Three Challenges for Morphological Doubling Theory

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2. Challenge 1: Reduplication in Compounding Contexts
3. Challenge 2: Phonological Targets for Reduplication
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1. Introduction

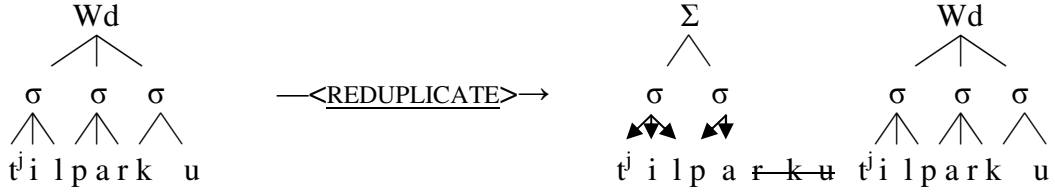
· Morphological Doubling Theory (MDT) (Inkelas and Zoll 2005) – A novel approach to morphology, primarily designed for reduplication but presumably extendable to other kinds of morphology (cf. I&Z 2005: 212).

· MDT abandons the usual *phonological copying* approach to reduplication, where the phonological make-up of the "reduplicant" is determined by copying material from some other morpheme/stem, "the base".
  Contra several different phonological copying theories, including:
  · Skeletal theory (Marantz 1982)
  · Prosodic morphology (McCarthy and Prince 1986)
  · Correspondence Theory (McCarthy and Prince 1995/1999)

Diyari – Paradigmatic case of templatic reduplication: RED=Σ (Inkelas and Zoll 2005: 79 [16])

(1)a. wiḻa 'woman' > **wila**-wiḻa
b. tʲilparku 'bird sp.' > **tʲilpa**-tʲilparku * tʲilparku-tʲilparku

(2) Traditional McCarthy and Prince (1986)-style account of Diyari



(3) Traditional, Correspondence Theory Account (with a Template)

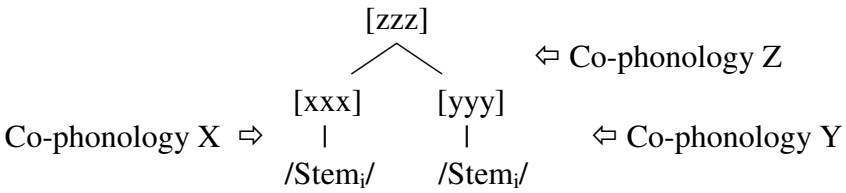
/ tʲilparku + RED /	RED=Σ	MAX$_{BR}$
a. **tʲilparku**-tʲilparku	*!	
b. ☺ **tʲilpa**-tʲilparku		rku
c. **tʲil**-tʲilparku	*!	parku

/ wiḻa + RED /	RED=Σ	MAX$_{BR}$
a´. ☺ **wiḻa**-wiḻa		
b´. **wi**-wiḻa	*!	ḻa

· MDT proposes instead that the identity between the two elements is *semantic*, rather than phonological.

· In MDT, reduplication itself *is a kind of* compounding construction, where the daughters are often (usually) identical:

(4) Schematic for Reduplication in Morphological Doubling Theory (Inkelas and Zoll 2005)

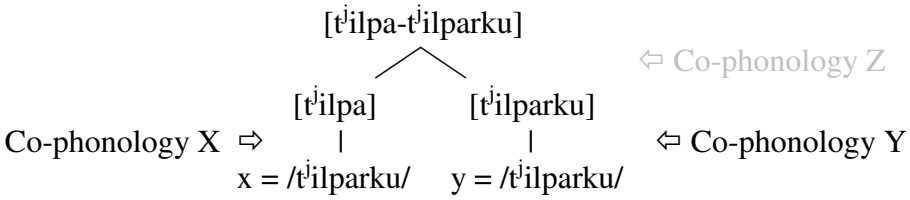


· "Partial reduplication" = Truncation regulated by the co-phonology of only one of the daughters (i.e. the *Doppelgänger*).

· In MDT, there is no direct relation between the "reduplicant" and its "base" (i.e. no B-R Correspondence between X and Y), and therefore no reduplication-specific phonology.

(5) MDT Analysis of Diyari: Separate Co-phonologies (~Inkelas and Zoll 2005: 79 [17])

a.



b. Co-phonology X: PWD≈FOOT >> IO-FAITH

/ tʲilparku /	PWD≈FOOT	IO-FAITH
a. tʲilparku	*!	
b. ☺ tʲilpa		rku
c. tʲil	*!	parku

c. Co-phonology Y: IO-FAITH >> PWD≈FOOT

/ tʲilparku /	IO-FAITH	PWD≈FOOT
a. ☺ tʲilparku		
b. tʲilpa	r!ku	
c. tʲil	p!arku	*

(6) <u>(Some of the) Proposed Advantages of MDT</u>

(I) It bypasses inadequacies of Correspondence Theory → There is no RED-specific phonology.

(II) It also captures "synonym constructions" under the same account—*semantic identity.*

(7) <u>Hindi synonym constructions: synonymous but etymologically distinct N's in compounds</u>
(Singh 1982, cited by Inkelas and Zoll 2005: 59 [48])

a. tan-badan	'body-body'	~	'body, etc.'
b. vivāh-šādi	'marriage-marriage'	~	'marriage, etc.'
c. dhan-daulat	'money-money'	~	'money, etc.'
d. šāk-sabji	'vegetable-vegetable'	~	'vegetable, etc.'

(The 1st N is native Hindi, the 2nd N is of Perso-Arabic origin.)

· This construction is semantically identical to "a productive process of echo-word reduplication in which the exact same stem is doubled" (I&Z p. 60):

(8) <u>Hindi echo word reduplication</u> (Inkelas and Zoll 2005: 60 [50]):

a. roti	'bread'	→	roti-voti	'bread, etc.'
b. namak	'salt'	→	namak-vamak	'salt, etc.'

· Other languages also show similar compounding of *synonyms*, *near-synonyms*, *antonyms*, etc.

(9) <u>(Some) Potential Problems for MDT</u>

(I´) There seems to be ample evidence for reduplication-specific phonology.
Many examples: e.g. *the emergence of the unmarked* (TETU) applying to the reduplicant only (FAITH_{IO} >> MARKEDNESS >> FAITH_{BR})
→ We'll see a case of TETU in our discussion of Tawala below.

(II´) MDT proposes ubiquitous and in most cases otherwise reduplication-specific truncation; this truncation has not been shown to apply equally to the supposedly relatable synonym constructions.

(10) I'll refer to this as <u>*the problemo-problem* problem</u> (cf.**problem-problem, *prob-problem*, *po-problem*, etc.).

2. Challenge 1: Reduplication in Compounding Contexts

How does the (morpho-phonological) process of reduplication interact with the (morpho-syntactic) process of compounding?

(11) A compound construction: $[X\text{-}Y]_Z$

(12) <u>There are at least 8 possible ways to reduplicate, ignoring infixation:</u>
a. Marking the *edges* of the compound: left edge, right edge, either edge, both edges.
b. Targeting the *sub-constituents* of the compound: X, Y, X <u>or</u> Y, X <u>and</u> Y.

· Many cases will be indeterminate: Canonical Stems: σσ, Canonical Reduplicants: σσ or less.

· The Lexicalist Hypothesis & the *thesis of the atomicity of words* (DiSciullo & Williams 1987)
→ Targeting sub-constituents of a compound should not be possible.

Targeting a Specific Members of a Compound: Hiaki NI—Red targets head (i.e. the verb)

(13) N-V Compounds in Hiaki (Harley and Haugen 2008)

	Compound	Gloss	Reduplicated form	Unattested
a.	pan-hooa bread-make	'making bread'	pan-**ho**-hoa	*pan-pan-hoa
b.	chit-wat-te saliva-throw-INTR	'spitting'	chit-**wat**-watte	*chit-chit-watte
c.	kuchu-sua fish-kill (pl.obj.)	'fishing'	kuchu-**su**-sua	*ku-kuchu-sua
d.	kova-hamti head-broken	'deep in thought'	kova-**ham**-hamti	*ko-kova-hamti
e.	Mao-noka Mayo-speak	'speaking in the Mayo language'	Mao-**no**-noka	*Mao-mao-noka

· Hiaki N-V Compounds create verbs, but the inflection attaches to the verbal element only:
cf. Lexicalist approaches to NI (Mithun 1984, Rosen 1989, et al.)

· Stump (2001)— typology of possible types of inflection:
Edge-Marking, Head-Marking, or Double-Marking (Both the Head and the Edge)

Targeting Both Members of a Compound: Chinese Adj-Adj Compounds

(14) Chinese Adj+Adj Compounds – AABB [A+RED+B+RED] (Feng 2006: 202 [170])

Base	Literal translation	Gloss	Reduplicated Form	Gloss
ganjing	'dry+clean'	"clean"	ganganjingjing	"clean" (intensified)
mingbai	'bright-white'	"clean"	mingmingbaibai	"clear" (intensified)
qingsong	'light-loose'	"relaxed"	qingqingsongsong	"relaxed" (intensified)
piaoliang	'pretty+bright'	"beautiful"	piaopiaoliangliang	"beautiful" (intensified)

Targeting Either Member of a Compound: Pima N-N Compounds

(15) Pima Noun-Noun Compounds (Munro and Riggle 2004 [5])

a. 'ònk-'ús → **'ò**-'onk-'ús ~ 'ònk-**'ú**-'us ~ **'ò**-'onk-**'ú**-'us
salt-tree → **RED**-salt-tree salt-**RED**-tree **RED**-salt-**RED**-tree
'tamarack' 'tamaracks' ~ 'tamaracks' ~ 'tamaracks'

b. bàn-nód:adag → **bà-**ban-nód:adag ~ bàn-**no**nd:adag ~ **bà-**ban-**no**nd:adag
coyote-plant.type → **RED**-coyote-plant coyote-**RED**-plant **RED**-coyote-**RED**-plant
'peyote' 'peyote (pl.)' ~ 'peyote (pl.)' ~ 'peyote (pl.)'

c. [li**l**-mì**mi**da]-hoa**h**as-hà**ha**'a]-[dá**da**gkuanakud:] (Munro and Riggle 2004 [18])
[glass]-[baskety-jar]-[wiper]
'glass dish cloth'

· 31 possible plurals for this compound with 5 stems (2^n-*1*)
· No scope effects for plural in Pima – there is free variation: reduplication of any or all of the stems in the compound makes the entire compound plural.

· Edge-marking reduplication on compounds should be relatively straight-forward under any theory.

· Any theory of phonology/morphology/reduplication must also somehow allow for reduplication to target specific sub-constituents of the compound, contra the Lexicalist Hypothesis.

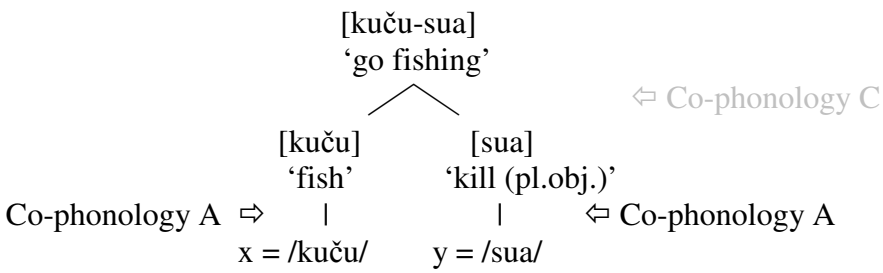
2.1. An MDT Account of Reduplication on Compounds in Hiaki

(16) N-V Compounding

kuchu-sua	→	kuchu-**su**-sua	*ku-kuchu-sua
fish-kill (pl.obj.)			
'fishing'			

(17) MDT Analysis: A Simple N-V Compound

a.

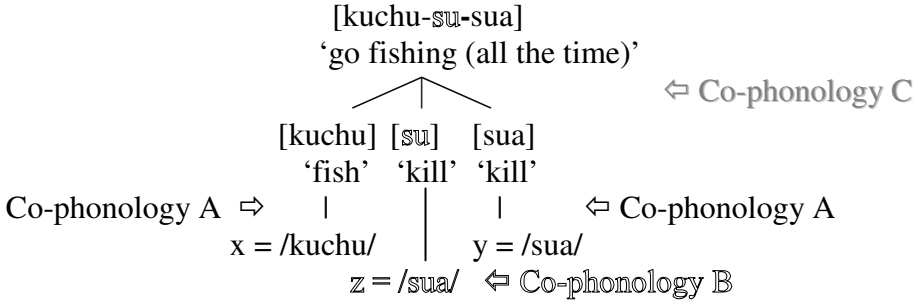


b. Co-phonology A: IO-FAITH >> PWD≈SYLLABLE

/ kuču + sua /	IO-FAITH	PWD≈SYLLABLE
a. ☺ kuču-sua		**
b. ku-sua	č!u	
c. kuču-su	a!	

(18) MDT Analysis: A Simple N-V Compound + Reduplication: N + V_i + V_i

a.



b. Co-phonology B: PWD≈SYLLABLE >> IO-FAITH

/ sua /	PWD≈SYLLABLE	IO-FAITH
a. sua	*!	
b. ☺ su		a

· Question: Why does Co-phonology B apply to one instance of √*sua* and not the other?
Possible Answer: Maybe there is something in Co-Phonology C (the Compound-level Co-Phonology) that prohibits the (redundant?) full expression of adjacent identical roots.
e.g. *REPEAT$_{[\Sigma]}$ -- parallel to Hicks Kennard's *REPEAT$_{[\sigma]}$ analysis of Tawala
(cf. *REPEAT, Yip 1998; Suzuki's1998 Generalized OCP: *X. . .X)

(19) Possible Analysis: Co-Phonology C: *REPEAT$_{[\Sigma]}$ >> IO-FAITH

/ kuchu + sua + sua /	*REPEAT$_{[\Sigma]}$	IO-FAITH
a. kuču-sua-sua	*!	
b. ☺ kuču-su-sua		a
c. 🙁 kuču-sua-su		a
d. kuču-su-su		a!a

· This gets us truncation in one of the identical daughters, but we still have to find some way to apply the truncation to the first one rather than the second.

· As a general strategy, though, I don't think that appealing to the Compound-level co-phonology (Co-Phonology C) is going to work, and we'll see why in the use of *Repeat at the compound level in Tawala below.

· If this general problem could be solved, MDT's semantic identity story seems relatively straightforward for cases of V-V compounding in Hiaki.

· Hiaki V-V compounds: the semantics of the reduplicant takes scope only over the reduplicated verbal element (i.e. they do not apply to the entire compound *qua* compound):

(20) Verb-Verb Compounds in Hiaki (Harley and Haugen 2008)

a. nok-ii'aa	→	**no**-nok-ii'aa	nok-**ii**-ii'aa	**no**-nok-**ii**-ii'aa
speak-want		**RED**-speak-want	speak-**RED**-want	**RED**-speak-**RED**-want
'want to speak'		'want to be speaking'	'wanting to speak'	'be wanting to be speaking'
b. nok-taite	→	**no**-nok-taite	nok-**tai**-taite	**no**-nok-**tai**-taite
talk-INCEP		**RED**-talk-start	talk-**RED**-INCEP	**RED**-talk-**RED**-start
'begin to talk'		'starting to speak (hab)'	'starts to talk (hesitates)'	'starting speaking'

(21) MDT Inputs for the different reduplication possibilities in Hiaki V-V Compounds:

a. [no] [nok] [ii'aa] b. [nok] [ii] [ii'aa] c. [no] [nok] [ii] [ii'aa]

⇨ /noka/ /noka/ /ii'aa/ /noka/ /ii'aa/ /ii'aa/ /noka/ /noka/ /ii'aa/ /ii'aa/

'speak' 'speak' 'want' 'speak' 'want' 'want' 'speak' 'speak' 'want' 'want'

· Semantically—this account is perhaps plausible.

· However, for a language like Pima the semantic identity story is much less felicitous:

(22) Reduplication of Noun-Noun Compounds in Pima (Munro and Riggle 2004)

’ònk-’ús →	a.	**’ò**-’onk-’ús	~	b. ’ònk-**’ú**-’us	~	c.	**’ò**-’onk-**’ú**-’us
	salt-tree	**RED**-salt-tree		salt-**RED**-tree			**RED**-salt-**RED**-tree
	‘tamarack’	‘tamaracks’	~	‘tamaracks’	~		‘tamaracks’

· There is no scope distinction for Red: the plural of ‘tamarack’ has three different but functionally equivalent inputs:

(23) MDT Inputs for the different reduplication possibilities:

	a.			b.			c.			
	[’o]	[’onk]	[’us]	[’onk]	[’u]	[’us]	[’o]	[’onk]	[’u]	[’us]
	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
⇨	/’ònk /	/’ònk /	/’ús /	/’ònk /	/’ús /	/’ús /	/’ònk /	/’ònk /	/’ús /	/’ús /
	|	|	|	|	|	|	|	|	|	|
	‘salt’	‘salt’	‘tree’	‘salt’	‘tree’	‘tree’	‘salt’	‘salt’	‘tree’	‘tree’

· Even worse: all of the possible inputs for:

(24) [li**l**-mì**mi**da]-hoa**h**as-hà**ha**’a]-[dá**da**gkuanakud:] (Munro and Riggle 2004 [18])
[glass]-[baskety-jar]-[wiper] (‘glass dish cloth’)

(25) ★An important missed generalization in MDT—the process of reduplication itself seems to have its own (only slightly iconic) semantic function: typically, to indicate plurality (of Entities or Events). (cf. Moravcsik 1978)

2.3. Reduplication and Compounding in Correspondence Theory

· Correspondence Theory, on the other hand, was primarily designed to account for reduplication via phonological association of a reduplicative affix with the stem to which it attaches, i.e. its “base”.

· Haugen (2008*c*) argues that not much is actually needed to address the question of reduplication in compounding contexts if we first answer a surprisingly under-theorized question:

(26) *What is the Base for Reduplication*?

· The default assumption in practice—the base is the entire stem to which the reduplicant attaches. ~ “Stray Erasure” in the early skeletal theories; implicitly this idea has been maintained in most of correspondence theory (MAX_{BR}).

(27) “The Base of a reduplicative morpheme consists of all of the segments in the output with the exception of the reduplicant”. (Hogoboom 2004)

· It seems to me that only Shaw 2005's Constituent Base Hypothesis adequately predicts the necessary range of both *morphological* and *prosodic* constituents which may serve as a base for reduplication.

(28) The Constituent Base Hypothesis: Definition of the Base (Shaw 2005: 167 [6])
The Base in a Reduplicant-Base correspondence relation is a constituent, i.e.

a. MCat:	Word, Stem, Root
b. PCat:	Prosodic Word, Foot, Syllable, Nucleus, Mora
c. PHead:	HeadFoot, σ́ = FootHead, Nuc = σHead, Headμ
d. CanonicalCat:	Canonical Root = [CVC] Canonical Stem = [CVCV]

· In Shaw's approach, the base is defined as either a morphological or prosodic constituent in the ANCHOR constraint that defines the reduplicant.[1]

· ANCHOR constraints are already needed in Correspondence Theory, so no new machinery is needed to account for targeting specific constituents: all that is needed is the recognition that possible targets can be morphological or prosodic constituents.

Different Morphological Bases

Ndebele (Hyman 2007)

(29) Ndebele Reduplication with Simple Verbs

a. lim-a	'cultivate'	**lim-a** + lim-a	'. . . a little here and there'
b. nambith-a	'taste'	**nambi** + nambith-a	

· Add derivational suffixes, e.g. *–el* or *–is*, and two patterns of reduplication are possible:

(30)i. Ndebele Reduplication with Complex Verbs: Base = Root + Derivational Suffix

a. lim-el-a	→	**lim-e** +	lim-el-a	'cultivate for/at'	(applicative *-el-*)
b. lim-is-a	→	**lim-i** +	lim-is-a	'make cultivate'	(causative *-is-*)

ii. Ndebele Reduplication with Complex Verbs: Base = Root Only

a´. lim-el-a	→	**lim-**a +	lim-el-a
b´. lim-is-a	→	**lim-**a +	lim-is-a

[1] Shaw's proposal is formally encoded in the following way:
(A) $\text{ANCHOR}_{\text{R-B}}$ L/R (Redup; MCat/PCat) (Shaw 2005: 172 [11a])
The left/right peripheral element of a Redup[licant] corresponds to the left/right peripheral element of a constituent in the Base-Output.
· Opposite-edge anchoring (and therefore mirror-image reduplication and other non-attested anchoring patterns) is ruled out by a more general ANCHOR constraint:
(B) $\text{ANCHOR}_{\text{I-O, O-O}}$ Edge (Cat1, Cat2) =def (Shaw 2005: 172 [11b])
$\forall$ Cat1 $\exists$ Cat2 such that Edge of Cat1 and Edge of Cat2 coincide, where Cat1, Cat2 $\in$ PCat $\cup$ GCat, Edge $\in$ {Right, Left}.

(31)i. $\text{ANCHOR}_{\text{R-B}}$ L (Redup; Verb Stem)
ii. $\text{ANCHOR}_{\text{R-B}}$ L (Redup; Verb Root)

· To return to the issue of reduplication in compounding contexts, then: nothing unique needs to be said about anchoring the reduplicant to one of the members of the compound:

(32)a. Hiaki N-V and V-V Compounds
$\text{ANCHOR}_{\text{R-B}}$ L (Redup; Verb Stem)

b. Pima N-N Compounds
$\text{ANCHOR}_{\text{R-B}}$ L (Redup; Noun Stem)

Interim Conclusion I:

· MDT faces several theoretical and empirical challenges based on the evidence from reduplication in compounding contexts that are not problems for Correspondence Theory.

· The second aspect of Shaw's Constituent Base Hypothesis, regarding phonological constituent bases, constitutes our second challenge for MDT:

3. Challenge 2: Phonological Targets for Reduplication

· One of the crucial tenets of MDT is the *thesis of morphological targets*:

(33) "a reduplication construction calls for morphological constituents (affix, root, stem, or word), and not phonological constituents (mora, syllable, foot)" (p. 25).

· MDT also rules out *base dependency*—which entails that the form of the reduplicant (i.e. the Doppelgänger) should not be influenced by the form of the base (i.e. the other stem).

Two empirical challenges from Uto-Aztecan

(I) Hiaki

· Hiaki exhibits a typologically rare pattern of "syllable copy" reduplication, where the content of the reduplicative syllable depends on the syllabic structure of the base, which looks exactly like the kind of base dependence that MDT should rule out:

(34) "Syllable Copy" Reduplication in Hiaki (Haugen 2003)

a. CV.CV-initial stems

i.	vu.sa	**vu.**vu.sa	***vus**.vusa	'awaken'
ii.	chi.ke	**chi**.chi.ke	***chik**.chike	'comb one's hair'
iii.	he.wi.te	**he**.he.wi.te	***hew**.hewite	'agree'
iv.	ko.'a.rek	**ko**.ko.'a.rek	***ko'**.ko'arek	'wear a skirt'

b. CVC.CV-initial stems

i.	vam.se	**vam.**vam.se	*__va__.vamse	'hurry'
ii.	chep.ta	**chep.**chep.ta	*__che__.chepta	'jump over'
iii.	chuk.ta	**chuk**.chuk.ta	*__chu__.chukta	'cut with a knife or saw'
iv.	bwalkote	**bwal**.bwal.ko.te	*__bwa__.bwalkote	'soften, smooth'

· However, this apparent base dependency might be circumvented if syllabification in the input (for both the stem and its Doppelgänger) is stipulated (Haugen 2008*b*).

(II) Mayo (Hagberg 1993)

· A more serious challenge seems to come from Mayo, where there are two classes of verbs which reduplicate differently depending on where accent falls in the unreduplicated form.

· Specifically, what the "base" is seems to be prosodically defined:

(35) Variable Reduplication in Mayo: Different Bases for Copying (Hagberg 1993)

a. Class 1 Verbs: Reduplicant = $\sigma_{\mu\mu}$; Target = Verb Stem; Base = Entire Verb Stem

i.	[om.té]	**om**.[óm.te]	***o'**.['om.te]	'hate'
ii.	[no.ká]	**nok**.[nó.ka]	***non**.[no.ka]	'speak'

b. Class 2 Verbs: Reduplicant = $\sigma_{\mu\mu}$; Target = Verb Stem; Base = 1st Syllable of Verb Stem Only

i.	[wóm].te	**wóm**.[wom].te	***wów**.[wom].te	'be frightened'
ii.	[nó].ka	**nó**n.[no].ka	***nók**.[no].ka	'know a language'

· A possible analysis along the lines of Shaw 2005—define these prosodically-defined bases via an Anchor constraint:

(36)a. $\text{ANCHOR}_{\text{R-B}}$ L (Redup; Verb Stem)
b. $\text{ANCHOR}_{\text{R-B}}$ L (Redup; σ_1 of Verb Stem)

Interim Conclusion II:

· Any theory of reduplication must address the issue of different morphological targets for reduplication. Compounding is only one such morphological context where this necessity emerges.

· Shaw's theory also allows us to define the base in reference to either morphological or phonological targets – there is cognitive salience for either kind of category.

· A novel claim: phonological bases can occur within morphological targets, or in other words, there are some phonologically-demarcated sub-stem bases.

(37) Haugen (*2008a,c*) introduces the following terminological distinction:
- *target* – the morphosyntactic unit to which reduplication applies.
- *base* – potentially distinguishable phonological sub-constituents of targets.

4. Challenge 3: Morphological Moras (based on Haugen and Hicks Kennard 2009)

- MDT crucially distinguishes two types of morpho-phonological duplication:
  (a) reduplication;
  (b) phonological copying.

(38) *Phonological copying* is supposedly differentiable from *reduplication* because the former:
  i. is not morphological;
  ii. is proximal (targeting the closest eligible element);
  iii. only copies one segment;
  iv. involves phonological identity (not semantic identity).

- We suggest that this proposed distinction cannot be absolute—there is an intermediate case: "mora affixation" (Samek-Lodovici 1992) ~ "mora augmentation" (Davis & Ueda 2006)

- Like phonological copying, mora affixation involves phonological identity between a proximal single segment, but it also serves a morphological purpose.

4.1. Morphological Gemination

- Here we follow Samek-Lodovici (1992)'s OT analysis of morphological gemination, wherein morphological gemination is analyzed as the affixation of a bare mora which is spelled out according to a language-specific ranking of syllable well-formedness constraints:

(39) Keley-i (Malayo-Polynesian) Morphological Gemination

Base	**pi.li**
a. Subject Focus Input:	um-pi.li
Subject Focus Output:	um-pi<u>l</u>.li
b. Object Focus Input:	pi.li
Object Focus Output:	pi<u>l</u>.li
c. Access Focus Input:	?i-pi.li
Access Focus Output:	?i-<u>p</u>.pi.li

4.2. Mora Affixation in Hiaki

Hiaki (Yaqui) (Uto-Aztecan) has rampant allomorphy in reduplication: multiple forms and multiple functions for reduplication, without a consistent form-function mapping (see Haugen 2003 and Harley and Amarillas 2003 for discussion).

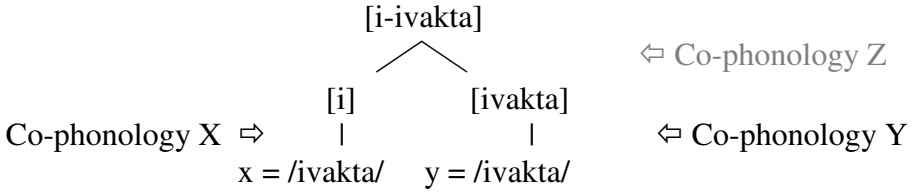
(40) Allomorphy in the Hiaki (Yaqui) Habitual (data from Molina et al. 1999)

a.	í.vak.ta	'embrace'	→	**i**-i.vak.ta	RED = σ
b.	kí.nak.ta	'squint, grimace'	→	**ki.na**-ki.nak.ta	RED = Σ
☆ c-i.	má.ve.ta	'receive'	→	ma**v**.ve.ta	AFFIX = μ
☆ c-ii.	yép.sa	'arrive'	→	ye**e**p.sa	

· An MDT analysis of the allomorphy in the Hiaki habitual requires co-phonologies for:
- · fully faithful stems (Co-Phonology Y) as well as for the truncating Doppelgängers;
- · the single syllable reduplicant (Co-Phonology X), and;
- · the disyllabic reduplicant (Co-Phonology W).

(41) **RED = σ**: *í.vak.ta* 'embrace' → ***i**-i.vak.ta* 'embrace habitually'

a.



b. Co-phonology X: PWD≈SYLLABLE >> IO-FAITH

/ ivakta /	PWD≈SYLLABLE	IO-FAITH
a. ivakta	*!	
b. ivak	*!	ta
c. ☹ iv		akta
d. ☹ i		v!akta

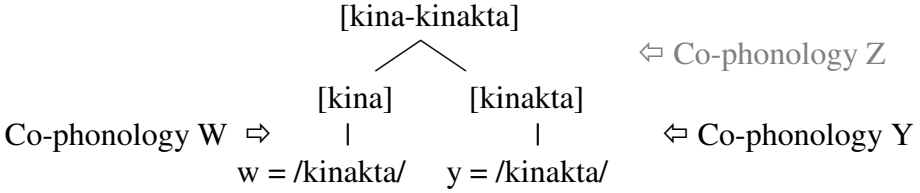
c. Co-phonology Y: IO-FAITH >> PWD≈FOOT

/ ivakta /	IO-FAITH	PWD≈SYLLABLE
a. ☺ ivakta		*
b. ivak	t!a	*
c. iv	a!kta	
d. i	v!akta	

We need to introduce a new co-phonology, Co-phonology W, to generate the disyllabic reduplicative allomorph form in ***kina**-kinakta*:

(42) **RED = Σ**: *kí.nak.ta* 'squint, grimace' → ***ki.na*-ki.nak.ta** 'squint habitually'

a.



b. Co-phonology W: PWD≈FOOT >> IO-FAITH

/ kinakta /	PWD≈FOOT	IO-FAITH
a. kinakta	*!	
b. ❸ kinak		ta
c. ☹ kina		kta
d. kin		akta
e. ki	*!	nakta

c. Co-phonology Y: IO-FAITH >> PWD≈FOOT

/ kinakta /	IO-FAITH	PWD≈FOOT
a. ☺ kinakta		*
b. kinak	t!a	
c. kina	k!ta	
d. kin	a!kta	
e. ki	n!akta	*

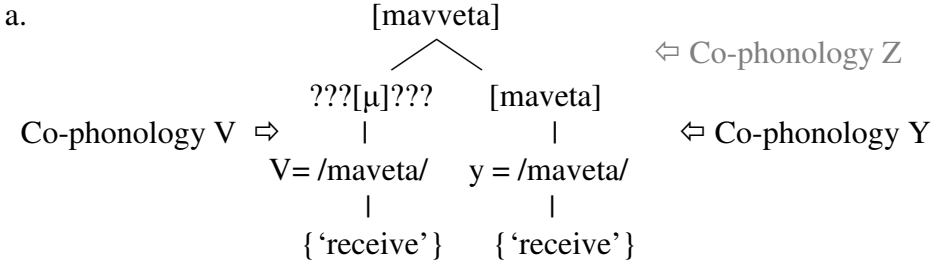
◎ Q: What limits the appearance of the various truncating co-phonologies to the environment of the compounding of a stem with its Doppelgänger?

How would mora affixation be accounted for in MDT?

· One possible approach to Hiaki mora affixation in MDT is to employ the same analysis as the habitual reduplication cases above, where the Doppelgänger input is the full stem with some kind of constraint restricting it to a mora (in Co-phonology V):

(43) A Problematic Analysis of Hiaki Habitual Mora Affixation

a.



b. Co-phonology V: PWD≈MORA

· A better alternative is to give a non-reduplicative account of Hiaki habitual mora affixation. Rather, the habitual affix in this case is simply a mora (à la Samek-Lodovici).

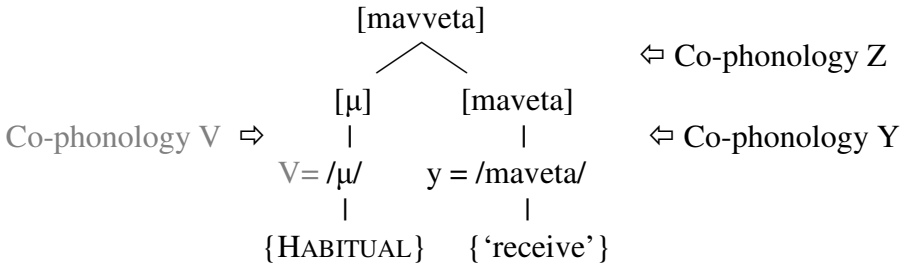
· Because the affix is a bare unit of prosody inserted for a morphological purpose, we are agnostic on its co-phonology status (illustrated below as a possible "V").

· The concatenation of the moraic affix with stem Y will be handled by Co-phonology Z, as in other cases of junctural phonology in MDT:

(44) A More Plausible Analysis of Hiaki Habitual Mora Affixation

AFFIX = μ: *ma.ve.ta* 'receive' → *mav.ve.ta* 'receive habitually'

a.



b. Co-phonology Y: IO-FAITH >> PWD≈FOOT, PWD≈SYLLABLE

/ maveta /	IO-FAITH	PWD≈FOOT	PWD≈SYLLABLE
a. ☺ maveta		*	*
b. mave	t!a		*
c. ma	v!eta	*	

c. Co-phonology Z: σWELL-FORMEDNESS >> $\text{AFFIX}_{\text{HAB}}$-LEFT

/ μ + maveta /	$\text{REALIZEMORPH}_{\text{HABITUAL}}$	σWELL-FORMEDNESS	$\text{AFFIX}_{\text{HAB}}$-LEFT
a. ma.ve.ta	μ!		
b. maa.ve.ta		*!	m(a)
c. ☺ mav.ve.ta			ma
d. ma.vet.ta			mav!e

(45) σWELL-FORMEDNESS = a cover constraint for a variety of σ-wellformedness constraints—including a preference for gemination over (non-underlyingly) long vowels, etc.

· Thus, MDT can relatively easily handle the phenomenon of mora affixation.

· However, it must do so in Hiaki at the expense of giving a separate kind of analysis for this allomorph of the Hiaki habitual.

· But, the allomorphs of the Hiaki habitual (and other functions of reduplication and mora affixation) have to be lexically listed somehow in *any* theory (cf. Haugen 2003, Harley and Amarillas 2003).

· Note, however, that the approach sketched here weakens an account of reduplication based on semantic identity—the reduplication constructions for habituality involve compounding a stem with its Doppelgänger to yield an idiomatic habitual meaning (interpreted at the compound level, Z), whereas the mora affixation construction involves the direct addition of the habitual meaning with a stem, so it is therefore compositional at Z.

4.3. The Problematic Case—Mora affixation and reduplication Tawala

· Like Hiaki, Tawala also has rampant reduplicative allomorphy, and it exhibits mora augmentation in certain contexts where reduplication would otherwise occur to mark the equivalent semantic function (what we call the 'durative', following Ezard 1997).

· Unlike the Hiaki habitual, however, the allomorphs of the Tawala durative, including mora augmentation, are completely phonologically predictable.

☆ Inkelas and Zoll (2005) give an MDT analysis of most of the durative allomorphs (46), but the mora augmentation examples (47) present a problem for the MDT analysis.

(46) Tawala Durative Allomorphs in Inkelas and Zoll (2005)

a.	be.i.ha	bi-be.i.ha	'to search'	(I&Z 2005: 95 [51a])
	ga.e	ge-ga.e	'to go up'	
	to.u	tu-to.u	'to weep'	
b.	a.pu	a.p-a.pu	'to bake'	(I&Z 2005: 95 [51b])
	a.tu.na	a.t-a.tu.na	'to rain'	
	o.to.wi	o.t-o.to.wi	'to make an appointment'	
c.	ge.le.ta	ge.le-ge.le.ta	'to arrive'	(I&Z 2005: 95 [52])
	ho.pu	ho.pu-ho.pu	'to go down'	
	hu.ne-ya	hu.ne-hu.ne-ya	'to praise'	

(47) Mora Augmentation in the Tawala Durative (Ezard 1997: 44; Hicks Kennard 2004:305 [4])

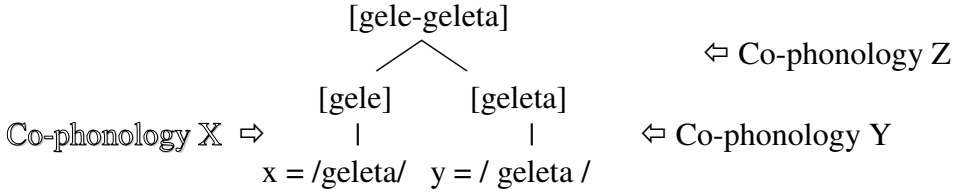
to.to.go	to.o.to.go	'be sick'
gu.gu.ya	gu.u.gu.ya	'preach'
ta.ta.wa	ta.a.ta.wa	'tremble'
te.te	te.e.te	'cross (bridge)'
ki.ki	ki.i.ki	'strangle'

4.3.1. The MDT Approach to Tawala reduplication

· Inkelas and Zoll want to give a unified account of the allomorphs in (46): in (c) the "reduplicant" is bimoraic, and in (a) and (b), where a bimoraic foot reduplicant would result in a two vowel sequence, the first vowel deletes.

(48) *ge.le.ta* 'to arrive' → *ge.le-ge.le.ta* 'be arriving'

a.



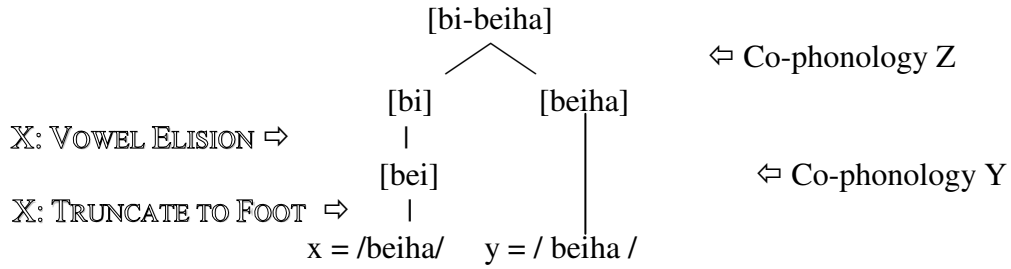
b. Co-phonology X: PWD≈FOOT >> IO-FAITH = TRUNCATE TO FOOT

/ geleta /	PWD≈FOOT	IO-FAITH
a. geleta	*!	
b. ☺ gele		ta
c. ge	*!	leta

c. Co-phonology Y: IO-FAITH >> PWD≈FOOT

/ geleta /	IO-FAITH	PWD≈FOOT
a. ☺ geleta		*
b. gele	t!a	
c. ge	l!eta	*

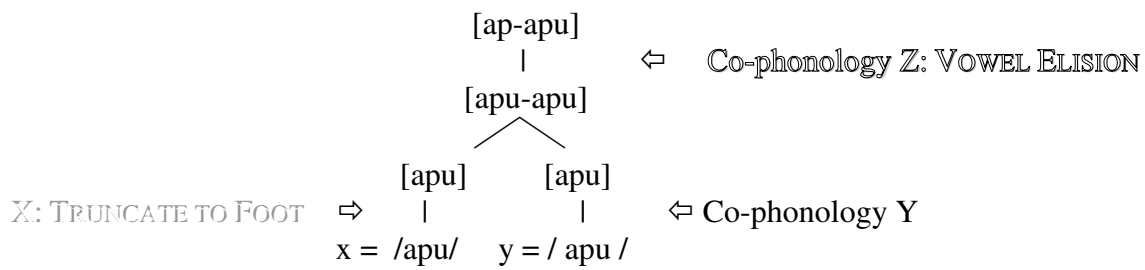
(49) *be.i.ha* 'to search' → *bi-be.i.ha* 'be searching'



· Inkelas and Zoll's ELISION rule (~ *VV) must apply in Co-phonology X to avoid elision in the Y-stem *beiha*: i.e. *bi-biha.

· Co-phonology X must also have vowel elision apply before truncation to rule out: *biha-beiha.

(50) *a.pu* 'to bake' → *a.p-a.pu* 'be baking'



· Now ELISION must apply at Co-phonology Z, since stem X *apu*, which undergoes the elision, does not have access to V-initial stem Y *apu* until after they are compounded at Z (*apu-apu).

· Because of the discrepancy of which Co-phonology much contain the ELISION rule, Inkelas and Zoll's current analysis of the data in (46) is not unified.

· We now turn to an MDT analysis of the additional data in (47), which poses a more serious challenge to the MDT approach to reduplication.

· As our analysis currently stands, MDT wrongly predicts output forms like *toto-totogo*, which would contain a bimoraic prefix and not trigger vowel elision:

(51) *to.to.go* 'be sick' → *to.o.to.go* 'being sick'

*[toto-totogo] ⇦ Co-phonology Z

[toto] [totogo]

X: Truncate to Foot ⇨ | | ⇦ Co-phonology Y

x = / totogo / y = / totogo /

· A possible solution—posit a moraic affix akin to *maveta* → *mav.veta*:

(52) A Plausible Analysis of Tawala Mora Infixation

AFFIX = μ: to.to.go 'be sick' → to.o.to.go 'being sick'

a. [tootogo] ⇦ Co-phonology Z

[μ] [totogo]

Co-phonology V ⇨ | | ⇦ Co-phonology Y

V= /μ/ y = /totogo/

| |

{DURATIVE} {'be sick'}

· A serious problem with this approach is that it misses the phonological regularity of the pattern, which can be accounted for, along with the other three reduplicant shapes, via Base-Reduplicant Correspondence.

4.3.2. Correspondence Theoretic account of mora augmentation in Tawala

· For a complete and unified analysis of all four patterns in the Tawala durative, see Hicks Kennard (2004), as well as discussion in Haugen and Hicks Kennard (2009).

(53) **Summary: The Tawala durative reduplication constraint hierarchy**

FAITH-IO, REALIZEMORPHEME >> *REPEAT$_\sigma$ (Hicks Kennard 2004)
>> ALIGN-L (RED, Wd), ANCHOR- L (RED, Base)
>> ANCHOR-L(Wd, Ft)
>> ONSET, ALIGN-L(Rt, Wd)
>>CONTIGUITY
>> MAX$_{BR}$

For our purposes, the crucial point is that:

(54) Mora epenthesis in the Tawala durative is *base dependent*: reduplication cannot occur in forms that begin with two identical syllables.

· Hicks Kennard (2004) proposes the application of the constraint, *REPEAT to the level of the syllable.

(55) *REPEAT$_\sigma$ Identical syllables cannot be adjacent (Yip 1995).

(56) ***REPEAT and The Emergence of the Unmarked in Tawala Moraic Epenthesis**

/RED + totogo/	MAX-IO	*REPEAT$_\sigma$	ANCHOR- L (RED, Base)	ALIGN-L(Rt, Wd)	MAX$_{BR}$
a. **to.go.**to.go.	t!o			togo	
b. **to.to.go.**to.to.go		*!*		totogo	
c. **to.**to.to.go		*!*		to	togo
d. **to.to.**to.to.go		*!**		toto	go
e. **o.**to.to.go.		*!	t	o	ttogo
f. to.**o.to.**to.go		*!	t		tgo
g. **to.o.**to.to.go		*!		too	tgo
h.☺ **to**.o.to.go.			t		ttogo
i. to.**o**.to.go.			t		ttogo

· Note also that the above constraint ranking, specifically the combination of *REPEAT$_\sigma$ and the compression mechanism ALIGN-L (RED, Wd) >> ALIGN-L(Rt, Wd), also correctly rules out candidates like ***geleta**-geleta (for having too long of a reduplicant) and ***ge**-geleta (for identical adjacent syllables).

Vowel Elision in Tawala

· As mentioned above, the MDT account has an Elision rule ($V_1V_2 \rightarrow V_2$) in two different Co-phonologies for the *bi-beiha* and *ap-apu* cases (i.e. Co-phonology X and Co-phonology Z, respectively).

· Hicks Kennard 2004 accounts for the apparent elision in both word classes with the same constraint ranking:

(57)

/RED + beiha/	*REPEAT$_\sigma$	ONSET	ALIGN-L(Rt, Wd)	CONTIGUITY	MAX$_{BR}$
a. **be.i.**be.i.ha.		**!	bei!		ha
b. **be.**be.i.ha.	*!	*	be		iha
c. ☺ **bi.**be.i.ha.		*	bi	e	eha
d. **ba.**be.i.ha.		*	ba	ei!h	eih
e. b**e**.e.i.ha		**!	b		biha

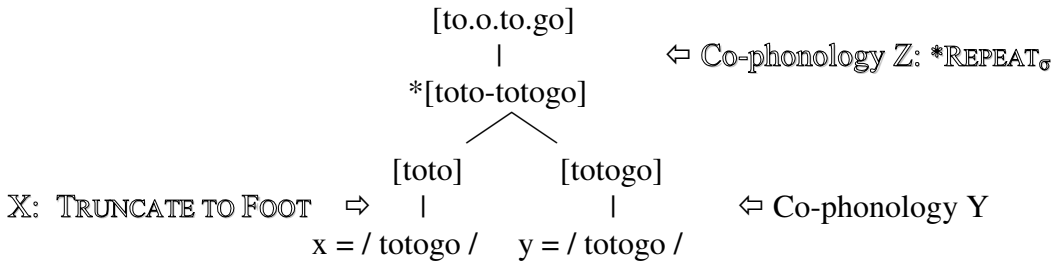
(58)

/RED + apu/	*REPEAT$_\sigma$	ONSET	ALIGN-L(Rt, Wd)	MAX$_{BR}$
a. **a.pu.**a.pu.		**!	apu	
b. ☺ **a.p**a.pu.		*	ap	u
c. **a.pu.**pu[2].	*!	*	ap	
d. **a.**a.pu.	*!	**	a	pu

4.3.3. *REPEAT$_\sigma$ in MDT

· One might be tempted to try to account for the *to.o.to.go* reduplication cases in MDT by importing the *REPEAT$_\sigma$ analysis into Co-phonology Z:

(59) *to.to.go* 'be sick' → *to.o.to.go* 'being sick'



(60) This approach, which should ban all cases of repeated syllables, has at least three problems in the analysis of Tawala morphology:

i. Repeated syllables are licit outputs in stems, e.g. "the base" in phonological copying theories, when they are not reduplicated or compounded: cf. *totogo*, etc. (cf. FAITH$_{IO}$, and recall that MDT does not recognize a distinction between "stem" and "reduplicant" faithfulness).

[2] This candidate would actually already have been ruled out by MAX$_{IO}$, but we have included it here because of its relevance to the MDT analysis of vowel elision .

ii. Identical adjacent syllables are also allowed in other cases of morphological concatenation yielding identical adjacent syllables:

a. Pronominal prefix + Verb stem: *a-a.ni*
1.SG.SUBJ-*eat*-OBJ
'I ate something'

b. Derivational prefix + Verb stem: *lu-lu.pa.li* **lu.u.pa.li*
derivational.prefix-'ask'
'beg'

☆ iii. Most crucially, *REPEAT$_\sigma$ also does not apply to *root-root compounds*:
nu.go-go.ho.la **nu.go.o.ho.la*
heart-jump
'surprised'

· Thus, the reduplicant in Tawala seems to have a restriction (*REPEAT$_\sigma$) not applicable to other compounds in the language—i.e. TETU in the reduplicant only.

· These cases show base-dependency and reduplication-specific phonology that are outlawed in MDT.

Interim Conclusion III:

· MDT can handle mora affixation relatively straightforwardly.

· However, the MDT analyses that we proposed above for Hiaki and Tawala fail to recognize the intimate connection between mora affixation and reduplication in these languages.

  · Semantically, reduplication and mora affixation are used for the same functions in both Hiaki and Tawala (habitual and durative, respectively), and MDT, which crucially focuses on semantic identity, utilizes different morphological analyses for this identical semantic function.

  · Phonologically, mora augmentation in Tawala results from a kind of base-dependency that is illicit in MDT.

    · In Correspondence Theory, on the other hand, the mora augmentation in the *totogo* examples is a standard case of the emergence of the unmarked, where a markedness constraint (*REPEAT$_\sigma$) is crucially ranked between Input-Base faithfulness (MAX$_{IO}$) and Base-Reduplicant (MAX$_{BR}$) faithfulness.

· Thus, our discussion further supports phonological copying approaches to reduplication which utilize Base-Reduplicant identity/correspondence.

5. Conclusion

(61) *Some of the empirical and theoretical points raised above for MDT are the following*:

Reduplication in Compounding Contexts

☺

· i. MDT naturally accounts for word-internal targets for reduplication in compounds.

☹

· ii. Reduplication does not behave like other compounds in some languages (e.g. Tawala).

· iii. The semantic identity account is not natural for some cases, and MDT does not recognize the (frequent) intrinsic semantic contribution of reduplication as a morphological process.

· iv. MDT's linking of reduplication constructions to synonym compounds (and related constructions) uniquely raises the *problemo-problem* problem, predicting a much higher frequency of truncation in such compounding cross-linguistically.

Phonological Targets for Reduplication

☹

· v. In contrast to Shaw's Constituent Base Hypothesis, MDT forbids the targeting of phonological constituents for reduplication, and other cases of base-dependency (cf. Mayo, and possibly Hiaki)

Morphological Moras

☺

· vi. The phenomenon of mora affixation/augmentation can be given a straightforward analysis in MDT along the lines of Samek-Lodovici 1992.

☹

· vii. MDT does not recognize the intimate connection of mora affixation to reduplication in some languages:

a. semantically, as in Hiaki and Tawala; and

b. phonologically, as in Tawala (another case of base-dependency).

(62) Some Important Open Questions for MDT

◎ What forces morphological doubling in the first place?

◎ What limits truncation co-phonologies to Doppelgänger compounding constructions in so many languages?

· In sum, the discussion above supports the phonological copy approach and base-reduplicant correspondence (e.g. MAX_{BR} in Tawala) in a general way. However, the empirical facts covered should of course be accounted for by any theory of the phonology-morphology interface.

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