Eva Zimmermann
Leipzig University
UNIVERSITÄT LEIPZIG

Being exceptional is being weak: Tonal exceptions in San Miguel el Grande Mixtec

AMP 2017
New York University
September 16, 2017

Main Claim: Gradient Symbolic Representations

1. Phonological elements can have different **degrees of presence** in an underlying representation, expressed as numerical activities (Smolensky and Goldrick, 2016; Rosen, 2016; Faust and Smolensky, 2017).
   (Cf. Rhodes (2012); Inkelas (2015); Vaxman (2016*a*,*b*) for similar concepts of 'strength')
2. Elements may retain their **weak activity in the output (=GSRO)**. The evaluation of markedness constraints can hence be influenced by different activities as well
3. **Harmonic Grammar** where constraints are weighted (Legendre et al., 1990; Potts et al., 2010)

$Y_1Z_{0.6}$	Z! 10	Max 8	*YZ 4	Dep 2	H
a. $Y_1Z_{0.6}$	-0.4		-0.6		-6.4
☞ b. Y_1Z_1			-1	-0.4	-4.8
c. $Y_{0.5}Z_1$		-0.5	-0.5	-0.4	-6.8
d. Y_1	-1	-0.6			-14.8

Max Assign violation X for any activity X in the input that is not present in the output.
Dep Assign violation X for any activity X present in the output but not in the input.
*M Assign violation X for activity X of structure M.
M! Assign violation X for activity X that the output structure lacks to M.

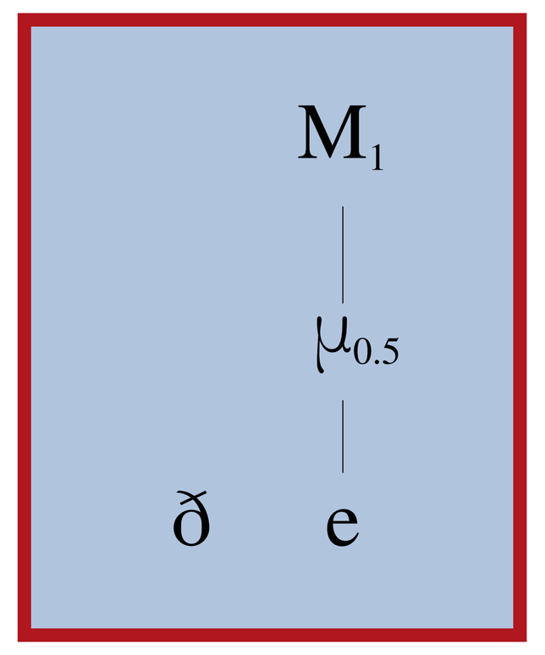
Case study 1: Exceptional non-hosts

- 'perturbing' morphemes trigger a tonal change on a following morpheme: **floating tones** (D1+D2+D3)
- some morphemes are exceptional **non-hosts for a floating H-tone** if the preceding morpheme ends in H (D4)
- not a regular phonological ban on *HH (D5+D6)

	Morpheme 1		Morpheme 2		Surface
D1.	kəbə̀$^{(H)}$	'day'	biko	'fiesta'	kəbə̀ bíko
D2.	kʷaʔà$^{(H)}$	'many'	sùʧí	'children'	kʷaʔà súʧí
D3.	nuʧi$^{(H)}$	'bean'	-ðe	3.MHon	nuʧiðé
D4.	βáá$^{(H)}$	Emph	-ðe	3.MHon	βááðe
D5.	βáá$^{(H)}$	Emph	-tɨ̀$^{(H)}$	3.Anim	βáátɨ́
D6.	ʃiní$^{(H)}$	'head'	ʧìʔí	'skunk'	ʃiní ʧíʔí

Analysis:

- some μ's have an activity lower than 1: they are **weak hosts for a floating tone** (=imperfect solution for T>μ)
- association to a weak host is **not a good enough reason to tolerate an OCP-violation**



San Miguel el Grande Mixtec
(Otomanguean; Southern Mexico)
Sources: Pike (1944, 1948); Mak (1950); McKendry (2013)

Threshold effect in HG for weak hosts:

Weight of …	is greater than	the weight of …	
T>μ	≫	OCP + MaxT	(cf. T1.)
OCP + MaxT	≫	0.5xT>μ	(cf. T3.)

T1. OCP and strong TBU

H_1H_1 (μ_1) + L_1 (μ_1) (D2.)	T>μ 60	OCP 24	MaxT 10	
a. H_1 (μ_1) H_1 L_1 (μ_1)	-1			-60
☞ b. H_1 (μ_1) H_1 (μ_1)		-1	-1	-34

T2. Floating H on weak host

M_1H_1 (μ_1) + M_1 ($\mu_{0.5}$) (D3.)	T>μ 60	OCP 24	MaxT 10	
a. M_1 (μ_1) H_1 M_1 ($\mu_{0.5}$)	-1			-60
☞ b. M_1 (μ_1) H_1 ($\mu_{0.5}$)	-0.5		-1	-40

T3. OCP and weak TBU

H_1H_1 (μ_1) + M_1 ($\mu_{0.5}$) (D4.)	T>μ 60	OCP 24	MaxT 10	
☞ a. H_1H_1 (μ_1) M_1 ($\mu_{0.5}$)	-1			-60
b. H_1 (μ_1) H_1 ($\mu_{0.5}$)	-0.5	-1	-1	-64

GSRO: Predicted typology of lexical exceptions

Activation scale of phonological elements: ≫ ≫

Underlying	Phonology	Output	GSR	GSRO	
a. *Exceptional repair: Weak element not realized*					
	*□○		✓	✓	e.g. Nuuchahnulth: unstable C's not realized if a marked syllable would result (Kim, 2003)
b. *Exceptional repair: Weak element realized*					
	*□□		✓	✓	e.g. Catalan: some stems exceptionally avoid adjacent sibilants by realizing /u/ (Bonet et al., 2007)
c. *Exceptional non-trigger: Weak element not repaired*					
	*□○		✗	✓	e.g. Classical Manchu: Some vowels do not trigger otherwise regular ATR-harmony (Smith, 2017)
d. *Exceptional non-target: Weak element does not change*					
	*■		✗	✓	→ MIG, case study 1
e. *Lexical support*					
	*Weak!		✓	✓	e.g. Japanese Rendaku: voicing only if stem and suffix trigger it; GSR analysis in Rosen (2016)
f. *True competition*					
	OneElement!		✓	✓	e.g. Moses Columbian Salish: 2 suffix- and 4 stem-types compete for stress (Czaykowska-Higgins, 1993) → MIG, case study 2

Case study 2: Exceptional tone patterns on /-jo/-ro/

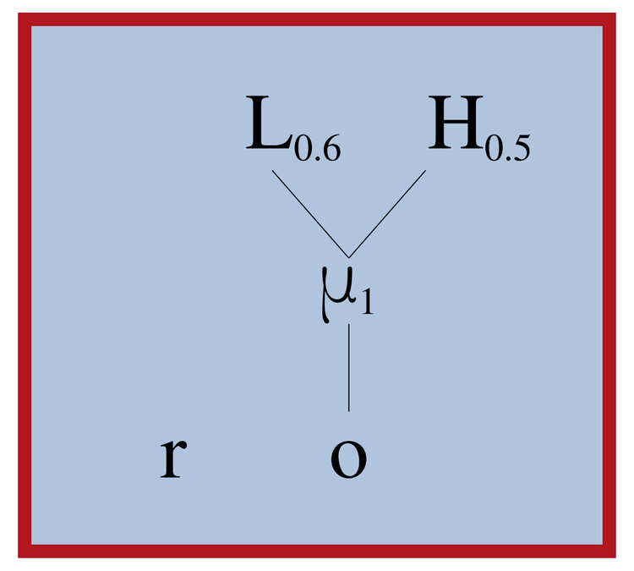
- /-jo/↔1.Incl and /-ro/↔2 **alternate between H, M, and L** depending on the preceding morpheme
- e.g. /hinì-jò/ 'know', /sáʔa-jó/ 'make', and /kee-ro/ 'eat'

/jo/ro/ after…		surface
R1.	L#	L
R2.	H#	L
R3.	L (H)#	L

/jo/ro/ after…		surface
R4.	M (H)#	M
R5.	M#	H
R6.	H (H)#	H

Analysis:

- /jo/ro/ associated to **two weakly activated tones** $L_{0.6}$ and $H_{0.5}$
- **$L_{0.6}$ preferred** over $H_{0.5}$: better for T>μ
  (exception: if the marked sequence *ML would result)
- $L_{0.6}$ and $H_{0.5}$ are not ideal for Spec: **spreading of a stem tone is preferred** but blocked for final tones by DepI_{Fin}



T4. Spreading of stem-final H

H_1 (μ_1) H_1 $L_{0.6}$ $H_{0.5}$ (μ_1) (R6.)	Spec 70	DepI_{Fin} 19	*LngT 15	MaxT 10	
a. H_1 H_1 (μ_1) $L_{0.6}$ (μ_1)	-0.4			-0.5	-33
b. H_1 H_1 (μ_1) $H_{0.5}$ (μ_1)	-0.5			-0.6	-41
☞ c. H_1 H_1 (μ_1 μ_1)			-1	-1.1	-26

T5. Preference for realizing $L_{0.6}$

H_1 (μ_1) + $L_{0.6}$ $H_{0.5}$ (μ_1) (R2.)	Spec 70	DepI_{Fin} 19	*LngT 15	MaxT 10	
☞ a. H_1 (μ_1) $L_{0.6}$ (μ_1)	-0.4			-0.5	-33
b. H_1 (μ_1) $H_{0.5}$ (μ_1)	-0.5			-0.6	-41
c. H_1 (μ_1 μ_1)		-1	-1	-1.1	-45

Summary: Tones of /jo/ro/

Spread: non-final T		No spread: final T	
R3.	$L_1 H_1$ (μ_1 μ_1)	R1.	L_1 (μ_1) $L_{0.6}$ (μ_1)
R4.	$M_1 H_1$ (μ_1 μ_1)	R2.	H_1 (μ_1) $L_{0.6}$ (μ_1)
R6.	$H_1 H_1$ (μ_1 μ_1)	R5.	M_1 (μ_1) $H_{0.5}$ (μ_1)