'gum' (as with toothless gums)
      kuuta 'stir'
      mamte 'put hands on, touch'
      (masa) vaite 'flap, flutter (wings)'
      maya, 'throw, toss'
      mohte, 'crumbling'

We cannot explain why *all* such semelfactive verbs may not also occur with -*k* when reduplicated, but the interaction between semelfactive class and tendency towards a progressive interpretation of reduplication is at least suggestive.

4.5   Compound and derived verbs

Hiaki exhibits a great deal of compounding and derivational morphology, in verbs as well as elsewhere. Some of the derivational morphology, such as the causative suffix, *-tua*, or the applicative suffix, *-ria*, are plausibly syntactically treated by assuming they project 'light' verbs in the syntactic structure which contribute an additional argument to the argument structure of the verb. These suffixes, however, despite their 'light' verb status and their bisyllabic phonological shape, do not reduplicate independently of the verb stem to which they attach (but Jelinek -sae, ii'aa, va-vae? do reduplicate):

(70)

	Verb	Meaning	Reduplicated form
a.	ee-tua feel-CAUS	'tease, make suffer'	e-'ee-tua *ee-tu-tua (imperative)[9]
b.	mahai-tua afraid-CAUS	'scare'	mahhai-tua(geminated) (imperative)
c.	mantekia-tua butter-CAUS	'buttering'	ma-mantekia-tua (imperative)
d.	asuka-tua sugar-CAUS	'sugaring'	a'asuka-tua (habitual)
e.	hin-tua cover-CAUS	'covering someone with e.g. a blanket.'	hi-hin-tua (imperative)
f.	naate-tua start-CAUS	'making something start, begin'	na-naate-tua (progressive?)
g.	hoo-ria back?-APPL	'do something for someone	ho-ho-ria (habitual)
h.	luuta-ria use.up-APPL	'use up something of someone else's'	lu-luuta-ria (habitual)

There appears to be some interesting variation, however, in how compounding interacts with reduplication. Consider the following cases, where the second element, the head, of the compound, reduplicates, leaving the initial element unchanged. (Glosses for morphemes, where provided, are taken from definitions provided in Molina et al. and should not be considered definitive; many morphemes remain unglossed. In any case, as is often the case with compounding and derivational morphology generally, the meaning of the whole

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[9] The example given for these reduplications, *Kat uusi-ta e'ee-tua*, 'Don't tease the child', make it clear that the reduplication has scope over the whole compound, not just the root. The sentence means "don't tease the child", not "don't make the child habitually suffer".

form is almost completely idiomatic, related only tenuously to the meanings of its individual parts, even where those meanings seem clear.):

(71) Verb   Meaning   Reduplicated form

	Verb	Meaning	Reduplicated form
a.	bwah-suma ??-tie	'braid'	bwah-su-suma
b.	bwal-wotte sheep?-??	'feel weak'	bwal-wot-wotte
c.	ele-siki-le ??-?red-VBL	'itch, tickle'	ele-si-sikile[10]
d.	ha'a-chih-te ??-mash-INTR	'sneeze'	ha'a-chih-chite
e.	hap-saka stand.PL-go.PL	'stand in a moving vehicle'	hap-sa-saka
f.	haa-wahsa'ate steam-??	'steaming'	haa-wa-wahsa'ate
g.	hiavih-muuke breath-die	'gasping, choking'	hiavihmu-muuke
h.	iva'a-chaka hug-?crooked	'hug, embrace	iva'a-cha-cha'e
i	iva'a-nama hug-??	'cradle, hold'	iva'a-na-nama
j.	kova-hamti head-broken	'concentrating'	kova-ham-hamti
k.	kupi-tomte eye?-blossom?	'loose sight temporarily'	kupi-tom-tomte
l.	kut-saite dark-??	'become dusk'	kut-sai-saite
m.	lioh-bwania God-promise	'give thanks'	lioh-bwa-bwania
n.	lio-noka God-talk	'pray'	lio-no-noka
o.	mau-karoa ??-??	'get up at dawn'	mau-ka-karoa
p.	machu'u-nama grasp?-around	'carry around'	machu'u-na-nama
q.	naa-muke ??cloud-TR?	'drunk, dizzy'	naa-mu-muke
r.	na-mutu cloud-??	'get cloudy'	na-mu-mutu >naamu = cloud

This is not the way that all compound verbs behave, however. Consider the verb *maachusaka* and its reduplicated form below:

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[10] This form also has a related noun, according to Molina et al, *elesiiki*, 'something that itches'. Molina et al. give a reduplicated form for this noun (recall that reduplication on nouns gives a distributed plural interpretation), where the first morpheme of the compound, not the second, is reduplicated: *e'elesiikia*.

(72) maachu-saka   'make it through   ma-machusaka
      light/dawn-go.PL   the night (til dawn)'

This verb, which seems to be a reasonably clear instance of a compound, is not reduplicated as *maachu-sa-saka*, like (68d) above (*hap-sa-saka*). Dedrick and Casad note that the verb *sime/saka* 'to go (SG/PL) is very productively used as an auxiliary indicating an ongoing or progressive aspect. In its auxiliary use, they show that it may reduplicate independently of the stem to which it is attached:

(73) Hume'e   'ame-mak   'emo   tu'uri-sa-saka-me
      those   them-with   selves enjoy-RED-go-NOM
      "Those who go (are) enjoying themselves with those others."

Determining whether there is a difference in reduplicative behavior between auxiliary *sime/saka* and *sime/saka* in a 'compound' will have to await further investigation, however. One interesting discrepancy in our database occurs with the singular version of the verb *hapsaka* 'go along standing', exemplified above in (66e). As shown above, *hapsaka* is given as reduplicating just the head of the compound, *-saka*. The tricky part is that not only does the verb *saka* supplete for number (*sime* in singular), so does the verb *hap-*: its singular form is *kik-*. In the singular, however, the reduplicated form in our corpus is not *kik-si-sime*, but *kik-kik-sime*. The example sentences we have are given below:

(74) a.   kat ee   trooke-po kik-kik-sime,   wet-ne'e
            Don't   truck-in RED-stand-go   fall-FUT
            "Don't stand up in the truck, you will fall."

      b.   Ume o'owi-m kamion-po   hap-sa-saka
            The man-PL truck-in   stand-RED-go
            "The men are standing up in the moving bus."

It seems likely that the difference between (74a) and (74b) is determined by the intent of the speaker, rather than by any morphological restriction. In (74a), we see the imperative, which we have hypothesized is an emphatic reduplication. In this particular sentence, obviously what is being emphasized is the injunction against standing, not against going in the truck, hence reduplication applies to *kik-* and not *-sime*. Whether *kik-si-sime* is also a possible form will have to await future research.

Another very similar pair which differs in whether the reduplication falls on the first or second element of the compound verb is *hipeteka* 'make (arrange) a bed' and *hipete*, 'make a mat'. The example sentences that occur in our corpus for these verbs are given below:

(75) a.   Aapo hiva   tu'ulisi   hippe-te-teka
            S/healways beautiful   bed-RED-lay.down
            "S/he makes a very nice bed."

b.	Uu yoeme	hi-hipe-te	>*hipetam*, 'mat, bed'
	The man	RED.mat.make	
	"The man makes mats."		

Both are clearly habitual. Dedrick and Casad note that *-te* has a causative meaning when attached to nominal stems; example (75b) seems like a clear example of this pattern, and the independent status of *-teka* in (75a) is confirmed in its ability to reduplicate; both are clearly idiomatic, however. The difference in reduplication here is likely determined by the size or nature of the affixed element; *-teka* is a verb in its own right, while *-te* is a one-syllable derivational affix. Above, we saw that some clearly disyllabic derivational affixes failed to reduplicate; see, however, the discussion of *-pea* below.

Another pair of elements which reduplication may be able to give us insight into is the compound uses of the verbs *e'a*, 'think', and *eiya*, 'care for'.[11] There are a couple of minimal pairs in our database, whose meanings seem close to identical. In the Molina et al. dictionary, the *-ea* member of the pair is listed as intransitive and the *-eiya* as transitive; in our example sentences, however, both occur transitively. In all cases, it's the head verb that is reduplicated:

(76)		Verb	Meaning	Reduplicated form
	a.	hu'un-ea ??-think	'know, be aware of'	hu'un-e-'ea
	b.	hu'un-eiya ??-care.for	'to find out, be aware of, acknowledge'	hu'un-e-'eiya
	c.	kuht-ea resent?-thinkangry'	'feeling hateful,	kuht-e'ea
	d.	kuht-eiya resent?-feel	'feeling hatred, dislike'	kuht-e'eiya

With *-eiya*, there seems to be a combination of gemination on the first element of the compound, plus reduplication on the second, in two cases, with *hun-* and with *hat-*:

(77)		Verb	Meaning	Reduplicated form
	a.	hunn-eiya ??-feel	'to belittle, tease, make fun of'	hunn-e'eiya
	b.	hun-hiawa ??-?noise	'to make fun of, deride, tease'	hun-hi-hiawa
	c.	hatt-eiya ??-feel	'fearless'	hatt-e-'eiya

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[11] There is a verb which would seem to be a member of the same group, *in-e'a* 'feel/sense'; however, its reduplicated form is *i-'ine'a*, not *in-e-'ea*.

In (77a) and (77c), the geminate consonant in the coda of the first morpheme must be derived, rather than present in the underlying form, because in (77b), we can see there is a very similar compound with the *hun-* element ungeminated. The question obviously is as to whether or not the gemination is lexically specified on the roots in question or if it is somehow triggered by the *-eiya* suffix.

A similar question arises for two roots for which we see odd manipulations of their coda consonants with suffixation and reduplication. We've seen both roots before, *hu'un-* , in *hu'un-eiya*, 'find out'; and *kuht-*, in *kuht-eiya,* 'feel hatred'. We give each verb again, with its reduplicated form, then followed by the related problematic form:

(78)   Verb   Meaning   Reduplicated form
       a.   hu'un-eiya 'to find out, be aware   hu'un-e-'eiya
            ??-care.for of, acknowledge'
       b.   hu'un-akte   'deliberately,   hu'u-na-nakte
                         intended'
       c.   kuht-eiya   'feeling hatred,   kuht-e'eiya
                         dislike'
       d.   kuht-iachi   'being hateful'   kuh-ti-tiachi

The problem arises in that the final (apparently superheavy) consonant of the root does not reduplicate when suffixed by vowel-initial *-eiya*, but does become part of the reduplicating form in *hu'unakte* and *kuhtiachi*. One obvious possibility is that the suffixes in the latter two cases are not *-akte* and *-iachi* but rather *-nakte* and *-tiachi*, triggering deletion of the matching consonant in the coda of the previous syllable. With *-eiya*, on the other hand, the superheavy consonant can resyllabify. This possibility awaits further morphological analysis.

Finally, we end with an element which synchronically behaves productively as a derivational verbal affix, the desiderative affix *-pea*, 'feel like', but, when reduplicated, reveals a more complex morphological shape which includes the auxiliary use of the verb *-ea*, 'think':

(79)   Verb   Reduplicated form
       a.   hoo-pea   'feel like doing sthg,   hoo-p-e'ea
            back?-DES be enthusiastic'

       b.   kot-pea   'feel like sleeping'   kot-p-e-'ea
            sleep-DES

The suffix *-pea* reduplicates as if it were made up of *-p-* plus *-ea*. Dedrick and Casad also notice this effect, and suggest that *pea* may originally derive from combining the postposition *-po* with *-ea*.

The overall implication of the interaction between compounding and reduplication is trouble for traditional notions of the lexicon. If compounds must be stored as memorized 'listemes' in the lexicon, and if reduplication is a productive inflectional process, then we seem to have a productive inflectional process operating on sub-constituents of compounds in the lexicon. An

'interpretive' morphology, which inserts morphological pieces after syntactic operations have applied, and in which idiomatic meanings may be defined over constituents of any size, has a much better chance of dealing with these phenomena — not that it will be easy even then. In the final analysis, it look as if compounds will need to be treated in the same way that non-idiomatic, productive serial and auxiliary verb constructions in Hiaki are treated, i.e. syntactically; this will predict the possibility of reduplication applying to the inner member of the compound, which seems, in this brief survey of the data, to be necessary.

5.   Conclusion

We have surveyed a great deal of data bearing on reduplication in Hiaki, and some patterns seem to have emerged. We have seen examples of the three main meanings conveyed by reduplication realized in all of the conceivable morphological shapes for reduplication, indicating that no one morphological shape is associated with one particular meaning. Forms showing secondary reduplication were somewhat more likely than other forms to bear an emphatic/imperative interpretation, but the correlation was far from perfect.

Adopting Jelinek's treatment of reduplication as a plural operator, we were able to determine some correlations between a verb's aspectual class and the semantic effect of reduplication. Stative verbs, when reduplicated, may come to be 'change of state' verbs, able to appear in the perfective, and we gave a treatment of the multiplication of states that suggests why that might be so. Similarly, semelfactive (punctual) verbs, when reduplicated, often end up with a progressive meaning and sometimes may appear in the perfective, and we extended our treatment of reduplication's multiplication effect to that phenomenon.

Finally, we considered the interaction of reduplication with compounding, and found that even compounds whose sub-constituents' contribution to their overall meaning is completely non-transparent are able to reduplicate 'inside' the compound, on its head; this is even the case for the desiderative suffix *-pea*, which is made up of *-p-* + *-ea*. We suggested that a non-lexicalist approach to morphology would be better able to accommodate such phenomena than a lexicalist approach.

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