

Long epenthetic vowels

Another instance of opaque μ projection

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Epenthetic vowels

(cf., for example, Piggott 1995, Vaux 2002, Hall 2011)

- inserted ‘too early’: they are opaque for many processes (stress and/or segmental processes)
 1. epenthetic vowels are defective, they lack a μ (e.g. Piggott 1995)
 2. they are inserted at a later stage in the derivation

- ➔ **This talk:**
 1. epenthetic vowels have ‘**too much**’ structure (=two μ ’s)
 2. they are inserted ‘**too late**’

Main Claim

- long epenthetic vowels as result of morphological lengthening: an opacity problem (in OT)
- an argument for **morph-contiguous prosodic licensing**
- the morph-contiguous μ -licensing constraint correctly predicts a two-fold typology of languages (morph-contiguous μ -licensing vs. alternating μ -licensing)
- alternative OT-accounts fail to predict long epenthesis

1. A case study: Southern Sierra Miwok

1.1 SSM data and opacity problem I

1.2 SSM data and opacity problem II

1.3 My analysis for long epenthesis

1.4 Further predictions

2. Alternative accounts

2.1 An alternative μ -affixation analysis

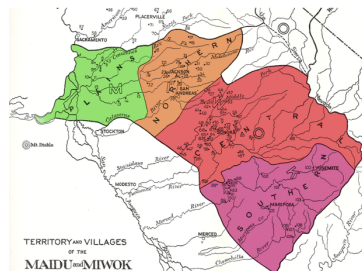
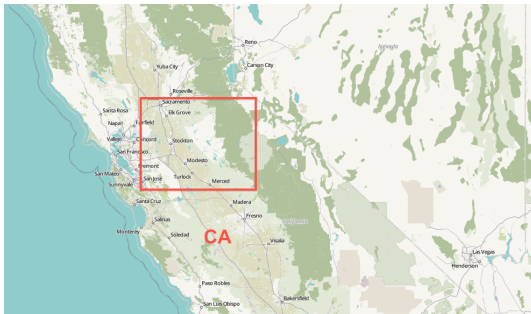
2.2 Alternatives: opacity solutions

3. Summary

A case study: Southern Sierra Miwok

Southern Sierra Miwok (=SSM)

- a few semispeakers or passive speakers today (Hinton 1994, Golla 2011)
- one of five moderately diverse Miwok languages (Yokuts-Utian)



Phonological Background

(Freeland 1951, Broadbent 1964, Callaghan 1987, Sloan 1991)

☛ syllables:

light: CV, CVC#

heavy: CVC, CV:, CV:C#, CVCC#

☛ iambic lengthening: vowel lengthening of the second V if neither the first nor second syllable is heavy (Hayes 1995, Buckley 1998)

☛ epenthesis of /ɨ/ or /i/

(1) *Phonological vowel epenthesis in SSM*

(Broadbent 1964:20)

he:l-ma: he:l*i*ma: 'I am fighting'

SSM Additive morphological length manipulation I

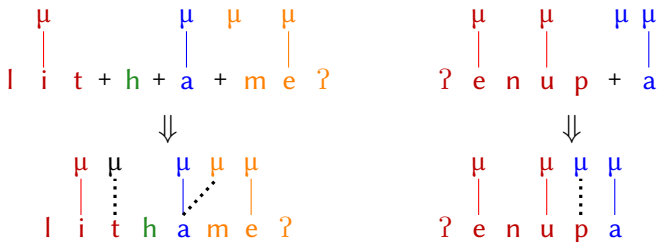
- (2) *Affixes trigger vowel lengthening* (Broadbent 1964)
- | | | | |
|---------------|-------------|--------------------|----|
| lit-h-a-:meʔ | litha:meʔ | ‘it’s risen on us’ | 63 |
| kel:a-na-:meʔ | kel:ana:meʔ | ‘It snowed on us’ | 63 |
| wile:p-a-:meʔ | wile:pa:meʔ | ‘it flashed no us’ | 63 |
- (3) *Affixes trigger gemination* (Broadbent 1964)
- | | | | |
|------------------|---------------|--------------------|-----|
| ʔenup-:e-ni:te-ʔ | ʔenup:eni:teʔ | ‘I chased you’ | 48 |
| halik- :e-te-ʔ | halik:eteʔ | ‘I hunted’ | 106 |
| jo:h-:a-ci-ʔ-hY: | jo:h:aciʔhY: | ‘it was killed’ | 119 |
| jo:h-k-:a-ko: | jo:huk:ako: | ‘they were killed’ | 82 |
- (4) *Non-concatenative morphology: vowel lengthening* (Broadbent 1964)
- | | | | |
|-------------|----------|------------------------|----|
| win-si-na-: | winsina: | ‘he just now came’ | 84 |
| ʔam:u-k-a-: | ʔam:uka: | ‘he got hurt just now’ | 82 |
| te:p-a-: | te:pa: | ‘he cut it’ | 48 |
| jo:h-k-a-: | jo:huka: | ‘he got killed’ | 82 |

A μ -affixation analysis for SSM I

→ lengthening morphology = μ -affixation

(Samek-Lodovici 1992, Davis&Ueda 2002+2006, Bye&Svenonius 2012, Grimes 2002, Wolf 2007, Topintzi 2008, Flack 2007, Yoon 2008, Kirchner 2007+2012, among others)

(5)



A μ -affixation analysis in OT(6) *Vowel lengthening*

		*FLOAT	* $\sigma_{\mu\mu}$	*V:	*C $_{\mu}$
a.		*!			
b.				*	

(In all tableaux/depictions, WBP μ -assignment to coda consonants is silently assumed)

A rule-based account

(8) i. Underlying:

l i t + h + a + m e ?

ii. Link μ -less Vs to epenthetic μ 's:

l i t h a m e ?

iii. Associate unassociated μ 's:

l i t h a m e ?

- lengthening arises since rule ii. is ordered before rule iii.: an instance of **counterbleeding** (Kiparsky 1973, McCarthy 2007, Bakovic 2011)

SSM Additive morphological length manipulation II

- if phonologically motivated epenthesis applies before an affix triggering lengthening, a **long epenthetic segments surface**

(9) *Long epenthesis I*

(Broadbent 1964, Sloan 1991)

a.	ʔumu:c-:meʔ	ʔumu:c <i>i</i> :meʔ	‘it’s raining on us’	B63
	ʔopa:-t-:meʔ	ʔopa:t <i>i</i> :meʔ	‘it’s clouding up on us’	B63
b.	le:le:-ni-:a	le:le:niʔ:a	‘school’	S29
	ʔese:l-ŋHe-:a-ci-ʔ-hi:	ʔese:lŋeʔ:aciʔhi:	‘his birth’	B119

Yet another opacity problem for a μ -affixation analysis

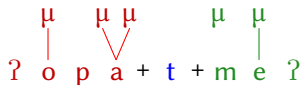
- a second μ dominating the epenthetic vowel?

(10)

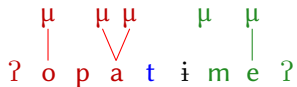
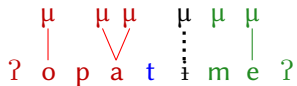
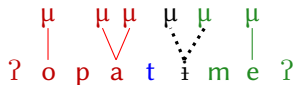
	μ μ μ μ μ \uparrow \vee \vee \uparrow \uparrow ? o p a + t + m e ?	*FLOAT	* $\sigma_{\mu\mu}$	DEP μ	*V:
a.	μ μ μ μ μ μ \uparrow \vee \vdots \uparrow \uparrow ? o p a t m e ?	*!	*		
b.	μ μ μ μ μ \uparrow \vee \vdots \uparrow \uparrow ? o p a t i m e ?				
c.	μ μ μ μ μ μ \uparrow \vee \vee \vee \uparrow ? o p a t i m e ?			*!	*

A rule-based analysis

(11) i. Underlying:



ii. Insert V to avoid illicit CVVC:

iii. Link μ -less Vs to epenthetic μ 's:vi. Associate unassociated μ 's:

SSM Additive morphological length manipulation III

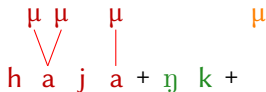
- if lengthening is expected for a base that ends in a consonant cluster, a final **long epenthetic vowel** is realized

(12) *Long epenthesis II* (Broadbent 1964:82)
 ha:ja-ŋk-: ha:jaŋki:
 daylight-VB-3.SG ‘it is daylight’

- vs. the contexts in (9): this epenthetic vowel has no independent (phonological) motivation!

A rule-based analysis

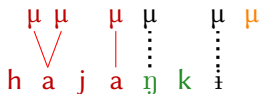
(13) i. Underlying:



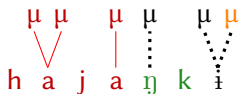
ii. Insert a V for every unassociated μ:



iii. Link μ-less Vs to epenthetic μ's:



vi. Associate unassociated μ's:



Interim summary

So far:

- morphological lengthening in SSM that can be analysed as μ affixation
- a **general opacity** problem: opaque μ projection on short vowels
- long epenthetic vowels in SSM add a **specific opacity problem**: vowels that are underlyingly absent project 'their own' μ

Morph-contiguous prosodic licensing

- The unmarked situation: Every phonological element is only dominated by prosodic nodes that are not affiliated with another morpheme.
 ~ MORPHEMECONTIGUITY across prosodic tiers

(14)



Assign a violation mark for every V_j that is only dominated by μ 's affiliated with another morpheme k

- = every V must be dominated by at least one μ that has the same morphological affiliation or no morphological affiliation

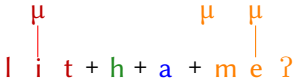


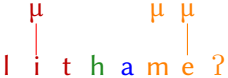
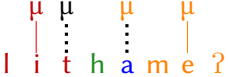


The constraint refers to...

- morphological ‘colours’; the assumption that all elements belonging to one morpheme can be identified by a colour (\sim index); epenthetic elements lack a colour (Oostendorp 2006)
- bidirectional parsing constraints for strict/weak prosodic layering

cf. LICENSE-X (Kiparsky 2003), HEADEDNESS (Selkirk 1995), or PARSE-INTO-X (Spaelti 1994, Ito&Mester 2009)

V → μ and the general opacity problem

(15)

	*FLOAT			DEP μ
a. 	*!			
b. 		*!		
 c. 				*

V → μ and the specific opacity problem I

(16)

		*FLOAT			DEP S	DEP μ
a.		*!		*		*
b.			*!		*	
☞ c.					*	*

V → μ and the specific opacity problem II

(17)

		*FLOAT	μ \uparrow V	* σ $\mu\mu\mu$	DEP S	DEP μ
	$\mu\ \mu$ μ μ h a j a + η k +					
a.	$\mu\ \mu$ $\mu\ \mu\ \mu$ h a j a η k			*!		*
b.	$\mu\ \mu$ μ μ h a j a η k i		*!		*	*
c.	$\mu\ \mu$ μ μ h a j a η k i				*	**

Further predictions

- a low-ranked $V \rightarrow \mu$ predicts that some vowels are exempt from morphological lengthening:
 - epenthetic vowels
 - vowels without an underlying μ
- **this prediction is borne out**

Arbizu Basque

(Hualde 1990, Weijer 1992, Artiagoitia 1993, Hualde&Urbina 2003, Hualde 2012)

- the genitive indefinite (&superlative) suffix /-n/ triggers V-lengthening (18-a) or insertion of unmarked /e/ (18-b)
- ➔ this V-epenthesis is independently motivated since a nasal can never be the second part of a coda cluster

(18) *Suffixes trigger lengthening in Arbizu Basque* (Hualde 1990:283)

	BASE	GEN.INDEF	
a.	alaba	alab a :n	‘daughter’
	pate	pate e :n	‘wall’
	asto	asto o :n	‘donkey’
	mendi	mendi i :n	‘mountain’
b.	txakur:	txakur e n	‘dog’
	gizon	gizon e n	‘man’

V-final

C-final

The predictions of $\vee \rightarrow \mu$: Alternating lengthening(19) *Epenthesis in Arbizu Basque*

	μ μ μ g i z o n + n	*CN.	*FLOAT	DEP S	*V: ↑ V
a.	μ μ μ g i z o n n	*!			*
b.	μ μ μ g i z o n e n			*	*
c.	μ μ μ μ g i z o n e n			*	*!

Diegueno




(Walker 1970, Langdon 1970, Miller 1999, Wolf 2007, Lacy 2012)

- there are 9 strategies to form plural of N/V in various combinations
- the most frequent one is vowel lengthening (20-a), sometimes cooccurring with other strategies as well (20-b)
- for some lexically marked stems, lengthening is absent (20-c)

(20) *Vowel lengthening in Diegueno* (Walker 1970, Wolf 2007)

	Base	PLURAL		
a.	tʃu:puɫ	tʃu:pu:ɫ	‘to boil’	Wa7
	ʃu:piɫ	ʃu:pi:ɫ	‘to close’	Wa7
	ɬap	ɬa:p	‘to burn’	Wa7
b.	ka:kap	neka:ka:p	‘to go around’	M105
	xtup	xu:tu:p	‘to jump’	M105
c.	jil	aɬʃu:jil	‘to carry (load) on back’	M105
	uʔux	tʃuʔux	‘to cough’	M103

The predictions of $\vee \rightarrow \mu$: Alternating lengthening(21) *Lexical exceptions in Diegueno*

	μ	*FLOAT	*V:	μ ↑ \vee
j i l +				
a.			*!	
 b.				*

A typology of morphological vowel epenthesis

(22)

Context I	Context II	Example	
Long underlying V	Short epenthetic V	Arbizu Basque	alternating
Long underlying V	Short underlying V	Diegueno	μ -licensing
Long underlying V	Long epenthetic V	SSM	morph-contiguous
Long underlying V	Long underlying V	Gidabal	μ -licensing

Interim summary

My analysis

- morphological lengthening in SSM follows from standard μ -affixation
- the constraint $\vee \longrightarrow \mu$ demanding morph-contiguous μ -projection predicts long epenthetic vowels
- it predicts a correct typology of languages with morph-contiguous and those with alternating μ -licensing

Alternative accounts

Two floating μ 's instead of one

(23)

μ μ μ μ μ
 | | | |
 l i t + h + a + m e ?

⇓

μ μ μ μ μ μ
 | | | | |
 l i t h a m e ?

μ μ μ μ μ μ
 | | | | | |
 ? o p a + t + m e ?

⇓

μ μ μ μ μ μ
 | | | | | |
 ? o p a t i m e ?

But...

- ...we know that epenthesis is allowed to ensure that the μ ('s) is (are) realized: *FLOAT \gg DEP-S

(24) *Long epenthesis, cf. (24)* (Broadbent 1964:82)

ha:ja-ŋk-: ha:jaŋki: 'it is daylight'

(25) *A misprediction: overapplication of epenthesis*

		* $\begin{matrix} \sigma \\ \mu\mu\mu \end{matrix}$	*FLOAT	DEP S	*V:
c.			*!		*
d.				**	*

Stratal OT

(e.g. Kiparsky 2000, Bermúdez-Otero to appear)

- 🦋 ‘Egalitarian Stratal OT’: At every stratum, all independent morphological objects undergo phonological evaluation (i.e. all morphological objects which are not part of other morphological objects) (Trommer 2011:72)
- ➔ morphemes are evaluated prior to concatenation and hence enter the derivation (fully) prosodified

Stratal OT and the general opacity problem: 😊

(26) *Stratum 1: Lexical Array*

	μ l i t	μ ↑ V	WbP	DEP μ		μ ↑ V	WbP	DEP μ	
a.	μ l i t		*!			μ ↑ V		*!	
☞ b.	μ μ l i t			*		μ a			*

→ no μ -less vowel enters the derivation of morphologically complex forms

Stratal OT and the specific opacity problem: ☹️

- The epenthetic vowel is not motivated/inserted before the lengthening context is present

→ **Epenthesis applies ‘too late’: a look-ahead problem**

(27)

μ μ μ μ μ
 | / \ | |
 ? o p a + t + m e ?

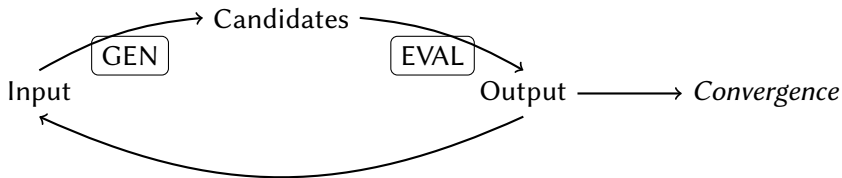
⇓

μ μ μ μ μ μ
 | / \ | | / \ |
 ? o p a t i m e ?

Harmonic Serialism

(Prince&Smolensky 1993, McCarthy 2008 et seq.)

- GEN is restricted: only a single step/operation applies to form candidates
- serial optimization: each step in a HS derivation is more harmonic than the step preceding it



Optimal Interleaving

(Wolf 2008)

- insertion of a morpheme is one step

(28)

MAX
F

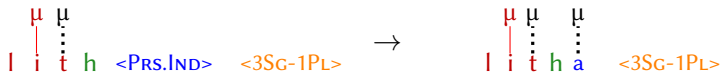
For every instance φ of the feature F at the morpheme level, assign a violation-mark if there is not an instance φ' of F at the morph level, such that $\varphi \preceq \varphi'$. (Wolf 2008:26)

Two versions of HS: Gradualness

- (29) *Faithfulness-based: HS¹* (McCarthy 2008+2010, Elfner 2013)
 Candidates differ from their input only by a single violation of a basic faithfulness constraint.
 → Syllabification (=μ-insertion) is never contrastive, comes for free
- (30) *Operation-based: HS²* (Elfner 2009, Pater 2012, Pruitt 2012, Torres-Tamarit 2012)
 Candidates differ from their input only by the application of one phonological operation.
 → Syllabification (=μ-insertion) is a phonological operation

HS and the general opacity problem: 😊

HS¹: morpheme realization and parsing into prosodic structure is one step:



HS²: morpheme insertion more important or providing μ -less V's with μ 's?

MAX-F \gg PARSE-S

= all morphemes are inserted
before μ -less vowels are
supplied with μ 's

→ **the same opacity
problem as in parallel OT**

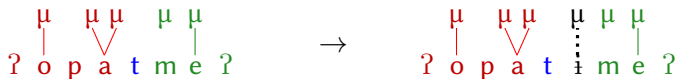
PARSE-S \gg MAX-F

= μ -less vowels are never
inserted

→ **no opacity problem**

HS and the specific opacity problem: ☹️

- no opacity problem if epenthesis and parsing into prosodic structure is one step:



But

there are concrete arguments against the assumption that epenthetic vowels are inherently dominated by a μ

The typology of epenthetic vowel and the insights that **some epenthetic vowels are best analysed as μ -less** (e.g. Piggott 1995)

📌 Summary

- 📌 morph-contiguous prosodic licensing solves the opacity problem of long epenthetic vowels in morphological lengthening contexts
- 📌 alternative accounts that can solve the general opacity problem of μ -affixation fail to predict long epenthesis
- 📌 re-ranking of $\vee \rightarrow \mu$ correctly predicts alternating lengthening languages