PARAGUAYAN GUARANÍ PROSODY AND THE TYPOLOGY OF VARIABLE AFFIX ORDER

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ABSTRACT. I document and analyze the prosodic and morphological structure of the verb in Paraguayan Guaraní (Tupian, ISO 639-3: `gug`), a heavily agglutinating language. I show that Paraguayan Guaraní suffixes are independently prosodified and, to a large extent, freely ordered. Following Bickel et al.'s (2007) account of Chintang (Kiranti, ISO 639-3: `ctn`), I propose that variable affix order arises as a consequence of suffixes subcategorizing for prosodic words.

I contrast this phonological account of variable affix order with morphological analyses, which model variable affix order with freely ranked morphotactic constraints. The *morphological* accounts predict that variable affix order is the marked pattern which has to be posited by the learner for each pair of permuting affixes. The *phonological* account predicts that variable affix order is the default. Both accounts find empirical support from cross-linguistic data. Thus, I propose that the phenomenon of variable affix order is not unified, but rather that it is driven by either phonology or morphology, giving rise to two distinct typological profiles.

1 INTRODUCTION

Affixes are frequently ordered by scope. A verb, for example, needs to be nominalized before it can undergo pluralization. In English, this is reflected in that the nominalizing *-ment* 'N' comes before the pluralizing *-s* 'PL,' with linear order reflecting the order of morphosyntactic operations (1).

(1) *establish -ment -s*
set up -N -PL
"establishments"

Some affixes are ordered templatically, which means that their order is invariant regardless of scope. In Mapuche, for example, *-faluw* 'pretend' always comes before negation *-la* 'NEG,' irrespective of whether this ordering mirrors semantics scope (2a) or counters it (2b).

(2) *pe -w -faluw -la -e -y -u*
see -REFL -pretend -NEG -IND.OBJ -IND -AGR
a. scopal: "I did not pretend to see you."
b. counter-scopal: "I pretended not to see you."
in Mapuche (Smeets, 1989, p. 348)

Occasionally, affix ordering is free without any corresponding change in meaning. In Choguita Rarámuri, causation may take scope over associated motion, regardless of whether the causative suffix *-t(i)* 'CAUS' (allomorph: *-r(i)* 'CAUS') follows (3a) or precedes (3b) the associated motion *-s(i)* 'MOT.'

(3) a. *wikará -s -ti -ma*
sing -MOT -CAUS -FUT.SG
"will make go along singing"
in Choguita Rarámuri (Caballero, 2010, p. 178)
b. *piwá -r -si -mo*
smoke -CAUS -MOT -FUT.SG
"will make go along smoking"
in Choguita Rarámuri (Caballero, 2010, p. 188)

Among the scopal (1), templatic (2), and variable (3) affix orders, the last one is by far least common. Given its rarity, the following question arises: What gives rise to variable affix order and what constrains it? In this paper, I address this question by distinguishing between two types of variable affix order systems and proposing an emergent typology of languages which allow for variable affix order.

My central case study is that of Paraguayan Guaraní (henceforth PG, ISO 639-3: `gug`), a heavily agglutinating language of the Tupian family. I document and analyze the prosodic and morphological structure of the PG verb. I show that PG suffixes are independently prosodified and, to a large extent, freely ordered. Adapting Bickel et al.'s (2007) account of Chintang (Kiranti, ISO 639-3: `ctn`), I propose that variable affix order arises as a consequence of suffixes subcategorizing for prosodic words.

I contrast this *phonological* account of variable affix order with previous *morphological* analyses (e. g. Caballero, 2010; Paster, 2006; Ryan, 2010), which model variable affix order with freely ranked morphotactic constraints.

The morphological account predicts that variable affix order is the marked pattern which has to be learned separately for each pair of permuting affixes. The phonological account, on the other hand, predicts that free affix order is the default. Both accounts find empirical support from cross-linguistic data. Thus, I propose that variable affix order is not a unified phenomenon, but rather that it is driven by either phonology or morphology, giving rise to distinct typological profiles.

The rest of the paper is organized as follows. Section 2 gives background on the language. Section 3 describes and analyzes the prosodic structure of Paraguayan Guaraní morphologically complex verbs. Section 4 considers restrictions on free permutation of PG suffixes. Section 5 proposes that variable affix order is not a unified phenomenon and outlines a typology where variable affix order arises via either phonological or morphological means. Section 6 defends the view that the PG functional morphemes are suffixes, rather than clitics or separate syntactic words. Section 7 concludes.

2 BACKGROUND

Paraguayan Guaraní (ISO 639-3: `gug`) is Tupian language of the Tupí–Guaraní branch, which is the most widely distributed branch of the family.

Paraguayan Guaraní is an official language of Paraguay (in addition to Spanish) and one of the most widely spoken American languages. This makes PG politically unique, as otherwise the Americas saw a strong shift towards colonial languages (English, Spanish, Portuguese).

Paraguayan Guaraní is a highly agglutinating language. All syllables are open. The languages shows a remarkable degree of nasal spreading, with nasality capable of spreading from nasal vowels in both directions and across word-boundaries. Prefixes express agreement categories and valence changing operations, while suffixes express other inflectional and derivational categories.

There is little previous scholarship on Paraguayan Guaraní stress and prosody. Gregores and Suárez (1967) provide the most extensive description of the language's prosodic system, which supports parts of my analysis.

Phonetically, stress correlates most robustly with pitch, duration, and intensity. Generally, pitch is a more reliable correlate of phrase-final stress,

whereas duration is a more reliable correlate of stress occurring earlier in a phonological phrase.

3 PROSODIC STRUCTURE

In this section, I describe and analyze the prosodic structure of Paraguayan Guaraní's morphologically complex verbs. I argue that the language's predominantly final stress is a result of a uniformly right-headed branching structure. I propose that PG verbal suffixes form two classes: prosodified and non-prosodified. Finally, I propose that all suffixes subcategorize for phonological words and that prosodic well-formedness requires that prosodified suffixes precede the non-prosodified ones.

First, consider basic stress facts. Stress predominantly falls on the last syllable. This generalization holds of verbs (4a), nouns (4b), adjectives (4c), numerals (4d), syntactically independent particles (4e), and even some suffixes (4f).[1] Stress is represented with the acute accent.

(4)	a.	*guatá*	walk	(gug_20210401_ixo_mmd)
	b.	*mbarakajá*	cat	(gug_mcg_20200923_ejg)
	c.	*morotĩ́*	blue	(gug_20210401_ixo_mmd)
	d.	*mbohapý*	three	(gug_20210401_ixo_mmd)
	e.	*va'ekué*	long ago	(gug_20210401_ixo_mmd)
	f.	*-riré*	-after	(gug_20210401_ixo_mmd)

Prefixes may not affect stress. Thus, stress is insensitive to the value of agreement (5a), valence (5b), and possession (5c), which are all expressed prefixally. This is to say, regardless of the prefix, stress remains final.

(5) a. *a- guatá*
A1SG- walk
"I walk" (gug_20210401_ixo_mmd)

b. *mbo- guatá*
CAUS- walk
"make walk" (gug_20210401_ixo_mmd)

1 There are lexically specified exceptions, e. g. (i).

(i)	a.	*óga*	house	(gug_ixo_20200910_mmd)
	b.	*atĩ́a*	sneeze	(gug_20210401_ixo_mmd)
	c.	*máramo*	never	(gug_20210401_ixo_mmd)
	d.	*-kuéra*	-PL	(gug_20210401_ixo_mmd)

c. *che- mbarakajá*
B1SG- cat
"my cat" (gug_20210401_ixo_mmd)

There are two classes of suffixes. Suffixes of the first class may be stressed. If one of these stressable suffixes attaches, stress shifts onto the last syllable of the suffix (6).

(6) a. *a- guata -sé*
A1SG- walk -want
"I want to walk" (gug_20210401_ixo_mmd)

b. *a- guata -vé*
A1SG- walk -more
"I walked more" (gug_20210401_ixo_mmd)

c. *a- guata -mo'ã́*
A1SG- walk -almost
"I almost walked" (gug_20210401_ixo_mmd)

When several stressable suffixes attach at once, stress falls on the last syllable of the last stressable suffix (7).[2]

(7) a. *a- guata -se -vé*
A1SG- walk -want -more
"I want to walk more" (gug_20210401_ixo_mmd)

b. *a- guata -pa -riré*
A1SG- walk -finish -after
"after I walk" (gug_20210301_mcg_mmd)

c. *a- guata -pota -ajá*
A1SG- walk -about to -while
"when I was ready to walk" (gug_20210329_mcg_mmd)

The other class consists of stressless suffixes. When a stressless suffix attaches, stress remains on the last syllable of the verb (8).

(8) a. *a- guatá -ta*
A1SG- walk -FUT
"I will walk" (gug_20210401_ixo_mmd)

2 The distinction between the stressable and unstressed suffixes may at first appear to track the distinction between suffixes and clitics. In Section 6, I address this question to show that stressable and unstressed suffixes alike are in fact suffixes, not clitics.

b. *a-* *guatá* *-ma*
A1SG- walk -already
"I already walked" (gug_20210401_ixo_mmd)

c. *a-* *guatá* *-ne*
A1SG- walk -dare
"I dare walk" (gug_20210401_ixo_mmd)

When several stressless suffixes attach, stress likewise remains on the last syllable of the verb and the stressless suffixes form a stressless string (9).

(9) a. *a-* *guatá* *-ta* *-ma*
A1SG- walk -FUT -already
"I want to walk more" (gug_20210401_ixo_mmd)

b. *a-* *guatá* *-ne* *-ramo*
A1SG- walk -dare -if
"if I dare walk" (gug_20210401_ixo_mmd)

c. *e-* *guatá* *-ke* *-na*
IMP- walk -FCE -REQ
"please walk" (gug_20210401_ixo_mmd)

Now I will describe the basic facts of variable affix order in Paraguayan Guaraní. There is considerable freedom with respect to ordering among the stressable suffixes (10-12).

(10) a. *a-* *guata* *-mo'ã* *-vé*
A1SG- walk -almost -more
"I planned to continue walking"

b. *a-* *guata* *-ve* *-mo'ã́*
A1SG- walk -more -almost
(gug_ixo_20201203_mmd)

(11) a. *o-* *guata* *-gua'u* *-sé*
A3- walk -pretend -want
"he pretends to want to walk"

b. *o-* *guata* *-se* *-gua'ú*
A3- walk -want -pretend
(gug_20210330_ixo_mmd)

(12) a. *e-* *guata* *-rei* *-mí*
IMP- walk -in vain -PLD
"go walk around a little bit"

b. *e-* *guata* *-mi* *-reí*
IMP- walk -PLD -in vain
(gug_20210329_mcg_mmd)

The different orders do not reflect scopal differences. Indeed, scope does not appear to play any role whatsoever in the interpretation of morphologically complex forms. For suffix permutations as in the examples above, the translations given for both orders are often identical or the two forms are identified as having "the same meaning."

When they are not, consultants often point to slightly different shades of the same meaning, which nevertheless do not point to changes in scope (13).

(13) a. *o- ñe'ẽ -rei -sé*
A3- speak -in vain -want
"he wanted to slander" (gug_20210318_ixo_mmd)

b. *o- ñe'ẽ -se -reí*
A3- speak -want -in vain
"he wanted to talk for no reason," "he wanted to criticize"
(gug_20210318_ixo_mmd)

The translation offered for (13a) reflects the fact that *ñe'ẽ-rei* 'talk-in vain' has the conventionalized meaning of "slander." The conventionalized meaning is less available in (13b) as *ñe'ẽ* 'talk' is separated from *-rei* 'in vain' by *-se* 'want,' but *-se* 'want' still takes the widest scope.

The lack of relevance of semantic scope to linear order can be verified by carefully controlling for scenario. In (14), a scenario is given in which *-gua'u* 'pretend' takes scope over *-se* 'want.' In (15), the scope reverses. In either scenario, either order of suffixes is possible, further testifying to the fact that semantic scope does not play a role in the ordering of suffixes.

(14) SCENARIO: You took your friend on a walk. He is not enthusiastic, but he does not want to offend you, so he feigns his excitement.

a. *o- guata -se -gua'ú*
A3- walk -want -pretend
"he pretends to want to walk" (gug_20210330_ixo_mmd)

b. *o- guata -gua'u -sé*
A3- walk -pretend -want
(gug_20210330_ixo_mmd)

(15) SCENARIO: There is a pretending contest. The participants choose the activity they pretend to do, and the more difficult the activity is to pretend, the more highly rewarded it is. It is most difficult to pretend to walk without actually walking, but if you succeed, you will get a lot of points.

a. *a- guata -se -gua'ú*
A1SG- walk -want -pretend
"I want to pretend to walk" (gug_20210330_ixo_mmd)

b. *a- guata -gua'u -sé*
A1SG- walk -pretend -want
(gug_20210330_ixo_mmd)

Furthermore, there is some freedom with respect to the reordering of stressless suffixes (16-18).

(16) a. *a- guatá -ma -nte*
A1SG- walk -already -only
"I only walk" (gug_20210406_mcg_mmd)

b. *a- guatá -nte -ma*
A1SG- walk -only -already
(gug_20210406_mcg_mmd)

(17) a. *e- guatá -nte -rire*
IMP- walk -only -if
"if I keep walking" (gug_20210412_mcg_mmd)

b. *e- guatá -rire -nte*
IMP- walk -if -only
(gug_20210412_mcg_mmd)

(18) a. *e- guatá -ta -ke*
IMP- walk -FUT -FCE
"you need to walk for sure"

b. ?[3] *e- guatá -ke -ta*
IMP- walk -FCE -FUT
(gug_20210412_mcg_mmd)

Finally, although there is ordering freedom within the domain of stressable suffixes and within the domain of stressless suffixes as well, the stressable suffixes always precede the stressless ones (19-21).

(19) a. *e- guata -mí -na*
IMP- walk -PLD -REQ
"please walk"

b. **e- guata -na -mí*
IMP- walk -REQ -PLD
(gug_20210405_mcg_mmd)

(20) a. *a- guata -pá -ma*
A1SG- walk -finish -already
"I finished walking"

b. **a- guata -ma -pá*
A1SG- walk -already -finish
(gug_20210405_mcg_mmd)

(21) a. *a- guata -potá -ne*
A1SG- walk -about to -may
"I will probably walk"

b. **a- guata -ne -potá*
A1SG- walk -may -about to
(gug_20210405_mcg_mmd)

This generalizes such that in morphologically complex forms, the stressable suffixes, such as *-pa* 'finish,' *-rei* 'in vain,' and *-gua'u* 'pretend,' precede unstressable suffixes, such as *-ta* 'FUT,' *-ma* 'already,' and *-ramo* 'if.' Stress falls on the last syllable of the last stressable suffix (22).

(22) *a- guata -pa -rei -gua'ú -ta -ma -ramo*
A1SG- walk -finish -in vain -pretend -FUT -already -if
"if I pretend that I will have already finished walking in vain"
(gug_20210401_ixo_mmd)

My proposal consists of four parts. First, prosodic constituents are right headed—this captures the preponderance of final stress in the language.

Second, there are two prosodic classes of suffixes: (i) separate prosodic words and (ii) non-prosodified suffixes—this captures the difference between suffixes which may carry stress and those which mayn't.

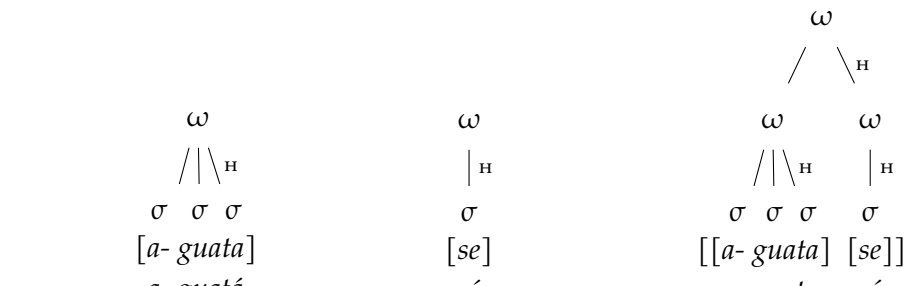
Third, all suffixes subcategorize for prosodic words—this captures the free ordering of Paraguayan Guaraní suffixes.

Fourth, prosodic well-formedness ensures that a non-minimal prosodic word immediately dominates only prosodic words—this captures the fact that stressable suffixes precede the stressless ones.

3 The order in (18b) was identified as dispreferred.

I will now flesh out the proposal in more detail. Prosodic constituents are right-headed. Thus, a verb receives final stress because its rightmost syllable is the prosodic head of the word (23a). I propose that stressable suffixes, such as *-se* 'want,' are also prosodified (23b). The two together form a non-minimal prosodic word which is headed, again, by the rightmost constituent (23c).[4] Prosodic constituency is represented with brackets [ ]. Headedness is represented with a small cap H.

(23)



The stress on *a-guata* 'A1SG-walk' in (23c) is lost in destressing due to clash with *-se* 'want.' However, it may also be preserved in careful pronunciation. Thus, in addition to (24a), (24b) is also possible. Secondary stress is represented with the grave accent.

(24) a. [*a-* *guata*] [*ve*]
a- *guata* *vé*
A1SG- walk more
"I walk more"

b. [*a-* *guata*] [*ve*]
a- *guatà* *vé*
A1SG- walk more
(gug_20210408_ixo_mmd)

The observation that non-final stresses in morphologically complex words are preserved receives support from previous literature. Gregores and Suárez (1967, p. 106) also claim that stems with stressed suffixes retain secondary stress. Nascimento (2008, p. 59) makes the same claim about a related language Guajá.

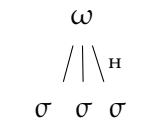
The mechanism of optional destressing applies across word boundaries in phonological phrases as well. For example, nouns with final stress may (25a) but need not (25b) undergo destressing when followed by a postposition with initial stress. Thus, the destressing seen in (23c) is a general operation which may affect morphologically complex verbs as well as multi-word phonological phrases.

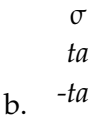
4 I am assuming that morphologically complex verbs have recursive prosodic structure. For a motivation of recursive prosodic structure, see Ito and Mester (2009, 2012).

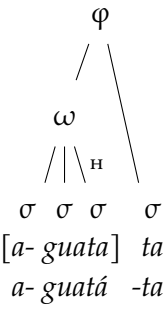
(25) a. [*jagua*] [*guýpe*]
jagua *guýpe*
dog under
"under a dog"

b. [*jagua*] [*guýpe*]
jaguà *guýpe*
dog under
(gug_ixo_20201029_mmd)

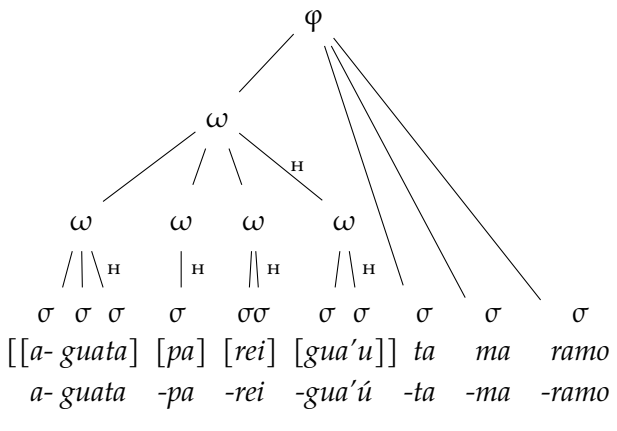
Now I turn to stressless suffixes. I propose that stressless suffixes, such as *-ta* 'FUT,' are not prosodified. Non-prosodified suffixes are represented without brackets. They are stray-adjoined and not dominated by any prosodic word node. Instead, they are immediately dominated by a phonological phrase (26).

(26) a.


b.


c.


In a morphologically complex forms with both prosodified and non-prosodified suffixes, primary stress falls on the last syllable of the last prosodified suffix (27).

(27)


Non-final prosodified suffixes may be realized with secondary stress (28).

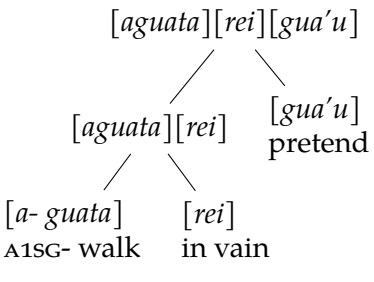
(28) [*a-* *ha*] [*kuaa*] [*se*] [*jevy*]
a- *hà* *kuaà* *sè* *jevý*
A1SG- go know want again
"I want to know how to go again"
(Gregores and Suárez, 1967, p. 106)

Furthermore, I propose that all suffixes subcategorize for a prosodic word to their left. I formulate the subcategorization requirement as a constraint (29) couched within Optimality Theory (McCarthy and Prince, 1986; Prince and Smolensky, 1993).

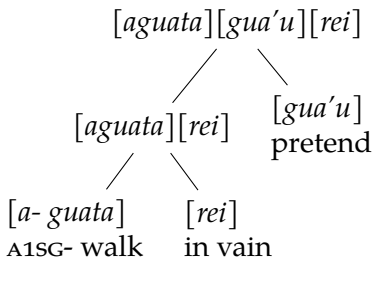
(29) SUBCATEGORIZATION, or: SUBCAT
Suffixes attach to the right edge of a prosodic word:
suffix : [ ]$_\omega$ __.

This subcategorization requirement derives the free ordering of PG suffixes. Consider a verb with two prosodified suffixes (30). Assume that the verb [*a-guata*] 'A1SG-walk' first combines with one suffix [*rei*] 'in vain.' The latter suffix [*gua'u*] 'pretend' may then, in accordance with its subcategorization frame, attach to [*rei*] 'in vain' (30a). It may, however, also infix by attaching to [*a-guata*] 'A1SG-walk' (30b). Thus, variable affix order obtains.[5]

(30) a.



b.



"I'm just pretending to walk" (`gug_20210406_mcg_mmd`)

This is an adaptation of Bickel et al.'s (2007) analysis of variable prefix ordering in Chintang (Kiranti, ISO 639-3: `ctn`). In Chintang, prefixes are freely ordered. Bickel et al. (2007) shows that they are also independently prosodified. They propose that Chintang prefixes subcategorize for a prosodic word to their right. As a consequence, in the example below, the three prefixes third person non-singular agent [*u*] '3NS.A,' first person non-singular patient [*kha*] '1NS.P,' and negation [*ma*] 'NEG' may freely permute without any change in meaning (31).

5 If the attachment of [*gua'u*] 'pretend' precedes the attachment of [*rei*] 'in vain,' the same reasoning applies; variable affix order order results in either case.

(31) a. [*u*] [*kha*] [*ma*] [*cop -yokt -e*]
3NS.A 1NS.P NEG see -NEG -PAST
b. [*u*] [*ma*] [*kha*] [*cop -yokt -e*]
c. [*kha*] [*u*] [*ma*] [*cop -yokt -e*]
d. [*kha*] [*ma*] [*u*] [*cop -yokt -e*]
e. [*ma*] [*u*] [*kha*] [*cop -yokt -e*]
f. [*ma*] [*kha*] [*u*] [*cop -yokt -e*]
"they didn't see us" in Chintang (Bickel et al., 2007, p. 44)

Turning again to PG, below the analysis of (30) is represented as an Optimality Theoretic tableau. Either suffix order satisfies SUBCATEGORIZATION, which means that both candidates are optimal (32).

(32)	[*a- guata*], [*gua'u*], [*rei*] A1SG- walk pretend in vain :	SUBCAT
☞ i.	[*aguata*][*gua'u*][*rei*]	
☞ ii.	[*aguata*][*rei*][*gua'u*]	

"I'm just pretending to walk" (`gug_20210406_mcg_mmd`)

The analysis extends to free ordering among non-prosodified suffixes. Below, *-ma* 'already' and *-nte* 'only' both subcategorize for a phonological word. Since there is only one phonological word [*a-guata*] 'A1SG-walk,' the subcategorization requirement of one of the suffixes will necessarily be unfulfilled. Since both candidates incur equal number of SUBCATEGORIZATION violations, both are optimal (33).

(33)	[*a- guata*], *ma*, *nte* A1SG- walk already only :	SUBCAT
☞ i.	[*aguata*]*mante*	**nte*
☞ ii.	[*aguata*]*ntema*	**ma*

"I only walk" (`gug_20210406_mcg_mmd`)

Thus, by adopting Bickel et al.'s (2007) proposal that affixes are prosodified and subcategorize for phonological words, I capture the variable ordering of prosodified as well as non-prosodified suffixes.

Finally, I propose that prosodic well-formedness is responsible for the fact that prosodified suffixes precede the non-prosodified ones. I formalize my

proposal with a version of the EXHAUSTIVITY constraint (34), which belongs to the family of Prosodic Domination constraints (Selkirk, 1995).[6]

(34) EXHAUSTIVITY(ω_{nonmin}, ω), or: EXHAUST
No non-minimal prosodic word immediately dominates a syllable.

I assume that a non-minimal prosodic word dominates the stem and all the prosodified suffixes. The EXHAUSTIVITY constraint ensures that the recursive word immediately dominates only minimal prosodic words by penalizing each non-prosodified suffix within it (35).[7]

(35)	[*a- guata*], [*pa*], *ta*, *ma* A1SG- walk finish FUT already	:	EXHAUST
☞ i.	[[*aguata*][*pa*]]*tama*		
ii.	[[*aguata*]*ta*[*pa*]]*ma*		**ta*
iii.	[[*aguata*]*tama*[*pa*]]		**ta*, **ma*

"I've almost finished walking"[8] (`gug_20210405_mcg_mmd`)

6 The SUBCATEGORIZATION constraint is sufficient to ensure the correct order of a prosodified suffix before a non-prosodified one if only one non-prosodified suffix is present (ii).

(ii)	[*a- guata*], [*rei*], *ta* A1SG- walk in vain FUT	:	SUBCAT
☞ i.	[*aguata*][*rei*]*ta*		
ii.	[*aguata*]*ta*[*rei*]		*[*rei*]

"I will walk for no reason" (`gug_20210406_mcg_mmd`)

However, with more than one non-prosodified suffix, SUBCATEGORIZATION alone does not uniquely determine the correct winner (iii). Hence, a recourse to EXHAUSTIVITY is needed.

(iii)	[*a- guata*], [*pa*], *ta*, *ma* A1SG- walk finish FUT already	:	SUBCAT
☞ i.	[*aguata*][*pa*]*tama*		**ma*
💣 ii.	[*aguata*]*ta*[*pa*]*ma*		*[*pa*]
iii.	[*aguata*]*tama*[*pa*]		**ma*, *[*pa*]

"I've almost finished walking" (`gug_20210405_mcg_mmd`)

7 Non-prosodified suffixes are not dominated by phonological words, but rather immediately dominated by phonological phrases. I assume that another EXHAUSTIVITY constraint which penalizes phonological phrases immediately dominating stray syllables ranks low, showing no activity in the language (iv).

(iv) EXHAUSTIVITY(φ, ω)
No phonological phrase immediately dominates a syllable.

Now I turn to an additional purchase of the proposed analysis. The current proposal makes it possible to explain why nasality does not spread from a prosodified nasal suffix onto the verbal stem. Normally in PG, nasality spreads from stressed nasal vowels leftward, including prefixes (36a). Nasality spreads from stressed nasal vowels within prosodified suffixes, but it does not spread from nasal suffixes onto verb stems (36b).

(36) a. [*o-* *je-* *kytĩ*]
õ- ñẽ- *kỹtĩ́*
A3- AGD- cut
"he cut himself" (gug_20210401_ixo_mmd)

b. [*a-* *vy'a*] [*mo'ã*]
a- *vy'a* *mõ'ã́*
A1SG- rejoice almost
"I was almost happy" (gug_20210401_ixo_mmd)

Under the current analysis, the boundaries of regressive nasalization correspond to the boundaries of the minimal phonological word. Prefixes do not form a separate phonological word, so nasality can spread onto prefixes. Suffixes, on the other hand, are prosodified separately, so nasality can spread within the suffix but not outside of it. Otherwise, one would have to arbitrarily stipulate that there is a boundary to nasal spreading between suffixes and the stem but not between prefixes and the stem.

Lastly, the analysis of some suffixes as prosodified receives support from the fact that some of them are cognates with or Proto-Tupí-Guaraní (henceforth PTG) reflexes of fully independent words (37-38).[9] B51 stands for Barbosa (1951), J98—for Jensen (1998), and M00—for Mello (2000).

(37) COGNATES

a.	*-sé* 'want'	*seia* 'want' in Tupinambá (B51, p. 144)[10]
b.	*-vé* 'more'	*bé* 'more' in Tupinambá (B51, p. 40)[10]
c.	*-mo'ã́* 'almost'	*moanga* 'pretend' in Tupinambá (B51, p. 90)[10]
d.	*-reí* 'in vain'	*rei* 'FRUST (frustrative)' in Kaiwá (J98, p. 539)[10]

8 The tableau does not consider candidates where *-ma* 'already' precedes *-ta* 'FUT,' which is prohibited on templatic grounds. For further discussion of templatic constraints, see Section 4.

9 Some fully independent PTG words have stressless reflexes in PG (v).

(v) REFLEXES

a. *-jave* 'while' †*jaβe* 'same' in PTG (M00, p. 164)[10]

10 The cited work does not relate the independent word to the Paraguayan Guaraní suffix.

e. *-mí* 'PLD' *miã* 'lady.voc (vocative)' in Tupinambá (B51, p. 88)[10]

(38) REFLEXES

a. *-pá* 'finish' †*paβ* 'finish' in PTG (J98, p. 143; M00, p. 185)[10]

b. *-potá* 'about to' †*potar* 'want' in PTG (J98, p. 518–519;[10] M00, p. 190)

c. *-ramó* 'recently' †*ramo* 'now' in PTG (M00, p. 194)[10]

In interim summary, I proposed that in Paraguayan Guaraní, the right branch of a prosodic constituent is its head, that suffixes can be classified as prosodified and non-prosodified, that all suffixes subcategorize for prosodic words, and that prosodic well-formedness prevents recursive prosodic words from immediately dominating non-prosodified suffixes.

This allowed me to capture the right-edge orientation of stress in PG, variable realization of secondary stress on non-final prosodic constituents, the variable suffix order, the linear precedence of prosodified suffixes over the non-prosodified ones, and the blocking of nasal spreading from prosodified suffixes onto verb stems. Finally, a cross-linguistic and historical perspective showed that many of the prosodified suffixes are fully independent words in related languages and in the proto-language, lending further credence to the analysis.

4 FIXED ORDER

In this section, I describe and analyze the restrictions on permutation of suffixes in PG. I propose that the restrictions on free suffix order are both scopal (mirroring the order of syntactic operations) and templatic. This contributes to the typology of affix ordering by presenting a system where subcategorization requirements and prosodic well-formedness interact with a limited demand on correspondence between linear order and syntactic structure as well as arbitrary morphotactic requirements.

The general order of morphemes within a morphologically complex verb is as follows. Verbal stems come first. All verbal stems are prosodified (39).

(39) VERBS (V)

a. [*guata*] walk

b. [*jeroky*] dance

c. [*mokõ*] swallow

...

Verbal stems are optionally modified by a manner adverb to their right. All adverbs are likewise prosodified (40).

(40) MANNER ADVERBS (*mann*)

a.	[*porã*]	good
b.	[*pya'e*]	fast
c.	[*mbegue*]	slow
	...	

Then there are two categories of suffixes with respect to their syntactic position. I will refer to the first category as predicate-level suffixes. Predicate-level suffixes express categories associated with tense, aspect, modality, desiderativity, and other broadly modificational meanings. Some predicate-level suffixes are prosodified while others are not (41).

(41) PREDICATE-LEVEL SUFFIXES (Pd)[11]

a.	[*se*]	want
b.	[*ve*]	more
c.	[*pa*]	finish
d.	[*mo'ã*]	almost
e.	[*pota*]	about to
f.	[*ramo*]	recently
g.	[*rei*]	in vain
h.	[*gua'u*]	pretend
i.	[*vy*]	intend (MCG), somewhat (IXO)
j.	[*guy*]	somewhat (IXO), reluctantly (MCG)
k.	[*ite*]	very
l.	[*mi*]	PLD (pleading imperative)
m.	*ta*	FUT (future)
n.	*ma*	already
o.	*ne*	dare (IXO), may (MCG)
p.	*nte*	only
	...	

Suffixes typically follows the adverb. This holds of prosodified (42) and non-prosodified (43) suffixes alike.

(42) a. [*o- guata*] [*mbegue*] [*ramo*]
A3- walks slow recently
"she just walked slowly"

b. ?*[*o- guata*] [*ramo*] [*mbegue*]
A3- walks recently slow
(`gug_20210308_mcg_mmd`)

11 Some of the glosses for predicate-level and clause-level suffixes are based on semantics proposed by Estigarribia (2020).

(43) a. [*o- guata*] [*mbegue*] *ta*
A3- walks slow FUT
"she will walk slowly"

b. ?*[*o- guata*] *ta* [*mbegue*]
A3- walks FUT slow
(gug_20210308_mcg_mmd)

The second category of suffixes are the clause-level suffixes. The clause-level suffixes include complementizer- and force-like morphemes. Some clause-level suffixes are prosodified while others are not (44).

(44) CLAUSE-LEVEL SUFFIXES (C)

a.	[*rire*]	after
b.	[*aja*]	while
c.	[*ha*]	N (nominalizer)
d.	*ramo*	if, when
e.	*rire*	if
f.	*jave*	while
g.	*vo*	while
h.	*vove*	while
i.	*va*	REL (relativizer)
j.	*ke*	FCE (forceful imperative)
k.	*na*	REQ (requestative imperative)
l.	*py*	URG (urging imperative)
	...	

Typically, predicate-level suffixes precede clause-level suffixes. Since predicate-level suffixes take scope over the predicate, while clause-level suffixes take scope over the entire clause, this affix order complies with the general cross-linguistic tendency for word order to reflect semantic scope or order of syntactic operations (cf. the Mirror Principle in Baker, 1985).

In particular, predicate-level suffixes precede clause-level suffixes (i) when the predicate-level suffix and the clause-level suffix are both prosodified (45-46),

(45) a. [*a- guata*] [*ve*] [*rire*]
A1SG- walk more$_{Pd}$ after$_{C}$
"after having walked"

b. ?*[*a- guata*] [*rire*] [*ve*]
A1SG- walk after$_{C}$ more$_{Pd}$
(gug_mcg_20201124_mmd)

(46) a. [*a- guata*] [*se*] [*aja*]
A1SG- walk want$_{Pd}$ while$_{C}$
"while I will want to walk"

b. *[*a- guata*] [*aja*] [*se*]
A1SG- walk while$_{C}$ want$_{Pd}$
(gug_ixo_20201203_mmd)

(ii) when the predicate-level suffix is prosodified but the clause level suffix is not (47-48),

(47) a. [*a-* *guata*] [*se*] *ramo*
A1SG- walk want$_{Pd}$ if$_{C}$
"if I want to walk"

b. ?*[*a-* *guata*] *ramo* [*se*]
A1SG- walk if$_{C}$ want$_{Pd}$
(gug_mcg_20201124_mmd)

(48) a. [*o-* *guata*] [*pa*] *va*
A3- walk finish$_{Pd}$ REL$_{C}$
"one who finished walking"

b. *[*o-* *guata*] *va* [*pa*]
A3- walk REL$_{C}$ finish$_{Pd}$
(gug_20210412_mcg_mmd)

and (iii) when neither the predicate-level suffix nor the clause level suffix is prosodified (49-50).

(49) a. [*a-* *guata*] *ta* *jave*
A1SG- walk FUT$_{Pd}$ while$_{C}$
"when I almost start to walk"

b. *[*a-* *guata*] *jave* *ta*
A1SG- walk while$_{C}$ FUT$_{Pd}$
(gug_20210222_mcg_mmd)

(50) a. [*a-* *guata*] *ta* *rire*
A1SG- walk FUT$_{Pd}$ if$_{C}$
"if I will walk"

b. *[*a-* *guata*] *rire ta*
A1SG- walk if$_{C}$ FUT$_{Pd}$
(gug_ixo_20201203_mmd)

However, (iv) when the clause-level suffix is prosodified but the predicate-level suffix is not, the order reverses (51-52).

(51) a. *[*a-* *guata*] *ta* [*aja*]
A1SG- walk FUT$_{Pd}$ while$_{C}$
"while I will walk"

b. [*a-* *guata*] [*aja*] *ta*
A1SG- walk while$_{C}$ FUT$_{Pd}$
(gug_20210222_mcg_mmd)

(52) a?*[*a-* *guata*] *ta* [*rire*]
A1SG- walk FUT$_{Pd}$ after$_{C}$
"after I will walk"

b. [*a-* *guata*] [*rire*] *ta*
A1SG- walk after$_{C}$ while$_{Pd}$
(gug_ixo_20201203_mmd_1)

Compare directly (49) with (51). In (49), the non-prosodified *jave* 'while' comes after *ta* 'FUT.' In (51), a prosodified morpheme with the same meaning [*aja*] 'while' before after *ta* 'FUT.' Also compare (50) with (52). In (50), the non-prosodified *rire* 'if' comes after *ta* 'FUT.' In (52), the segmentally identical but prosodified [*rire*] 'after' comes before *ta* 'FUT.'

The last configuration (iv), where the clause-level predicate-level suffix appears after the predicate-level suffix, is specifically the one where the expected order of Pd before C would result in a non-prosodified suffix before a prosodified suffix (53). The switch in the order can be understand as an avoidance of that dispreferred prosodic structure.

(53) (i) [Pd] ≺ [C]
(ii) [Pd] ≺ C
(iii) Pd ≺ C
(iv) [C] ≺ Pd

This pattern can be modeled as a consequence of competing demands on the ordering of suffixes. I propose that there is a constraint which favors correspondence between linear order and syntactic scope (54).

(54) PHONOLOGY≈SYNTAX (Ltd.), or: PH≈SYN
The linear order directly reflects aspects of syntactic derivation:
V ≺ *mann* ≺ Pd ≺ C.

PHONOLOGY≈SYNTAX (Ltd.) is violated whenever a manner adverb is followed by a suffix and whenever a clause-level suffix is followed by a predicate-level suffix. However, the constraint is limited only to the relative order among these major categories (hence Ltd.). For example, it does not penalize counterscopal ordering of two predicate-level suffixes.

PHONOLOGY≈SYNTAX (Ltd.) is outranked by EXHAUSTIVITY, which assigns a violation mark for each non-prosodified suffix followed by a prosodified suffix. This predicts the correct affix order (i) when both the predicate-level suffix and clause-level suffix are prosodified (55),

(55)	[*a- guata*], [*pa*], [*rire*] A1SG- walk finish$_{Pd}$ after$_{C}$:	EXHAUST »	PH≈SYN
☞ i.	[*aguata*][*pa*][*rire*]		
ii.	[*aguata*][*rire*][*pa*]		*C ≺ Pred
	"after I finish walking" (`gug_20210406_mcg_mmd`)		

(ii) when predicate-level suffix is prosodified and the clause level suffix is not (56),

(56)	[*o- guata*], [*pota*], *va* A3- walk about to$_{Pd}$ REL$_{C}$:	EXHAUST »	PH≈SYN
☞ i.	[*oguata*][*pota*]*va*		
ii.	[*oguata*]*va*[*pota*]	**va*	————
	"one who will just begin to walk" (`gug_20210408_ixo_mmd`)		

and (iii) when both the predicate-level and the clause-level suffixes are non-prosodified (57).

(57)	[*a- guata*], *ta*, *rire* : A1SG- walk FUT$_{Pd}$ if$_{C}$:	EXHAUST »	PH≈SYN
☞	i. [*aguata*]*tarire*		
	ii. [*aguata*]*rireta*		*C ≺ Pred
	"if I will walk"	(gug_ixo_20201203_mmd)	

Finally, the ranking of EXHAUSTIVITY above PHONOLOGY≈SYNTAX (Ltd.) predicts the correct order when the clause-level suffix is prosodified but the predicate-level suffix is not (58).[12]

(58)	[*a- guata*], *ta*, [*rire*] : A1SG- walk FUT$_{Pd}$ after$_{C}$:	EXHAUST »	PH≈SYN
	i. [*aguata*]*ta*[*rire*]	**ta*	
☞	ii. [*aguata*][*rire*]*ta*		*C ≺ Pred
	"after I will walk"	(gug_ixo_20201203_mmd)	

Recall that the constraint PHONOLOGY≈SYNTAX (Ltd.) is sensitive only to relative ordering of suffixes of different categories. Thus, it does not penalize a counterscopal ordering of two predicate-level suffixes. If the two predicate-level suffixes are also prosodified, either order satisfies SUBCATEGORIZATION and EXHAUSTIVITY. Thus, variable suffix order obtains (59).

(59)	[*o- guata*], [*se*], [*gua'u*] : A3- walk want$_{Pd}$ pretend$_{Pd}$:	SUBCAT,	EXHAUST »	PH≈SYN
☞	i. [*oguata*][*se*][*gua'u*]			
☞	ii. [*oguata*][*gua'u*][*se*]			
	"they pretend that they want to walk" (gug_20210329_mcg_mmd)			

Finally, in addition to the limited correspondence between syntactic structure and linear order, there are syntactically and semantically unmotivated restrictions which need to be captured via templatic constraints (60).

12 The nominalizer [*ha*] 'N' follows predicate-level suffixes (vi). This can be modeled by introducing a morphotactic constraint which enforces Pred ≺ [*ha*] 'N' and which is ranked above EXHAUSTIVITY.

(vi) a. [*a-* *guata*] *ta* [*ha*]
A1SG- walk FUT$_{Pd}$ N$_{C}$
"that I will walk"

b. ?*[*a-* *guata*] [*ha*] *ta*
A1SG- walk N$_{C}$ FUT$_{Pd}$
(gug_20210408_ixo_mmd)

(60) MORPHOTACTICS, or: MORPH
The linear order obeys precedence relations:
[*se*] 'want' ≺ [*ve*] 'more,'
[*vy*] 'intend' ≺ [*ve*] 'more,'
[*pota*] 'about to' ≺ [*se*] 'want,'
ke 'FCE' ≺ *na* 'REQ,'
...

For example, the suffix [*se*] 'want' always precedes [*ve*] 'more' (61).

(61)		[*a- guata*], [*ve*], [*se*] A1SG- walk more want :	MORPH,	PH≈SYN
	i.	[*aguata*][*ve*][*se*]	*[*ve*][*se*]	————
☞	ii.	[*aguata*][*se*][*ve*]		

"I want to keep walking more" (`gug_ixo_20201112_mmd`)

These morphotactic restrictions seen in PG are not semantic in nature. First, some of them are actually counter-scopal. In both (62) and (63), [*ve*] 'more' takes narrow scope; *more* modifies *walking* and *running*, not *wanting* and *intending*. The linear order mismatches scope.

(62) a. [*a- guata*] [*se*] [*ve*]
A1SG- walk want more
"I want to keep walking more" (`gug_ixo_20201112_mmd`)

b. *[*a- guata*] [*ve*] [*se*]
A1SG- walk more want

(63) a. [*o- dispara*] [*vy*] [*ve*]
A3- run intend more
"he's trying to intend to run more" (`gug_20210315_mcg_mmd`)

b. *[*o- dispara*] [*ve*] [*vy*]
A3- run more intend

Second, there are morphotactic restrictions among suffixes which do not interact scopally in any obvious manner. For example, there is no clear sense in which the requestative imperative *na* 'REQ' takes semantic scope over the forceful imperative *ke* 'FCE' (64a). Yet, the reverse order is not possible (64b). Likewise, there is no clear sense in which the urging imperative *py* 'URG' should be semantically incompatible with the forceful imperative *ke* 'FCE.' And yet, they cannot occur together (65).

(64) a. [*e- guata*] *ke* *na*
IMP- walk FCE REQ
"please walk"

b. *[*e- guata*] *na* *ke*
IMP- walk REQ FCE
(`gug_20210318_ixo_mmd`)

(65) a. *[*e-* *guata*] *ke* *py*
IMP- walk FCE URG
intended: "walk!"

b. *[*e-* *guata*] *py* *ke*
IMP- walk URG FCE
(gug_20210318_ixo_mmd)

Finally, the more common suffixes, such as [*se*] 'want,' [*ve*] 'more,' and [*pa*] 'finish,' show more ordering restrictions than less common suffixes, such as [*rei*] 'in vain' and [*gua'u*] 'pretend.' Since morphotactic restrictions are arbitrary and need to be learned on a morpheme-by-morpheme basis, this trend can be understood as arising on learning grounds: It is easier for a language learner to acquire morphotactic constraints for the more frequent morphemes which provide robust input than for the rarer ones.

In interim summary, Paraguayan Guaraní suffixes show ordering restrictions of two types: scopal and templatic. Scopal restrictions were captured with the PHONOLOGY≈SYNTAX (Ltd.) constraint, which ensures a limited correspondence between syntactic derivation and linear order. Deviations from the correspondence between syntactic derivation and linear order are phonological in nature; they were captured by ranking PHONOLOGY≈SYNTAX (Ltd.) below EXHAUSTIVITY. In addition, there are templatic restrictions on suffix ordering, which need to be stipulated separately. These were captured with MORPHOTACTIC constraints. Since ordering restrictions need to be learned on a morpheme-by-morpheme basis, the more common suffixes show more ordering restrictions than less common ones.

5 VARIABLE ORDER

Now I turn my attention again to variable suffix ordering, introduced in Section 3. Cross-linguistically, variable affix order (henceforth VAO) is rare. In this section, I ask the following question: When variable affix order arises, what is responsible for it? To address the question, I first review my account of VAO in PG, which I refer to as *phonological*, and compare it with previous treatments of VAO, which I refer to as *morphological*. I then propose that the two accounts track two different mechanisms responsible for VAO, correctly predicting typological differences between languages with phonological and morphological VAO.

In Section 3, the variable suffix order of PG is given a fundamentally phonological explanation: suffixes subcategorize for prosodic words to their left, and many suffixes are prosodic words, which gives rise to free ordering. In other words, VAO is a consequence of the fact that either suffix order satisfies the SUBCATEGORIZATION requirements (66).

(66)		[*o- guata*], [*se*], [*gua'u*] : SUBCAT A3- walk want$_{Pd}$ pretend$_{Pd}$
☞	i.	[*oguata*][*se*][*gua'u*]
☞	ii.	[*oguata*][*gua'u*][*se*]

"they pretend that they want to walk" (`gug_20210329_mcg_mmd`)

This is fundamentally an adaptation of Bickel et al.'s (2007) proposal to PG. Since the proposed analysis explains VAO on the grounds of subcategorization for prosodic words, I will refer to this approach as *phonological*.[13]

Now I will contrast the phonological account of VAO with another approach, which I will refer to as *morphological*. Most previous accounts of VAO fall in this category (e. g. Caballero, 2010; Paster, 2006; Ryan, 2010).

Morphological accounts of assume semantic scope to be the dominant force in affix ordering (e. g. Baker, 1985; Condoravdi and Kiparsky, 1998). This has been formalized, for example, by Condoravdi and Kiparsky (1998) as the SCOPE constraint (67).

(67) SCOPE
Morphological constituency reflects scope.

Morphological accounts capture VAO with free ranking of morphotactic constraints, which enforce pair-wise suffix order (e. g. Paster, 2006). This is to say, for each pair of permuting suffixes, there are two morphotactic constraints which can be ranked either way. The different rankings of those constraints correspond to different outputs. Morphological accounts do not make any reference to phonology (prosodic status, subcategorization, etc.).

An example of a morphological account of VAO is Caballero's (2010) analysis of Choguita Rarámuri (or Tarahumara, henceforth CR). In CR, the associated motion suffix *-si* 'MOT' and the causative suffix *-ti* (or *-ri*) 'CAUS' can appear in either order irrespective of their scopal relation.

Caballero (2010) models the variable order of *-si* 'MOT' and *-ti* (*-ri*) 'CAUS' with two morphotactic constraints: MOT-CAUS, which favors the precedence of *-si* 'MOT' over *-ti* (*-ri*) 'CAUS,' and CAUS-MOT, which favors the precedence of *-ti* (*-ri*) 'CAUS' over *-si* 'MOT.' The constraints MOT-CAUS and CAUS-MOT are freely ranked, which I represented with the tilde (MOT-CAUS ~ CAUS-MOT). When the morphotactic constraints MOT-CAUS and CAUS-MOT outrank SCOPE, a counterscopal suffix order results. When CAUS-MOT ranks above MOT-CAUS

13 PG presents a picture somewhat more complex than Chintang, in that—unlike in Chintang, where prefix ordering is completely free (Bickel et al., 2007)—there are scope- and template-based restrictions on suffix ordering in PG. Those restrictions are discussed in Section 4.

(CAUS-MOT » MOT-CAUS), *-ri* 'CAUS' comes before *-si* 'MOT' despite the fact that *-si* 'MOT' may have narrow scope (68).

(68)		*piwá, -ri, -si* smoke CAUS MOT :	CAUS-MOT »	MOT-CAUS »	SCOPE
	i.	*piwá-si-ri*	*	———	
☞	ii.	*piwá-ri-si*		*	———

"makes go along smoking" in CR (Caballero, 2010, p. 195)

When MOT-CAUS ranks above CAUS-MOT (MOT-CAUS » CAUS-MOT), *-si* 'MOT' comes before *-ti* 'CAUS' despite the fact that *-ti* 'CAUS' may have narrow scope (69).

(69)		*sú, -ti, -si* sew CAUS MOT :	MOT-CAUS »	CAUS-MOT »	SCOPE
☞	i.	*sú-si-ti*		*	———
	ii.	*sú-ti-si*	*	———	

"goes along making sew" in CR (Caballero, 2010, p. 195)

Thus, variable order of the associated motion suffix *-si* 'MOT' and the causative suffix *-ti* (*-ri*) 'CAUS' is modeled by the free constraint ranking MOT-CAUS ~ CAUS-MOT.

If one were to extend this sort of morphological account to PG, one would have to propose free rankings of morphotactic constraints for each pair of variably ordered suffixes. Thus, for example, the variable order of [*se*] 'want' and [*gua'u*] 'pretend' would be captured by the free constraint ranking [SE][GUA'U] ~ [GUA'U][SE]. When [SE][GUA'U] ranks above [GUA'U][SE], [*se*] 'want' comes before [*gua'u*] 'pretend,' regardless of scope (70).

(70)		[*o- guata*], [*se*], [*gua'u*] A3- walk want pretend :	[SE][GUA'U] »	[GUA'U][SE]
☞	i.	[*oguata*][*se*][*gua'u*]		*
	ii.	[*oguata*][*gua'u*][*se*]	*	———

"they pretend that they want to walk" (`gug_20210329_mcg_mmd`)
or "they want to pretend to walk" (`gug_20210330_ixo_mmd`)

When [GUA'U][SE] ranks above [SE][GUA'U], [*gua'u*] 'pretend' comes before [*se*] 'want,' again regardless of scope (71).

(71)		[*o- guata*], [*se*], [*gua'u*] : A3- walk want pretend	[GUA'U][SE] »	[SE][GUA'U]
	i.	[*oguata*][*se*][*gua'u*]	*	————
☞	ii.	[*oguata*][*gua'u*][*se*]		*

"they pretend that they want to walk" (gug_20210329_mcg_mmd)
or "they want to pretend to walk" (gug_20210330_ixo_mmd)

Thus, both the phonological model (Bickel et al., 2007 and my adaptation of their account) and the morphological model are capable of capturing VAO in Paraguayan Guaraní. However, I propose that by locating VAO in different subcomponents of the grammar, the two models make different predictions with respect to the frequency and distribution of VAO. I argue that VAO in Paraguayan Guaraní and Chintang is phonologically-driven and reject the morphological account shown in (70-71). Still, I argue that the morphological account is appropriate for languages where VAO is not conditioned phonologically. Thus, I propose that VAO is not a unified phenomenon and that the two different models both find evidence in different languages.

I propose that the morphological model predicts that VAO is the most marked, and therefore least frequent. (The prediction is correct for languages where VAO is not phonologically driven.) The argument goes as follows: Assuming that the learner is first predisposed to learn the order of suffixes which corresponds to semantic scope or order of syntactic operations (e. g. the Mirror Principle in Baker, 1985, p. 375, here formalized with Condoravdi and Kiparsky's SCOPE), and that the learner will not posit constraints for which they do not have evidence, scopal affix order has the simplest grammar (1 constraint), templatic affix order is more complex (2 constraints), and VAO is most complex (3 constraints). This is schematized in Table 1.

ORDER	GRAMMAR	CXTY	MARKEDNESS	FREQ
SCOPAL	SCOPE	low	default	high
TEMPLATIC	X-Y » SCOPE	higher	marked	lower
VARIABLE	X-Y ~ Y-X » SCOPE	highest	highly marked	lowest

Table 1: Affix ordering in morphology.

Furthermore, assuming that higher complexity results in higher markedness, and that markedness correlates inversely with frequency (both within a language and cross-linguistically), the morphological model makes the

following prediction: scopal affix order is the most common, templatic affix order is less common, and variable is the least common.

The prediction of the morphological model is generally borne out. Cross-linguistically, VAO is rare. In languages with VAO, it is often restricted to only a couple of morphemes. In Chichewa, for example, VAO obtains only in two instances: (1) the reciprocal *-an* 'REC' and the causative *-its* 'CAUS' can be variably ordered to express a causativized reciprocal (Hyman, 2003, p. 251), and (2) the applicative *-il* 'APP' and the passive *-idw* 'PASS' can be variably ordered when the applicative introduces a locative expression (Hyman, 2003, p. 253). In Choguita Rarámuri, only three suffixes (the causative *-ti* 'CAUS,' the associated motion *-si* 'MOT,' and the desiderative *-nale* 'DESID') can be variably ordered (Caballero, 2010, p. 190). In Fuuta Tooro Pulaar, only two suffixes (the causative *-n* 'CAUS' and the modal *-r* 'MOD') can be variably ordered (Paster, 2006, p. 183).

In Paraguayan Guaraní, however, most of the suffixes are freely ordered. Thus, PG does not conform with the prediction of the morphological model. I propose that this is so because affix order in PG is driven not by morphology, but rather phonology. Thus, I adapt the phonological model for PG, where VAO is driven by subcategorization for phonological words, not by freely ranked templatic constraints.

Adopting the phonological model captures the intuition that VAO in PG is the default, not the most marked order. It also explains why the more common suffixes, such as [*se*] 'want,' [*ve*] 'more,' and [*pa*] 'finish,' show more ordering restrictions than less common suffixes, such as [*rei*] 'in vain' and [*gua'u*] 'pretend.'

On the phonological account, templatic restrictions have to be learned on a morpheme-by-morpheme basis. Assuming that the learner needs to have some threshold input to learn a constraint, the learner is biased to acquire constraints for morphemes which are more often present in the input.

On the morphological account, it is surprising why the common morphemes have more templatic restrictions. If learning VAO requires learning two morphotactic constraints, but learning templatic affix order requires learning only one morphotactic constraint, the less common suffixes require learning more constraints that the more common ones. Yet, given our assumption about learning, we expect more lexeme-specific idiosyncrasies among the common lexical items, with frequency aiding in acquisition.

These results are even clearer for Chintang. In Chintang, affix ordering is completely free (Bickel et al., 2007). Adopting the phonological account, where VAO arises as a consequence of subcategorization predicts this directly. In (72), the three prefixes appear immediately to the left of a phono-

logical word in every candidate, regardless of their order. Thus, every candidate satisfies the SUBCATEGORIZATION requirements.

(72)		[*u*], [*kha*], [*ma*], [*cop -yokt -e*] 3NS.A 1NS.P NEG see -NEG -PAST : SUBCAT
☞	i.	[*u*][*kha*][*ma*][*copyokte*]
☞	ii.	[*u*][*ma*][*kha*][*copyokte*]
☞	iii.	[*kha*][*u*][*ma*][*copyokte*]
☞	iv.	[*kha*][*ma*][*u*][*copyokte*]
☞	v.	[*ma*][*u*][*kha*][*copyokte*]
☞	vi.	[*ma*][*kha*][*u*][*copyokte*]

"they didn't see us" in Chintang (Bickel et al., 2007, p. 44)

On the other hand, adopting the morphological account for Chintang, where VAO arises as a consequence of freely-ranked morphotactic constraints, requires proposing freely ranked constraints which specify order for each pair of prefixes (73). The squiggly arrow (⇜) connects different prefix orders with constraint rankings which generate them.

(73) a. [*u*] [*kha*] [*ma*] [*cop -yokt -e*]
3NS.A 1NS.P NEG see -NEG -PAST
⇜ [*u*][KHA] » [KHA][*u*], [KHA][MA] » [MA][KHA]

b. [*u*] [*ma*] [*kha*] [*cop -yokt -e*]
⇜ [*u*][MA] » [MA][*u*], [MA][KHA] » [KHA][MA]

c. [*kha*] [*u*] [*ma*] [*cop -yokt -e*]
⇜ [KHA][*u*] » [*u*][KHA], [*u*][MA] » [MA][*u*]

d. [*kha*] [*ma*] [*u*] [*cop -yokt -e*]
⇜ [KHA][MA] » [MA][KHA], [MA][*u*] » [*u*][MA]

e. [*ma*] [*u*] [*kha*] [*cop -yokt -e*]
⇜ [MA][*u*] » [*u*][MA], [*u*][KHA] » [KHA][*u*]

f. [*ma*] [*kha*] [*u*] [*cop -yokt -e*]
⇜ [MA][KHA] » [KHA][MA], [KHA][*u*] » [*u*][KHA]

"they didn't see us" in Chintang (Bickel et al., 2007, p. 44)

This is considerably less parsimonious and intuitively fails to capture the fact that variable affix order is the dominant (or only, as is the case for Chintang) affix order. In the absence of ordering restrictions, we should endeavor to discover a mechanism which allow us to capture the freedom to permute directly, as opposed to stipulating for every possible order separately that it

is permissible. The phonological model—but not the morphological one—fulfills this desideratum.

Finally, the phonological model captures the connection between VAO and prosodification which obtains in Chintang and PG. The morphological model does not relate affix order to their phonology, making this correlation appear accidental.

Thus, I propose that what is referred to as VAO instantiates one of two possibilities: morphological VAO or phonological VAO. Most previously described systems instantiate morphological VAO (e. g. Caballero, 2010; Paster, 2006; Ryan, 2010). In the morphological VAO, the order by default reflects scope. Deviations from the default scopal order are modeled with templatic constraints. When morphotactic constraints can freely permute, VAO obtains. Morphological VAO does not require that the affixes have any particular phonological properties. Since—under the morphological model—VAO requires specific freely ordered constraint rankings, VAO is predicted to be the rarest word order. This prediction is borne out.

Choguita Rarámuri is a good example of a language where the morphological model applies: suffixes are ordered predominantly by scope, with some templatic restrictions, and only three affixes (the causative *-ti* 'CAUS,' the associated motion *-si* 'MOT,' and the desiderative *-nale* 'DESID') can be variably ordered (Caballero, 2010, p. 190). To capture the patterns, Caballero (2010) posits only six morphotactic constraints in total (p. 191).

Phonological VAO takes place when phonological subcategorization requirements of affixes result in them being very promiscuous with respect to what they attach to. Essentially, this reverses the situation: In phonological VAO, the default affix order is free, as in PG and Chintang.[14] In PG, suffix order is further constrained by scopal and templatic considerations. The differences between phonological and morphological VAO are summarized in Table 2.

In summary, I proposed that VAO is not a unified phenomenon. Rather, it has a locus in either morphology or phonology. In most languages (e. g. Caballero, 2010; Paster, 2006; Ryan, 2010), VAO is driven by freely ranked templatic constraints. In PG and Chintang, however, it is a consequence of subcategorization for phonological words. The two sources of variable suffix ordering correlate with the different properties, giving rise to two typologically distinct systems.

14 Another potential candidate for a language with phonological VAO is Mari. In Mari, plural markers, case endings, and possessive suffixes show considerable freedom of ordering (Luutonen, 1997, p. 13). Luutonen (1997) observes that "[i]n Mari, the plural morphemes *šamə̑č*, *βlak*, and *βlä* have many characteristics that make them resemble words rather than affixes" (p. 24).

ORDER	ω-SUBCAT	NO ω-SUBCAT
SCOPAL	marked	default
TEMPLATIC	marked	marked
VARIABLE	default (phonological VAO)	highly marked (morphological VAO)

Table 2: Markedness by affix order and affix subcategorization frame.

6 SYNTACTIC STATUS

Finally, I turn to the question of the syntactic status of the verbal morphemes. So far, I have assumed that the morphemes under discussion are suffixes, as opposed to clitics or independent syntactic words, despite their unusual profile: they are independent phonological words and they show variable ordering. In this section, I provide evidence in support of my assumption.

Following Nevins (2011), I assume that "[a]ffixes are functional heads that are part of the clausal spine (or features of those functional heads) and join up with the verb by head-movement" (p. 958). I define clitics as phonologically deficient elements which do not participate in head movement.

First, PG functional morphemes, such as [*se*] 'want' or [*gua'u*] 'pretend,' cannot function as independent predicates, despite their verb-like meanings (74). This is consistent with suffixhood and clitichood but inconsistent with independent wordhood.

(74) a. *[*a-* *se*]
A1SG- want
intended: "I want"

b. *[*che-* *se*]
B1SG- want
(gug_20210318_ixo_mmd)

(75) a. *[*a-* *gua'u*]
A1SG- pretend
intended: "I pretend"

b. *[*che-* *gua'u*]
B1SG- pretend
(gug_20210318_ixo_mmd)

Second, verbal functional morphemes attach only to the main predicate (76). This is consistent with suffixhood. In this, they contrast with PG's unambiguous clitics, which likewise express functional meanings but are less selective with respect to their hosts (77).[15]

15 PG suffixes can attach to conjoined predicates, which are multi-word phonological constituents (vii).

(76) a. [*ha'e*] [*o- guata*] *ta*
(s)he A3- walk FUT
"(s)he will walk"

b. *[*ha'e*] *ta* [*o- guata*]
(s)he FUT A3- walk
(gug_20210406_mcg_mmd)

(77) a. [*ha'e*] [*o- guata*] *hina*
(s)he A3- walk PROG
"(s)he is walking right now"

b. [*ha'e*] *hina* [*o- guata*]
(s)he PROG A3- walk
(gug_20210406_mcg_mmd)

Third, despite the fact that the order of functional morphemes in Paraguayan Guaraní is largely free, the morphemes are subject to some ordering and co-occurrence restrictions (78-79). Semantically unmotivated ordering and co-occurrence restrictions are consistent with suffixhood but unexpected of clitics and independent words.

(78) a. [*o- dispara*] [*vy*] [*ve*]
A3- run intend more
"he's trying to intend to run more" (gug_20210315_mcg_mmd)

b. *[*o- dispara*] [*ve*] [*vy*]
A3- run more intend

(79) a. *[*e- guata*] *ke py*
IMP- walk FCE URG
intended: "walk!"

b. *[*e- guata*] *py ke*
IMP- walk URG FCE
(gug_20210318_ixo_mmd)

Fourth, negation is expressed with the circumfix *nd(e)- -(r)i* 'NEG.' The prefixal *nd(e)-* appears to the left of agreement morphology. The suffixal *-(r)i* appears at the right edge of the verbal stem or any of the prosodified functional morphemes which follow it. The generalization is that the suffixal *-(r)i* of the negation circumfix *nd(e)- -(r)i* 'NEG' attaches to the right edge of a prosodic word (80).

(vii) [*a- mokõ*] [*ha*] [*a- jeroky*] [*aja*]
A1SG- drink and A1SG- dance while
"while I drink and dance"
not: "I drink and while I dance" (gug_20210304_ixo_mmd)

This is not a problem for the analysis of PG verbal functional morphemes as suffixes, though. Orgun (1996) and others show cases such as (viii), where unequivocal suffixes are attached to conjoined predicates. This is referred to as suspended affixation in Lewis (1967).

(viii) (*halk-ın*) [*acı ve sevinç*] *-ler-i*
people-GEN sorrow and joy -PL-3SG.POSS
"the people's sorrows and joys" in Turkish (Orgun, 1996, p. 25)

(80) [*nde- re- guata*] [*se*] [*ve*] *ma* *ramo*
NEG- B1SG- walk ↑ want ↑ more ↑ already ↗ if ↗
-i *-i* *-i* **-i* **-i*
-NEG -NEG -NEG -NEG -NEG
"if you don't want to walk anymore" (gug_20210408_ixo_mmd)

Circumfixation is unsurprising if the prosodified functional morphemes are affixes, but unexpected if they are clitics or syntactically independent words.

Fifth, the realization of the future morpheme is sensitive to the presence of negation. In positive clauses, the future is realized as *ta* 'FUT.' In negative clauses, the future is realized as [*mo'ã*] 'FUT' (81).[16] Given the assumptions of Deal and Wolf (2017), Embick and Marantz (2008), and Sande, Jenks, and Inkelas (2020) about vocabulary insertion and locality restrictions on allomorphy, 'FUT' must be a suffix. Since (a) suffixes linearly precede enclitics and (b) 'FUT' follows all the prosodified functional morphemes, prosodified functional morphemes must also be suffixes.

(81) a. [*nd- a- guata*] [*mo'ã*] *i*
NEG- A1SG- walk FUT NEG
"I won't walk"

b. *[*nd- a- guata*] *i* *ta*
NEG- A1SG- walk NEG FUT
(gug_20210218_ixo_mmd)

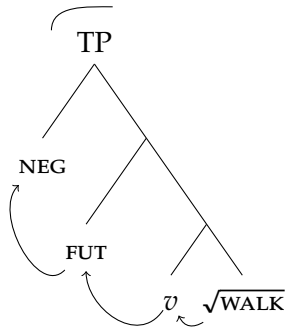
Following Embick and Marantz (2008), I assume that all lexical roots are complements to category-defining phase heads. Following Sande, Jenks, and Inkelas (2020), I assume that phases are domains of cyclic spell-out and that information from outside of a phase is unavailable during the spell-out of that phase. Following Deal and Wolf (2017), I assume that vocabulary insertion rules can be sensitive to linearly adjacent morphosyntactic elements within a phase.

If 'FUT' is a suffix, it is a part of the clausal spine and joins up with the verb by head movement (82a). If 'FUT' is a clitic, then by definition it does not participate in head movement. Since 'FUT' is not selected for by any head, it is not an argument. Thus, if 'FUT' is a clitic, it must be a phrasal modifier which adjoins to the verb (82b).

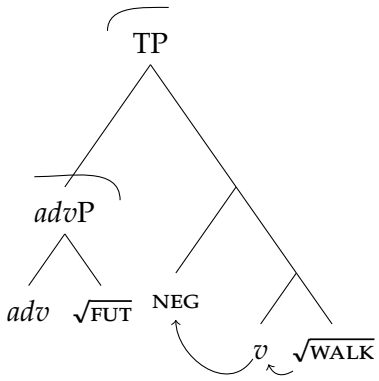
16 Despite homophony, the future exponent in the context of negation [*mo'ã*] 'FUT' is a different from the morpheme [*mo'ã*] 'almost.' This can be seen in that the two can co-occur (ix).

(ix) [*nd- a- guata*] [*mo'ã*] *i* [*mo'ã*]
NEG- A1SG- walk FUT NEG almost
"I almost won't walk" (gug_20210414_ixo_mmd)

(82) a.



b.



Spell-out at phase boundaries is indicated with arches. In (82a), the verb and all of the functional heads with which the verb joins by head movement are part of one phase.[17] In (82b), 'FUT' is phrasal modifier. Since 'FUT' is headed by the categorizing head *adv*, and all categorizing heads are phasal heads, 'FUT' undergoes spell-out by itself before adjoining to TP.

Recall that the future morpheme 'FUT' shows contextual allomorphy in the presence of negation. If the negative circumfix *nd(e)- -(r)i* 'NEG' is present, FUT is spelled out as [*mo'ã*] (83a). Otherwise, FUT is spelled out as *ta* (83b).

(83) a. FUT ↔ [*mo'ã*] / __ NEG
b. FUT ↔ *ta*

If 'FUT' is analyzed as a suffix, 'FUT' and 'NEG' are spelled out together (82a), so rule (83a) can straightforwardly apply. However, if 'FUT' is analyzed as a clitic (i. e. a phonologically deficient adjunct), it undergoes spell-out in a phase separate from the phase in which 'NEG' is located (82b). Thus, rule (83a) is prevented from applying and 'FUT' fails to show contextual allomorphy. In other words, if 'FUT' were a clitic, it would be spelled out by itself without "access" to information about morphosyntactic features (such as 'NEG') outside of its phase. This would mean that the allomorph [*mo'ã*] would never be selected. Thus, 'FUT' must be a suffix.

Furthermore, suffixes precede enclitics. The future morpheme 'FUT' comes to the right of prosodified functional morphemes (84). Since the future morpheme 'FUT' is a suffix, the prosodified functional morphemes are also suffixes.

17 Note that *v*P is not a phase. At first glace, this contradicts the assumption that all category-defining phase heads are phase heads (Embick and Marantz, 2008). Following den Dikken (2007) and Gallego (2008), I assume that the phase boundary moves together with the head which introduces it. Thus, in cases of *v*-to-T movement, as in (82), it is the TP, not the *v*P, that is a phase.

(84) a. [*nd- a- guata*] [*se*] [*mo'ã*] *i*
NEG- A1SG- walk want FUT NEG
"I will not want to walk" (gug_20210406_mcg_mmd)

Sixth and last, the verbal stem and the functional morphemes which attach to it show syntactic integrity. This is to say, no phrasal category can intervene between them (85-86).[18] This is suggestive of a structure derived by head movement, which is in turn definitional of suffixhood.

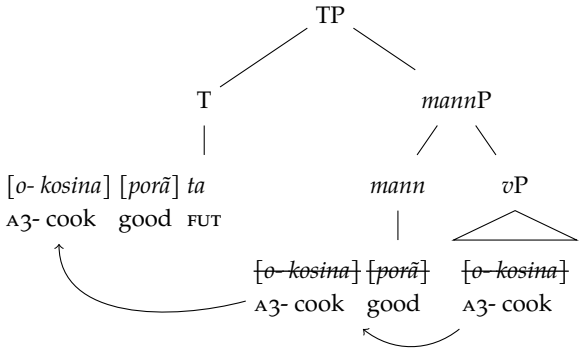
(85) a. [[*a- guata*] [*se*] [*ve*]] [*ne- -ndive*]
A1SG- walk want more B2SG- -with
"I want to walk with you more" (gug_20210406_mcg_mmd)

b. *[*a- guata*] [*se*] [*ne- -ndive*] [*ve*]
A1SG- walk want B2SG- -with more
intended: "I want to walk with you more"
(gug_20210406_mcg_mmd)

18 An interesting complication is that suffixes come after manner adverbs (x).

(x) [*o- kosina*] [*porã*] *ta*
A3- cook good FUT
"she will cook well" (gug_20210308_mcg_mmd)

I maintain that no phrasal category can occur between the verbal stem and the suffixes by proposing that adverbs are heads of functional projections through which the verb passes as it moves up the clausal spine (xi).



(xi)

The claim that the adverb is not a phrasal category but rather a head is supported by the observation that two adverbs cannot be conjoined with [*ha*] 'and.' Stacking adverbs without [*ha*] 'and,' however, is possible (xii).

(xii) [*a- kosina*] [*porã*] (*[*ha*]) [*pya'e*] [*se*]
A1SG- cook good and fast want
"I want to cook well and fast" (gug_20210318_ixo_mmd)

(86) a. [[*a-* *guereko*] *ramo*] [*pete'ĩ*] [*jagua*]
A1SG- have if one dog
"if I have a dog" (gug_20210414_ixo_mmd)

b. *[*a-* *guereko*] [*pete'ĩ*] [*jagua*] *ramo*
A1SG- have one dog if
intended: "if I have a dog" (gug_20210414_ixo_mmd)

7 CONCLUSION

In conclusion, I described and analyzed the prosodic system of Paraguayan Guaraní. I proposed that the language's predominantly final stress derives from the universal right-headedness of prosodic constituents.

I posited that PG suffixes come in two varieties: prosodified and non-prosodified. I observed that the prosodified suffixes come before the non-prosodified ones, but that otherwise their ordering is largely free. I derived the variable ordering by adapting Bickel et al.'s (2007) analysis of affixes as subcategorizing for prosodic words. I captured the linear precedence of prosodified suffixes with reference to Prosodic Dominance (Selkirk, 1995).

I categorized the restrictions on PG affix order as (1) limited correspondence between linear order and syntactic structure and (2) templatic effects. Thus, I documented a novel agglutinating system with part variable, part templatic, and part scopal morpheme order, emergent from interactions of prosodic hierarchy, phonological subcategorization, templatic restrictions, and syntactic structure.

Finally, I proposed that variable affix order is not a unified phenomenon, but rather that it originates in one of two subcomponents of the grammar: phonology (via subcategorization requirements) or morphology (via free ranking of morphotactic constraints). Thus, I proposed a a nascent typology of variable affix order which distinguished phonologically-driven VAO from morphologically-driven VAO. In a phonological VAO system, free ranking is the default (although it might be restricted by scopal and morphotactic constraints). In a morphological VAO system, the scopal and templatic orders predominate; variable order is the marked pattern, modeled by free ranking of morphotactic constraints.

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