Allomorphy between tone and segments in Yucunany Mixtepec

An optimality-theoretic account

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Phonologically conditioned suppletive allomorphy (PCSA)

(1) *PCSA* (cf., for example, Paster 2006)
The surface representation/effect of one morpheme M is different depending on the phonological context and this difference cannot be attributed to phonological changes independently expected in this context.

(2) *Segmental PCSA in Moroccan Arabic* (Mascaro 2007)

	Base	3.Sg.Masc		*Possible analysis:*
a.	ʃafu	ʃafuh	'error'	3.Sg.M ↔ /h/ /V__
b.	ktab	ktabu	'book'	3.Sg.M ↔ /u/ /C__

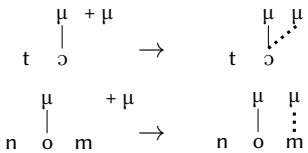
➞ **poly-representational analysis**

Non-concatenative PCSA

- non-concatenative 'PCSA': in (3), different operations (gemination, vowel lengthening) apply
- both operations can be analysed in autosegmental phonology as addition of a μ

(3) *Non-concatenative 'PCSA' in Asante Twi (Dolphyne 1996, Paster 2010)*

	Base		Past (+Obj)	*Possible analysis:*
a.	tɔ	'to buy'	tɔː	
	dane	'to turn'	daneː	
b.	nom	'to drink'	nomː	
	ɔpameː	's/he sewed (it)'	ɔpamː	



➞ **mono-representational analysis**

Main Claim

- propose an analysis for a phonologically predictable allomorphy in Yucunany Mixtepec Mixtec (=YM)
  - a morphological low tone with different surface effects, or
  - the realization of additional segments
- an argument for **contrastive prosodic specification in the underlying form**:

different underlying syllable structure = different surface effects

➞ a prediction of OT and Richness of the Base

Allomorphy in Yucunany Mixtepec

Mixtec languages

- indigenous languages, spoken in southern Mexico (Otomanguean)
- most communities have less than 50.000 speakers (McKendry 2013)

(4) *State of Oaxaca*

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Background on Yucunany Mixtepec Mixtec (YM)

(Pike&Ibach 1978, Paster&Beam 2004a,b, Paster 2007,2012)

- no codas, restricted set of initial onset clusters
- three tones: H (=V́), M (=V), L (=V̀), and contour tones
- vowel length is not contrastive – default assumption: TBU=σ
  (‘VV(VV)’ notated to have enough space for contour tones!)
- underlined V’s=nasalized V’s

1.Sg formation in YM

- a low tone is added and creates a contour on the final σ (5-a)
- a low tone overwrites M on final σ (5-b)
- a segmental allomorph /–yù/ surfaces (5-c)

(5) *Tonal allomorphy in Yucunany Mixtepec (Paster&Beam 2004:3-4)*

a.	nàmá	‘soap’	nàmáà	‘my soap’	L **H**	→ L **HL**
	tìtzi	‘stomach’	tìtziì	‘my stomach’	L **M**	→ L **ML**
b.	la’la	‘mucus’	la’là	‘my mucus’	M **M**	→ M **L**
	xá’nu̱	‘cigarette’	xá’nù̱	‘my cigarette’	H **M**	→ H **L**
c.	sòkò	‘shoulder’	sòkòyù	‘my shoulder’	L **L**	→ L **L yù**
	tutù	‘paper’	tutùyù	‘my paper’	M **L**	→ M **L yù**

1.Sg formation in YM: context generalizations

A. a low tone is added and **creates a contour** for H-final stems

(6)	nàmá	'soap'	nàmáà	'my soap'	L **H**	→ L **HL**
	xínìí	'hat'	xínìíì	'my hat'	H **LH**	→ H **LHL**

B. a low tone **overwrites M** on final σ

(7)	la'la	'mucus'	la'là	'my mucus'	M **M**	→ M **L**
	xá'nu̱	'cigarette'	xá'nù̱	'my cigarette'	H **M**	→ H **L**

➜ if this would not create an LH L

(8)	yùúti	'sand'	yùútiì	'my sand'	LH **M**	→ LH **ML**
	yòóso	'metate'	yòósoò	'my metate'	LH **M**	→ LH **ML**

➜ or an L L

(9)	tìtzi	'stomach'	tìtziì	'my stomach'	L **M**	→ L **ML**
	kwà'a	'man's sister'	kwà'aà	'my man's sister'	L **M**	→ L**ML**

C. a segmental allomorph /–**yù**/ **surfaces** if the stem ends in a L-toned σ

(10)	sòkò	'shoulder'	sòkòyù	'my shoulder'	L **L**	→ L **L yù**
	tutù	'paper'	tutùyù	'my paper'	M **L**	→ M **L yù**

Analysis in Paster&Beam (2004)

- 1.Sg is 'marked by a floating L tone that associates to the end of the root' (p.71)
- a different allomorph /yù/ for bases ending in L

  ➙ **homophony avoidance**

Theoretical question

Is a monorepresentational analysis possible?

- Why does an additional low tone sometimes creates a new contour tone and sometimes overwrites an underlying base tone?
- How can the addition of a tone and the realization of a segmental string follow from a single underlying representation?

A monorepresentational analysis for YM

Main claim

A monorepresentational analysis:

A segmental /yu/ + L; the former only realized as last resort

1.SG ↔ L yu /#__

❶ Non-realization of /yu/

- the /yu/ underlyingly lacks a σ node and since DEP-σ (11-a) is higher ranked than MAX-S (11-b), the morpheme is preferably not realized (➜ morphemes that are realized in all contexts have an underlying σ)
- the L must be realized due to undominated MAX-L (11-c)

(11)

a.	DEP σ	Assign a violation mark for every output σ without an input correspondent.
b.	MAX S	Assign a violation mark for every input segment without an output correspondent.
c.	MAX L	Assign a violation mark for every input L-tone without an output correspondent.

(12) *Preference for not realizing the /yu/ but realization of the L-tone ➤(6)*

	L_1 H_2 L_a σ_i σ_{ii} na ma yu	MAX L	DEP σ	MAX S
a.	L_1 H_2 σ_i σ_{ii} na ma	*!		**
b.	L_1 H_2 L_a σ_i σ_{ii} σ na ma yu		*!	
☞ c.	L_1 H_2 L_a σ σ na ma			**

❷ Contour creation vs. overwriting

- contour tones are penalized by *CONTOUR$_\sigma$ (=*CNT$_\sigma$) (13-a)
- a contour is created with base-final H's since MAX-H (13-b) and MAX-L dominate *CNT$_\sigma$
- overwriting is predicted since *CNT$_\sigma$ dominates MAX-M (13-c)

(13)

a.	*CNT$_\sigma$	Assign a violation mark for every σ that is associated to more than one tone. (Yip 2002:80)
b.	MAX H	Assign a violation mark for every input H-tone without an output correspondent.
c.	MAX M	Assign a violation mark for every input M-tone without an output correspondent.

(14) *Floating L creates a contour with base-final H ➤(6)*

	L_1 H_2 L_a σ_i σ_{ii} na ma yu	MAX L	MAX H	DEP σ	*CNT$_\sigma$	MAX M	MAX S
☞ a.	L_1 H_2 L_a σ σ na ma				*		**
b.	L_1 L_a σ σ na ma		*!				**

(15) *Floating L overwrites a base-final M ➤(7)*

	M_1 M_2 L_a σ_i σ_{ii} la' la yu	MAX L	MAX H	DEP σ	*CNT$_\sigma$	MAX M	MAX S
a.	M_1 M_2 L_a σ_i σ_{ii} la' la				*!		**
☞ b.	M_1 L_a σ_i σ_{ii} la' la					*	**

❸ No adjacent L-initial syllables

- no overwriting of M if two adjacent σ's both associated with an L at their left edge would result
- a positional, non-local OCP (16) banning two adjacent σ's starting both with an L

(16) $*^{L}\sigma^{L}\sigma$ Assign a violation mark for every pair of adjacent σ's that are associated with an initial L.

(17) *No adjacent L-initial σ: Contour creation for M-final bases I ➤(8)*

	L_1 H_2 M_3 L_a σ_i σ_{ii} yu ti yu	MAX L	$*^{L}\sigma^{L}\sigma$	*CNT$_\sigma$	MAX M	MAX S
☞ a.	L_1 H_2 M_3 L_a σ_i σ_{ii} yu ti			**		**
b.	L_1 H_2 L_a σ_i σ_{ii} yu ti		*!	*	*	**

(18) *No adjacent L-initial σ: Contour creation for M-final bases II ➤(9)*

	L_1 M_2 L_a σ_i σ_{ii} ti tzi yu	MAX L	$*^L\sigma^L\sigma$	$*CNT_\sigma$	MAX M	MAX S
☞ a.	L_1 M_2 L_a σ_i σ_{ii} ti tzi			*		**
b.	L_1 L_a σ_i σ_{ii} ti tzi		*!		*	**

❹ Realization of /yu/ as last resort

- association of L to bases ending in an L is excluded by *[TT]: contour tones (adjacent tones associated to the same TBU) must be different
- realization of /**yu**/ **as last resort** to satisfy MAX-L becomes optimal

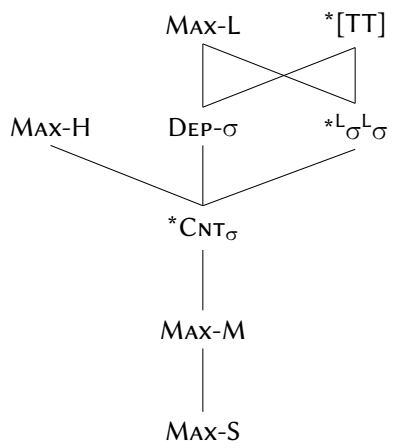
(19) *[TT] Assign a violation mark for every pair of adjacent identical tones that are associated to one TBU.

(20) *No adjacent L's: realization of /–yù/ ➤(10)*

	M_1 L_2 L_a σ_i σ_{ii} tu tu yu	*[TT]	MAX L	DEP σ	$*^L\sigma^L\sigma$	MAX S
a.	M_1 L_2 L_a σ_i σ_{ii} tu tu	*!				**
b.	M_1 L_a σ_i σ_{ii} tu tu		*!			**
☞ c.	M_1 L_2 L_a σ_i σ_{ii} σ tu tu yu			*	*	

YM: complete ranking

(21)



Summary

- a monorepresentational analysis:
  - a floating tone and
  - a segmental string that is only realized as last resort
- the learner is faced with an instance of incomplete neutralization: in 4 of 5 possible (phonological) contexts, she is only provided with a subset of evidence for the complete representation (only the tone, not the segmental content)

Implications and further prediction

Richness of the base and underlying contrast

- (22-a) and (22-b) are both possible input representations in OT

(22) a. σ / yu ➤ realized in all contexts b. yu ➤ realized as a last resort

- the analysis based on Dep-σ implies that this difference between underlying forms has crucial surface effect
- independent arguments for contrastive syllabification in, for example, Elfner (2006), Iosad (2013), or Vaux (2013)

  ➞ an economy argument: a **lexical contrast is reduced to a difference in underlying prosodic structure**

More allomorphy involving defective segmental morphemes: Aymara

- morphemes triggering lengthening of a preceding vowel in La Paz Aymara (Andes, spoken in Bolivia and Peru)

(23) *Vowel lengthening in the future (Briggs 1976, Hardman 2001)*

	Base	Future	
a.	sar**a**	sar**a:**	
	'go'	'(I) will go'	B265+266
b.	ap**a**	ap**a:**tam	
	'bring, have'	'he will bring'	H211
c.	alj**a**	alj**a:**ma	
	'sell'	'I will sell'	H211

More allomorphy involving defective segmental morphemes: Aymara

- whenever double-lengthening is expected, /-ja:/ surfaces
- no superlong vowels: alternative repair to realize both 'lengthenings'

(24) *Allomorphy between* **:** *and ja (Beesley 2000)*

a. warm**i-:-:**
women-VB-1>3.FUT
'I will be a women'
warm**ija:** *warmi::

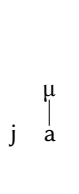
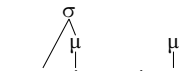
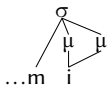
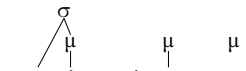
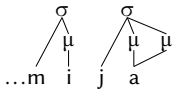
b. qulʲqi-n**i-:-:**ta
money-possessor-VB-1>3.FUT-FS
'You will have money'
qulʲqin**ija:**ta *qulʲqini::ta

Aymara: monorepresentational analysis

- /-ja/ underlyingly lacks a σ and is not realized if lengthening possible
  - realization of /ja/ implies a violation of DEP-σ and is dispreferred
  - MAX-μ demands that its μ must be realized: lengthening of preceding V

→ **realization of /-ja/ as last resort to realize the μ**

(25) *Autosegmental analysis of Aymara*

Underlying:	Allomorph 1: V-lengthening	Allomorph 2: Realization of /ja/
	Input:  Output: 	Input:  Output: 
	DEP-σ ≫ *V:, MAX-S	MAX-μ, *V:: ≫ DEP-σ

Summary and Conclusion

A monorepresentational account of allomorphy

- for an account of allomorphy in YM where realization of only an additional tone alternates with realization of segments

  → crucial assumption: **prosodically defective segments are only realized as a last resort**
- extension of this account to Aymara where a non-concatenative allomorph alternates with a segmental allomorph as well
- prosodically defective morphemes are independently predicted in OT: an economy argument if they can account for apparently lexical contrasts/allomorphy pattern

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(Caballero-Morales, 2008), 15 Mixtec languages in Bickel and Nichols (ongoing), 52 in Lewis et al. (2014); Iosad (2013), (McKendry, 2013)