Suffix independence in Paraguayan Guarani nasal harmony

Introduction. Nasal harmony is a phonological process in which the nasality of a segment spreads at a long distance onto other segments. The nasal harmony system of Paraguayan Guarani has been described for decades (Gregores & Suárez, 1967; Estigarribia, 2020), and has significantly contributed to developments in phonological theory (Beckman, 1998; Walker, 1999; Piggott, 2003). However, its interactions with the morphological structure of the language and its variation across dialects are relatively understudied. This work introduces two important findings from in-situ fieldwork in Coronel Oviedo, Paraguay, and remote fieldwork with speakers from urban cities (Asunción and Concepción). First, suffixes exhibit independence in regressive (leftward) harmony: unstressed suffixes fail to neutralize the oral-nasal contrast, and all nasal suffixes fail to trigger regressive spread. The second is that, although progressive (rightward) harmony is a different phonological process than regressive harmony (Russell, 2022), suffixes also show independence from progressive harmony in urban dialects of Guarani.

Regressive harmony. The oral-nasal contrast in Guarani roots and prefixes is only evident in stressed syllables and is neutralized in unstressed syllables. (1) shows that the nasality of the stressed syllable is contrastive, but there is no equivalent minimal pair in which the nasality of unstressed syllables is contrastive. Second, stressed nasal vowels spread nasality up to the left edge of the morphological word, as in (2). In regressive harmony, voiceless sounds remain unaffected, and the voiced palatal *j* nasalizes to *ñ*. Segment alternations are boxed, and triggers of harmony are bolded.

(1)	*tupa*	*tupã*	(2) a.	*ja-jo-h-ayhu*	b. *ña-ño-pytyv**õ***
	[tuˈpa]	[tũˈpã]		[ʤa.ʤo.haⁱ.ˈhu]	[ɲã.ɲõ.pɨ̃.tɨ̃.ˈṽõ]
	‘bed’	‘god’		1PL.INCL-REC-DIR-love	1PL.INCL-REC-help
	*[tũˈpa]			‘we love each other’	‘we help each other’

The behavior of suffixes, however, is inconsistent with the above generalizations. Suffixes in Guarani are contrastively nasal even when these are lexically unstressed (3a-b). Additionally, nasal suffixes fail to spread their nasality onto preceding suffixes, roots, and prefixes. In (3), all vowels to the left of the nasal suffixes are non-nasal and the palatal *j* fails to nasalize to *ñ*. This is true of both unstressed (3a-b) and stressed nasal suffixes (3c).

(3)	a.	*e-ju-na*	b.	*a-japo-ma*	c.	*o-jehu-rõ*
		[e.ˈʤu.nã]		[a.ʤa.ˈpo.mã]		[o.ʤe.hu.ˈr̃õ]
		IMP-come-REQ		1SG-work-CMPL		3-happen-if
		‘please, come!’		‘I already work’		‘if it happens’

So, in general, suffixes exhibit “independence” from the phonological properties of nasality that roots and prefixes are subject to. This is typologically well supported, as languages often show phonological asymmetries across affixal and morphological domains (Elkins, 2020).

Progressive harmony. However, suffixes aren’t completely independent to nasalization. In progressive harmony, some suffix-initial voiceless stops undergo nasalization either to nasal-oral stops (4: /k/ → [ᵑg]), or full nasal consonants (5: /p/ → [m]).

(4)	a.	*jagua-kuéra*	b.	*t**ãi**-nguéra*	(5)	a.	*o-karu-péve*	b. *o-ñe’**ẽ**-méve*
		[ʤa.ɯᵚa.ˈkᵚe.ɾa]		[tãⁱ.ˈᵑgᵚe.ɾa]			[o.ka.ɾu.ˈpe.ʊe]	[õ.ɲẽ.ʔẽ.ˈmẽ.ʊe]
		dog-PL		tooth-PL			3-eat-UNTIL	3-talk-UNTIL
		‘dogs’		‘teeth’			‘until he eats’	‘until he talks’

Some roots are also affected by progressive nasal harmony, as observed in causative constructions (6) and in compounds (7). As with suffixes, the root-initial voiceless stops nasalize following nasal syllables. As Russell (2022) and others have noted, regressive and progressive harmony are distinct phonological processes in Guarani: voiceless stops remain unaffected in regressive spread but they alternate under progressive spread, and progressive spread is lexically-specific since only some stop-initial roots and suffixes undergo nasalization.

(6)	a.	*o-**p**ay*	b.	*a-**mo**-**mb**ay*	*ha'e*	(7)	a. *o-**k**y*	b. *h-as**ẽ**-**ng**y*
		[o.ˈpaʲ]		[ã.mõ.ˈᵐbaʲ]	3		[o.ˈkɨ]	[hã.sẽ.ˈᵑgɨ]
		3-wake.up		1SG-CAUS-wake.up	him		3-rain	3POSS-cry-rain
		'he woke up'		'I woke him up'			'it rains'	'weep'

Urban dialects. The data thus far has been from speakers in Coronel Oviedo, a smaller rural town. However, speakers from more urban areas show little to no progressive nasalization in suffixes. In fact, the initial voiceless stops of various suffixes fail to alternate to their nasal counterparts when the root is nasal (8-9). However, these speakers still show the alternations in roots observed in (6-7) above and are otherwise consistent with the patterns described above.

(8)	a.	*o-ñe'**ẽ**-**p**éve*	b.	*o-kosi**na**-**p**éve*	(9)	a.	*t**ãi**-**k**uéra*	b. *mit**ã**-**k**uéra*
		[õ.ɲẽ.ʔẽ.ˈpe.ʊe]		[õ.kõ.sĩ.nã.ˈpe.ʊe]			[tãĩ.ˈkʷe.ɾa]	[mĩ.tã.ˈkʷe.ɾa]
		3-talk-UNTIL		3-cook-UNTIL			tooth-PL	child-PL
		'until he talks'		'until he cooks'			'teeth'	'children'

Summary and implications. This work introduces two new findings in the realm of Guarani nasal harmony. The first is that suffixes show independence with respect to nasal alternations in regressive harmony (in both rural and urban dialects). The second is that urban dialects seem to generalize such independence to progressive harmony, wherein suffixes fail to show the characteristic alternations found in roots of their dialect. This work on Guarani therefore contributes to the typology of attested phonological asymmetries across morphological domains. In addition, the data are from fieldwork on underrepresented dialects of Guarani in linguistic literature, and this work is among the first at attempting to study the dialectical variation of progressive harmony. Many speakers from urban areas (and in fact across Paraguay) report not speaking "good" or "proper" Guarani relative to the Guarani of other people and to that taught in schools. Ultimately, studying dialectical variation contributes to the development of robust and falsifiable phonological theories, and normalizes variation within a population of speakers.

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