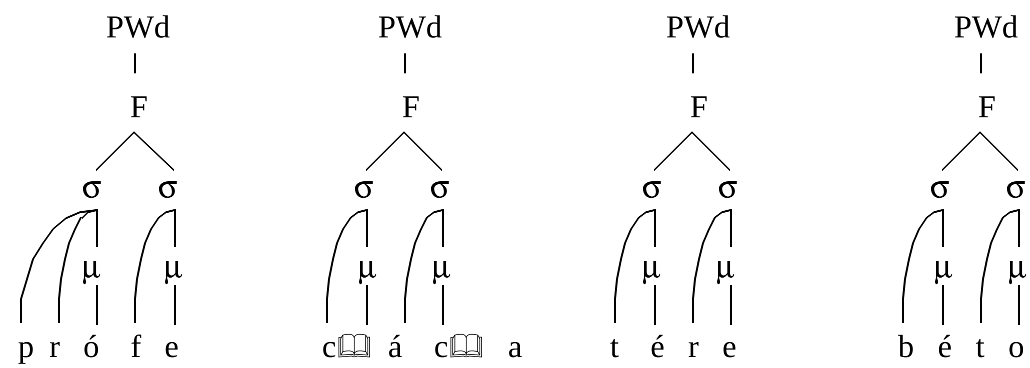
FOOT-SENSITIVE WORD MINIMIZATION IN SPANISH[*]

Carlos-Eduardo Piñeros
University of Iowa

0. Introduction

Prior analyses of Spanish truncatory morphology (Prieto 1992, Lipski 1995, Colina 1996) have found that Spanish truncated forms tend to conform to an invariant prosodic shape that is equivalent to a left-headed disyllabic foot (e.g. a syllabic trochee).

(1) Prosodic structure of Spanish truncated forms:



profesor	*muchacha*	*Teresa*	*Alberto*
'teacher'	'girl'	'Theresa'	'Albert'

Whereas Prieto (1992) and Colina (1996) have studied a type of truncated forms that preserves the initial part of the source form (e.g. *profe* < *profesor* 'teacher'), Lipski (1995) has undertaken the task of accounting for an alternative truncation process that preserves the final part of the source form (e.g. *beto* < *alberto* 'Albert'), and which is substantially less tolerant of syllable markedness. The following examples further illustrate both truncation processes.

(2)

Source From	*Type-A Truncation*[1]	*Type-B Truncation*
Alfonso	Alfon	Poncho
Cristina	Cristi	Tina
Dionisio	Dioni	Nicho

In this paper, I focus on the second of these processes, which I will refer to as Type-B truncated forms. My claim is that the reason why Type-B truncated forms tend to preserve the final, as opposed to the initial part of the source form, is because they are sensitive to the foot structure of their source forms. Specifically, a Type-B truncated form must preserve the segments parsed under the main-stressed foot of its source form because the head of the prosodic word must be maximized. Given that in Spanish the main-stressed foot is restricted to the domain of a right-edge three-syllable window, the material preserved in the truncated form must come from the last three syllables of the source form. I demonstrate that this account based on prosodic heads is superior to an analysis that relies on successive applications of prosodic circumscription (Lipski 1995). The latter cannot help mutilating prosodic units in order to derive the desired results, whereas the analysis I develop respects the integrity of prosodic constituents at all times providing additional support for the claim that prosodic heads may define the domain of morphological operations, as proposed by Alderete (1995).

1. Type-B truncated forms

There is a truncation process in Spanish that shortens the source form (SF) to fit a disyllabic template, which is filled with segments that come mainly from the last three syllables of SF depending on its stress pattern.

(3) a. Ultimately-stressed SF's:

[i.(nés)]$_{PWd}$	[(né.c□a)]$_{PWd}$	Inés
[i.sa.(βél)]$_{PWd}$	[(bé.la)]$_{PWd}$	Isabela
[xo.a.(kín)]$_{PWd}$	[(kí.no)]$_{PWd}$	Joaquín
[ba.len.(tín)]$_{PWd}$	[(tí.no)]$_{PWd}$	Valentín

b. <u>Penultimately-stressed SF's</u>:

[do.ro.(té.a)]$_{\text{PWd}}$	[(té.a)]$_{\text{PWd}}$	Dorotea
[si.(rí.lo)]$_{\text{PWd}}$	[(lí.lo)]$_{\text{PWd}}$	Cirilo
[ful.(xén.sjo)]$_{\text{PWd}}$	[(xén.c🕮o)]$_{\text{PWd}}$	Fulgencio
[bi.(sén.te)]$_{\text{PWd}}$	[(c🕮én.te)]$_{\text{PWd}}$	Vicente

c. <u>Antepenultimately-stressed SF's</u>:

[a.ris.(tó.βu).lo]$_{\text{PWd}}$	[(tó.βo)]$_{\text{PWd}}$	Aristóbulo
[(kán.di).δa]$_{\text{PWd}}$	[(kán.da)]$_{\text{PWd}}$	Cándida
[kri.(sós.to).mo]$_{\text{PWd}}$	[(c🕮ó.to)]$_{\text{PWd}}$	Crisóstomo
[(lá.sa).ro]$_{\text{PWd}}$	[(lá.c🕮o)]$_{\text{PWd}}$	Lázaro

Although they have also been attested in dialects of Peninsular Spanish, Type-B hypocoristics are more commonly found among Latin American dialects. Boyd-Bowman (1955) presents the most extensive corpus of data on this process. He studies Latin American hypocoristics from the perspective of child language acquisition and observes that this type of truncated forms (TF) tend to avoid certain sounds by deleting them and/or by replacing them with other sounds (e.g. [(c🕮í.la)] < [se.(sí.lia)] 'Cecilia').

Type-B hypocoristics have a tendency to avoid marked structure both at the prosodic and segmental levels. Lipski (1995) points out that a Type-B truncated from always surfaces with a CV.CV shape, except in some cases in which the first syllable is closed by a nasal (e.g. *Canda* < *Cándida*). Onset clusters are simplified by deleting the second element of the cluster (e.g. *Dina* < *Alejandrina*) and diphthongs are avoided by omitting the high vocoid (e.g. *Chela* < *Graciela*, *Balo* < *Braulio*).[2] As we will see below, however, the most important generalization is that the segments preserved in TF are the correspondents of segments parsed under the main-stressed foot of SF. In (3a), for example, the syllabic trochee is fleshed out with the correspondents of the last syllable of SF because the main-stressed foot of SF is erected only on this syllable (e.g. [(né.c□a)] < [i.(nés)] 'Inés') In (3b), TF preserves the correspondents of segments parsed by the last two syllables of SF because the main-stressed foot subsumes the ultimate and penultimate syllables of SF (e.g. [(lí.lo)] < [si.(rí.lo)] 'Cirilo'). In (3c), most of the segments preserved in TF are the correspondents of segments parsed by the penultimate and ante-penultimate syllables of SF given that the main-stressed foot in these SF's is pushed back one syllable from the right edge of the word due to the extrametrical character of the final mora (e.g. [(tó.βo)] < [a.ris.(tó.βu).lo] 'Aristóbulo').[3]

2. Word minimization in Spanish truncation processes

In their study of Diyari reduplication, McCarthy and Prince (1994) find that the reduplicant exhibits a templatic form which happens to coincide with the Minimal Word (MinWd) in this language: $[(\sigma\sigma)_{Ft}]_{PWd}$. They propose that MinWds are unmarked Prosodic Words (PWds) that arise when the following PWd-Restrictor constraints are strictly respected.

(4) Prosodic-Word Restrictor Constraints:

PARSE-SYLL: *Parse syllables*
All syllables are parsed into feet.

FT-BIN: *Foot Binarity*
Feet are binary at some level of analysis (μ, σ)

ALL-FT-R:[4] *All Feet Right*
Every foot stands in final position in the PWd.

Perfect satisfaction of the three PWd-Restrictor constraints is only possible when the PWd contains a single binary foot. This is because PARSE-SYLL demands that all syllables in the output be parsed by a foot. Additionally, FT-BIN requires feet to achieve binarity either at the moraic or syllabic level.[5] ALL-FT-R is an alignment constraint that governs the position of feet. Because ALL-FT-R ranges over all feet, every single foot is evaluated on the distance that separates it from the right edge of the prosodic word (McCarthy and Prince 1993b). When ALL-FT along with PARSE-SYLL and FT-BIN are top-ranking, the optimal output form may contain no more and no less than a single binary foot regardless of the number of syllables present in the input form. As illustrated in (5) below, any candidate preserving more than two syllables is doomed for it can not help falling in violation of at least one of the PWd-Restrictor constraints (5a-c).

(5) FT-BIN, PARSE-SYLL, ALL-FT-R

Input: σσσ	FT-BIN	PARSE-SYLL	ALL-FT-R
a. $[(\sigma)_{F2}(\sigma\sigma)_{F1}]_{PWd}$	* !		F_2: σσ
b. $[(\sigma\sigma)_{F2}(\sigma)_{F1}]_{PWd}$	* !		F_2: σ
c. $[(\sigma\sigma)_{F1}\sigma]_{PWd}$		* !	F_1: σ
d. $[\sigma(\sigma\sigma)_{F1}]_{PWd}$		* !	
e. ☞ $[(\sigma\sigma)_{F1}]_{PWd}$			

Word minimality is enforced when the PWd-Restrictor constraints dominate faithfulness constraints. Benua (1995) uses this approach in order to account for Japanese hypocoristics and I extend it here to Spanish truncated forms. The following constraints are active as well.

(6) FT-FORM=T: *Trochaic Foot Form*
(Based on McCarthy and Prince 1993b)

Align the left edge of a foot with the left edge of its head (a stressed syllable).

(7) MAX(SF-TF): *Maximization of the Source Form*
(Based on McCarthy and Prince 1995)

Every element in the Source Form has a correspondent in the Truncated Form. (e.g. syllable, segment, etc.)

Given that in Spanish the single foot contained in TF is always a trochee (e.g. [(c🕮ú.c🕮o)] < [xe.(sús)] 'Jesus'), the constraint FT-FORM=T must be top-ranking. On the other hand, the fact that TF forms a MinWd at the expense of losing the correspondents of some SF-elements (e.g. [(lé.na)] < [max.da.(lé.na)] 'Magdalena') is an indication that the MAX(SF-TF) constraint family is dominated by the PWd-Restrictor constraints. The ranking FT-BIN, PARSE-SYLL, ALL-FT >> MAX(SF-TF) is the hallmark of truncation. When the PWd-Restrictor constraints outrank MAX(SF-TF), identity between TF and SF is often sacrificed in order to obtain the unmarked PWd.

(8) FT-FORM=T, FT-BIN, PARSE-SYLL, ALL-FT-R >> MAX(SF-TF, σ)

SF: [σσσσ]	FT-FORM=T	FT-BIN	PARS-	ALL-FT-R	MAX(SF-TF,
a. [(σ̀ σ)(σ́ σ)]				F2: σσ !	
b. [σ (σ́ σ)]			*		*
c. [(σ̀)(σ́ σ)]		*		F2: σσ	*
d. ☞ [(σ́ σ)]					* *
e. [(σ σ́)]	* !				* *

Truncation is then the price that must be paid for word minimization. To the detriment of MAX(SF-TF), the dominant PWd-Restrictor constraints force TF not to exceed two syllables. An additional prosodic requirement is imposed by Ft-FORM=T, which forces right-headedness on the parser of these two syllables. The candidate that meets these requirements is the optimal Spanish TF (8d).[6]

3. Prosodic-head maximization

The main argument I want to defend is that the formation of Type-B truncated forms is sensitive to the head of the prosodic word (PWd). Related to this issue is the proposal made in Alderete (1995) to interpret the tendency to avoid stress assignment on epenthetic vowels as a type of input-dependence that involves prosodic heads.

(9) HEAD-DEP: *Dependence on the Head of Prosodic Constituents* (Alderete 1995)

Every element contained in a prosodic head in S_2 must have a correspondent in S_1.

Here, I propose to account for Type-B truncated forms through the counterpart of HEAD-DEP. That is, HEAD-MAX(imization). As I pointed out in section 2 above, there is a strong tendency for truncated forms of Type-B to preserve those segments that are contained in the main-stressed foot of SF. Consider the following additional examples.

(10) a. Ultimately-stressed SF's:

[be.a.(trís)]$_{PWd}$	[(tí.c🕮a)]$_{PWd}$	Beatriz
[en.kar.na.(sjón)]$_{PWd}$	[(c🕮ó.na)]$_{PWd}$	Encarnación
[se.βas.(tján)]$_{PWd}$	[(c🕮á.no)]$_{PWd}$	Sebastián

b. <u>Penultimately-stressed SF's</u>:

[a.(lí.sja)]$_{PWd}$	[(lí.c🕮a)]$_{PWd}$	Alicia
[ar.(mán.do)]$_{PWd}$	[(mán.do)]$_{PWd}$	Armando
[kar.(ló.ta)]$_{PWd}$	[(ló.ta)]$_{PWd}$	Carlota

c. <u>Antepenultimately-stressed SF's</u>:

[(fe.(lí.si).to]$_{PWd}$	[(lí.c🕮o)]$_{PWd}$	Felícito
[i.(pó.li).to]$_{PWd}$	[(pó.lo)]$_{PWd}$	Hipólito
[(mé.li).δa]$_{PWd}$	[(mé.la)]$_{PWd}$	Mélida

These data reveal a strong drive to preserve those elements parsed under the head of the PWd. Prosodic-head maximization is accomplished when output string S_2 provides a correspondent for every segment contained in a prosodic head of input string S_1. To implement this proposal, I will assume that the input for truncation is a derived output form since only an output form would contain prosodic heads.

(11) HEAD-MAX: *Maximize the Head of Prosodic Constituents*

Every element contained in a prosodic head in S_1 must have a correspondent in S_2.

The specific version of HEAD-MAX that is at play in Type-B truncated forms is HEAD(PWd)MAX, which demands faithfulness to the head of the PWd.

(12) HEAD(PWd)MAX: *Maximize the Head of the PWd*

Every element contained in the head of the PWd of SF (e.g. the main-stressed foot) must have a correspondent in TF.

Considering that in Spanish the head of the PWd tends to lie towards the right edge of the word, it is precisely HEAD(PWd)MAX that forces TF to preserve the final part of the source form.

In partial summary, the optimal TF must be a candidate that reduces to a MinWd because the PWd-Restrictor constraints dominate MAX(SF-TF). But because HEAD(PWd)MAX dominates the PWd-Restrictor constraints, the segments to be parsed under the MinWd must be those parsed under the main-stressed foot of SF. The effect of this ranking is illustrated in the following tableau where, for reasons of space, the PWd-Restrictor constraints FT-BIN, PARSE-SYLL, ALL-FT-R are abbreviated as PWR.

(12) HEAD(PWd)MAX >> PWR >> MAX(SF-TF)

SF: [max.δa.(lé.na)]	HEAD(PWd)MAX	PWR	MAX(SF-TF)
a. [(màx.δa)(lé.na)]		* !	
b. [da.(lé.na)]		* !	max
c. [(dá.le)]	n ! a		
d. ☞ [(lé.na)]			maxδa
e. [(máx.δa)]	l ! ena		lena

Candidate (12a) opts for preserving every element in SF in compliance with MAX(SF-TF), but this is of no avail because it contains a non-final foot that is penalized by PWR. Candidate (12b) has a single foot that sits at the right margin of the word but it still runs afoul of PWR because it contains an unparsed syllable. Only the disyllabic forms (12c-e) abide by PWR; but among these there is only one that maximizes the head of the PWd optimally. Whereas (12c) and (12e) preserve segments that are outside the main-stressed foot of SF, candidate (12d) provides a correspondent for every single element within that prosodic domain.

This explains in a principled manner why [(lé.na)] is the optimal Type-B truncated form for the source form [max.δa.(lé.na)]. On the one hand, the drive to achieve the unmarked prosodic configuration of a MinWd forces SF to undergo truncation, but on the other hand, those elements in the main-stressed foot may not be deleted because they are protected by the prominence of the prosodic head. Tableau (13) includes additional examples that corroborate these findings.

(13) HEAD(PWd)MAX >> PWR >> MAX(SF-TF)

SF: [kar.(ló.ta)]	HEAD(PWd)MAX	PWR	MAX(SF-TF)
a. [kar.(ló.ta]		* !	
b. [(kár.lo)]	t ! a		ta
c. ☞ [(ló.ta)]			kar
SF: [en.r̄i.(ké.ta)]			
a'. [(èn.r̄i)(ké.ta)]		* !	
b'. [r̄i.(ké.ta)]		* !	en
c'. ☞ [(ké.ta)]			enr̄i
d'. [(r̄í.ke)]	t ! a		ta
e'. [(én.r̄i)]	k ! eta		keta

When SF is disyllabic and both syllables are parsed by the main-stressed foot, compliance with HEAD(PWD)MAX and PWR should be possible without having to sacrifice any material. Such is the case illustrated in tableau (14) below for the hypocoristic [(r̄ó.c🕮a)] < [(r̄ó.sa)] 'Rose'. Given that SF is already disyllabic, there is no need for shortening (14a). In fact, under such circumstances, any truncated candidate will score worse than a fully preserved form since monosyllabic candidates (e.g. consisting of a light syllable) can not help falling in violation of PWR (14b,c).

(14) HEAD(PWd)MAX >> PWR >> MAX(SF-TF)

SF: [(r̄ó.sa)]	HEAD(PWd)MAX	PWR	MAX(SF-TF)
a. ☞ [(r̄ó.c🕮a)]]			
b. [(r̄ó)]	s ! a	*	sa
c. [(c🕮á)]	r ! o	*	ro

In the following sections, I will show how this general tendency of maximizing the head of the PWd applies to TF's arising from SF's that do not follow the unmarked penultimate-stress pattern. Section 4 deals with TF's generated from antepenultimately-stressed SF's. Section 5 focuses on the principles that cause Type-B truncated forms to have their characteristic CV.CV shape. Section 6 is dedicated to TF's created from ultimately-stressed SF's. In section 7, the analysis is extended to cover a subset of Type-B truncated forms that preserves the initial consonant of SF. Section 8 contrasts this constraint-based analysis with a serial account (Lipski 1995). Section 9 summarizes the findings and draws some conclusions.

4. Type-B TF's from ante-penultimately-stressed SF's

When SF is ante-penultimately-stressed, the optimal TF is selected according to the same constraint ranking established above. However, this subset of data reveals that right ANCHORing (McCarthy and Prince 1995) is also active in the formation of Type-B truncated forms.

(15) Ante-penultimately-stressed SF's:[7]

[a.ris.(tó.βu).lo]	[(tó.βo)]	Ariostóbulo
[(kán.di).δa]	[(kán.δa)]	Cándida
[kri.(sós.to).mo]	[(čó.to)]	Crisóstomo

[(lá.sa).ro]	[(lá.čo)]	Lázaro
[(trán.si).to]	[(tán.čo)]	Tránsito

Here, where the main-stressed foot of SF is not in absolute word-final position, it becomes evident that in addition to preserving those segments parsed under the head of the PWd, there is also a strong tendency to preserve the rightmost element in SF.

(16) ANCHOR(SF-TF)R: *Anchor the right edge of the Source Form*
(Based on McCarthy and Prince 1995)

Any element at the right periphery of the Source Form has a correspondent at the right periphery of the Truncated Form.

ANCHOR(SF-TF)R must dominate HEAD(PWd)MAX given that it is better to keep a correspondent for the rightmost segment in SF than one for the rightmost segment in the main-stressed foot, when these are two different segments. According to this, the optimal Type-B truncated form is one that does not sacrifice right ANCHORing over prosodic-head maximization (17b).

(17) ANCHOR(SF-TF)R >> HEAD(PWd)MAX

SF: [a.ris.(tó.βu).lo]	ANCHOR(SF-TF)R	HEAD(PWd)MAX
a. [(tó.βu)]	* !	
b. ☞ [(tó.βo)]		u

When the main-stressed foot of SF is in absolute word-final position (e.g. penultimately-stressed words), ANCHOR(SF-TF)R and HEAD(PWd)MAX do not come into conflict because they both require the preservation of the rightmost segment in SF. This is the reason why the effect of ANCHOR(SF-TF)R is not visible when SF is paroxytonic.

(18) ANCHOR(SF-TF)R >> HEAD(PWd)MAX

SF: [kris.(tí.na)]	ANCHOR(SF-TF)R	HEAD(PWd)MAX
a. [(tí.na)]		

Incorporating ANCHOR (SF-TF)R into the constraint ranking established in Section 3 above, the selection of the optimal Type-B truncated form from a penultimately-stressed SF is as follows. Any candidate that is not equivalent to a MinWd is ruled out by PWR (19a). HEAD(PWd)MAX also discards any candidate that prefers to preserve a segment outside the domain of the main-stressed foot of SF over one that is protected by that prosodic domain (19b). The only exception to this is if the segment outside the head of the PWd is the rightmost element in SF. In such case, ANCHOR(SF-TF)R favors the candidate that gives priority to the rightmost element of SF (19d).

(19) ANCHOR(SF-TF)R >> HEAD(PWd)MAX >> PWR >> MAX(SF-TF)

SF:	[(lá.sa).ro]	ANCHOR(SF-TF)R	HEAD(PWd)MAX	PWR	MAX(SF-TF)
a.	[(lá.ča).ro]			* ¡	
b.	[(čá.ro)]		l ! a		la
c.	[(lá.ča)]	* !			ro
d. ☞	[(lá.čo]		a		ar

5. Syllable unmarkedness

Despite the strong tendency of TF to remain faithful to the head of the PWd of SF, HEAD(PWd)MAX is not always perfectly obeyed. Lipski (1995) observes that Type-B hypocoristics feature syllables of the form CV. "The only exception is the possibility for the first syllable to end in a nasal, homorganic with the following consonant" (p. 391).[8] In order to achieve this unmarked syllabic form, the optimal TF must keep from providing a correspondent for certain segments.

5.1 Avoidance of complex syllable position nodes

When the main-stressed foot of SF contains a syllable with a complex onset, the corresponding Type-B truncated form fails to preserve one of the segments under the branching syllable position node. The following examples show that the consonant that survives is always the one of lower sonority.

(20)	*Source Form*	*Type-B TF*	*Gloss*
	[a.le.xan.(drí.na)]$_{PWd}$	[(dí.na)]$_{PWd}$	Alejandrina
	[a.le.(xán.dro)]$_{PWd}$	[(xán.do)]$_{PWd}$	Alejandro
	[am.(bró.sjo)]$_{PWd}$	[(bó.c🕮o)]$_{PWd}$	Ambrosio
	[en.(grá.sja)]$_{PWd}$	[(gá.c🕮a)]$_{PWd}$	Engracia
	[lu.(kré.sja)]$_{PWd}$	[(ké.c🕮a)]$_{PWd}$	Lucrecia

Some of the examples in (20) also show that complex nuclei are simplified as well. As the following data confirm, it is always the vocoid of higher sonority that is preserved.

(21)	[a.de.(láj.da)]$_{PWd}$	[(lá.la)]$_{PWd}$	Adelaida
	[(bráw.ljo)]$_{PWd}$	[(bá.lo)]$_{PWd}$	Braulio
	[ka.(sjá.no)]$_{PWd}$	[(c🕮á.no)]$_{PWd}$	Casiano
	[(fáws.ta)]$_{PWd}$	[(fá.ta)]$_{PWd}$	Fausta
	[fe.li.(sjá.no)]$_{PWd}$	[(c🕮a.no)]$_{PWd}$	Feliciano

These data suggest that the markedness constraint *COMPLEX (Prince and Smolensky 1993) is high-ranking.

(22) *COMPLEX: *No Complex Syllable Position Nodes*
Syllable position nodes do not branch.

*COMPLEX must outrank HEAD(PWd)MAX given that omitting the correspondent of a segment parsed by the main-stressed foot of SF is preferred over creating a complex syllabic constituent in TF. Tableau (23) illustrates how these constraints interact with the constraints involved in the partial ranking established in section 3 above. Although HEAD(PWd)MAX assures that the segments parsed by the main-stressed foot take priority over segments outside the head domain, it is unable to prevent the loss of segments that, although protected by the prominence of the main-stressed foot, pose a challenge to the higher-ranking syllable markedness constraint *COMPLEX.

(23) *COMPLEX >> HEAD(PWd)MAX >> PWR >> MAX(SF-TF)

SF: [lu.(kré.sja)]	*COMPLEX	HEAD(PWd)MAX	PWR	MAX(SF-TF)
a. [lu.(kré.sja)]	* ! *		*	
b. [(kré.sja]	* ! *			lu
c. [(kré.sa)]	* !	j		lu j
d. [(ké.sja)]	* !	r		lu r
e. ☞ [(ké.c🕮a)][9]		r j		lu r j
SF: [(bráw.ljo)]				
a'. [(bráw.ljo)]	* ! * *			
b'. [(báw.ljo)]	* ! *	r		r
c'. [(bá.ljo)]	* !	r w		r w
d'. ☞ [(bá.lo)]		r w j		r w j

Candidates (23e) and (23d') are the winners because they are the only MinWd's that manage to completely rid all syllable position nodes of branching structure while providing the greatest number of correspondents possible for those segments in the main-stressed foot of SF.

The selection of which of the two segments under a complex syllable position node is to be preserved is made according to the Universal Syllable Margin and Peak Hierarchies (Prince and Smolensky 1993), which are based on the universal sonority scale. (*t* = a segment of minimal sonority, *a* = a segment of maximal sonority)

(24) *Universal Margin Hierarchy* (Prince and Smolensky 1993)

*M/*a* >> *M/*i* >> . . . >> *M/*t*

(25) *Universal Peak Hierarchy* (Prince and Smolensky 1993)

*P/*t* >> . . . >> *P/*i* >> *P/*a*

Anti-associational constraints of the type *M/α militate against the parsing of segments as syllable margins, whereas anti-associational constraints of the type *P/α penalize the parsing of segments as syllable peaks. According to the Universal Margin Hierarchy, parsing a low-sonority segment as a syllable margin is better than parsing a high-sonority segment in that position because such association entails the violation of a lower-ranking anti-margin constraint. Conversely, the Universal Peak Hierarchy dictates that parsing a low-sonority segment as a syllable peak is worse than parsing a high-sonority segment in that position because such association entails the violation of a higher ranking anti-peak constraint. Given that maximizing the head of the PWd requires the parsing of certain segments as syllable margins, the anti-margin constraints *M/α must be dominated by HEAD(PWd)MAX.

(26) *COMPLEX >> HEAD(PWd)MAX >> *M/α

SF: [a.le.xan.(drí.na)]	*COMPLEX	HEAD(PWd)MAX	*M/r	*M/n	*M/d
a. [(drí.na)]	* !		*	*	*
b. ☞ [(dí.na)]		r		*	*
c. [(rí.na)		d	*		

Under the pressure of *COMPLEX, the optimal TF must avoid the branching onset included in the main-stressed foot of SF. Candidate (26a) is the first one to be discarded for it makes no effort to meet this condition. Candidates (26b) and (26c) illustrate two different ways to satisfy *COMPLEX. But only candidate (26b) abides by the sonority considerations enforced by *M/α. It optimizes the margin of the first syllable by selecting the segment of lower sonority.

Given that Type-B truncated forms also maximize the main-stressed foot of SF at the expense of parsing certain segments as syllable peaks, it must be that HEAD(PWd)MAX also outranks the anti-peak constraints *P/α. High-ranking *COMPLEX forces the simplification of complex nuclei and *P/α favors the preservation of the vocoid of higher sonority; the most harmonic peak (27b).

(27) *COMPLEX >> HEAD(PWd)MAX >> *P/α

SF: [a.de.(láj.δa)]	*COMPLEX	HEAD(PWd)MAX	*P/i	*P/a
a. [(láj.la)]	* !		*	* *
b. ☞ [(lá.la)]		j		* *
c. [(lí.la)]		a	*	*

In sum, the optimal Type-B truncated form is a MinWd that is as faithful to the main-stressed foot of SF as possible. When the main-stressed foot of SF contains branching syllable constituents, TF may not provide a correspondent for the two segments under the branching node. A selection is made according to universal principles of markedness, which favor the parsing of low-sonority segments as syllable margins and high-sonority segments as syllable peaks.

5.2 Avoidance of syllable codas

Type-B truncated forms also display a tendency to avoid closed syllables. However, this tendency is not as strong or consistent as the drive to simplify complex syllable position nodes. Some Latin American dialects tend to bar syllable codas more strictly than others do. I will first focus on the data that exhibit the effects of a stricter condition on syllable codas, and then I will extend the analysis to the data that obey a more relaxed coda condition. The examples in (28) below show that when the main-stressed foot of SF contains a syllable closed by an oral segment, TF fails to provide a correspondent for it.

(28)	[(fáws.ta)]$_{PWd}$	[(fá.ta)]$_{PWd}$	Fausta
	[(ék.tor)]$_{PWd}$	[(é.to)]$_{PWd}$	Héctor
	[um.(bér.to)]$_{PWd}$	[(bé.to)]$_{PWd}$	Humberto
	[(xór.xe)]$_{PWd}$	[(kó.ke)]$_{PWd}$	Jorge
	[r̄ o.(sál.βa)]$_{PWd}$	[(c🕮á.βa)]$_{PWd}$	Rosalba

On the basis of these data, one could argue that syllable codas are barred. The constraint NOCODA would be responsible for this effect.

(29) NOCODA: *No Syllable Codas*
(Prince and Smolensky 1993)

Syllables must not have a coda.

Like *COMPLEX, NOCODA is a markedness constraint that favors the optimal syllable shape (e.g. CV). The fact that syllable codas are omitted in TF indicates that NOCODA outranks HEAD(PWd)MAX. This ranking would account for the data in (28).

(30) NOCODA >> HEAD(PWd)MAX. >> PWR >> MAX(SF-TF)

SF: [(ék.tor)]	NOCODA	HEAD(PWd)MAX	PWR	MAX(SF-TF)
a. [(ék.tor)]	* ! *			
b. [(é.tor)]	* !	k		k
c. ☞ [(é.to)]		k r		k r

Nevertheless, as Lipski (1995) points out, it is possible for the first syllable of TF to be closed, as long as it is a nasal segment that closes it (31). The following examples are representative.

(31)	[kons.(tán.sa)]$_{PWd}$	[(táň.c🕮a)]$_{PWd}$	Constanza
	[do.(míŋ.ga)]$_{PWd}$	[(míŋ.ga)]$_{PWd}$	Dominga
	[li.(sán̪.dro)]$_{PWd}$	[(c🕮án̪.do)]$_{PWd}$	Lisandro
	[or.(tén.sja)]$_{PWd}$	[(téň.c🕮a)]$_{PWd}$	Rosalba
	[bi.(sén̪.te)]$_{PWd}$	[(c🕮én̪.te)]$_{PWd}$	Vicente

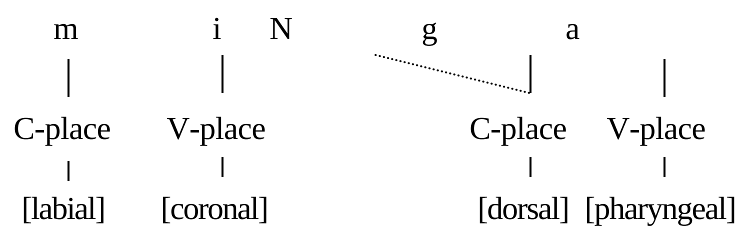
If NOCODA were the constraint being enforced in Type-B truncated forms; these data would never arise. But since they do, one must assume that codas are not categorically barred but rather conditioned. Therefore, instead of relying on NOCODA, one must resort to a constraint that tolerates certain types of codas. That is exactly the effect of CODACONDITON (Itô 1986, Prince and Smolensky 1993).

(32) CODACOND: *Condition on Syllable codas*

A coda consonant can have no place specification of its own at all.

This less strict version of NOCODA allows coda consonants as long as they are placeless. Such situation arises in Spanish whenever a nasal segment is followed by another consonant. As a consequence of assimilation, the nasal gives up its own place feature and relies on the articulation of the following consonant.[10]

(33)



This place-sharing property of nasals provides an explanation for Lipski's (1995) remark that only the first syllable of SF may be closed, and if so; the closing segment must be a nasal. By being parasitic on the place of articulation of a following consonant, a nasal is able to pass undetected by the scanning of CODACOND. However, this is only possible if the nasal is parsed by a word-internal coda because only there it is followed by another consonant to share place features with. In tableau (34) below, candidate (34c) is optimal because it is the only MinWd that is able to preserve all segments in the main-stressed foot of SF without incurring any violations of the principles of syllable markedness (e.g. CODACOND, *COMPLEX). Candidate (34a) not only runs afoul of CODACOND but it also falls in violation of PWR because in contains an unparsed syllable. Candidate (34b) violates CODACOND twice because both /r/ and /n/ are segments specified for place.[11]

(34) CODACOND >> HEAD(PWd)MAX >> PWR >> MAX(SF-TF)

SF: [ar.(míN.da)]	CODACOND	HEAD(PWd)MAX	PWR	MAX(SF-TF)
a. [a r . (m í N .d a)] pl	* !		*	
b. [(á r . m í n)] pl pl	* ! *	da		da
c. ☞ [(m í N . d a)]				ar

Note that the fact that nasals must rely on their own place of articulation when deprived of the support of a following consonant explains why not even nasals may close the second syllable of TF (34b).

The constraint CODACOND as defined in (32) above is able to account for the data considered so far. However, there is yet another set of data, not considered by Lipski (1995), that calls for a less strict version of CODACOND. Consider the following examples attested in dialects of Central America (e.g. Southern Mexico and Guatemala) as reported by Boyd-Bowman (1955).

(35)	*Source Form*	*Truncated Form*	*Gloss*
	$[a.☞us.(tín)]_{PWd}$	$[(tín)]_{PWd}$	Agustín
	$[be.a.(trís]_{PWd}$	$[(tĩš)]_{PWd}$	Beatriz
	$[en.kar.na.(sjón)]_{PWd}$	$[(c🕮ón)]_{PWd}$	Encarnación
	$[xe.(sús)]_{PWd}$	$[(c🕮us)]_{PWd}$	Jesús
	$[(lwís)]_{PWd}$	$[(lĩš)]_{PWd}$	Luis

Boyd-Bowman (1955) points out that this type of data exhibit phonological features of the local dialect. He claims that the Spanish dialects of Yucatan and Guatemala are influenced by Mayan language, which explains the presence of /š/ rather than /s/ and the tendency to drop the final vowel (p. 365). He is assuming, of course, that these truncated forms should be disyllabic and end in a vowel, given that in standard dialects, the SF's in (35) give rise to the TF's in (36).

(36)	*Source Form*	*Truncated Form*	*Gloss*
	[a.☞us.(tín)]$_{PWd}$	[(tí.no)]$_{PWd}$	Agustín
	[be.a.(trís]$_{PWd}$	[(tí.ča)]$_{PWd}$	Beatriz
	[en.kar.na.(sjón)]$_{PWd}$	[(c🕮ó.na)]$_{PWd}$	Encarnación
	[xe.(sús)]$_{PWd}$	[(c🕮u.čo)]$_{PWd}$	Jesús
	[(lwís)]$_{PWd}$	[(lí.čo)]$_{PWd}$	Luis

Whereas the TF's in (36) comply with CODACOND as defined in (32), the data in (35) violate it blatantly. For the monosyllabic TF's in (35) to arise, a more tolerant CODACONDITION needs to be posited. Central American dialects differ from standard dialects in allowing TF's to host coronal segments in coda position.

(37) R-CODACOND: *Relaxed Condition on Syllable Codas*
(Prince and Smolensky 1993)

A coda consonant can have only Coronal place or else no place specification of its own at all.

This new version of CODACOND allows TF to provide a correspondent for a coda segment as long as it bears no place feature other than coronal. In tableau (38), candidate (38b) is optimal because it is the only MinWd (note that binarity is met moraically) that is able to provide a correspondent for every single segment in the main-stressed foot of SF without running afoul of the markedness constraint CODACOND.[12]

(38) R-CODACOND >> HEAD(PWd)MAX. >> PWR >> MAX(SF-TF)

SF: [xe.(sús)][13]	R-CODACOND	HEAD(PWd)MAX	PWR	MAX(SF-TF)
a. [(čúp)	* !			
b. ☞ [(čús)]				
c. [(čú)]		s !	*	s

Furthermore, in Central American dialects, TF may be disyllabic and have its first syllable closed by a non-nasal coronal segment (e.g. [(nár.δo)]), provided that the main-stressed foot of SF is disyllabic (e.g. [(ber.(nár.δo)] Bernardo). Tableau (39) below illustrates this state of affairs. Candidate (39a) satisfies all constraints except for a fatal violation of PWR because it contains an unparsed syllable. Candidates (39b-d) comply with PWR and R-CODACOND but they are ruled out by HEAD(PWd)MAX because they fail to provide correspondents for certain segments in the main-stressed foot of SF. Note that although a monosyllabic candidate that achieves binarity at the moraic level is able to satisfy PWR (39c,d), it is not optimal because it fails to provide correspondents for some segments parsed by the head of the PWd of SF. Candidate (39e) is the only MinWd that fully maximizes the main-stressed foot of SF without violating the markedness constraint R-CODACOND.

(39) R-CODACOND >> HEAD(PWd)MAX. >> PWR >> MAX(SF-TF)

SF: [ber.(nár.δo)]	R-CODACOND	HEAD(PWd)MAX	PWR	MAX(SF-TF)
a. [ber.(nár.δo)			* !	
b. [(bér.nar)]		δ ! o		δo
c. [(bér)]		n ! arδo		narδo
d. [(nár)]		δ ! o		ber δo

e. ☞ [(nár.δo)]				ber

Finally, in Central American dialects, the second syllable of a disyllabic TF may also be closed (e.g. [(čáŋ.xe)l] Changel) if the main-stressed foot of SF is disyllabic and its second syllable is closed (e.g. [xo.(sjáŋ.xe)l] José Angel[14]). For reasons of space, I will abbreviate the syllable well-formedness constraints *COMPLEX and R-CODACOND as SYLL-WELL. In tableau (40) below, candidates (40a,b) fall in violation of SYLL-WELL because they contain a branching nucleus. Candidates (40d,e) achieve more optimal syllables than (40c), but this is at the unnecessary expense of leaving out the correspondents of certain segments in the main-stressed foot of SF. It is not necessary to leave out the correspondents of the consonants that close the two syllables of the main-stressed foot of SF because CODACOND is more relaxed in these dialects making coronal codas acceptable. Candidate (40c) is optimal because it maximizes the head of the PWd without violating SYLL-WELL since the consonants that close its two syllables are both coronal segments.

(40) R-CODACOND >> HEAD(PWd)MAX. >> PWR >> MAX(SF-TF)

SF: [xo.(sjáŋ.xe)l]	SYLL-WELL	HEAD(PWd)MAX	PWR	MAX(SF-TF)
a. [xo.(čjáŋ.xe)l]	* !		*	
b. [(čjáŋ.xe)l]	* !			xo
c. ☞ [(čáŋ.xe)l][15]		j		xo j
d. [(čá.xe)l]		j n !		xo j n
e. [(čá.xe)]		j n !		xo j n l

Summing up, Type-B hypocoristics tend to avoid syllable codas. However, the degree to which this tendency is enforced is subject to dialectal variation. Standard dialects prohibit all place features in the coda, whereas Central American dialects ease up the condition to tolerate coronal consonants. This allows the preservation of a greater number of segments among those parsed under the main-stressed foot of SF.

5.3 Lateral segments in the coda

It was argued in Section 5.2 above that coda nasals may pass undetected by CODACOND (32) because they do not have a place specification of their own since they may rely on the place of articulation of a following consonant. But given that nasals are not the only consonants that undergo place assimilation in Spanish, one would expect TF to preserve other coda segments through place sharing. In particular, the lateral [l] also acquires the place feature of a following coronal consonant. It becomes dental when preceding the dental stops /t, d/ (e.g. [(ál̪.to)] < /alto/ 'tall', [al̪.(dé.a)] < /aldea/ 'village') or alveo-palatal when it precedes the alveo-palatal affricate [č] (e.g. [koļ.(čón)] < /kolčon/ 'mattress').[16] This assimilatory behavior of laterals casts two predictions. On the one hand, /l/ is expected to lack a correspondent in TF when followed by a non-homorganic consonant. But on the other hand, it is expected to have a correspondent in TF when preceding a homorganic consonant. The TF's in (41) prove that the first prediction is borne out. These data indicate that CODACOND, as it was defined in (32), is active. It forces the deletion of /l/ whenever the lateral precedes a non-homorganic segment.

(41) [an.(sél.mo)]$_{PWd}$ [(čé.mo)]$_{PWd}$ Anselmo

[(síl.βja)]$_{PWd}$	[(čí.βa)]$_{PWd}$	Silvia
[(tél.mo)]$_{PWd}$	[(té.mo)]$_{PWd}$	Telmo
[(ól.☞a)]	[(kó.ka)]$_{PWd}$	Olga

In the corpus of data reported by Boyd-Bowman (1955), I found quite a number of Spanish names where /l/ precedes a labial consonant within the main-stressed foot. However, I could only find one example where /l/ is followed by a velar consonant in such context (e.g. [(kó.ka)] < [(ól.ga)] 'Olga'). Nonetheless, this example corroborates the claim that /l/ deletes when preceding a non-homorganic segment whether it is a labial or a velar.

(42) CODACOND >> HEAD(PWd)MAX. >> PWR >> MAX(SF-TF)

SF: [an.(sél.mo)]	CODACOND	HEAD(PWd)MAX	PWR	MAX(SF-TF)
a. [an.(čél.mo)]	* !		*	
b. [(čél.mo)]	* !			an
c. ☞ [(čé.mo)]		l		an l

Given that a non-assimilated lateral bears its own place feature, its preservation in TF is sanctioned by CODACOND, which bars all place features in the coda. This explains why candidate (42c) is preferred over (42a,b). The optimal TF must sacrifice the correspondent of a segment in the main-stressed foot in order to comply with CODACOND. This is indeed what one expects under the analysis presented in Section 5.2.

The prediction that /l/ should be preserved in TF when followed by a homorganic consonant within the main-stressed foot of SF is also borne out. However, an unexpected change in the structural role of this segment comes about. Note that although /l/ is preserved in the TF's in (43), it is no longer in coda position. Instead, it has become a syllable onset (e.g. a violation of STROLE, defined in 50 below).[17]

(43)	[gi.le.(βá l̑.do)]$_{PWd}$	[(bá.lo)]$_{PWd}$	Guilebaldo
	[gri.(sél̑.da)]$_{PWd}$	[(čé.la)]$_{PWd}$	Griselda
	[i.(mél̑.da)]$_{PWd}$	[(mé.la)]$_{PWd}$	Imelda
	[leo.(pól̑.do)]$_{PWd}$	[(pó.lo)]$_{PWd}$	Leopoldo

The most puzzling fact about these data is that /d/, a segment that is not in violation of any of the syllable well-formedness constraints, is lost whereas /l/, the segment that challenges CODACOND, is preserved. It seems clear that no principle of syllable well-formedness could be forcing the disappearance of /d/ since, unlike codas, onsets are universally not banned, but required. Taking this remark into account, one is forced to look for an explanation beyond syllable structure. My suggestion is that the cause for the disappearance of /d/ is a ban on the sequence /ld/.

(44) *LD: The sequence /ld/ is disallowed.

However, even under the assumption that the sequence /ld/ is prohibited, one would expect the offending structure to be simplified in favor of /d/ rather than /l/ since, according to the Universal Margin Hierarchy, the segment of lower sonority makes a better syllable margin. I do not have a satisfactory solution for this problem at this time.[18] But I would like to point out that in addition to the obvious deletion approach, it would not be unreasonable to argue that the /l/ that survives in TF is the correspondent of both /l/ and /d/ given that these two segments are quite similar. Such an approach would need to rely on correspondence constraints such as

UNIFORMITY (McCarthy and Prince 1995), IDENT (McCarthy and Prince 1995) and STRUCTURALROLE (McCarthy and Prince 1993a) because the two segments in SF would have a single correspondent in TF (a violation of UNIFORMITY); also, the segment in SF that serves as correspondent of both /l/ and /d/ is not featurally identical to both of them (a violation of IDENT); and the correspondent of /l/ in TF plays a different syllabic role (a violation of STRUCTUREROLE).

Despite this unexpected pattern of /ld/ sequences, the essential arguments I defend in this paper stand strong. Type-B TF's tend to preserve the final, as opposed to the initial part of SF, because the head of the PWd must be maximized. Perfect maximization of the prosodic head is possible when the main-stressed foot of SF is built on unmarked syllables. Otherwise, some of the segments within the head domain must be sacrificed in favor of syllable unmarkedness.

6. Type-B TF's from ultimately-stressed SF's

Depending on the version of CODACOND that is enforced (32 or 37); a Type-B truncated form generated from an ultimately-stressed SF may be monosyllabic or disyllabic. In Central American dialects, where R-CODACOND (37) allows TF-syllables to be closed by a coronal consonant, the MinWd requirement on TF may be met by a single heavy syllable, as it is confirmed by the following examples.

(45)	*Source Form*	*Truncated Form*	*Gloss*
	[be.a.(trís)]$_{PWd}$	[(tís)]$_{PWd}$	Beatriz
	[kon.sep.(sjón)]$_{PWd}$	[(c🕮ón)]$_{PWd}$	Concepción

[da.(njél)]$_{PWd}$	[(nél)]$_{PWd}$	Daniel
[ga.(βrjél)]$_{PWd}$	[(bél)]$_{PWd}$	Gabriel

Given that the coda consonant in TF contributes with a mora, the monosyllabic foot is able to meet binarity at the moraic level. However, coronal codas are the only type of marked syllable structure that is tolerated in TF. *COMPLEX makes sure that all branching syllable nodes in the main-stressed foot of SF are simplified in TF. The reader is reminded that SYLL-WELL subsumes both *COMPLEX and R-CODACOND.

(46) SYLL-WELL >> HEAD(PWd)MAX >> PWR >> MAX(SF-TF)

SF: [ga.(βrjél)]	SYLL-WELL	HEAD(PWd)MAX	PWR	MAX(SF-TF)
a. [ga.(βrjél)]	* ! *		*	
b. [(brjél)]	* ! *			ga
c. [(bjél)]	* !	r		ga r
d. ☞ [(bél)]		r ! j		ga rj
e. [(bé)]		r ! j l	*	ga rj l

Candidates (46a-c) run afoul of top-ranking SYLL-WELL because they contain branching syllable nodes. Candidates (23d,e) avoid all violations of SYLL-WELL by deleting the more sonorous segment of the onset cluster and the less sonorous segment of the diphthong, in compliance with the Universal Syllable Margin and Peak Hierarchies. These candidates only differ in the preservation of one segment. In this regard, it is important to highlight that there is nothing compelling the deletion of the coda segment since /l/ is compatible with R-CODACOND. The rivalry between (46d) and (46e) is settled by HEAD(PWd)MAX. By providing a correspondent for the coda segment, (46d) spares one violation of this constraint and it also manages to maintain foot binarity. According to this, for Central American dialects, the formation of Type-B TF's from ultimately-stressed SF's is quite straightforward. Here again, the head of the PWd is maximized modulo syllable markedness.

In standard dialects, where CODACOND (32) bars all place features from the coda, an interesting variation arises. The following examples show that even though the main-stressed foot of an ultimately-stressed SF is monosyllabic, its corresponding TF in standard dialects is disyllabic.

(47) Ultimately-stressed SF's:

[xo.a.(kín)]	[(kí.no)]	Joaquín
[ba.len.(tín)]	[(tí.no)]	Valentín
[xe.(sús)]	[(čú.čo)]	Jesús
[se.βas.(tján)]	[(čá.no)]	Sebastián
[i.sa.(βél)]	[(bé.la)]	Isabel
[(krús)]	[(kú.ča)]	Cruz
[i.(nés)]	[(né.ča)]	Inés
[pu.ri.fi.ka.(sjón)]	[(čó.na)]	Purificación
[moj.(sés)]	[(čé.če)]	Moisés
[be.a.(trís)]	[(bí.če)]	Beatriz

Crucially, a segment that is not present in SF appears in TF. The new segment may be /o/, /a/ or /e/, which are precisely the three most common word-markers in Spanish, and which also serve to realize the gender morpheme: *-a* 'feminine', *-o* 'masculine, *-e* 'masculine/feminine' (Harris 1985). The presence of this new element in TF indicates that the correspondence constraint DEPENDENCE is being violated.

(48) DEP(SF-TF): *Dependence on the Source Form*

(Based on McCarthy and Prince 1995)

Every element in the Truncated Form must have a correspondent in the Source Form.

Under the ranking CODACOND >> HEAD(PWd)MAX >> PWR >> DEP(SF-TF), the appearance of a new vowel in TF is forced by HEAD(PWd)MAX and PWR under pressure by CODACOND (32). Given that no syllable may be closed by a place-specified consonant, the only two options are to either let go of the coda segment or parse it with a different syllabic role. The first alternative has disastrous consequences. It would not only run afoul of HEAD(PWd)MAX but it would also be penalized by PWR since a unary foot would arise (49c). The second alternative, on the other hand, makes it possible for TF to abide by CODACOND and maximize the head of the PWd without challenging PWR (49b). This entails the addition of a new segment to act as the nucleus of a new syllable, which serves to provide a structural position to transfer the offending segment from the coda to the onset. Given that DEP(SF-TF) is bottom ranking, the addition of this new segment is affordable. Note that in standard dialects, CODACOND immediately dismisses the candidate that remains identical to the main-stressed foot (49a), because it contains a place-specified consonant in the coda.

(49) CODACOND >> HEAD(PWd)MAX >> PWR >>DEP(SF-TF)

SF:	[xo.a.(kín)]	CODACOND	HEAD(PWd)MAX	PWR	DEP(SF-TF)
a.	[(kín)]	* !			
b. ☞	[(kí.no]				o
c.	[(kí)]		n !	*	

This strategy of preserving a coda segment at the expense of parsing it with a different syllabic role is also sanctioned by the correspondence constraint STROLE.

(50) STROLE: *Structural Role* (McCarthy and Prince 1993a)
Correspondent elements play identical syllabic roles.

Furthermore, the preservation of the coda segment with a different syllabic role also works to the detriment of ANCHOR(SF-TF)R (16). According to these remarks, the markedness constraint CODACOND outranks the correspondence constraints STROLE and ANCHOR(SF-TF)R.

(51) CODACOND >> STROLE, ANCHOR(SF-TF)R

SF:		[i.sa.(βél)]	CODACOND	STROLE	ANCHOR(SF-TF)R
a.		[(bél)]	* !		
b.	☞	[(bé.la)]		*	*

Under this analysis, the epenthetic vowel, which yields a new syllable in TF, serves to simplify the marked syllable structure contained in the main-stressed foot of SF. Its presence in TF is motivated by the need to generate a structural position to transfer the undesired coda consonant (51b).[19]

Finally, when the main-stressed foot of SF contains a single open syllable (e.g. [(čé.o)] < [xo.(sé)] José), the epenthetic vowel also appears in TF but for different reasons. In this case, perfect maximization of the prosodic head is not enough to meet foot binary. To complete a binary foot, TF must insert a segment that contributes with weight. This segment could be a consonant or a vowel. If a consonant is added, TF would be equivalent to a MinWd but it would contain a syllable coda that runs afoul of CODACOND (52c). A more harmonic solution is achieved if a vowel is added instead. Although the new syllable lacks an onset, neither of the active SYLL-WELL constraints (e.g. *COMPLEX or CODACOND) is challenged (52b).

(52) SYLL-WELL >> HEAD(PWd)MAX >> PWR >>DEP(SF-TF)

SF: [xo.(sé)]	CODACOND	HEAD(PWd)MAX	PWR	DEP(SF-TF)
a. [(cé)]			* !	
b. ☞ [(čé.o)]				o
c. [(čél)	* !			l

In conclusion, Type-B TF's originated from ultimately-stressed SF's also corroborate the claim that the head of the PWd determines the domain of truncation. If the prosodic head may not always be totally maximized it is because it contains marked syllable structure.

7. Type-B TF's with left-anchoring

Lipski (1995) groups together the examples presented in (53) below. This subset of data has the peculiarity that the word-initial segment wins over the foot-initial one.

(53) TF's with Left-Anchoring:

[ful.(xen.sjo)]	[(fén.čo)]	Fulgencio
[fe.δe.(rí.ko)]	[(fí.ko)]	Federiko
[flo.(rín.da)]	[(fín.da)]	Florinda
[xe.(rár.δo)]	[(xá.δo)]	Gerardo
[ma.(rí.na)]	[(mí.na)]	Marina
[r̄o.(δrí.☞o)]	[(r̄í.☞o)]	Rodrigo

I propose to analyze these data as a case where ANCHOR(SF-TF)L is active as well.

(54) ANCHOR(SF-TF)L: *Anchor the left edge of the Source Form*
(Based on McCarthy and Prince 1995)

Any element at the left periphery of the Source Form has a correspondent at the left periphery of the Truncated Form.

Since the segment sitting at the left periphery of SF takes priority over the one sitting at the left periphery of the main-stressed foot, ANCHOR(SF-TF)L must dominate HEAD(PWd)MAX.

(55) ANCHOR(SF-TF)L >> HEAD(PWd)MAX

SF: [ful.(xén.sjo)]	ANCHOR(SF-TF)L	HEAD(PWd)MAX
a. [(xén.čo)]	* !	
b. ☞ [(fén.čo)]		x

Without major complication, this constraint-based analysis is able to account for all Type-B truncated forms regardless of the stress pattern of SF. The main insight is that most of the material preserved in TF comes from the head of the PWd. The fact that some segments in the prosodic head are not preserved and that sometimes, certain segments outside the prosodic head are preserved, follow from the interaction of the active constraints.

8. Comparison with a serial account

In order to account for Type-B TF's, Lipski (1995) relies on the derivational procedures of Prosodic Circumscription and Template Mapping. In the application of prosodic circumscription, a parsing function Φ delimits the prosodic constituent C within the base B at one of its edges E: Φ(B, C, E) (McCarthy and Prince 1990, 1993a, 1995). In Lipski's (1955) account, the parsing function Φ is first set to delimit the rightmost foot of the word. That is, Φ(Word, Foot, Right). Consider the derivation of *Chando* from *Lisandro*.

(56) a. First application of prosodic circumscription:

Parsing Function: Φ(Word, Foot, Right)
Base: [li.(sán.dro)]
(B = B/Φ * B:Φ) = (B = * <sán.dro>)

b. Residue deletion:

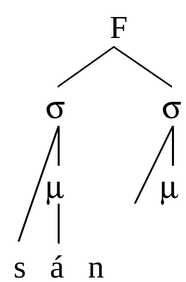
DEL/Φ([li.(sán.dro)]) = ∅ * <sán.dro>

c. Second application of prosodic circumscription:

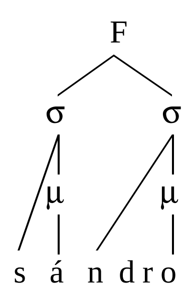
Parsing Function: Φ(Foot, Syllable, Left)
Base: (sán.dro)

(B = B:Φ * B/Φ) = (B = <sán> * <dro>)

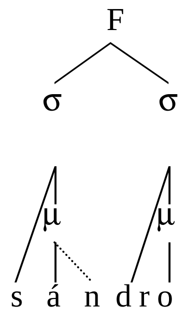
d. First application of template mapping:



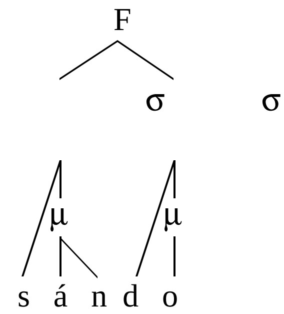
e. Second application of template mapping:



f. Coda adjunction:



g. Stray erasure:



h. Low-level phonetic rule:

/s/ → [č] sando → čándo

When the function Φ applies, it divides B into the kernel B:Φ = <sán.dro> and the residue B/Φ = (56a). A morphological operation called DEL(elition) is then used to dispose of the residue (56b). Once the residue is deleted, the remaining foot is submitted to a second application of prosodic circumscription. This time, the parsing function is defined as Φ(Foot, Syllable, Left). The syllable sitting at the left edge of the extracted foot is circumscribed as a new kernel. When Φ applies to <sán.dro>, it separates the kernel B:Φ = <sán> from the residue B/Φ = <dro> (56c). This second application of prosodic circumscription is necessary because mapping must take place syllable by syllable. Only so is it possible to avoid that coda segments get mapped onto the template. Also, note that after this second application of prosodic circumscription, the morphological operation DEL must not apply to the residue because both syllables are necessary to satisfy the template. A syllabic trochee whose syllable nodes are pre-specified to dominate a single mora and a single prenuclear segment forms the template. A mapping function M maps the kernel B:Φ = <sán> onto the first syllable of the trochee in a template-driven edge-inward fashion. This means that the two positions dominated by the first syllable node of the template must be filled in with the leftmost consonant and the rightmost vocoid of the kernel melody (56d). It is crucial that stray erasure does not apply right after the first mapping. Otherwise, the nasal segment would be lost. On the second application of template mapping (56e), the nasal consonant is parsed as the onset of the second syllable. Through the template-specific rule of Coda Adjunction, the nasal is transferred from the onset of the second syllable to the coda of the first syllable (56f). Stray Erase is then allowed to apply to clean up the representation of all unassociated material (56g). Finally, a low-level phonetic rule changes /s/ into /č/.

This serial approach is successful in deriving the attested forms. Nevertheless, the analysis has several shortcomings. For instance, it resorts to a type of prosodic circumscription that does not respect prosodic constituency at all times. When SF is penultimately-stressed, the first and second applications of prosodic circumscription extract a foot and a syllable, respectively. Since these are prosodic constituents, Prosodic Morphology Theory is observed. A different situation arises when the source form of the hypocoristic is antepenultimately-stressed.[20] The serial approach uses prosodic circumscription to extract the three rightmost syllables of the source form because they are all necessary to generate the right TF. Nevertheless, these syllables do not form a prosodic constituent. As an illustration, consider the case of SF *Aristóbulo* whose prosodic structure is [a.ris.(tó.βu).lo]. If a prosodic constituent is to be extracted, then it must be the foot (tó.βu) and not the sequence <(tó.βu).lo> because the latter is not a prosodic unit. Under strict observance of Prosodic Morphology Theory, the serial approach is unable to derive the correct TF's for ante-penultimately-stressed SF's. This rule-based analysis works at the expense of overlooking prosodic constituency, which I have proved is an essential factor in the generation of Type-B truncated forms. It also requires unnecessary complications reflected by the many applications of prosodic circumscription and template mapping, not to mention the need to stipulate at what point of the derivation stray erasure should apply or not apply so that the correct results may be obtained. Another stipulation made by the serial approach concerns the hypocoristic template. If the template may be altered by adding an extra association line to accommodate a nasal consonant (56f), there is no reason why other association lines should not be added to preserve other segments. There is no evidence in support of the claim that a nasal consonant that is parsed as an onset is later on transferred to a preceding coda. Such proposal is ingenious and serves the purpose of creating a temporary shelter for a nasal segment that is necessary to generate the correct form. However, it has no phonological reality.

In contrast, the constraint-based analysis I propose does not run into these problems. First of all, there is no such thing as a hypocoristic template that is stipulated to have a certain number of nodes and whose association lines may be conveniently manipulated. The shape of TF is the result of universal prosodic constraints that favor the MinWd as an optimal prosodic configuration (McCarthy and Prince 1993b, Benua 1995). Furthermore, given that this configuration arises from constraint interaction, the MinWd may take a different form depending on whether the PWd-Restrictor constraints interact with a constraint that tolerates certain place-specified codas (e.g. R-CODACOND) or with a constraint that bars all place-specified codas (e.g. CODACOND). In the first case, the MinWd does not necessarily have to be disyllabic since binarity may be met at the moraic level. The serial approach, however, would need to posit not one but two templates in order to cover the data attested in Central American dialects, and even so, it misses the point that the motivation for truncation is to achieve prosodic unmarkedness.

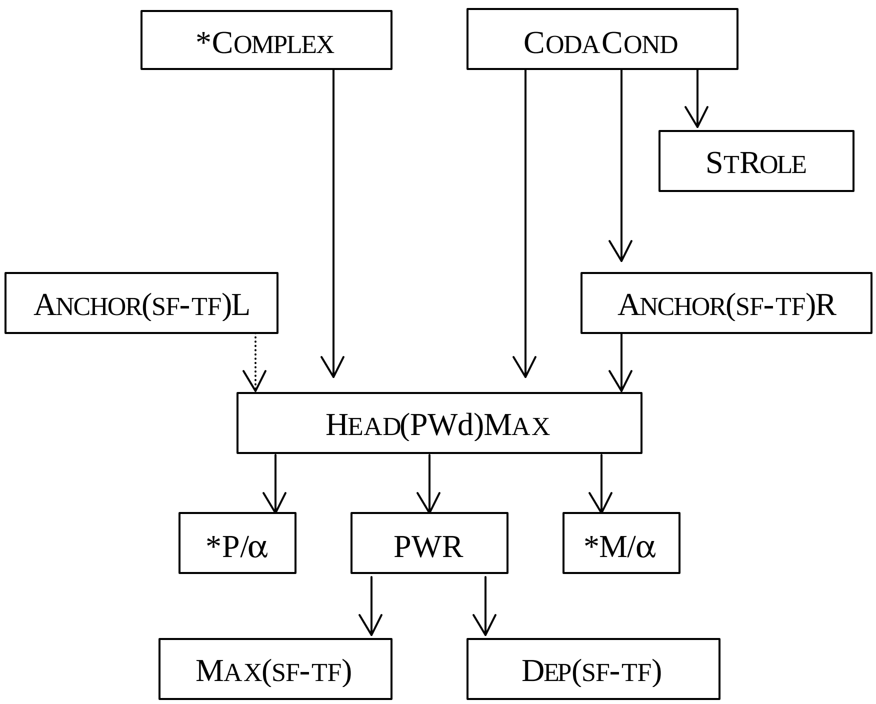
Clearly, the constraint-based account has greater explanatory power than the rule-based account. For instance, rather than relying on successive applications of prosodic circumscription and template mapping in order to get rid of those segments that are not preserved in TF, the constraint-based analysis relies on universal principles of markedness that have been independently motivated. Complicated applications of edge-inward template mapping do not explain why complex onsets and nuclei should be simplified in TF. In the constraint-based analysis, on the other hand, universal markedness constraints such as *COMPLEX serve to capture the fact that branching nodes are structurally costly for containing an abundant number of marks. When markedness constraints are enforced, marked structures must be simplified. However, this does not happen arbitrarily. It does not depend on how many association lines are drawn on a template. This is a phonological process that obeys universal principles of sonority formalized as the Universal Margin and Peak Hierarchies (Prince and Smolensky 1993).

The constraint-based analysis I propose not only accounts for the data; it also explains them. It highlights the role played by prosodic heads and respects the actual boundaries of these prosodic domains. This analysis is successful because it is couched within a theory that does not require perfect satisfaction of constraints. Rather, minimal violation is tolerated. So, when TF preserves segments that do not belong to the head of the PWd, it is not necessary to alter the boundaries of the main-stressed foot or to add another step in the derivation, like the serial account does. Simply, the preservation of non-head elements may be required by other constraints that take priority over prosodic-head maximization (e.g. ANCHOR(SF-TF)R/L).

4.3 Summary and conclusions

Spanish truncated forms arise as an effect of universal prosodic constraints that reduce the PWd to a MinWd. When the prosodic constraints FT-BIN, PARSE-SYLL and ALL-FT dominate MAX(SF-TF), the PWd may contain no more and no less than a single binary foot. Consequently, if the source form (SF) contains more segmental material than can be fit into the MinWd, the new output is a truncated form (TF) that may not be identical to SF. In Type-B truncated forms, the segments that are preserved in TF are mostly the correspondents of those segments parsed under the main-stressed foot of SF. This is because the prosodic constraint HEAD(PWd)MAX outranks the PWd-Restrictor constraints favoring the preservation of the portion of SF that is prosodically more prominent. However, not all of the segments parsed under the main-stressed foot of SF may be preserved in TF because the markedness constraints *COMPLEX and CODACOND outrank HEAD(PWd)MAX. This constraint ranking causes the simplification of branching syllable nodes and the avoidance of coda consonants, which is done respecting the Universal Syllable Peak and Margin Hierarchies. ANCHORing also plays an important role in the formation of Type-B truncated forms. By virtue of dominating HEAD(PWd)MAX, ANCHOR(SF-TF)R is able to force the preservation of the word-final segment over the foot-final one, when they are not the same element. On the other hand, when ANCHOR(SF-TF)L outranks HEAD(PWd)MAX, it favors the preservation of the word-initial segment over the foot-initial one. Type-B truncated forms are a typical case of Emergence of the Unmarked, where marked structures that are allowed to emerge elsewhere in the language, are avoided in a particular domain of the language that favors unmarked structures, both prosodically and segmentally. The following chart illustrates the dominance relations that hold among the active constraints. (The dotted line indicates that the dominance relationship is optional)

(57) Type-B-TF's constraint ranking

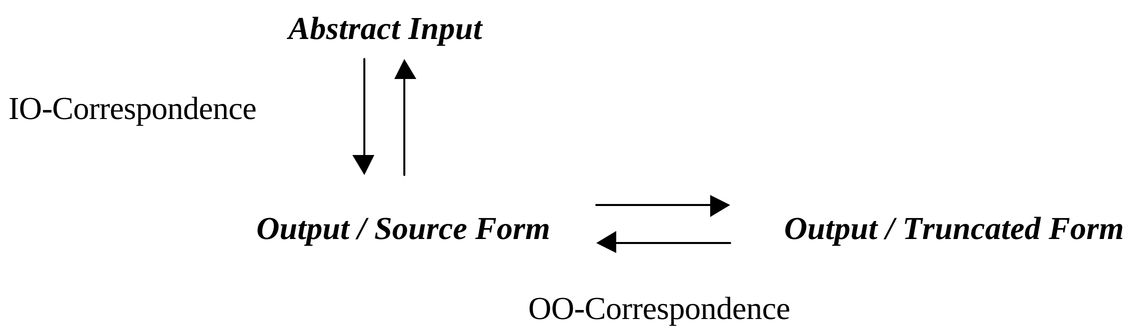


To conclude, I want to stress that Spanish Type-B truncated forms constitute robust empirical evidence for two important proposals in current Phonological Theory. First, this process provides additional support for prosodic-head correspondence constraints. The proposal of Alderete (1995) introduces HEAD-DEPENDENCE to capture the fact that prosodic heads are dependent on the input. Type-B truncated forms exemplify the exact counterpart of

HEAD-DEPENDENCE. HEAD-MAXIMIZATION captures the fact that the elements within a prosodic head are required to appear in the output. Through HEAD-MAXIMIZATION, a prosodic head may circumscribe the domain of a morphological process.

Second, Type-B truncated forms represent an unquestionable case of output-to-output correspondence (McCarthy and Prince 1995, Benua 1995, Kenstowicz 1994). The input for truncation must be a derived output form that is endowed with prosodic structure because this process specifically refers to prosodic constituents in the source form. This supports the truncation model proposed by Benua (1995).

(58) Truncation Model (Based on Benua 1995)



However, unlike Benua, the type of evidence I provide is not of the allophonic type, which has been questioned (Hale, Kissock and Reiss 1997), but the more compelling prosodic structure of the source form. Since foot structure is a derived property that may not be present in an abstract input form, and Type-B truncated forms depend on the prosodic structure of the source form; the input for truncation must be a derived output form.

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Notes

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[*] To appear in Probus. I am very grateful to the three anonymous reviewers whose valuable comments helped me improve this paper. All remaining errors are mine.

[1] For various analyses of Type-A truncated forms see Prieto (1992), Colina (1996) and chapter 4 of Piñeros (1998).

[2] Some sound substitutions also take place (e.g. [s] → [c🕮], [f] → [p], [x] → [k], [r] → [l], etc.) but I will not deal with them here since I am focusing on the prosodic principles that govern the formation of this type of truncated forms. For an in-depth discussion of these segmental issues the reader is referred to Piñeros (1999) and Chapter 4 of Piñeros (1998).

[3] I am assuming after Dunlap (1991), Rosenthall (1994) and Alderete (1995) that the Spanish lexicon is divided in two types of words. I follow Rosenthall (1994) in the assumption that the stress pattern of Type-A words results from the ranking ALIGN >> NONFINALITY, which forces the main-stressed foot to be word final (e.g. [a.sun.(sjón)] 'Asunción'; [max.ða.(lé.na)] 'Magdalena'), whereas Type-B words obey the ranking NONFINALITY >> ALIGN, which keeps the main-stressed foot from parsing the rightmost mora of the word. The latter ranking creates the effect of extrametricality (e.g. [(áŋ.xe)l] 'Angel'; [(lá.sa).ro] 'Lázaro'). However, I disagree with Rosenthall (1994) with respect to the ranking of the constraint FOOT-FORM. I assume that this constraint is dominated in both Type-A and Type-B words given that Spanish builds trochees on HL sequences (e.g. [bi.(sén.te)] 'Vicente'; [(trán.si).to] 'Tránsito'). The specific FOOT-FORM constraint that is violated in these marked trochees is RHYTHMICHARMONY (Prince and Smolensky 1993), whose violations are justified by the need to achieve optimal alignment since ALIGN outranks FOOT-FORM in both Type-A and Type-B words.

Type-A words: ALIGN >> NONFINALITY >> FOOT-FORM

SF: /maxdalena/	ALIGN	NONFINALITY	FOOT-FORM
a. ☞ [max.ða.(lé.na)]		* !	
b. [max.(ðá.le).na]	* !		
SF: /asunsion/			
a. ☞ [a.sun.(sjón)]		*	
b. [a.(sún).sjón]	* !		
c. [[a.(sún.sjon)]		*	* !

SF: /bisente/	ALIGN	NONFINALITY	FOOT-FORM
a. ☞ [bi.(sén.te)]		*	*

b. [bi.(sén).te]	* !		

Type-B words: NONFINALITY >> ALIGN >> FOOT-FORM

SF: /lasaro/	NONFINALITY	ALIGN	FOOT-FORM
a. [la.(sá.ro)]	* !		
b. ☞ [(lá.sa).ro]		*	
SF: /anxel/			
a. [(áŋ.xel)]	* !		*
b. ☞ [(áŋ.xe)l]		*	
c. [(aŋ.(xél)]	* !		
SF: /transito/			
a. [tran.(sí.to)]	* !		
b. ☞ [(trán.si).to]		*	*
c. [(trán).si.to]		* * !	

4 There are actually two versions of ALL-FT. ALL-FT-R requires every foot to be word final, whereas ALL-FT-L demands that every foot be word initial. Given that Spanish feet tend be as close to the right edge of the word as possible (e.g. [kan.de.(lá.βro)] 'chandelier'), I assume that ALL-FT-R is the version of ALL-FT that is active in Spanish.

5 Note that since Type-B truncated forms tend to have a CV.CV shape, FT-BIN may not be satisfied by a single syllable. As we will see below, the avoidance of marked syllables is forced by syllable well-formedness constraints such as *COMPLEX and CODACONDITION, which conspire to bar heavy syllables. However, some Latin-American dialects have a more relaxed CODACONDITION, which allows syllables to be closed by certain consonants. In such dialects, TF may consist of a foot built on a single heavy syllable (e.g. [(čús)] < [xe.(sús)] 'Jesus'; [(néš)] < [i.(nés)] 'Ines' in Southern Mexico and Guatemala, as reported by Boyd-Bowman, 1955).

6 This ranking is not only valid for Type-B but also for Type-A truncated forms. Piñeros (1998) shows that one of the main differences between these two truncation processes is that whereas Type-A truncated forms are governed by left-anchoring, Type-B truncated forms obey prosodic-head maximization. In both cases, however, TF is equivalent to a left-headed disyllabic foot, which follows from the ranking established above.

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7 In Section 5 below, I take up the task of explaining why certain segments parsed under the main-stressed foot of SF lack a correspondent in TF.

8 However, a careful examination of the data reported by Boyd-Bowman (1955) reveals that for certain dialects, nasals are not the only consonants that may close the first syllable of TF (e.g. [(nár.ðo)] < [ber.(nár.ðo)] 'Bernardo' attested in Mexico). In fact, even the second syllable of the hypocoristic may be closed in some dialects (e.g. [(čáŋ.xel)] < [xo.(sjáŋ.xel)] 'José Angel' attested in Guatemala). In order to cover this kind of data, in section 5.2 below, I propose to account for the CV/CVC contrast through a CODACONDITION that may be stricter in some dialects than in others.

9 The obvious palatalization exhibited by this example suggests that the SF-segment /j/ is not actually deleted. Rather, the segment /č/ in TF acts as correspondent for both /s/ and /j/ (e.g. a violation of UNIFORMITY, McCarthy and Prince 1995). According to this, candidate (23e) does not actually incur four but only three violations of MAX(SF-TF). For an in-depth discussion of these segmental issues see Piñeros (1998, 1999).

10 Place assimilation also affects the lateral /l/ when preceding another [coronal] consonant. /l/ becomes dental when preceding the dental stops /t, d/ (e.g. [(ál̪.to)] < /alto/ 'tall', [al̪.(dé.a)] < /aldea/ 'village') or palatal when it precedes the alveo-palatal affricate [č] (e.g. [kol̦.(čón)] < /kolčon/ 'mattress'). According to this, one would expect /l/ to be preserved in TF just like nasals do through place sharing. This is indeed the case. But given that there is an additional complication, I reserve this discussion for section 5.2.

11 I use *pl* to signal the presence of place features in the coda.

12 It is not possible to provide any examples where a non-coronal coda segment deletes in this context because there are no Spanish names ending in a non-coronal consonant. Latin American dialects only allow the coronal segments /s, ð, n, l, r/ word-finally.

13 In Mexican Spanish, where both [(čús)] and [(čú.čo)] have been attested, an alternative TF for SF [xe.(sús)] 'Jesus' is [(čúj)]. The latter runs afoul of *COMPLEX, because it contains a branching syllable nucleus, and it also violates DEP(SF-TF), because it introduces a segment that is not present in SF. Given that these two types of violations are not consistently found in the rest of the data, I tend to believe that [(čúj)] originates from an alternative truncation process.

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14 This example is particularly revealing of the fact that the input for truncation must be a derived output form. Note that even if feet were assumed to be present underlyingly (e.g. /xo(sé)/ 'José', /(ánxe)l/ 'Angel'), the right truncated form for *José Angel* could still not be derived. In contrast, under the assumption that the input for truncation is the attested output form [xo.(sjáŋ.xe)l] 'José Angel', the truncated form [(čáŋ.xe)l] is a straightforward case of head-maximization. Note that although the final consonant is outside the domain of the main-stressed foot, its preservation in TF is guaranteed by ANCHOR(SF-TF)R.

15 [(čán.xe)l] is another clear case of palatalization through fusion. In other words, the segment /č/ in TF acts as correspondent for both /s/ and /j/ in SF (e.g. a violation of UNIFORMITY, McCarthy and Prince 1995). From this viewpoint, [(čán.xe)l] actually does not incur any violations of HEAD(PWd)MAX.

16 Place sharing has been proposed to account for the spirantization anomaly involving the sequence /ld/ (Harris 1984). The voiced stops /b, g/ spirantize when they follow /l/ (e.g. [kál.βo] < /kalbo/ 'bald', [sál.ɣo] < /salgo/ 'I leave'), whereas /d/ remains unchanged in the same context (e.g. [(fál̪.da)] < /falda/ 'skirt'). Following Steriade (1982), Harris (1984) redefines Guerssel's (1978) Adjacency Identity Constraint in autosegmental terms. He proposes a universal convention that I paraphrase as follows. Given a phonological representation REP where *x* and *y* are segments linked at some autosegmental tier, a process P may only affect *x* or *y* if both *x* and *y* satisfy the structural description of P. This convention would preclude the spirantization of /d/ when preceded by /l/ given that /l/ is not a voiced obstruent and spirantization only applies to voiced obstruents. Furthermore, even though /d/ is a voiced obstruent, spirantization would not apply to /d/ alone because /d/ is linked to /l/ at the place node.

Within a constraint-based framework, Kirchner (1998) proposes to account for lenition (spirantization being a type of lenition) through the interaction of two constraint families: FAITHFULNESS vs. LAZINESS. Within this effort-based approach, LAZY is the constraint that sanctions articulatory effort, whereas IDENT(F) is the faithfulness constraint that requires featural identity between correspondent elements. Spirantization arises as an effect of the ranking LAZY >> IDENT(continuant). To the best of my knowledge, no proposal has been made yet within these lines in order to account for the spirantization anomaly involving the sequence /ld/ in Spanish. Since this issue falls beyond the scope of this paper, I leave it for future research.

[17] I was unable to find any examples of Spanish names where /l/ is followed by /č/, which could further support the claim that place sharing enables /l/ to pass undetected by CODACOND.

[18] An ad hoc solution to this problem is presented in Chapter 4 of Piñeros (1998) where it is assumed that two parsing constraints (e.g. PARSE-l and PARSE-d) interact with *LD in the ranking PARSE-l >> *LD >> PARSE-d to produce the right results. This ranking is able to force the preservation of /l/ over /d/ under a ban on the sequence /ld/. Nevertheless, this approach lacks explanatory power.

[19] As suggested by an anonymous reviewer, the features of the epenthetic vowel may be determined through the percolation of morphological information that associate /a/ with the feminine morpheme, /o/ with the masculine morpheme, and /e/ with either of them.

[20] I am assuming after Rosenthall (1994) that antepenultimate stress in Spanish results from compliance with the constraint NONFINALITY, which yields a dactyl at the right margin of the word by forcing the main-stressed foot to shift back one syllable: $[\ \ldots\ (\acute{\sigma}\sigma)\sigma]_{PWd}$.