

Morpheme Distinctiveness and feature exchange in DhoLuo

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1. The Issue

(1) *The DhoLuo [ðoluo] genitive*

	<i>Nom.Sg.</i>	<i>Gen.sg.</i>	<i>gloss</i>
(a)	ɒt	ɒd	'house'
(b)	buk	bug	'book'
(c)	agoko	agog	'chest'
(d)	kɒθ	kɒð	'rain'
(e)	dɛbɛ	dɛp	'debbi'
(f)	kidi	kit	'stone'
(g)	cogo	cok	'bone'
(h)	puoðo	puoθ	'garden'

- The plural is similar (see below)
- Recent theoretical discussion: Stonham 1994, Alderete 2001, Horwood 2001, Kurisu 2002.
- Description: Stafford 1967, Gregersen 1974, **Okoth-Okombo 1982**, Omondi 1982.

(2) *Generalizations (to be revised!)*

- Delete the final vowel
- Reverse the voicing of the stem-final consonant

(3) *Issues*

- How to do subtraction in a concatenative morphology.
- How to do 'exchange rules' in a concatenative morphology.

(4) *Apparent implications*

- The DhoLuo genitive cannot be formed by standard morpheme concatenation. It supports the idea of morphemes as rules/constraints (e.g. Anderson 1992).
- The DhoLuo genitive shows that contrast preservation/actuation can play a role in morpheme realization. The correct generalization is that the genitive must be surface-distinct from its base (the nom.sg.) (Alderete 2001; also see Łubowicz 2002; for subtractive morphology see Horwood 2001).

1.1 The Proposal

(5) *My proposal*

- (a) The DhoLuo genitive can be explained in a concatenative morphology.
- (b) There are two different featural morphemes.
 [+voice, -sonorant]
 [-voice]
- (c) These morphemes must be realized *distinctively*.
 Relates to work by Samek-Lodovici (1993,1994), McCarthy & Prince (1995), Akinlabi (1996), [Kurusu 2001].
- (d) They must be rightmost in the stem.

(6) /kid[■][-voice]/

	kid	[-voice] not distinctively realized
ᵐᵃ	kit	[-voice] distinctively realized

(7) /ɒt[■][+voice,-sonorant]/

	ɒt	[+voice] not distinctively realized
ᵐᵃ	ɒd	[+voice] distinctively realized

- (i) impossible to realize [-sonorant] distinctively, since the root is [-sonorant].

(8) /ɒt[■][+voice,-son][■][-voice]/

	ɒt	[-voice] <i>not</i> realized distinctively. [+voice,-son] <i>not</i> realized distinctively.
ᵐᵃ	ɒd	<u>[+voice] realized distinctively!</u> [-voice] not realized distinctively.

- (9) MORPHDISF For all morphemes M,
 there is some faithful exponent E of M,
 and E is not a faithful exponent of any other morpheme M₂,
 where M and M₂ are in the same stem.
 - ‘Exponent’ = ‘feature’ in this context.
 - After McCarthy & Prince (1995)

(10) *Morpheme distinctness vs contrast preservation*

Morpheme distinctness is not the same as contrast preservation/actuation.
 Morpheme distinctness does not *force* a contrast to appear on the surface.
 It forces some aspect of a morpheme to be faithfully realized if the morpheme would otherwise be completely obscured on the surface.

(11) *Outline*

- §2: Evidence for DhoLuo featural morphemes.
- §3: The Genitive as realization of both morphemes.
- §4: Alternatives
- §5: Implications & conclusions.

2. DhoLuo featural morphemes

- (12) Morphemes consisting of features alone exist.
Recent OT references: Zoll (1996a,b), Akinlabi (1996)

- (13) *Chaha object labialization* (McCarthy 1983:179, Zoll 1996b)

	root	root+object	Gloss
(a)	dænæg	dænæg ^w	‘hit’
(b)	nækæb	nækæb ^w	‘find’
(c)	mækær	mæk ^w ær	‘burn’
(d)	qætær	q ^w ætær	‘kill’
(e)	sædæd	sædæd	‘chase’

Analysis

- (a) [+round] falls on the rightmost consonant.
 (b) Constrained by a ban on labialized coronals (see esp. (e))
- (14) *Featural affixes from Akinlabi* (1996)
 (a) Nuer [+voice], [+continuant] marks tense, aspect.
 (b) Zoque [ɿ] marks 3p.sg.
 (c) Terena [+nasal] marks 1p.possessive.
 (d) Japanese [ɿ] marks ‘uncontrolledness’
 (e) Aka [+voice] marks noun class 5.

- (15) *DhoLuo Background*

labial	dental	alveolar	palatal	velar	glottal
p		t	c	k	
b		d	ɟ	g	
^m b		ⁿ d	^ɲ ɟ	^ŋ g	
(f)	θ	s			h
	ð				
m		n	ɲ	ŋ	
		l, r			
w			j		

- Syllable= (C(w))V(V)(C)

2.1 The DhoLuo [-voice] morpheme

- (16) Nominalization (V→N)
 • Eliminate stem-final vowel
 (a) /+vd obstruent/ → [-vd obstruent]
 (b) /w/ → [p]
 (c) /j/ → [c]
 (d) In other cases “only the final vowel is deleted with no change in the last consonant.”

(17) *Data*

	<i>verb root</i>	<i>Nominalization</i>	<i>gloss</i>
(a)	kuodo	kuot	‘cause to swell’
	nego	nek	‘kill’
	maðɒ	maθ	‘drink’
(b)	biwo	bip	‘heap’
	ciewo	ciep	‘wake up’
(c)	bijɒ	bic	‘squeeze’
	cajɒ	cac	‘despise’

(18) *Nominalization*

<i>labial</i>	<i>dental</i>	<i>alveolar</i>	<i>palatal</i>	<i>velar</i>	<i>glottal</i>
p		t	c	k	
b		d	ɟ	g	
^m b		ⁿ d	ⁿ ɟ	^ŋ g	
f	θ	s			h
	ð				
m		n	ɲ	ŋ	
		l	r		
w			j		

- Output target: Voiceless segments with the same PoA.
- Undergoers: Non-nasals, non-liquids.

(19) *Proposal*: Nominalizer is a featural morpheme: [-voice]

2.1.1 C-change I

- (20) MORPHDISF For all morphemes M,
there is some faithful exponent E of M,
and E is not a faithful exponent of any other morpheme M₂,
where M and M₂ are in the same stem.

(21)

/neg ▣ [-voice]/	MORPHDISF	IDENT[voice]	<i>Comments</i>
(a) neg	*!		no faithful exponent of [-voice]
☞ (b) nek		*	Faithful exponent of both <i>neg</i> and [-voice]

(22) /j w/ → [c p]

/bij ▣ [-voice]/	MORPHDISF	IDENT[manner]	IDENT[voice]
(a) bij	*!		
☞ (b) bic		*	*

(23) *Already voiceless*

/dt [□] [-voice]/	MORPHDISF	IDENT[voice]
(a) dt	*	
(b) ɒd	*	*!

(24) Nasal preservation blocks /^NC/ and /N/ → [-voice]

/ban [□] [-voice]/	IDENT[nasal]	MORPHDISF
(a) ban		*
(b) bat	*!	

(25) Liquid preservation blocks /l r/ → [t c]

/bar [□] [-voice]/	IDENT[liquid]	MORPHDISF
(a) bar		*
(b) bat	*!	

2.1.2 Subtraction

(26) *We need this constraint anyway:*/buk[□][-voice]/ → [buk], *[puk](27) *Proposal:* The [-voice] morpheme must be *rightmost* in its stem.

- ALIGN-R(Suffix,Stem)

(28) || ALIGN-R(Suffix,Stem), *V₀, DEP » MAX-V ||

(29)

/nego [□] [-voice]/	ALIGN-R(Suf,Stem)	MAX-V
(a) nek		*
(b) neko	*!	

- *[nego] violates *V₀
- *[negot] violates DEP

(30) Why does /nego[□][-voice]/ → [nek]

- not
- (a) *[neko] *without deletion*
 - (b) *[nego] *with realization of [-voice] on the vowel*
 - (c) *[negot] *with epenthesis*

(31) Non-realization and non-distinct realization are different things.

- For this account to work, the nominalizer morpheme must still be *realized* in /ban₁[□][-voice]₂/ → [ban_{1,2}o], *[ban₁o]
- MORPHMAXF For every morpheme there is some F s.t. F corresponds to F'

(32)

/ban ₁ ■ [-voice] ₂ /	MORPHMAXF	MORPHDISF
(a) ban _{1,2}		*
(b) ban ₁	*!	

- MORPHMAXF, ALIGNR(Suff,Stem) » MORPHDISF, MAXV

2.2 The DhoLuo [+voice,-sonorant] demonstrative morpheme

(33) Before a demonstrative (e.g. *ca* ‘that’), a noun undergoes the following changes:

- Eliminate stem-final vowel
- (a) /-vd obstr/ → [+vd obstr]
 (b) /l/ → [ʰd]

(34) *Data*

	<i>nom.sg.</i>	<i>nom.sg. + demonstr.</i>	<i>Gloss</i>
(a)	ɒt	ɒd ca	‘that house’
	abic	abiɟ ca	‘five’
	buk	bug ca	‘that book’
	kɒθ	kɒð ca	‘that rain’
(b)	lɪɛl	lɪɛ ⁿ d ca	‘that drum’
	bakul	baku ⁿ d ca	‘that bowl’

(35) *Demonstrative C-changes*

<i>labial</i>	<i>dental</i>	<i>alveolar</i>	<i>palatal</i>	<i>velar</i>	<i>glottal</i>
p		t	c	k	
b		d	ɟ	g	
^m b		ⁿ d	^j ɟ	^ŋ g	
f	θ	s			h
	ð				
m		n	ɲ	ŋ	
		l			
w			r, j		

- Maybe also [N] → [ʰN C]

(36) *Generalizations:*

Output target: a voiced obstruent with the same PoA.

Undergoers: (a) All obstruents with a voiced counterpart

(b) Sonorants except the glides.

(37) *Proposal:* A featural suffix [+voice,-son]

(38) *Realization of [-voice]*

/ɒt ■ [+vd,-son]/	MORPHDISF	IDENT[voice]
(a) ɒt	*!	
(b) ɒd		*

(39) *Realization of [-son]*

/liɛl [□] [+vd,-son]/	MORPHDISF	IDENT[F]
(a) liɛl	*!	
☞ (b) liɛ ⁿ d		

Issues

- F ≠ [liquid] (see tableau (25))
- F is some feature that [lⁿd] and [l] share, but [l] and [t] do not.
- Why not /l/→[d]?

2.2.1 **Blocking**

(40) /s/ does not change (cf Chaha labialization case)

(41) (a)

/ ^m bas [□] [+vd,-son]/	*z	IDENT[strident]	MORPHDISF
☞ (a) ^m bas			*
(b) ^m baz	*!		
(c) ^m bad		*!	

(b)

/ ^m bas [□] [+vd,-son]/	*z	IDENT-Place	MORPHDISF
☞ (a) ^m bas			*
(b) ^m bað	*!	*!	

(42) *Glides do not change*

- Leads to a ranking paradox?

3. The genitive and both featural morphemes

(43) *DhoLuo morphemes & constructions*

Morpheme	[-voice]	[+voice,-son]	[e]
nom.sg.			
nominalizer	✓		
demonstrative		✓	
genitive sg.	✓	✓	
nom.plural	✓	✓	✓
gen.plural	✓	✓	✓

(44) *Changes in the genitive*

- Deletion of the stem-final vowel
- (a) /non-palatal -vd obstr/ → [+vd obstr]
- (b) /+vd obstruent/ → [-vd obstruent]
- (c) /N/ → [^Nstop]
- (d) /l/ → [ⁿd]
- (e) /r/ → [c]
- (f) /w/ → [p]
- (g) /j/ → [c]
- (h) /c/ → [j] or ∅
- (i) Other segments /^NC f s h/ don't change

(45) *Changes in the genitive*

labial	dental	alveolar	palatal	velar	glottal
p		t	c	k	
b		d	j	g	
^m b		ⁿ d	ⁿ j	ⁿ g	
f	θ	s			h
	ð				
m		n	ɲ	ŋ	
		l	r		
w			j		

(46) *Data*

	nom.sg.	gen.sg	gloss
(a)	ɒt	ɒd	'house'
	kɒθ	kɒð	'rain'
	buk	bug	'book'
(b)	dɛbe	dɛp	'debbi'
	kidi	kit	'stone'
	mɒɡɒ	mɒk	'flour'
	puoðo	puoθ	'garden'
(c)	olemo	ole ^m b	'fruit'
	ɡɒɲia	ɡɒ ⁿ d	'sack'
	lweɲ	lwe ⁿ ɟ	'battle'
	cɒŋ	cɒ ⁿ g	'knee'
(d)	bul	bu ⁿ d	'drum'
	pala	pa ⁿ d	'knife'
(e)	bura	buc	'meeting'
	dwarɒ	dwac	'need'
(f)	gowi	gop	'debt'
	ɟowi	ɟop	'buffalo'
(g)	apwɒɟɒ	apwɒc	'rabbit'
	taja	tac	'lamp'
(h)	kwac	kwa/kwaj	'leopard'
	ic	ɪ/ɪj	'stomach'

(i)	^m bas	^m bas	'agemate'
	lahu	lah	'cow'

- (47) Essentially, the realization of the genitive is the summation of the realization of the demonstrative and nominalizer.
- (48) Proposal: Genitive = [+voice, -sonorant] • [-voice]
Because the morphemes have contradictory specifications for [voice], only one can be realized. MORPHDISF decides.
- (49) MORPHDISF For all morphemes M,
there is some faithful exponent E of M,
and E is not a faithful exponent of any other morpheme.

- (50) /pt ■ [+voice, -sonorant] ■ [-voice]/

[pt]	• [-voice] morpheme has a faithful exponent, but it is shared with the root. • [+voice] morpheme does not have a faithful exponent. • Root morpheme has a faithful and distinct exponent.
[pd]	• [-voice] morpheme does not have a faithful exponent. • [+voice] morpheme has a faithful exponent <i>and</i> it is not shared with any other morpheme. • Root morpheme has a faithful and distinct exponent.

i.e. There's no way to realize the [-voice] morpheme distinctively,
but there is a way to realize the [+voice] morpheme distinctively.

- (51)

/pt ■ [+vd, -son] ■ [-voice]/	MORPHDISF
(a) pt	* *!
ᵀᵀ (b) pd	*

- (52)

/debe ■ [+vd, -son] ■ [-voice]/	MORPHDISF
(a) deb	* *!
ᵀᵀ (b) dep	*

- (53) *Other realizations*

(a) /n/ → [ᵀd] to realize [-sonorant].

*[d] because of IDENT[±nasal]

(b) /j r/ → [c]; /w/ → [p] to realize [-voice].

Why not → [j b], realizing [-sonorant] and being more faithful?

- (54) *No change: /h/*

/h ■ [+vd, -son] ■ [-voice]/

[ḥ] No [ḥ] in DhoLuo

[ð] IDENT[Place]

4. Predictions & Alternatives

- (55) • The Morpheme Distinctness approach predicts that all exchange rules & subtractive processes are morphologically triggered.
(Just like Anti-Faithfulness.)

- (56) *Anti-faithfulness* (Alderete 2000, 2001)
 $\neg$ OO-IDENT[F] “It is not the case that every OO-corresponding segment agrees in the feature [F].”
 • i.e. *some* correspondents disagree in [F].
 • *Only* applies on the OO dimension.

(57)

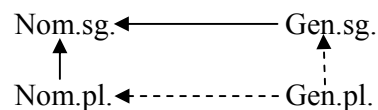
/bat+GEN./	$\neg$ OO-IDENT[voice]	OO-IDENT[voice]
(a) bat	*!	
(b) bad		*

(58)

/cogo+GEN./	$\neg$ OO-IDENT[voice]	OO-IDENT[voice]
(a) cog	*!	
(b) cok		*

- (59) *Prediction of Anti-Faithfulness theory*
 Feature value exchange can only happen between Base and Derivative.

(60) *Base relations*



- (a) $\neg$ OO-IDENT[voice] must apply to the relation Base→genitive and Base→plural.

i.e. [bat] {nom.sg.} ~ [bad] {gen.sg.}, [cog] {nom.sg.} ~ [cok] {gen.sg.}
 [bat] {nom.sg.} ~ [bede] {nom.pl.}, [cog] ~ [coke] {nom.pl.}

- (b) But Base→Gen.pl.

Nom.sg. [bat]
 Nom.pl. [bede]
 Gen.sg. [bad]
 Gen.pl. [bede], *[bete]

- (c) *Implication*: The *input*'s voicing changes, not the *base*'s.

(61) *No multiple reversals*

[[at [■] [+vd]]]	→ [ad]
[[[at [■] [+vd]]] [■] [+vd]]]	→ [ad]
[[[[at [■] [+vd]]] [■] [-vd]]] [■] [+vd]]]	→ [ad]
[[[[[at [■] [+vd]]] [■] [-vd]]] [■] [+vd]]] [■] [-vd]]]	→ [ad]

- (62) *Other differences*
- Subtraction: Anti-faithfulness allows subtraction to take place anywhere in the root, through $\neg$ MAX (Horwood 2001). The present approach sees subtraction as due to ALIGN-L/R, predicting that only stem edges can be eliminated.
 - The Morpheme Distinctness analysis of DhoLuo relied on the existence of independent featural morphemes that had opposite values for the same feature. If this is the only way in which ‘exchanges’ can come about, if one finds an exchange from $[\alpha F] \rightarrow [-\alpha F]$ in a language, one could expect independent morphologically-triggered changes from $[+F] \rightarrow [-F]$ and $[-F] \rightarrow [+F]$.

5. Conclusions

- (63) DhoLuo plural/genitive formation is not an exchange rule.
- Exchanges come about when two featural morphemes with opposite feature values compete for realisation.
- (64) The subtractive aspect of the DhoLuo genitive, nominalizer, and demonstrative forms can be ascribed to $\parallel$ ALIGN-R(Suffix,Stem) » MAX-V $\parallel$.
- (65) Nothing has been added to the grammar.
- (66) *Challenges raised by Alderete (2001)*
- (a) Feature insertion + non-automatic spreading
 - (b) Metathesis (as a marked of Saanich ‘actual’).
 - (c) Dominant-accenting affixes
e.g. Japanese [-kko] suppresses accent throughout the word:
/kóobe-kko/ [koobe-kko] ‘native of Kobe’
 - (d) *Reduplicative identity-avoidance*
Yip (1998): avoidance of perfect reduplicant copy.

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References

- Akinlabi, Akinbiyi (1996). “Featural affixation.” *Journal of Linguistics* 32: 238-289.
- Alderete, John (2001). “Dominance effects as transderivational anti-faithfulness.” *Phonology* 19.2: 201-254.

- Anderson, Stephen R. (1992). A-Morphous Morphology. Cambridge: Cambridge University Press.
- Gregersen, Edgar A. (1972). "Consonant polarity in Nilotic". In Erhard Voeltz (ed.) 3rd Annual Conference on African Linguistics. Bloomington: Indiana University. pp.
- Horwood, Graham (2001). "Anti-faithfulness and subtractive morphology." Rutgers Optimality Archive 446.
- Kurusu, Kazutaka (2002). The phonology of morpheme realization. PhD dissertation, University of California at Santa Cruz [ROA 490].
- Lubowicz, Anna (2002). Contrast preservation in phonological mappings. PhD dissertation, University of Massachusetts, Amherst [ROA 554].
- McCarthy, John (1983). "Consonantal morphology in the Chaha verb". In M. Barlow, D. Flickinger and M. Wescoat (eds.). Proceedings of WCCFL 2. Stanford: Stanford Linguistic Association. pp. 176-188.
- McCarthy, John and Alan Prince (1995). "Faithfulness and Reduplicative Identity". In Jill Beckman, Suzanne Urbanczyk and Laura Walsh Dickey (eds.). University of Massachusetts Occasional Papers in Linguistics UMOP 18. Amherst, MA: GLSA. pp. 249-384.
- Okoth-Okombo, Duncan (1982). DhoLuo morphophonemes in a generative framework. Berlin: Dietrich Reimer Verlag.
- Omondi, Lucia Ndong'a (1982). The major syntactic structures of DhoLuo. Berlin: Dietrich Reimer Verlag.
- Samek-Lodovici, Vieri (1992). "Universal constraints and morphological gemination: A crosslinguistic study", ms. Brandeis University.
- Samek-Lodovici, Vieri (1993). "A unified analysis of crosslinguistic morphological gemination", ROA 149.
- Stafford, R.L. (1967). An elementary Luo grammar, with vocabularies. Nairobi: Oxford University Press.
- Stonham, John (1994). Combinatorial morphology. Amsterdam: John Benjamins.
- Yip, Moira (1998). "Identity avoidance in phonology and morphology". In Steven Lapointe, Diane Brentari and Patrick Farrell (eds.). Morphology and its relation to phonology and syntax. Stanford: CSLI [ROA 82, 83]. pp. 216-246.
- Zoll, Cheryl (1996). Parsing below the Segment in a Constraint-based Framework. Doctoral dissertation, University of California, Berkeley [ROA 143].