Paraguayan Guarani progressive nasalization as phonologically conditioned allomorphy

handout slides

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1 Introduction

- Most Tupi-Guarani languages show extensive nasalization processes. [2]
- Some show both **regressive** and **"progressive"** nasal spread simultaneously (Lapierre & Michael 2018).
- An example from Paraguayan Guarani:

(1) a. n^{d}e-jagu**a**-ˈkuera
2SG-dog-PL
'your dogs'

b. nẽ-mĩtã-ˈŋ^{g}uera
2SG-child-PL
'your children'

- Although regressive nasalization in Guarani is exceptionless, **progressive** nasalization is morpheme-specific. [3]

(1) a. n^{d}e-jagu**a**-ˈkuera
2SG-dog-PL
'you dogs'

b. nẽ-mĩtã-ˈŋ^{g}uera
2SG-child-PL
'your children'

(2) a. o-kar**u**-ˈpeve
3-eat-until
'until he eats'

b. õ-kõsĩnã-ˈmẽvẽ
3-cook-until
'until he cooks'

(3) a. o-kaˈr**u**-ta
3-eat-FUT
'he will eat'

b. õ-kõsĩˈnã-ta
3-cook-FUT
'he will cook'

* often dismissed as **idiosyncratic** and **unproductive**
* remains **understudied** compared to regressive nasalization

2 This talk

- First formal analysis of Guarani progressive nasalization as **phonologically conditioned suppletive allomorphy** (Carstairs 1988, Paster 2006) [4]
  - morphemes have different lexical specifications (Tranel 1990, et seq.)
  - predicts differential behavior of suffixes in progressive nasalization
- Alternative analyses are possible but more complex (Russell 2021)
- Analysis can be extended to account for dialectal variation and other constructions (Appendix)

[1] A huge thank you to the native speakers of Paraguayan Guarani for sharing their language with me: Irma Ovelar, María Gómez, Laure Galeano, Elvira Martínez, Alfredo Almirón, Armando, and Analía García. Thank you to Claire Moore-Cantwell, Ben Eischens, Harold Torrence, Kie Zuraw, Sam Zukoff, Bruce Hayes, Jian-Leat Siah, Hunter Johnson, and members of the UCLA Phonology Seminar. All errors are my own.

3 Background

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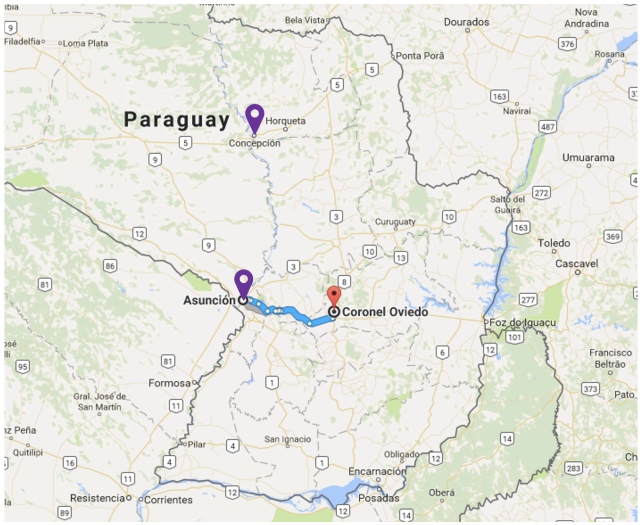
- Paraguayan Guarani (Tupi-Guarani, Tupian) is spoken by 5-6 million in Paraguayan and neighboring areas of Argentina and Brazil.
- All data collected in consultation with **8** native speakers.
  - **6**: in-situ fieldwork in Coronel Oviedo, Paraguay
  - **2**: virtual fieldwork; Asunción and Concepción



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- 12 phonemic vowels of 6 qualities (i, ɨ, u, e, o, a), all contrasting in nasality.
- No voiced stops, instead has nasal-oral stops [m^b, n^d, $ŋ^g$]. All contrast with plain voiceless stops.
- Nasal-oral stops and full nasal consonants are in complementary distribution. Similarly, *j* [ʤ] and *ñ* [ɲ].

(4) a. -m^ba TOT b. -mã CMPL

(5) a. a'ja ‘during’ b. ã'ñã ‘evil’

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- Regressive and “progressive” nasaliation are different mechanisms (Lapierre & Michael 2018, Russell 2021, Cabrera 2024).

(5)

	regressive	**progressive**
triggers	rightmost nasal vowels, nasal-oral stops	root nasal vowels
targets	voiced segments	initial voiceless stops, or full suffixes
locality	local	non-local
productivity	productive	lexically specific
prosodic struc.	sensitive	insensitive

* no **“bidirectional”** nasalization

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- Extensive and exceptionless **regressive** (leftward) nasalization.
  - triggered by phonemic nasal vowels and nasal-oral stops
  - suffixes and roots form their own prosodic domain (Cabrera 2024)

(6) a. n^da-ja-jo-hai'hu-i
NEG-1PL.IN-REC-love-NEG
‘we don’t love e.o.’

b. mã-ñã-ñõ-hẽn^du-i
NEG-1PL.IN-REC-listen-NEG
‘we don’t listen to e.o.’

(7) õ-ñẽʔẽ-se-'m^ba-ta-mã
3-talk-DES-TOT-FUT-CMPL
‘he will want to finish talking’

(8) [[[[[prefix - root] - suff] - suff] - suff] - suff]

4 Progressive nasalization: the facts

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- Only a handful of stop-initial morphemes undergo progressive harmony alternations.

(9) a. jagua-ˈkuera
dog-PL
'dogs'

b. mĩtã-ˈŋgᵍuera
child-PL
'children'

(10) a. a-jeroˈkɨ-ta
1SG-dance-FUT
'I will dance'

b. ãĩ-pɨ̃tɨ̃ˈṽõ-ta
1SG-help-FUT
'I will help'

(11) a. a-jeroˈkɨ-mã
1SG-dance-CMPL
'I finished dancing'

b. ãĩ-pɨ̃tɨ̃ˈṽõ-mã
1SG-help-CMPL
'I finished helping'

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- Suffix targets are affected differently by progressive nasalization.

(12) a. o-karu-ˈpa
3-eat-TOT
'he ate (completely)'

b. õ-ñẽʔẽ-ˈmᵇa
3-talk-TOT
'he talked (completely)'

(13) a. che-ˈsɨ-pe
1SG-mother-DOM
'my mother'

b. chẽ-mĩˈtã-mẽ
1SG-child-DOM
'my child'

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- Progressive nasalization triggered only by phonemic nasal vowels.

(14) pãnã**mᵇ**i-ˈkuera *-ˈŋgᵍuera
butterfly-PL
'butterflies'

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- Alternations may stack and occur non-locally.

(15) a. o-karu-se-pa-pota-ˈpeve
3-eat-DES-TOT-INCIP-until
'until he is about wanting to finish eating'

b. õ-ñẽʔẽ-se-mᵇa-mᵇota-ˈmẽ̃ṽẽ
3-talk-DES-TOT-INCIP-until
'until he is about wanting to finish talking'

* across intervening suffixes (-se DES)
* across oral vowels of alternating suffixes

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- Verbal and nominal roots also show lexically-specific progressive alternations, as seen in compounds.

(16) a. o-ˈkɨ
3-rain
'it rains'

(17) a. ãmã-ˈŋgᵍɨ
rain-rain
'rain'

b. hũ-ˈŋgᵍɨ
black-rain
'grey; brown'

c. h-ãsẽ-ˈŋgᵍɨ
3POSS-cry-rain
'weep'

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- List of stop-initial suffixes

(Estigarribia 2020, Russell 2021)

undergoing (T ~ N^D)			**undergoing** (full nas.)			**non-undergoing**	
ˈkuera	ˈŋ^{g}uera	PL	pe	mẽ	LOC;DOM	ta	FUT
ˈpa	ˈm^{b}a	TOT	ˈpeve	ˈmẽṽẽ	‘until’	pa	Q
poˈta	m^{b}oˈta	INCIP				ke	FORCE
ˈtɨ	ˈn^{d}ɨ	COLL				mã	CMPL
						nã	REQ
(and roots)						nẽ	DUB
						mõˈʔã	NEG.FUT
						ˈmĩ	PLEA;DIM

(T = voiceless stop; N^D = nasal-oral stop)

5 The analysis

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1. Lexical specificity

→ Morphemes differ in their lexical specification in three ways (Tranel 1990, et seq.)

(T = voiceless stop; N^D = nasal-oral stop)

(18)

undergoing	ˈkuera ~ ˈŋ^{g}uera PL	{TV, NV}	NV → **N^DV**
undergoing	pe ~ mẽ LOC; DOM	{TV, NṼ}	
non-undergoing	ta FUT	{TV}	
	mã CMPL	{NṼ}	

* **post-oralization** N → N^DV / __ V (Stanton 2017)

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2. Phonological conditioning

(19) *[αNAS]]$_{ROOT}$ … [-αNAS, -CONT] (PROGHARM)

Assign a violation to every non-local sequence of a rightmost [αNAS] segment in a root followed by a [-αNAS] stop in the output.

Root control (non-local) Symmetric (α)

(20) õ-ñẽʔẽ-se-m^{b}a-m^{b}oˈta
3-talk-DES-TOT-INCIP

(21) *jagu**a**-ˈŋ^{g}uera, *mĩtã-ˈkuera
dog-PL child-PL

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- PROGHARM selects nasal-initial allomorphs in the presence of nasal roots.

(22) mĩtã-ˈŋ^{g}uera *-ˈkuera
child-PL

(23)

/$\tilde{V}_{RT}$- { TV, NV }/	*NV	IDENT[NAS]	PROGHARM	*CONTOUR
a. Ṽ - TV			*!	
b. V - TV		*!		
c. Ṽ - NV	*!			
☞ d. Ṽ - N^DV				*

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- Similarly, oral-initial allomorphs are selected in the presence of an oral root.

(24) jagua-ˈ[k]uera *-ˈŋ^{g}uera
dog-PL

(25)

/V_{RT} - { TV, NV }/	*NV	IDENT[NAS]	PROGHARM	*CONTOUR
☞ a. V - TV				
b. V - NV	*!		*	
c. V - N^{D}V			*!	*
d. Ṽ - N^{D}V		*!		*

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- Suffixes with full nasalization have a nasal vowel in their nasal allomorph.

(26) kosiˈnã-[mẽ] *-pe
kitchen-LOC

(27)

/Ṽ$_{RT}$ - { TV, NṼ }/	*NV	IDENT[NAS]	PROGHARM	*CONTOUR
a. Ṽ - TV			*!	
☞ b. Ṽ - NṼ				
c. Ṽ - N^{D}Ṽ				*!

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- Non-alternating morphemes violate PROGHARM optimally.

→ **Nasal root, oral suffix**

(28) ãˈ-pɨ̃tɨ̃ˈṽ**õ**-[t]a *-n^{d}a
1SG-dance-FUT

(29)

/Ṽ$_{RT}$ - { TV }/	*NV	IDENT[NAS]	PROGHARM	*CONTOUR
☞ a. Ṽ - TV			*	
b. Ṽ - N^{D}V		*!		*
c. V - TV		*!		

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→ **Oral root, nasal suffix**

(30) a. o-jeroˈkɨ-m̃ã
3-dance-CMPL

(31)

/V$_{RT}$ - { NṼ }/	*NV	IDENT[NAS]	PROGHARM	*CONTOUR
☞ a. V - NṼ			*	
b. V - TṼ		*!		
c. Ṽ - NṼ		*!		*

* suffixes fail to spread nasality to preceding suffixes and roots.

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- Accumulating violations of PROGHARM predict stacking of progressive alternations.

(32) a. mĩtã-ˈŋᵍuera-mẽ
child-PL-DOM

(33)

/$\tilde{V}_{RT}$ - { TV, NV } - { TV, N$\tilde{V}$ }/	*NV	IDENT[NAS]	PROGHARM	*CONTOUR
a. V - TV - TV			**!	
b. V - TV - N$\tilde{V}$			*!	
c. V - NV - N$\tilde{V}$	*!			
☞ d. V - N^{D}V - N$\tilde{V}$				*

6 Closing

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- I argued that Paraguayan Guarani progressive nasalization is a case of **phonologically conditioned suppletive allomorphy**.
  - no literal spread of nasality feature, nor bidirectional spread (Lapierre & Michael 2018, Russell 2021, Cabrera 2024)
  - differences in lexical specification predicts differences across suffixes (Tranel 1990, et seq.)

(34)

undergoing	ˈkuera ~ ˈŋᵍuera PL	{TV, NV} NV → **N^{D}V**
undergoing	pe ~ mẽ LOC; DOM	{TV, N$\tilde{V}$}
non-undergoing	ta FUT	{TV}
	mã CMPL	{N$\tilde{V}$}

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Extensions and future work:

- Alternative analyses possible but unfavorable.
  → lexically-indexed constraints (Pater 2007, et seq.)
  → agreement by correspondence (Rose & Walker 2014)
- Extend analysis to **root** alternations?
  → compounds and exceptional causative constructions (Russell 2021, Estigarribia 2021)

(35) a. kaˈʔu
'drunk'

b. ãk**ã**-ŋᵍaˈʔu
head-drunk
'dizzy'

c. **mõ**-ŋᵍaˈʔu
CAUS-drunk
'to inebriate'

* mixed evidence for their **productivity** vs. **lexicalization**

- **Dialectal variation** might point to a more complex allomorhpy selection process.

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Appendix

Dialectal variation

- All data previously discussed is from Coronel Oviedo speakers.
- Asunción and Concepción speakers show **optional** progressive nasalization.

Coronel Oviedo speakers:

(36) a. õ̃-ñẽʔẽ̃-se-m^{b}a-m^{b}ota-ˈmẽ̃ṽẽ
3-talk-DES-TOT-INCIP-until
'until he is about wanting to finish talking'

Asunción, Concepción speakers:

(37) a. õ̃-ñẽʔẽ̃-se-pa-pota-ˈpẽve
3-eat-DES-TOT-INCIP-until
'until he is about wanting to finish eating'

- Optionality is **asymmetric**: nasal(-initial) suffix allomorphs cannot occur with oral roots.

  Asunción, Concepción speakers:

  (38) a. mĩtã-ˈkuera
  child-PL
  'children'

  b. *jagua-ˈŋᵍuera
  dog-PL
  'dogs'

  (39) a. chẽ-mĩˈtã-pe
  1SG-child-DOM
  'my child'

  b. *che-ˈsi-mẽ
  1SG-mother-DOM
  'my mother'

- **Proposal:** speakers regularize progressive nasalization, preferring oral allomorphs in general (Bonet et al. 2007).

  (40) PRIORITY
  Given an input containing allomorphs, assign a violation mark to each morpheme that does not respect the lexical priority ordering of allomorphs. (Bonet et al. 1007)

- **Dialectal variation:** relative ranking of PRIORITY and PROGHARM
  - competing pressures of lexical preference for orality and phonological optimization

** Asunción, Concepción speakers:* variable ranking of PRIORITY and PROGHARM

(41)

/$\tilde{V}_{RT}$- { TV ≫ NV }/	*NV	IDENT[NAS]	PRIORITY	PROGHARM	*CONTOUR
☞ a. $\tilde{V}$ - TV				*	
b. V - TV		*!			
c. $\tilde{V}$ - N^DV			*!		*

** Coronel Oviedo speakers:* strict ranking of PROGHARM over PRIORITY

(42)

/$\tilde{V}_{RT}$- { TV ≫ NV }/	*NV	IDENT[NAS]	PROGHARM	PRIORITY	*CONTOUR
a. $\tilde{V}$ - TV			*!		
b. V - TV		*!			
☞ c. $\tilde{V}$ - N^DV				*	*

Roots in progressive nasalization

- **Recall:** roots undergo progressive nasalization.

  (43) a. o-ˈkɨ
  3-rain
  'it rains'

  (44) a. ãmã-ˈŋᵍɨ
  rain-rain
  'rain'

  b. hũ-ˈŋᵍɨ
  black-rain
  'grey; brown'

  c. h-ãsẽ-ˈŋᵍɨ
  3POSS-cry-rain
  'weep'

- Roots also alternate in **exceptional causative constructions** (Estigarribia 2020, Russell 2021, Estigarribia 2021)

  (44) a. o-ˈpaɨ
  3-wake.up
  'he woke up'

  b. õ-**mõ**-ˈᵐbaɨ diego-pe
  3-CAUS-wake.up diego-DOM
  'he woke up Diego'

  (45) a. che-kaiˈgue
  1SG-bore
  'I'm bored'

  b. nᵈe chẽ-**mõ**-ŋᵍaiˈgue
  2SG 1SG-CAUS-bore
  'you bored me'

- **Exceptional:** otherwise follow the expected repressive nasalization pattern.

(46) a. ã̲-**m̲ᵇ**o-puˈpu ʔɨ
1SG-CAUS-hot water
'I boiled water'

b. nᵈe ã-mõ-kãnẽˈʔ**õ**
2SG 1SG-CAUS-tired
'I tired you'

- At the surface, exceptional causatives have **two possible analyses**:
  - **Analysis 1:** root is exceptionally nasal-initial

(47) õ-mõ-ˈ**mᵇ**aɨ → root not phon. conditioned
3-CAUS-wake.up

  - **Analysis 2**: causative prefix is exceptionally nasal

(48) õ-m̲õ̲ˈmᵇaɨ → root is phon. conditioned
3-CAUS-wake.up

* **Analysis 2** is in line with proposed analysis

* **mõ-** prefix is exceptionally nasal, selecting nasal-initial allomorphs

- Crucially, there's mixed evidence for **productivity vs. lexicalization** of exceptional causatives:

Productive	**Lexicalized**
· consistent allomorphy across compounds and causatives	· exceptional cntrs. have idiomatic meanings
· speakers generalize to new constructions	· exceptional causative variably used across cntrs/contexts

⋆ **Productive:** roots that show progressive nasalization in compounds also show progressive nasalization in causatives

(49) a. kaˈʔu
'drunk'

b. ãk**ã-**ŋᵍaˈʔu
head-drunk
'dizzy'

c. **mõ-**ŋᵍaˈʔu
CAUS-drunk
'to inebriate'

(50) a. tɨˈkɨ
'drop; to drip'

b. ãm**ã-**ŋᵍɨˈkɨ
rain-to.drip
'rainwater'

c. **mõ-**ŋᵍɨˈkɨ
CAUS-to.drip
'to squeeze/distill'

⋆ **Productive:** speakers generalize to new constructions and environments

(51) a. o-ˈkɨ
3-rain
'it rains'

b. h̲õ̲-ˈŋᵍɨ
black-rain
'grey; brown'

c. h̲-ãs̲ẽ̲-ˈŋᵍɨ
3POSS-cry-rain
'weep'

Context: *Imagine you don't want to go to work because you're sick. You pray to the gods that it rains so you don't have to work. It finally starts to rain - your prayers worked! How do you say "I made it rain"?*

(51) che ã-mõ-ˈŋᵍɨ, *ã-mᵇo-ˈkɨ
1SG 1SG-CAUS-rain
'I made it rain'

⋆ **Lexicalized:** exceptional causatives have idiomatic meanings, while non-exceptional causatives have compositional meanings

(52) a. õ-**mõ**-ŋ^{g}araˈi pe mĩˈtã-mẽ
3-CAUS-man DEM child-DOM
'he **baptized** the child' (Russell 2021)

b. pe i-viˈgote õ-**m^{b}o**-karaˈi pe mĩˈtã-mẽ
DEM 3-mustache 3-CAUS-man DEM child-DOM
'The mustache **makes** the child look **like a man**' (Russell 2021)

(53) a. che n-ã-**mõ**-m^{b}u-i pe bomba
1SG NEG-1SG-CAUS-sound-NEG DEM balloon
'I didn't **pop/explode** the balloon'

b. che n-ã-**m^{b}o**-ˈpu-i pe i-m^{b}araˈka
1SG NEG-1SG-CAUS-sound-NEG DEM 3-guitar
'I didn't **sound** the guitar'

⋆ **Lexicalized:** variable use of exceptional causative across construction-s/contexts

(54) a. n^{d}e chẽ-**mõ**-ŋ^{g}aiˈgue
2SG 1SG-CAUS-bored
'you bored me'

b. n^{d}e nã-chẽ-**m^{b}o**-kaigue-i
2SG NEG-1SG-CAUS-bored-NEG
'you didn't bore me'

(55) a. che ɾ̃õ-**mõ**-m^{b}iˈta
1SG 1/2-CAUS-stop
'I stopped you'

b. che nõ-ɾ̃õ-**m^{b}o**-piˈta-i
1SG NEG-1/2-CAUS-stop-NEG
'I didn't stop you'

• Crucially, should only extent proposed analysis to exceptional causatives if they show the same productivity (phonological conditioning) as suffixes.