Paraguayan Guarani progressive nasalization as phonologically conditioned allomorphy

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handout   slides

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. nᵈe-jagu**a**-ˈ⟨k⟩uera
         2SG-dog-PL
         'your dogs'

     b. n͡ẽ-mĩt**ã̃**-ˈ⟨ŋᵍ⟩uera
         2SG-child-PL
         'your children'

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

(1) a. nᵈe-jagu**a**-ˈ⟨k⟩uera
         2SG-dog-PL
         'you dogs'

     b. n͡ẽ-mĩt**ã̃**-ˈ⟨ŋᵍ⟩uera
         2SG-child-PL
         'your children'

(2) a. o-kar**u**-ˈ⟨peve⟩
         3-eat-until
         'until he eats'

     b. õ̃-kõsĩn**ã̃**-ˈ⟨m̃ẽṽẽ⟩
         3-cook-until
         'until he cooks'

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

     b. õ̃-kõsĩˈn**ã̃**-⟨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)

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3 Background

- Paraguayan Guarani (Tupi-Guarani, Tupian) is spoken by 5-6 million [5] 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
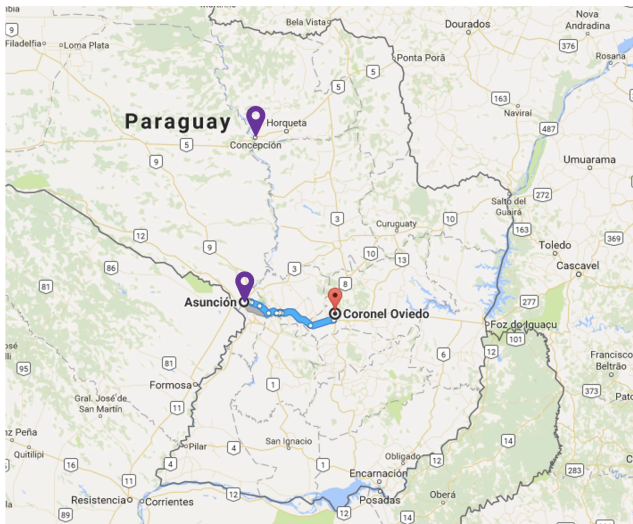
- 12 phonemic vowels of 6 qualities (i, ɨ, u, e, o, a), all contrasting in nasality.

- 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^{b}a   b. -m̄ã   (5) a. aˈj̄a   b. ãˈn̄ã

  TOT   CMPL   'during'   'evil'

- Regressive and "progressive" nasaliation are different mechanisms [7] (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

- Extensive and exceptionless **regressive** (leftward) nasalization. [8]
  - triggered by phonemic nasal vowels and nasal-oral stops
  - suffixes and roots form their own prosodic domain (Cabrera 2024)

(6) a. n^{d}a-j̄a-j̄o-haiˈhu-i   b. m̄ã-m̄ã-m̄õ-hẽn^{d}u-i
         NEG-1PL.IN-REC-love-NEG   NEG-1PL.IN-REC-listen-NEG
         'we don't love e.o.'   'we don't listen to e.o.'

(7) õ-ñẽʔẽ́-se-ˈm^{b}a-ta-mã̄
     3-talk-DES-TOT-FUT-CMPL
     'he will want to finish talking'

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

4 Progressive nasalization: the facts

[9]

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

(9) a. jagua-ˈ⟦k⟧uera
         dog-PL
         'dogs'

    b. m̃ĩtã̃-ˈ⟦ŋᵍ⟧uera
         child-PL
         'children'

(10) a. a-jeroˈki-⟦ta⟧
         1SG-dance-FUT
         'I will dance'

    b. ãĩ-pĩtĩˈv̄õ-⟦ta⟧
         1SG-help-FUT
         'I will help'

(11) a. a-jeroˈki-⟦mã⟧
         1SG-dance-CMPL
         'I finished dancing'

    b. ãĩ-pĩtĩˈv̄õ-⟦mã⟧
         1SG-help-CMPL
         'I finished helping'

[10]

- Suffix targets are affected differently by progressive nasalization.

(12) a. o-karu-ˈ⟦pa⟧
         3-eat-TOT
         'he ate (completely)'

    b. õ-ñẽʔẽ̃-ˈ⟦mᵇa⟧
         3-talk-TOT
         'he talked (completely)'

(13) a. che-ˈsi-⟦pe⟧
         1SG-mother-DOM
         'my mother'

    b. chẽ-m̃ĩˈtã̃-⟦mẽ⟧
         1SG-child-DOM
         'my child'

[11]

- Progressive nasalization triggered only by phonemic nasal vowels.

(14) p̃ãnã̃**mᵇ**i-ˈ⟦k⟧uera *-ˈŋᵍuera
       butterfly-PL
       'butterflies'

[12]

- Alternations may stack and occur non-locally.

(15) a. o-karu-se-⟦p⟧a-⟦p⟧ota-ˈ⟦peve⟧
         3-eat-DES-TOT-INCIP-until
         'until he is about wanting to finish eating'

    b. õ-ñẽʔẽ̃-se-⟦mᵇ⟧a-⟦mᵇ⟧ota-ˈ⟦mẽṽẽ⟧
         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

[13]

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

(16) a. o-ˈ⟦k⟧ɨ
         3-rain
         'it rains'

(17) a. ãmã̃-ˈ⟦ŋᵍ⟧ɨ
         rain-rain
         'rain'

    b. h̃ũ-ˈ⟦ŋᵍ⟧ɨ
         black-rain
         'grey; brown'

    c. h-ãsẽ̃-ˈ⟦ŋᵍ⟧ɨ
         3POSS-cry-rain
         'weep'

☐14

- List of stop-initial suffixes

(Estigarribia 2020, Russell 2021)

undergoing (T ~ N^D)			**undergoing** (full nas.)			**non-undergoing**	
ˈkuera	ˈŋ^guera	PL	pe	mẽ	LOC;DOM	ta	FUT
ˈpa	ˈm^ba	TOT	ˈpeve	ˈmẽṽẽ	'until'	pa	Q
poˈta	m^boˈta	INCIP				ke	FORCE
ˈtɨ	ˈn^dɨ	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

☐15

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^guera 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)

☐16

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.

<u>Root control (non-local)</u>   <u>Symmetric (α)</u>

(20) õ-ñẽʔẽ̃-se-m^ba-m^boˈta
3-talk-DES-TOT-INCIP

(21) *jagua-ˈŋ^guera, *mĩtã̃-ˈkuera
dog-PL   child-PL

☐17

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

(22) mĩtã̃-ˈŋ^guera *-ˈkuera
child-PL

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

(23)

[18]

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

(24) jagua-ˈk̟uera *-ˈŋᵍuera
      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		*!		*

[19]

- 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				*!

[20]

- Non-alternating morphemes violate PROGHARM optimally.

→ **Nasal root, oral suffix**

(28) ãˈi-pɨ̃tɨ̃ˈṽõ-ta *-nᵈa
      1SG-dance-FUT

(29)

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

[21]

→ **Oral root, nasal suffix**

(30) a. o-jeroˈkɨ-m̃ã͞
          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.

[22]

- Accumulating violations of PROGHARM predict stacking of progressive alternations.

(32)　a.　m̃ı̃tã̃-'ŋᵍuera-m̃ẽ (with leftward arrow above)
　　　child-PL-DOM

(33)

/Ṽ_RT - { TV, NV } - { TV, NṼ }/	*NV	IDENT[NAS]	PROGHARM	*CONTOUR
a.　V - TV - TV			**!	
b.　V - TV - NṼ			*!	
c.　V - NV - NṼ	*!			
☞　d.　V - NᴰV - NṼ				*

6　Closing

[23]

- 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	'kuera ~ 'ŋᵍuera PL	{TV, NV}	NV → **NᴰV**
undergoing	pe ~ m̃ẽ LOC; DOM	{TV, NṼ}	
non-undergoing	ta FUT	{TV}	
	mã̃ CMPL	{NṼ}	

[24]

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.　ka'ʔu　　b.　ãkã̃-ŋᵍa'ʔu　　c.　**mõ̃**-ŋᵍa'ʔu
　　　'drunk'　　　head-drunk　　　CAUS-drunk
　　　　　　　　　'dizzy'　　　　'to inebriate'

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

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

7　References

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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. õ-ñẽʔẽ̃-se-m^ba-m^bota-ˈmẽ̃ṽẽ
            3-talk-DES-TOT-INCIP-until
            'until he is about wanting to finish talking'

  Asunción, Concepción speakers:

  (37) a. õ-ñẽʔẽ̃-se-pa-pota-ˈpeve
            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. mĩtã̃-ˈkuera   b. *jagua-ˈŋ^guera
            child-PL   dog-PL
            'children'   'dogs'

  (39) a. chẽ-mĩˈtã̃-pe   b. *che-ˈsi-mẽ
            1SG-child-DOM   1SG-mother-DOM
            'my child'   '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^{D}V			*!		*

* 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^{D}V				*	*

Roots in progressive nasalization

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

  (43) a. o-ˈk̅ɨ
       3-rain
       'it rains'

  (44) a. $\overleftarrow{ãmã}$ã-ˈŋ^{g}ɨ   b. $\overleftarrow{hũ}$-ˈŋ^{g}ɨ   c. $\overleftarrow{h-ãsẽ}$-ˈŋ^{g}ɨ
       rain-rain   black-rain   3POSS-cry-rain
       'rain'   'grey; brown'   'weep'

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

  (44) a. o-ˈp̅aɨ   b. õ-**mõ**-ˈm̅^{b}aɨ   diego-pe
       3-wake.up   3-CAUS-wake.up diego-DOM
       'he woke up'   'he woke up Diego'

  (45) a. che-k̅aiˈgue   b. n^{d}e chẽ-**mõ**-ŋ^{g}aiˈgue
       1SG-bore   2SG 1SG-CAUS-bore
       'I'm bored'   'you bored me'

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

  (46) a. $\overleftarrow{ã}$-**m^b**o-puˈpu ʔɨ   b. n^{d}e $\overleftarrow{ã-mõ-kãnẽ}$ˈʔ$\bar{õ}$
       1SG-CAUS-hot water   2SG 1SG-CAUS-tired
       'I boiled water'   'I tired you'

8

- At the surface, exceptional causatives have **two possible analyses**:

  – **Analysis 1:** root is exceptionally nasal-initial

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

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

  (48)   õ-**mõ**-m̲ᵇaɨ   → 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   b.   ãk**ã**-ŋᵍaˈʔu   c.   **mõ**-ŋᵍaˈʔu
         'drunk'   head-drunk   CAUS-drunk
                        'dizzy'   'to inebriate'

  (50)   a.   tɨˈkɨ   b.   ãm**ã**-ŋᵍɨˈkɨ   c.   **mõ**-ŋᵍɨˈkɨ
         'drop; to drip'   rain-to.drip   CAUS-to.drip
                        'rainwater'   'to squeeze/distill'

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

(51)   a.   o-ˈk̲ɨ   b.   h**ũ**-ŋ̲ᵍɨ   c.   h-ãs**ẽ**-ˈŋ̲ᵍɨ
       3-rain   black-rain   3POSS-cry-rain
       'it rains'   'grey; brown'   '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-ˈŋ̲ᵍɨ,   *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**-ŋ̲ᵍaraˈi   pe   mĩˈtã-mẽ
           3-CAUS-man   DEM   child-DOM
           'he **baptized** the child' (Russell 2021)

      b.   pe   i-viˈgote   õ-**m**ᵇo-k̲araˈi   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**-m̲ᵇu-i   pe   bomba
           1SG   NEG-1SG-CAUS-sound-NEG   DEM   balloon
           'I didn't **pop/explode** the balloon'

      b.   che   n-ã-**m**ᵇo-ˈp̲u-i   pe   i-mᵇaraˈka
           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. nᵈe chẽ-**mõ**-ŋᵍaiˈgue
2SG 1SG-CAUS-bored
'you bored me'

b. nᵈe nã-chẽ-**mᵇo**-kaigue-i
2SG NEG-1SG-CAUS-bored-NEG
'you didn't bore me'

(55) a. che r̃õ-**mõ**-mᵇiˈta
1SG 1/2-CAUS-stop
'I stopped you'

b. che nõ-r̃õ-**mᵇo**-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.