

The Mixtec couplet is morphologically and prosodically defined

Ben Eischens (UCLA)

Ryan Bennett (UCSC)

Acknowledgements

This is joint work with Ryan Bennett at UCSC

We are extremely grateful to members of the community of San Martín Peras, both in Oaxaca and in California, for generously sharing their language with us.

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Introduction

Researchers often give shorthand names to highly-specific, complex phenomena

- Pitch accent (Japanese, Swedish)
- Word tone vs syllable tone (Mende, Poko)
- Set A vs Set B (Mayan)
- Tone groups (Chinese)

Introduction

There is often debate of whether these shorthands are grammatical categories in and of themselves, or results of interactions of independently-necessary components of grammar

- Pitch accent has been argued to be an interaction of phonological tones and obligatoriness/culminativity (Hyman, 2011)
- Word tone has been argued to arise from markedness constraints on tonal melodies (McPherson, 2022)

Introduction

A term repeatedly used in the study of Mixtec (Otomanguean) languages is the **couplet**.

- Pike (1948), Mak (1953), Longacre (1955), Pike and Cowan (1967), Pike and Small (1974), Pike and Oram (1976), North and Shields (1977), Josserand (1983), Marlett (1992), Gerfen (1996), Macaulay and Salmons (1995), Macken and Salmons (1997), Daly and Hyman (2007), McKendry (2013), DiCanio et al. (2014), Herrera Zendejas (2014), Carroll (2015), Mendoza (2016), León Vázquez (2017), DiCanio et al (2018), Peters (2018), Becerra-Roldán (2019), Peters and Mendoza (2020), Uchihara and Mendoza (2022), among many others.

Nature of the couplet is treated at length in Penner (2019).

Introduction

Basic meanings of couplet:

- Prototypical root shape in Mixtec
- Bimoraic minimal word: Two short vowels, or one long vowel


Canonical roots are no larger and no smaller


Introduction


Basic meanings of couplet:


- Prototypical root shape in Mixtec
- Bimoraic minimal word: Two short vowels, or one long vowel

Canonical roots are no larger and no smaller

1. saà 
[saà]
'bird'
'pájaro'

2. sánà 
[sânǎ]
'crazy'
'loco'

3. ìvì 
[ìβì]
'two'
'dos'

4. iin 
[iĩ]
'one'
'uno'

Introduction

It is not obvious whether the Mixtec ‘couplet’ is a grammatical category of its own, or an instantiation of independently-needed grammatical mechanisms

Morphological:

Couplet = morphological root

(Pike and Cowan, 1967; Pike and Oram, 1976; Marlett, 1992; Macaulay and Salmons, 1995; a.o.)

Prosodic:

Couplet = prosodic foot

(Gerfen, 1996; Macken and Salmons, 1997; Carroll, 2015; Penner, 2019; a.o.)

Introduction

Guiding question:

Is the couplet a grammatical primitive, or shorthand for something else?

Introduction

This presentation: In SMP Mixtec, some properties of the couplet make reference to a bimoraic foot, and others to the a morphological root.

- **Both** components are necessary to account for phonological patterns in the language.
- But they are not always isomorphic

The term couplet is a shorthand for a complex interplay of grammatical structures

Introduction

Roadmap:

- Background on SMP Mixtec
- The foot as a unit in SMP Mixtec
- The root as a unit in SMP Mixtec
- Conclusion

Background: SMP Mixtec

SMP Mixtec is an Otomanguean language of Western Oaxaca, Mexico.

Spoken by ~10,000 in Oaxaca
(INEG 2010)

Many speakers of Peras Mixtec
live in Oxnard, Santa María,
Salinas, and Watsonville, CA
(Mendoza 2020)





Ahuejutla, Oaxaca.

Background

Default VSO word order (Ostrove 2018, Mendoza 2020), mostly isolating and tonal morphology.






At least five lexical tones (Peters 2018):

- High (´)
- Mid (v)
- Low (̀)
- Low-high rise (ˇ)
- Falling tone(s) (ˆ)

Background

Mora = TBU

- Tri-tonal contours only on long vowels

	H-L 	M-L 	L-L 	LH-L 	HL-L 
CVCV	nánà [nánǎ̃] mother 'mother' 'madre'	konì [konǐ̃] POT.see 'will see' 'verá'	ìvì [ìβì̃] two 'two' 'dos'	xǐyò [ʃijò̃] dress 'dress' 'vestido'	xánù [ʃânù̃] cigarette 'cigarette' 'cigarillo'

Background

Mora = TBU

- Tri-tonal contours only on long vowels

	H-L 	M-L 	L-L 	LH-L 	HL-LH 
CVV	kuáàn [k ^w áà]̃ yellow 'yellow' 'amarillo'	saà [saà] bird 'bird' 'pájaro'	xàà [jàà] chin 'chin' 'barbilla'	ñǔù [ɲǔù] night 'night' 'noche'	tióǒ [tʰiǒǒ] mallow 'mallow' 'alache'

Background

Another important characteristic: Oral and nasal vowels contrast

1. kuáàn



[k^wáǎ̃]

yellow

‘yellow’

‘amarillo’

2. kuáà



[k^wáà]

blind

‘blind’

‘ciego’

The couplet as a prosodic foot

The prosodic foot

Across Mixtec languages, [ʔ] has a restricted distribution.

This distribution is described in terms of the **couplet** in many studies

- Josserand (1983:228): “[ʔ] occurs in couplet-medial position”
- Macaulay & Salmons (2005): “Glottalization is ... a feature of the couplet”

The prosodic foot

Several scholars (Penner, 2019 and references therein) have used this distribution to convincingly argue that the distribution of [ʔ] is best defined in terms of the **bimoraic foot**.

Similar evidence can be found in the distribution of contrastive [ʔ] and [h], as well as non-contrastive [h] in SMP Mixtec

The prosodic foot

Restriction 1:

Contrastive [ʔ] and
[h] may only occur in
the middle of a word

1. síví
[síβí]
CONF
'It *is*'
'sí *es*'




The prosodic foot

Restriction 1:

Contrastive [ʔ] and [h] may only occur in the middle of a word

1. síví 
[síβí]
CONF
'It is'
'sí es'

2. ntsí'i 
[ntsíʔi]
blue
'blue'
'azul'

3. sì'và 
[sìʔβà]
seed
'seed'
'semilla'


The prosodic foot


Restriction 1:

Contrastive [ʔ] and [h] may only occur in the middle of a word

1. síví 
[síβí]
CONF
'It is'
'sí es'

2. ntsí'i 
[ntsíʔi]
blue
'blue'
'azul'

3. sǐ'vǎ 
[sǐʔβǎ]
seed
'seed'
'semilla'

4. ntsíjǐ 
[ntsíhǐ]
sunny
'sunny'
'soleado'

5. ntsǐjvǐ 
[ntsǐhβǐ]
egg
'egg'
'huevo'

The prosodic foot

Hypothetical forms with (underlying)¹ initial or final [ʔ]/[h] are unattested

1. *kii'

*[kiiʔ]

unattested

2. *kij

*[kiih]

unattested

3. *'ii

*[ʔii]

unattested

4. *jii

*[hii]

unattested

¹ [ʔ] is often inserted to resolve vowel hiatus at morpheme boundaries, but is not underlying. The one exception to this generalization is the demonstrative [hàá], meaning 'that (proximal)'

The prosodic foot

Restriction 1

Contrastive [ʔ]/[h]
only in middle of word

The prosodic foot

Restriction 2: Non-contrastive [h] precedes word-medial voiceless consonants

1. síví



[s^híβí]

CONF

'It *is*'

'sí *es*'

The prosodic foot

Restriction 2: Non-contrastive [h] precedes word-medial voiceless consonants

1. síví

[s^íβ^í]

CONF

‘It is’

‘sí es’



2. ntsikǎ

[nʰtsi^hkǎ]

banana

‘banana’

‘plátano’



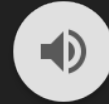
3. sàtǎ

[sà^htǎ]

back

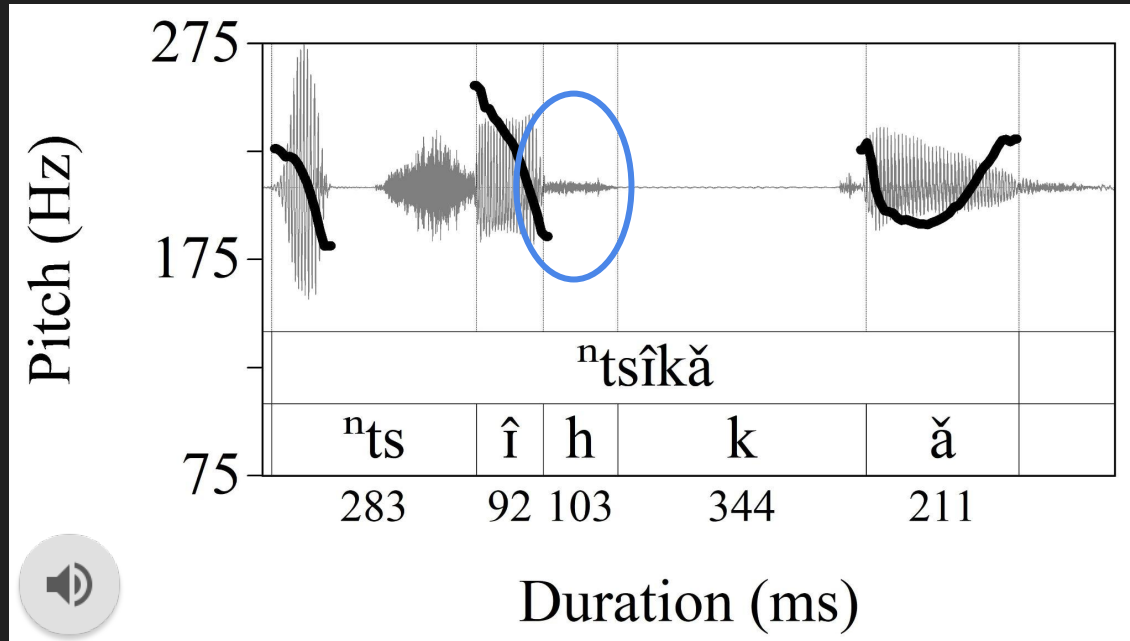
‘back’

‘espalda’



The prosodic foot

Restriction 2: Non-contrastive [h] precedes word-medial voiceless consonants



The prosodic foot

Restriction 1

Contrastive [ʔ]/[h]
only in middle of word

Restriction 2

Non-contrastive [h]
before word-medial
voiceless Cs

The prosodic foot

Two potential formulations of these generalizations:

Morphological:

[ʔ]/[h] may only occur
morpheme-medially

Prosodic:

[ʔ]/[h] may only occur
foot-medially

Disambiguating evidence comes from trimoraic roots

The prosodic foot

While most roots in SMP Mixtec are bimoraic, some are trimoraic or larger.

- These usually contain a **fossilized prefix** (Peters, 2018)
- Very unlikely to be synchronically multimorphemic

The prosodic foot

While most roots in SMP Mixtec are bimoraic, some are trimoraic or larger.

- These usually contain a **fossilized prefix** (Peters, 2018)
- Very unlikely to be synchronically multimorphemic

1. tsìkiva



[tsìkiβa]

butterfly

‘butterfly’

‘mariposa’

2. nakava



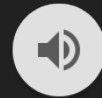
[nakaβa]

POT.fall

‘will fall’

‘se caerá’

3. kixaà



[kixaà]

POT.arrive

‘will arrive’

‘llegará’

The prosodic foot

Restriction 1: Contrastive [ʔ] and [h] may only occur in the middle of a word

The prosodic foot


Restriction 1: Contrastive [ʔ] and [h] may only occur ~~in the middle~~ of a word


The prosodic foot


Restriction 1: Contrastive [ʔ] and [h] may only occur on the penultimate mora of a word


The prosodic foot

Restriction 1: Contrastive [ʔ] and [h] may only occur on the penultimate mora of a word

1. tsìmá'à 
[tsìmáʔà]
raccoon
'raccoon'
'mapache'

2. kuyí'vi 
[kujíʔβi]
POT.fear
'will fear'
'temerá'

3. ntakòjo 
[ntakòhɔ]
POT.get.up
'will get up'
'se levantará'

4. natìjvi 
[nãtìhβi]
POT.appear
'will appear'
'aparecerá'

The prosodic foot

Hypothetical forms with [ʔ]/[h] on the antepenult are unattested

1. *tsi'maa
*[tsiʔ]mãã
unattested

2. *kujyava
*[kuhjaβa]
unattested

The prosodic foot

Restriction 2: Non-contrastive [h] precedes word-medial voiceless consonants

The prosodic foot


Restriction 2: Non-contrastive [h] precedes ~~word-medial~~ voiceless consonants


The prosodic foot

Restriction 2: Non-contrastive [h] precedes voiceless consonants
following the penultimate mora of a word

The prosodic foot

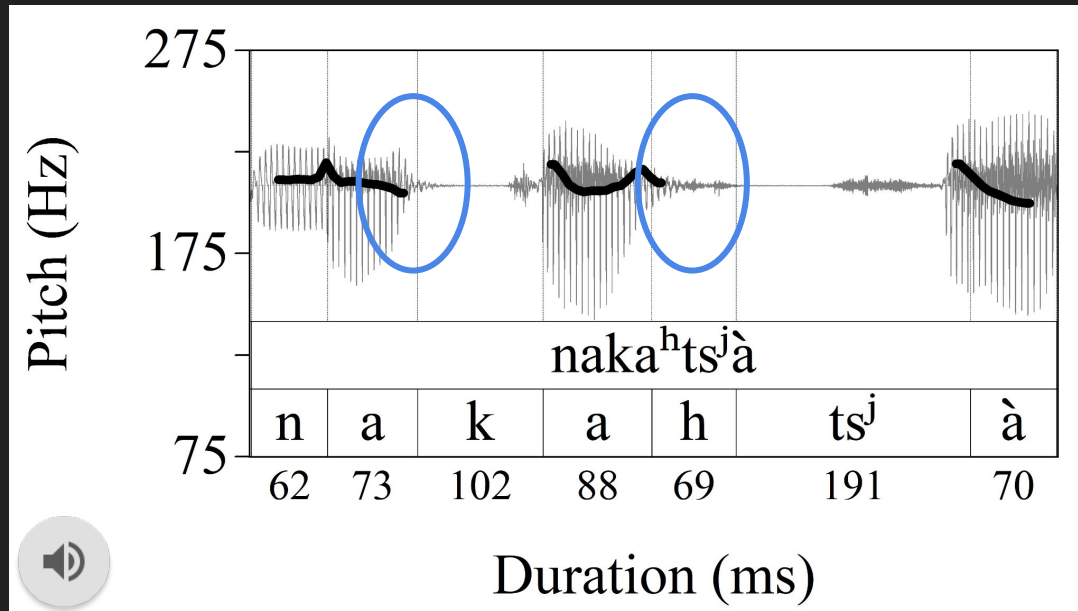
Restriction 2: Non-contrastive [h] precedes voiceless consonants
following the penultimate mora of a word

1. nakatsia 
[nãka^htsiã]
POT.wash
'Will wash'
'lavará'

2. jùtǎtá 
[jùtǎ^htá]
mirror
'mirror'
'espejo'

The prosodic foot

Restriction 2: Non-contrastive [h] precedes voiceless consonants following the penultimate mora of a word



The prosodic foot

Hypothetical forms with non-contrastive [h] after the antepenult are unattested

1. *nakatsia
*[nã^hka^htsjă]
unattested

2. *jùtătă
*[jù^htă^htă]
unattested

The prosodic foot

Potential formulations of the generalization:

Morphological:

[ʔ]/[h] may only occur
morpheme-medially

Prosodic:

[ʔ]/[h] may only occur
foot-medially

The prosodic foot

Contrastive [ʔ]/[h]
are always in the
middle of a
middle of a
right-aligned,
bimoraic (**foot**)

1. (ntsí'i)	2. (ntsíjǐ)	3. tsì(má'à)	4. nta(kòjo)
[(ⁿ tsíʔi)]	[(ⁿ tsíhǐ)]	[tsì(máʔà)]	[ⁿ ta(kòho)]
blue	sunny	raccoon	POT.get.up
'blue'	'sunny'	'raccoon'	'will get up'
'azul'	'soleado'	'mapache'	'se levantará'
5. (sì'và)	6. (ntsìjǐvǐ)	7. ku(yí'vi)	8. na(tìjvi)
[(sìʔβà)]	[(ⁿ tsìhǐβǐ)]	[ku(jíʔβi)]	[na(tìhβi)]
seed	egg	POT.fear	POT.appear
'seed'	'egg'	'will fear'	'will appear'
'semilla'	'huevo'	'temerá'	'aparecerá'

The prosodic foot

They never occur
elsewhere, even in
longer
(morphemes)

1. (ntsí'i)	2. (ntsíjĩ)	3. (tsimá'à)	4. (ntakòjo)
[(ⁿ tsí'ɨ)]	[(ⁿ tsí ^h ĩ)]	[(tsimá'ǎ'ǎ)]	[(ⁿ takò ^h o)]
blue	sunny	raccoon	POT.get.up
'blue'	'sunny'	'raccoon'	'will get up'
'azul'	'soleado'	'mapache'	'se levantará'
5. (sì'và)	6. (ntsìjvĩ)	7. (kuyí'vi)	8. (natìjvi)
[(sì'βà)]	[(ⁿ tsì ^h βĩ)]	[(kují'βi)]	[(natì ^h βi)]
seed	egg	POT.fear	POT.appear
'seed'	'egg'	'will fear'	'will appear'
'semilla'	'huevo'	'temerá'	'aparecerá'

The prosodic foot

Non-contrastive [h] is always in the middle of a right-aligned, bimoraic (**foot**)

It never occurs elsewhere, even in longer morphemes

1. (ntsikǎ)
[(^hntsikǎ)]
banana
'banana'
'plátano'

2. (sàtǎ)
[(sàhtǎ)]
back
'back'
'espalda'

3. na(katsiǎ)
[nã(ka^htsiǎ)]
POT.wash
'will wash'
'lavará'

4. yù(tǎtá)
[jù(tǎhtá)]
mirror
'mirror'
'espejo'

The prosodic foot

It never occurs
elsewhere, even in
longer (**morphemes**)

1. (ntsikǎ)

[(^{n̥}tsi_hkǎ)]

banana

‘banana’

‘plátano’

2. (sàtǎ)

[(sà_htǎ)]

back

‘back’

‘espalda’

3. (nakatsiǎ)

[(nǎka_htsiǎ)]

POT.wash

‘will wash’

‘lavará’

4. (yùtǎtá)

[(jùtǎ_htá)]

mirror

‘mirror’

‘espejo’

The prosodic foot

Potential formulations of the generalization:

~~Morphological:
[?]/[h] may only occur
morpheme-medially~~

Prosodic:
[?]/[h] may only occur
foot-medially

The prosodic foot

Conclusion:

There is phonological evidence for a **right-aligned, bimoraic foot** in SMP Mixtec

The prosodic foot

If the couplet is reducible to independent grammatical machinery...

Morphological:

~~Couplet = morphological root~~

~~(Pike and Cowan, 1967; Pike and
Oram, 1976; Marlett, 1992;
Macaulay and Salmons, 1995; a.o.)~~

Prosodic:

Couplet = prosodic foot

(Gerfen, 1996; Macken and
Salmons, 1997; Carroll, 2015;
Penner, 2019; a.o.)

The prosodic foot

But independent phonological patterns point to the **morpheme** as an important unit in SMP Mixtec phonology.

The couplet as a morphological root

The morphological root

The distribution of nasal vowels is often restricted in Mixtec languages.

These restrictions are often defined in terms of the couplet:

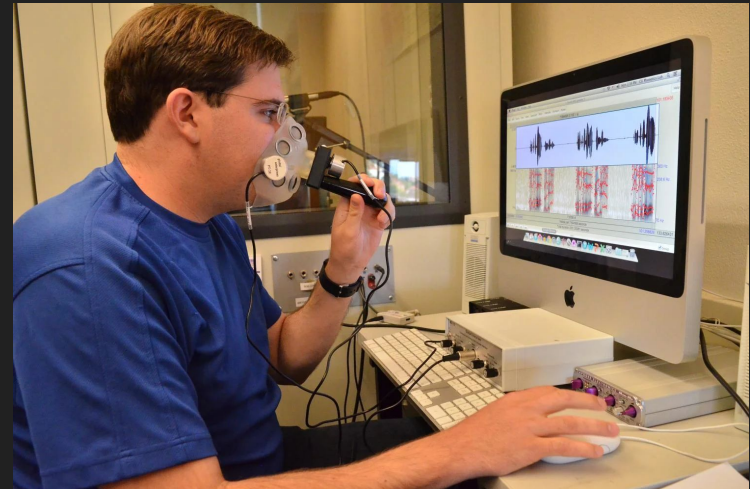
- Pike and Cowan (1967:5): “If the first of two vowels is nasal in a monomorphemic couplet, the second vowel is usually nasal”
- Zylstra (1980:21): “Nasalization of vowels extends through couplets of the form CVV and CV?V where the vowel are identical”
- Marlett (1992:425-426): “nasalization is an autosegmental feature that links to the right edge of a morpheme” – later equated to the couplet

The morphological root

As expected, many of these restrictions also hold in SMP Mixtec.

Whenever possible, I'll show phonetic evidence from **oro-nasal airflow** data

- A mask that measures airflow from oral and nasal cavities
- Gathered from one speaker, more to come



The morphological root

Restriction 1: Vowels following approximants (1-2) and prenasalized consonants (3-4) are obligatorily **oral**

The morphological root

Restriction 1: Vowels following approximants (1-2) and prenasalized consonants (3-4) are obligatorily **oral**

1. kò'và



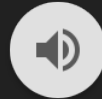
[kò'βà]

sibling

'sibling'

'hermano/a'

2. tsìntuyǔ



[tsìntùjǔ]

figleaf.flower

'figleaf flower'

'flor de chilacayote'

3. kòntò



[kò'ntò]

knee

'knee'

'rodilla'

4. ntsì



[ntsì]

dead

'dead'

'muerto'

The morphological root

Restriction 1: Vowels following prenasalized consonants and approximants are obligatorily **oral**

- Hypothetical roots that violate this restriction are unattested

1. *kò'vàn

*[kòʔβǎ]

unattested

2. *tsìntuyǎn

*[tsìntùjǎ]

unattested

The morphological root

Restriction 1

No nasal vowel after
approximants or ⁿC

The morphological root

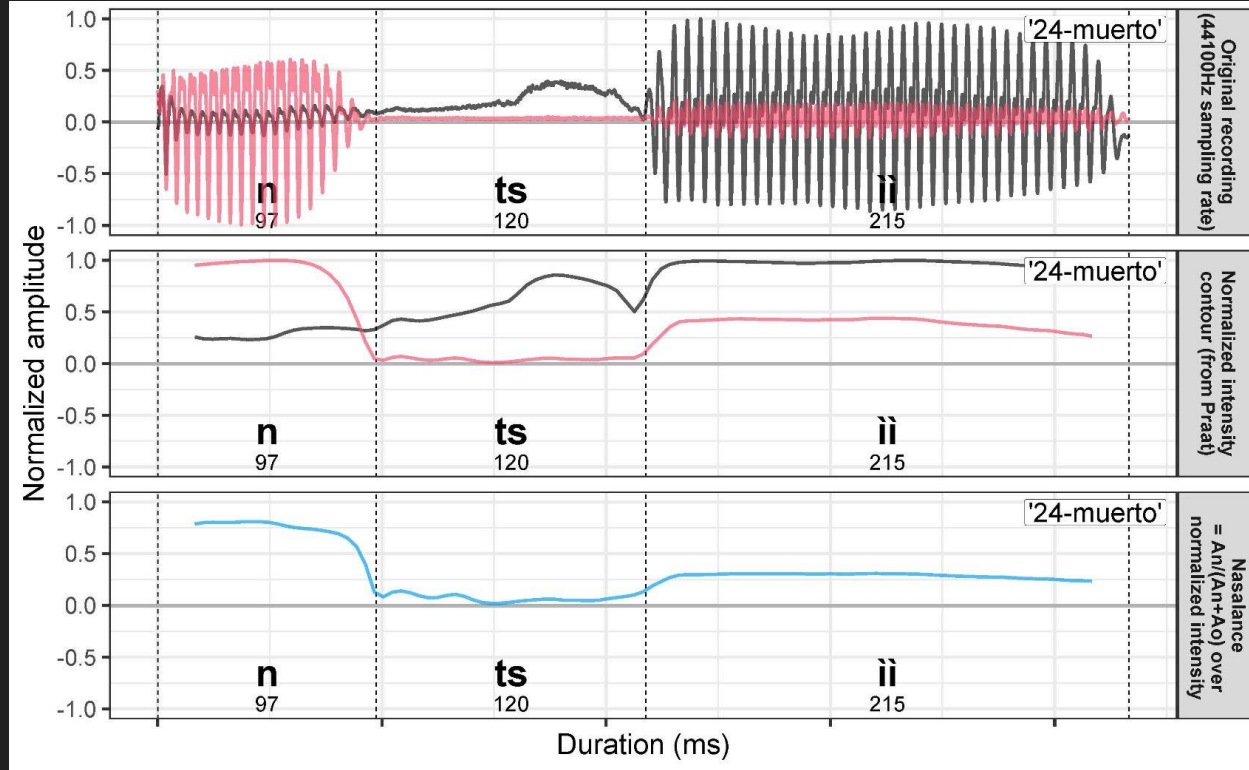
1. ntsii

[ntsii]

dead

'dead'

'muerto'



The morphological root

Restriction 2: Vowels following nasal consonants are obligatorily **nasal**

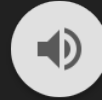
The morphological root

Restriction 2: Vowels following nasal consonants are obligatorily **nasal**

1. nánà
[nǎnǎ]
mother
'mother'
'madre'



2. ñuù
[ɲũũ]
town
'town'
'pueblo'



The morphological root

Restriction 2: Vowels following nasal consonants are obligatorily **nasal**

- Hypothetical forms that violate this generalization are unattested

1. *nánà

*[nánà]

unattested

2. *ñuù

*[ñuù]

unattested

The morphological root

Restriction 1

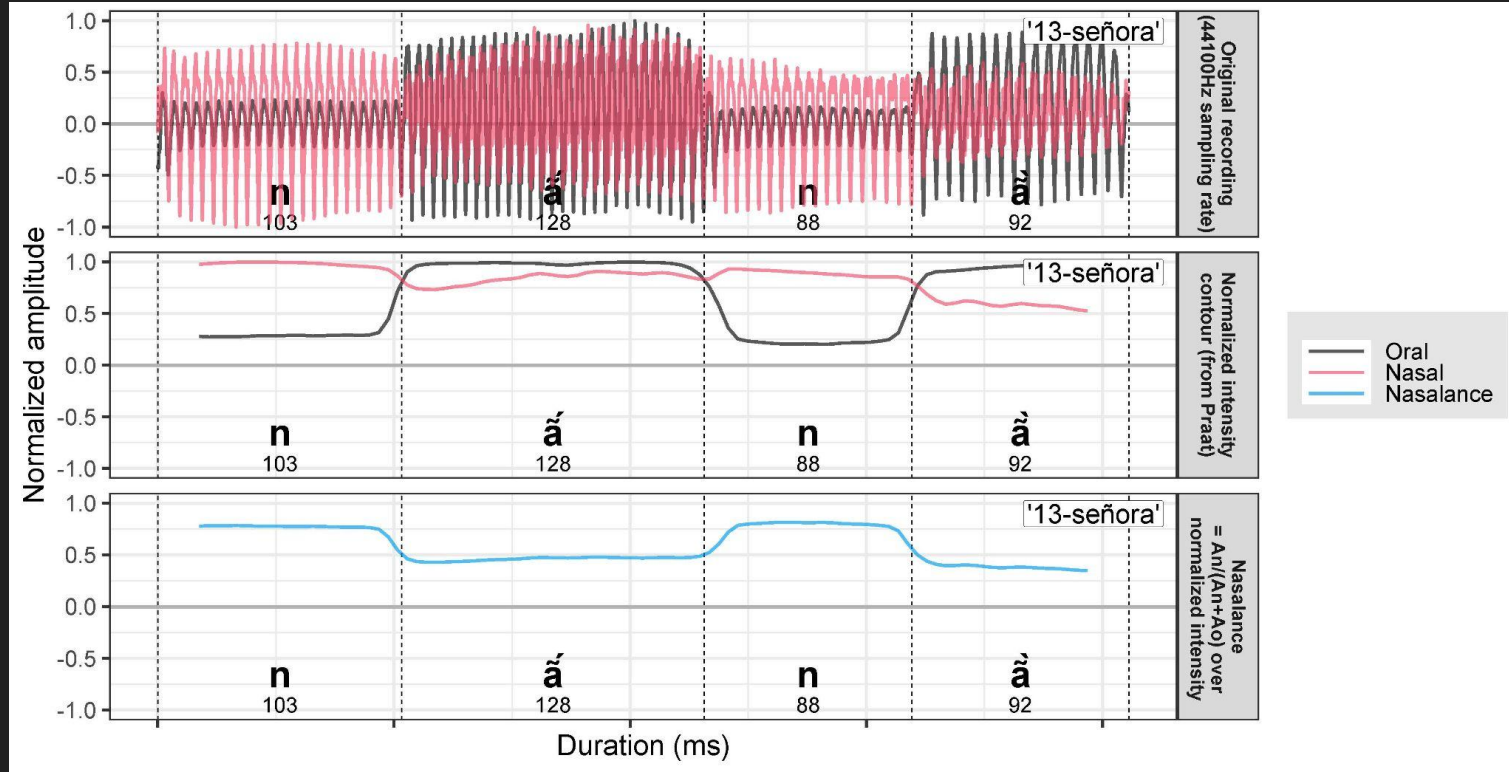
No nasal vowel after
approximants or ⁿC

Restriction 2

No oral vowel after
nasals

The morphological root

1. nánà
[nǎnǎ]
mother
'mother'
'madre'

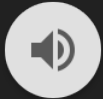


The morphological root


Restriction 3: Adjacent vowels must match in nasality


The morphological root

Restriction 3: Adjacent vowels must match in nasality

1. kuáàn 
[k^wáǎǎ]
yellow
'yellow'
'amarillo'

2. kuáà 
[k^wáà]
blind
'blind'
'ciego'

3. kuá'àn 
[k^wáʔǎ]
IMP.go
'go!'
'vete!'

4. kuá'à 
[k^wáʔà]
red
'red'
'rojo'

The morphological root

Restriction 3: Adjacent vowels must match in nasality

- Hypothetical forms that violate this generalization are unattested

1. [k^wáǎ]

unattested

2. [k^wǎà]

unattested

3. [k^wáʔǎ]

unattested

4. [k^wǎʔà]

unattested

The morphological root

Restriction 1

No nasal vowel after
approximants or ⁿC

Restriction 2

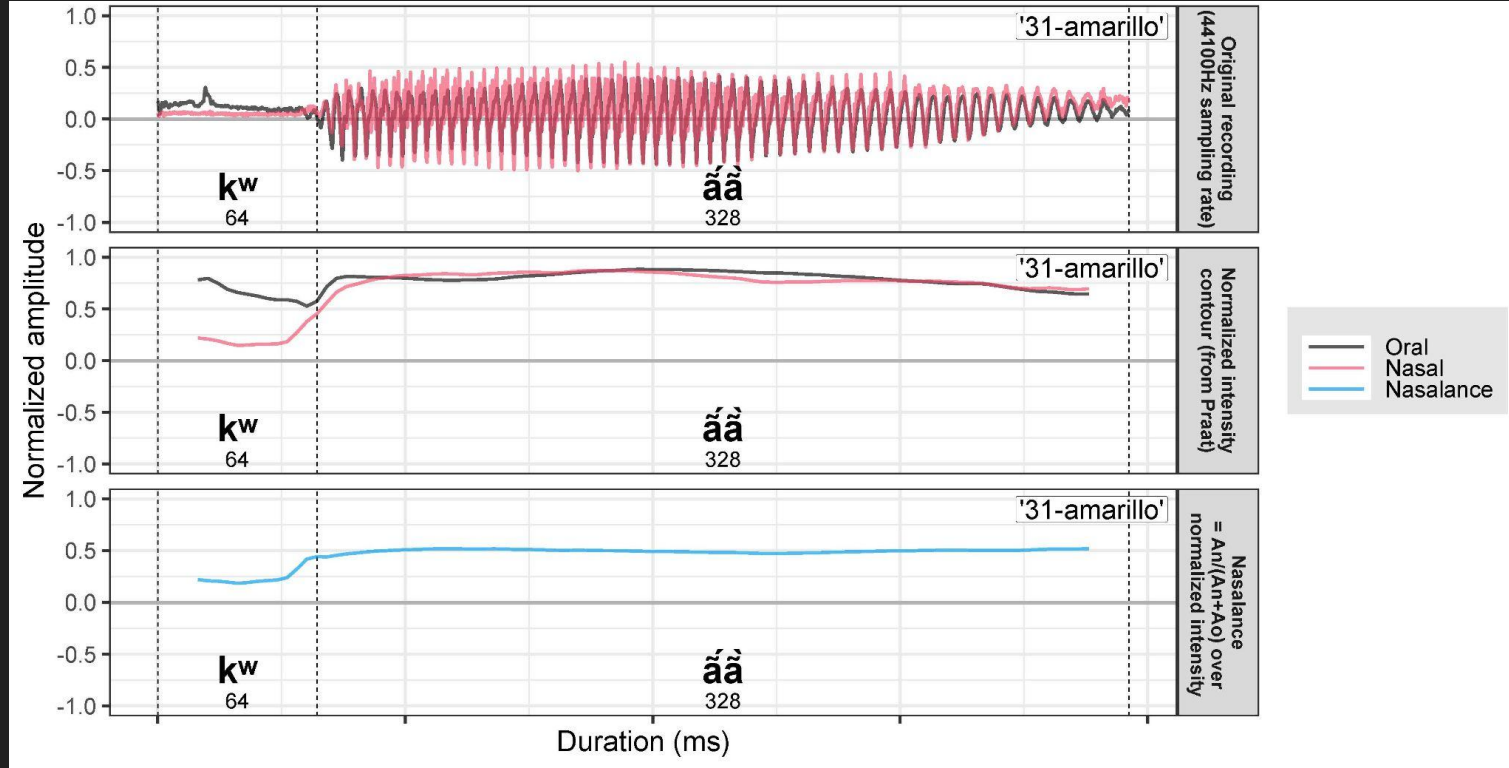
No oral vowel after
nasals

Restriction 3

Adjacent vowels
match in nasality

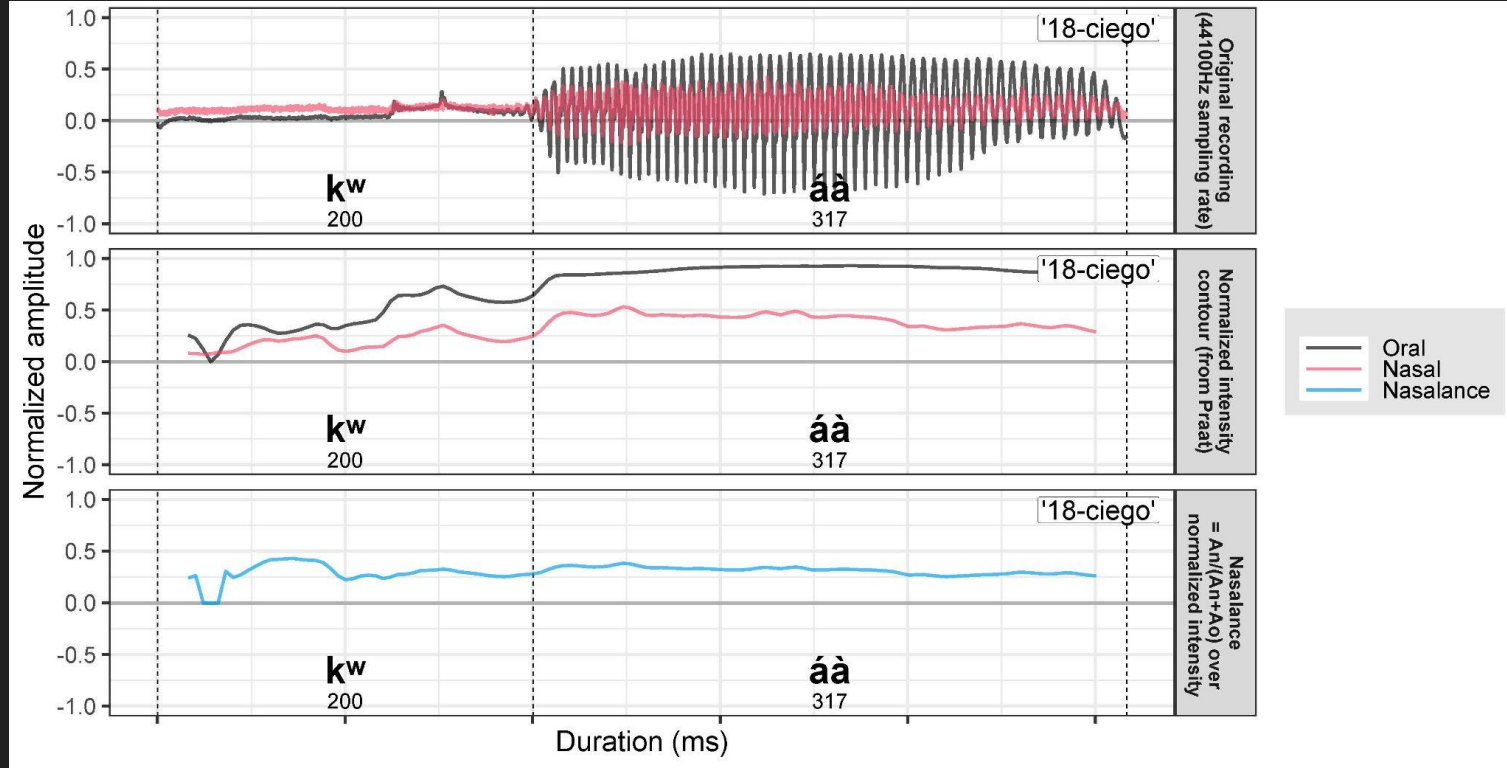
The morphological root

1. kuáàn
[kwáà̃]
yellow
'yellow'
'amarillo'



The morphological root

1. kuáà
[k^wáà]
blind
'blind'
'ciego'



The prosodic foot

Two potential formulations of this generalization:

Morphological:

These restrictions hold
morpheme-internally

Prosodic:

These restrictions hold
foot-internally

Disambiguating evidence comes from enclitic pronouns


The morphological root

In SMP Mixtec, a number of pronouns **overwrite** the final vowel of the stem they attach to


The morphological root

In SMP Mixtec, a number of pronouns **overwrite** the final vowel of the stem they attach to

2Sg =ún

1. ká'àn =ún 
[káʔǔ̃]
CONT.speak=2Sg
'You speak'
'Hablas'

1Pl.Incl =é

3. kòntò =é 
[kòntě]
knee=1Pl.Incl
'our knees'
'nuestras rodillas'

The morphological root

These enclitics can violate the generalizations established earlier

- As noted for other varieties, too (Pike and Cowan, 1967; Penner, 2019)

The morphological root

These enclitics can violate the generalizations established earlier

Restriction 1


No nasal vowel after
approximants or ⁿC

The morphological root


These enclitics can violate the generalizations established earlier

Restriction 1

No nasal vowel after
approximants or ⁿC

1. kòntò =ún 
[kòntũ]
knee=2Sg
'your knee'
'tu rodilla'

2Sg =ún

2. tsìntuyǔ =ún 
[tsìntùjũ]
figleaf.flower =2Sg
'your figleaf flower'
'tu flor de chilacayote'

The morphological root

These enclitics can violate the generalizations established earlier

Restriction 2

No oral vowels after
nasals

The morphological root

These enclitics can violate the generalizations established earlier

Restriction 2
No oral vowels after
nasals

1Pl.Incl =é

1. nánà =é

[náně]



Mother =1Pl.Incl

‘our mother’

‘nuestra madre’

The morphological root

1PI.Incl =é

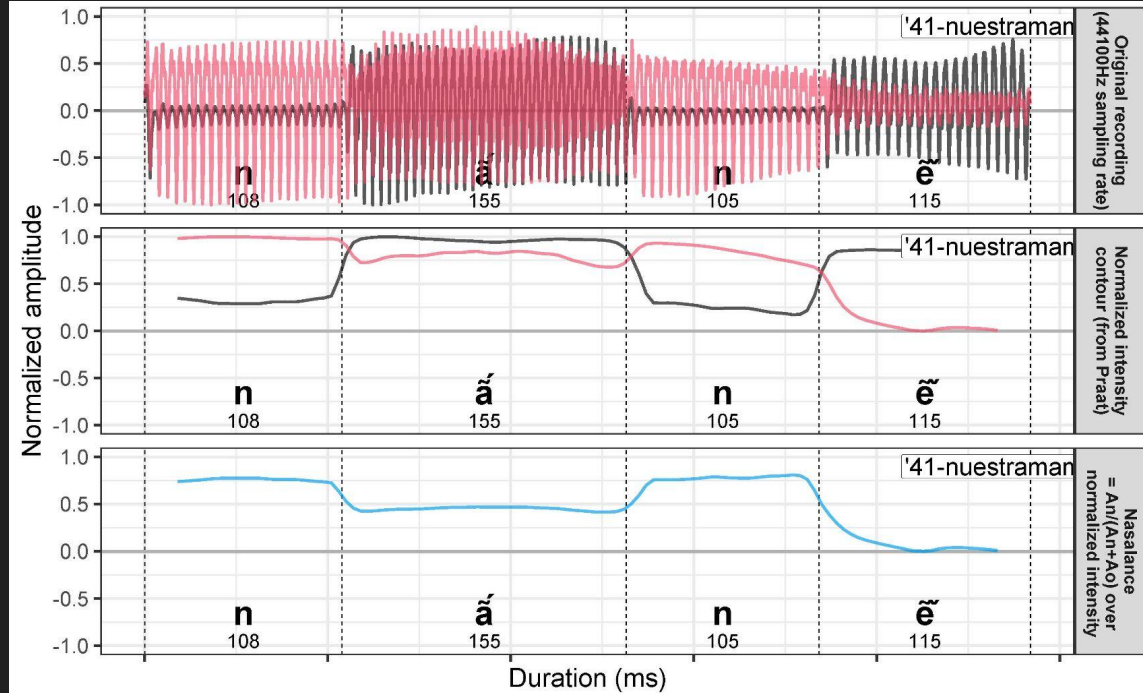
1. nánà =é

[nãñě]

Mother =1PI.Incl

‘our mother’

‘nuestra madre’



The morphological root

These enclitics can violate the generalizations established earlier

Restriction 3

Adjacent vowels
match in nasality

The morphological root

These enclitics can violate the generalizations established earlier

Restriction 3

Adjacent vowels
match in nasality

2Sg =ún

1. xàà =ún



[àǔ]

chin=2Sg

'your chin'

'tu barbilla'

The morphological root

2Sg =ún

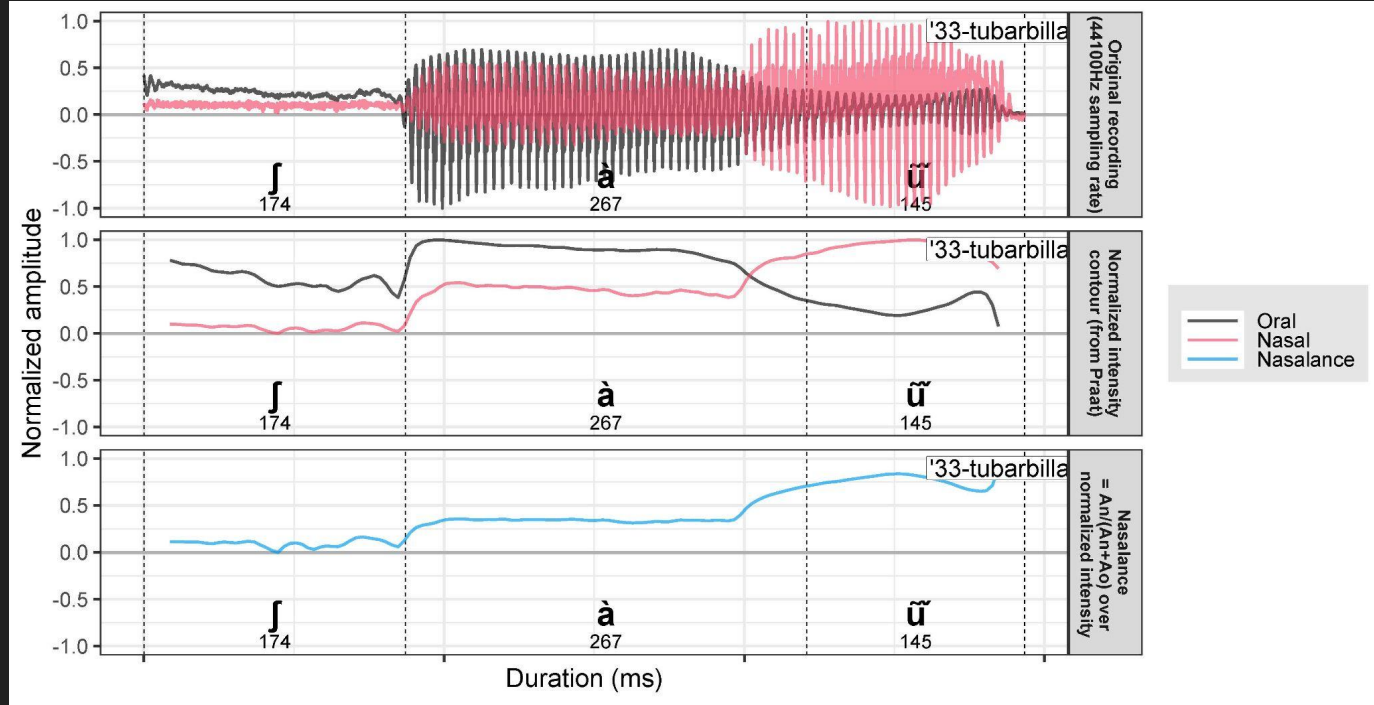
1. xàà =ún

[àũ]

chin=2Sg

'your chin'

'tu barbilla'



The morphological root

These enclitics can violate the generalizations established earlier

Restriction 3

Adjacent vowels
match in nasality

2Sg =ún

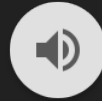
1. xàà =ún

[àũ]

chin=2Sg

'your chin'

'tu barbilla'



1Pl.Incl =é

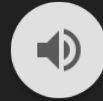
2. tsiáàn =é

[tsjáě]

forehead=1Pl.Incl

'our foreheads'

'nuestras frentes'



The prosodic foot

Two potential formulations of this generalization:

Morphological:

These restrictions hold
morpheme-internally

Prosodic:

These restrictions hold
foot-internally

The morphological root

In all these cases, the violating sequence is contained in a single **(foot)**.

The morphological root

In all these cases, the violating sequence is contained in a single (**foot**).

Restriction 1

No nasal vowel after
approximants or ⁿC

1. (kòntò =ún)
[(kòⁿtũ)]
knee =2Sg
'your knee'
'tu rodilla'

Restriction 2

No oral vowel after
nasals

2. (nánà =é)
[(nǎⁿě)]
mother =1Pl.Incl
'our mother'
'nuestra madre'

Restriction 3

Adjacent vowels
match in nasality

3. (xàà =ún)
[(jàũ)]
chin =2Sg
'your chin'
'tu barbilla'

The prosodic foot

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These restrictions hold
morpheme-internally

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The morphological root

Violating sequences are split across (**morpheme boundaries**)

The morphological root

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'your knee'
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Restriction 2

No oral vowel after
nasals

2. (nánà) (=é)
[(nǎn)(ě)]
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'our mother'
'nuestra madre'

Restriction 3

Adjacent vowels
match in nasality

3. (xàà) (=ún)
[(ʃà)(ǔ)]
chin =2Sg
'your chin'
'tu barbilla'

The prosodic foot

Two potential formulations of this generalization:

Morphological:

These restrictions hold
morpheme-internally

Prosodic:

These restrictions hold
foot-internally

The morphological root

Conclusion:

There is phonological evidence for the **root/stem** as an important piece of SMP
Mixtec phonotactics

Similar patterns found in other varieties, too (Pike and Cowan, 1967; Penner, 2019)

The prosodic foot

If the couplet is reducible to independent grammatical machinery...

Morphological:

Couplet = morphological root

(Pike and Cowan, 1967; Pike and Oram, 1976; Marlett, 1992; Macaulay and Salmons, 1995; a.o.)

Prosodic:

~~Couplet = prosodic foot~~

~~(Gerfen, 1996; Macken and Salmons, 1997; Carroll, 2015; Penner, 2019; a.o.)~~

Review and conclusion

Review and conclusion

Guiding question:

Is the couplet a grammatical primitive, or shorthand for something else?

Review and conclusion

Two potential hypotheses:

Morphological:

Couplet = morphological root

(Pike and Cowan, 1967; Pike and Oram, 1976; Marlett, 1992; Macaulay and Salmons, 1995; a.o.)

Prosodic:

Couplet = prosodic foot

(Gerfen, 1996; Macken and Salmons, 1997; Carroll, 2015; Penner, 2019; a.o.)

Review and conclusion

The distribution of [ʔ] and [h] point to a **right-aligned, bimoraic foot**

~~Morphological:~~

~~Couplet = morphological root~~

~~(Pike and Cowan, 1967; Pike and Oram, 1976; Marlett, 1992; Macaulay and Salmons, 1995; a.o.)~~

Prosodic:

Couplet = prosodic foot

(Gerfen, 1996; Macken and Salmons, 1997; Carroll, 2015; Penner, 2019; a.o.)

Review and conclusion

Nasalization patterns point to a **monomorphemic root/stem**

Morphological:

Couplet = morphological root

(Pike and Cowan, 1967; Pike and Oram, 1976; Marlett, 1992; Macaulay and Salmons, 1995; a.o.)

Prosodic:

~~Couplet = prosodic foot~~

~~(Gerfen, 1996; Macken and Salmons, 1997; Carroll, 2015; Penner, 2019; a.o.)~~

Review and conclusion

Conclusion:

The Mixtec couplet cannot be completely defined as just a bimoraic foot or just a morphological root

Review and conclusion

Two remaining possibilities:

Mixtec-specific:

The couplet is a grammatical primitive in Mixtec languages, not reducible to independently-necessary mechanisms

Cross-linguistic:

The couplet is a descriptive shorthand that refers to the interaction between prosody and morphology

Review and conclusion

Two remaining possibilities:

~~Mixtec-specific:~~

~~The couplet is a **grammatical primitive** in Mixtec languages, not reducible to independently-necessary mechanisms~~

Cross-linguistic:

The couplet is a descriptive shorthand that refers to the interaction between prosody and morphology

Review and conclusion

Ultimately, the **couplet** is a descriptive shorthand for a constellation of properties:

- Minimally and maximally bimoraic
- Monomorphemic

	Morphologically simplex		Morphologically complex	
Bimoraic foot	[?]/[h]	Nasalization	[?]/[h]	Nasalization
Not bimoraic foot	[?]/[h]	Nasalization	[?]/[h]	Nasalization

Review and conclusion

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Review and conclusion

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Review and conclusion

The phonological behavior of the Mixtec couplet is that of a monomorphemic, bimoraic foot

- It is not just one or the other, but can be derived by independently-necessary mechanisms

If a grammatical primitive of its own, its best definition might be the prototypical root.

Thank you!

Appendix

Appendix A: OT Analysis

To get right-aligned, bimoraic feet:

	/CVCVCV/	Ft-Bin	Align-R[Ft,w]	TROCHEE	Parse- μ
→	CV(CVCV)				*
	(CVCVCV)	*!			
	(CVCV)CV		*!		*
	CV(CV'CV)			*!	
	CVCVCV				***!

Appendix A: OT Analysis

To restrict [ʔ] and [h] to these positions

	/CVʔCVʔCVʔ/	Ft-Con ¹	Max-[ʔ]-Stress	*[ʔ]	Max-[ʔ]
→	CV('CVʔCV)			*	**
	('CVʔCV)CV	*!			**
	CV(CV'CVʔ)	*!			**
	CV('CVCV)		*!		***
	CVʔ('CVʔCVʔ)			***!	

¹Constraints on foot structure (binarity, right alignment, trochee)

Appendix A: OT Analysis

To get morpheme-internal spread:

	/CṼ/	MAX-[Nas]	AGREE-[Nas]	*SPREAD
→	CṼṼ			*
	CVV	*!		
	CṼ		*!	

Appendix A: OT Analysis

To block spread across morpheme boundaries

	/CVV + \tilde{V} /	COALESCE ¹	*SPREAD[+]	MAX-[Nas]	AGREE-[Nas]	*SPREAD
→	CV+ \tilde{V}				*	
	CVV+ \tilde{V}	*!				
	C \tilde{V} + \tilde{V}		*!			*
	CV+V			*!		

¹Whatever combination of constraints derives the vowel-overwriting behavior of enclitics

Appendix A: OT Analysis

To put it all together

	/CV?CV?V + \tilde{V} /	COAL	*Spread[+]	Ft-Con	Max-['?]	*[?]	MAX[?]	AGREE[Nas]	*Spread
→	CV('CV? \tilde{V})						*	*	
	CV('CV?V \tilde{V})	*!						*	
	CV('C \tilde{V} ? \tilde{V})		*!						*
	(CV?CV)+ \tilde{V}			*!				*	
	CV('CV+ \tilde{V})				*!			*	
	CV?('CV? \tilde{V})					**!		*	