AN OPTIMALITY THEORETIC ACCOUNT OF SPANISH PRIMARY NOMINAL STRESS[1]

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1. INTRODUCTION

The purpose of this paper is attempt an optimality theoretic (OT) account of Spanish nominal stress. Under the current proposal, nominals can be divided among a set of unmarked Class A words (i.e. *sabána, finál*) and a marked set of Class B words (i.e. *sábana, árbol*). This analysis proposes that Class A vs. Class B words can be differentiated based on the RH-TYPETROCHAIC and RH-TYPEIAMBIC constraints; in a Class A hierarchy, RH-TYPEIAMBIC >> RH-TYPETROCHAIC while for Class B words the constraints are reversed. Although the majority of nominals in Spanish can be accounted for by two similar hierarchies, word-final stressed nominals (i.e. *Perú*) and certain proparoxytones (i.e. *náufrago*) cannot be addressed under the current OT proposal without positing some form of lexical stress.

Section 2 provides an overview of Spanish nominal stress patterns as described by Harris (1983). Section 3 begins with the optimality theoretic constraints used in this analysis and proceeds with an OT account of Class A and Class B nominals. Section 4 discusses the current proposal and the restrictions it imposes on illegitimate surface forms. This investigation is summarized in Section 5.

2. BACKGROUND

Harris (1983) provides detailed observations of Spanish stress patterns. In effect, the following generalizations are made of Spanish nominals:

(i) Primary stress falls on one of the last three syllables of a word (*mé.tri.co, pri.ma.vé.ra, fa.cul.tád*)

(ii) Antepenultimate primary stress is ill-formed in the context of a heavy penult (e.g. a penult with a branching rhyme). For example, **te.lé.fos.no*; however, proparoxytones may have a branching final rhyme as in *Ál.va.rez*.

According to (i), a hypothetical word such as *atapama* may realize stress on *a.tá.pa.ma, a.ta.pá.ma*, or *a.ta.pa.má*. The observation in (ii) explains why native speakers do not accept the well-formedness of penultimate stress in **a.tá.pai.ma*; however, antepenultimate stress may include a branching rhyme in the final syllable as shown by such words as *espécimen*. In addition to (ii), word-final glides require stress (*maméy* but **mámey*). Concerning markedness, the majority of vowel-final Spanish nominals realize stress on the penult.[2] Hence, when a word is vowel-final, the word will most likely manifest penultimate stress (*mésa, zapáto, líbro*); however, in consonant-final words, final syllable stress is more common (*finál, habladór, interés*). Harris (1983; 68) uses the observation in (ii) to support the claim that a trill is underlyingly a series of two taps. Hence, native speakers judge the nonce word *víborra* to be ill-formed and Harris attributes its illegitimacy due to its branching penult.

In order to account for these observations, Harris (1983) posits left-branching foot trees (of the type *sw*), extrametricality, Stray Rhyme Adjunction, and an important distinction between the derivational word and terminal elements (i.e. the *o/a* gender markers on nouns). Prior to Harris (1983), several generative approaches describe Spanish stress (Hooper and Terrell, 1976; Foley, 1977). Since Harris (1983), there have been many other attempts to account for Spanish nominal stress including Harris (1995). Roca (1988) proposes an unbounded system of stress

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[2] To my knowledge, there has been no published work on the exact number of vowel-final lexical words that maintain penultimate stress given a large corpus; however, Whitley (1976) lists quite a few.

in which stress is assigned to the stem-final stress bearer; however, Roca (1997) revises his approach to include the interaction of three separate stress rules alongside lexical exception marking. Lipski (1997) argues for one to three moraic feet, extrametricality, and two different stress parameters that are lexically set. In each analysis, lexical marking, extrametricality, and quantity sensitivity all come into play.

3.   OT AND SPANISH NOMINALS

Section 3.1 addresses the necessary optimality theoretic constraints that attempt to account for Spanish nominals of Class A and Class B. Section 3.2 provides tableaus of Class A nominals while Section 3.3 analyzes Class B nominals under a different constraint ranking. Section 3.4 identifies the difficulties of the current analysis for word-final stress and proparoxytones with a heavy antepenult.

3.1 Constraints

In accordance with Kager (1999) and Pater (2000), the OT analysis in this paper incorporates constraints that have already been proposed in the literature. Therefore, it is not the goal of this paper to justify the constraints for universality; however, it should be noted that this analysis does not invent any novel constraints to merely account for the data.[3] The six constraints are as follows in order to account for Spanish nominals:

(1) GRWD = PRWD: GRAMMATICAL WORD MUST BE A PROSODIC WORD
(2) MNONFINALITY: MORAIC NON-FINALITY. NO PROSODIC HEAD IS FINAL IN PROSODIC WORD[4]
(3) FTBIN: FEET ARE BINARY ON THE MORAIC LEVEL
(4) ALIGNHEAD - R: THE HEAD FOOT IS RIGHTMOST IN PROSODIC WORD
(5) RH-TYPEIAMBIC: FEET HAVE FINAL PROMINENCE
(6) RH-TYPETROCHAIC: FEET HAVE INITIAL PROMINENCE

In order to successfully discriminate between pairs as *sábana* vs. *sabána*, Spanish nominals can be divided between two classes. Class A words reflect the majority of Spanish words in which RH-TYPEIAMBIC >> RH-TYPETROCHAIC. In contrast, Class B words require a different constraint ordering in which RH-TYPETROCHAIC >> RH-TYPEIAMBIC.[5]

3.2 Class A words

In order to correctly realize the Class A surface forms (i.e. *sa.bá.na*), constraints (1) – (6) are proposed such that (1) >> (2) >> (3) (4) (5) >> (6). Hence, this section justifies the following constraint ranking for Class A nominals:[6]

(7) GRWD = PRWD >> MNONFINALITY >> FTBIN , ALIGNHEAD - R , RH-TYPEIAMBIC >> RH-TYPETROCHAIC

It is clear that GRWD = PRWD >> MNONFINALITY when given a single syllable word with stress, such as *fé* in Table 1. Hence monosyllabic words can be accounted for under Class A nominals. In the case of *fé*, if extrametricality were given precedence over stress, then *fé* would be realized without stress. It is of no consequence that FTBIN is also violated for the winning candidate because there are no other optimal candidates.

Table 1

/fe/ - *faith**faith*_A	GRWD = PRWD	MNON FINALITY	FTBIN	ALIGNHEAD - R	RH-TYPE IAMBIC	RH-TYPE TROCHAIC
☞ [(fé)]		*	*			
*[<fe>]	*!		*			

Disyllabic words with two light syllables and stress on the penult support the hierarchy of MNONFINALITY >> FTBIN. For example, the token *ka.sa* is realized in Table 2.[7]

Table 2

/kasa/ - *house*_A	GRWD = PRWD	MNON FINALITY	FTBIN	ALIGNHEAD - R	RH-TYPE IAMBIC	RH-TYPE TROCHAIC
☞ [(ká).<sa>]			*			
*[(ka.sá)]		*!				
*[(ká).sa]		*!		*		
*[(ká.sa)]		*!				

Tables 3-7 demonstrate that FTBIN , ALIGNHEAD - R , and RH-TYPEIAMBIC are all of equal rank. In all five instances, the winning candidate does not violate any of these three constraints.

Table 3

/primabera/ - *Spring*_A	GRWD = PRWD	MNON FINALITY	FTBIN	ALIGNHEAD - R	RH-TYPE IAMBIC	RH-TYPE TROCHAIC
☞ [pri.(ma.bé).<ra>]						*
*[pri.(má.be).<ra>]					*!	
* [(pri.má).be.<ra>]				*!		
*[(pri.ma.bé).<ra>]			*!			

Table 4

/calentamiento/ - *warming*_A	GRWD = PRWD	MNON FINALITY	FTBIN	ALIGNHEAD - R	RH-TYPE IAMBIC	RH-TYPE TROCHAIC
☞ [ka.(len).ta.(myén).<to>]						*
* [ka.(lén).ta.(myen).<to>]				*!		
* [ka.(len.tá).(myen).<to>]			*!			

Table 5

/rason/ - *reason*_A	GRWD = PRWD	MNON FINALITY	FTBIN	ALIGNHEAD - R	RH-TYPE IAMBIC	RH-TYPE TROCHAIC
☞ [(ra.só)<n>]						
*[(rá.so)<n>]						
*[ra.(só)<n>]			*!			
*[ra.(són)]		*!				

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[7] Another possibility is that disyllabic words with penultimate stress are Class B words because only GRWD = PRWD and MNONFINALITY determine the outcome; however, for the sake of simplicity, words such as *casa* and *libro* are analyzed as Class A words.

Table 6

/syudad/ - *city*$_A$	GRWD = PRWD	MNON FINALITY	FTBIN	ALIGNHEAD - R	RH-TYPE IAMBIC	RH-TYPE TROCHAIC
☞ [sy(u.dá)<d>]						*
*[(syú.da)<d>]				*!		
*[syu.(dád)]		*!				

Table 7

/salamanka/ - *Salamanca*$_A$	GRWD = PRWD	MNON FINALITY	FTBIN	ALIGNHEAD - R	RH-TYPE IAMBIC	RH-TYPE TROCHAIC
☞ [(sa.la).(mán).<ka>]						
*[(sa.lá).(man).<ka>]				*!		
*[sa.(la.mán).<ka>]			*!			

Tables 3-6 support the hierarchy in which RH-TYPEIAMBIC >> RH-TYPETROCHAIC; the iambic foot type over the trochaic foot reflects the primary difference between Class A and B nominals. Hence we find *rasón* and *primavéra* instead of **ráson* and **primávera*.

In Table 6, *ciudad* may require an underlying glide instead of a vowel, in order to avoid a tri-moraic foot. Although Harris (1983) provides strong evidence that GV and VG are heavy, in Harris (1995; 881) he posits *láudano* to be underlyingly *láw.da.no* in which the *w* is not moraic. A second possibility in line with Harris (1992; referenced by Lipski, 1997) is that FTBIN may have to allow bimoraic or monomoraic syllables as heads of a disyllabic foot (i.e. then [(syú.da)<d>] would be the winning candidate).

In summary, the current Class A ranking includes the following nominals: monosyllabic (*fé*), final light syllable paroxytones (*primavéra, calentamiénto*), and final heavy syllable oxytones (*ciudád, maméy*).

3.3 Class B nominals

The ranking of RH-TYPEIAMBIC >> RH-TYPETROCHAIC for Class A nominals must be reversed in order to account for Class B nominals. Tables 8-10 reflect this necessary reordering of the last two constraints. Under a Class B ranking, proparoxytones with a light final syllable (*mé.tri.co*) and paroxytones with a heavy final syllable (*ár.bol*) can be accounted for.

Table 8

/metrico/ - *metric*$_B$	GRWD = PRWD	MNON FINALITY	FTBIN	ALIGNHEAD - R	RH-TYPE TROCHAIC	RH-TYPE IAMBIC
☞ [(mé.tri).<co>]						*
*[(me.trí).<co>]					*!	
*[me.(trí.co)]		*!				

Table 9

/sabana/ - *sheet*$_B$	GRWD = PRWD	MNON FINALITY	FTBIN	ALIGNHEAD - R	RH-TYPE TROCHAIC	RH-TYPE IAMBIC
☞ [(sá.ba)<na>]						
*[(sa.bá).<na>]					*!	
*[sa.(bá.na)]		*!				

Table 10

/arbol/ - *tree*$_B$	GRWD = PRWD	MNONFIN ALITY	FTBIN	ALIGNHEAD - R	RH-TYPE TROCHAIC	RH-TYPE IAMBIC
☞ [(ár.bo).<l>]						*
*[(ar.bó).<l>]					*!	

Hence, Class B words reflect those nominals that are generally considered marked in Spanish for stress.

4.   DISCUSSION

A positive aspect of the attempted OT model is that it predicts the ill-formedness of proparoxytones with a heavy penult; an effective model should be able to explain why certain forms do not exist. As stated in Section 2, Harris observes that penultimate stress is impossible if the penult is heavy.[8] Hence, *teléfono* is possible while *te.lé.fos.no* is ill-formed. The OT model in Section 3 predicts that *teléfono* is a Class B nominal while the ill-formed *teléfosno* violates ALIGNHEAD - R. Hence, a proparoxytone with a heavy penult will always be ill-formed because the heavy penult should always be parsed as a foot and it will always be to the right of the word.[9] Table 11 demonstrates the impossibility of realizing *teléfosno* under the current OT model.

Table 11

/telefosno/	GRWD = PRWD	MNON FINALITY	FTBIN	ALIGNHEAD - R	RH-TYPE IAMBIC	RH-TYPE TROCHAIC
☞ [(te.le).(fós).<no>]						
*[(te.lé).(fos).<no>]				*!		*
*[te.(le.fós).<no>]			!*			*

The current model can also account for Harris's observation that if a word is glide-final, then stress must fall on the final syllable – if word-final glides are Class A nominals. Table 12 shows the evaluation of *con.vóy*.[10]

In Table 12, a fourth candidate *[(con).vo<y>] would equally rank with the winning candidate; however, *cón.*voy is not typically realized. Therefore, another constraint should be able to rule out this fourth candidate. Such a rule might include ALLFEET-R.

Table 12

/con.voy/ - *convoy*$_A$	GRWD = PRWD	MNON FINALITY	FTBIN	ALIGNHEAD - R	RH-TYPE IAMBIC	RH-TYPE TROCHAIC
☞ co(n.vo)<y>]						*
*[con.(voy)]				*		
*[con.vo<y>]						

One difficulty of the current rankings is that they cannot account for proparoxytones with a branching rhyme in the final syllable. For example, words such as *es.pé.ci.men* and *Ál.va.rez* would result in *es.pe.(ci.mé)n* or *Al.(va.ré)z* given the Class A ranking, and *es.pe.(cí.me)n* or *Al.(vá.re)z* given the Class B ranking.

A second difficulty of the OT analyses in Sections 3.3 and 3.4 involves word-final stress in polysyllabic nominals.[11] Due to the high rank of MNONFINALITY in the hierarchy, it is difficult to address surface forms such as *Perú* and *Panamá*. The current analysis of Class A and Class B nominals cannot account for word-final stress. For

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[8] However, Roca (1997) points out the Spanish name *Frómista* and the borrowed place names *Wáshington* and *Mánchester*.

[9] The PARSESYLL constraint does not appear on these rankings but it would fall-in next to NON-FINALITY.

[10] Lipski (1997) points out that some dialects pronounce *cón.voy* instead of the more common form of *con.vóy*. Partly based on this evidence, he suggests that Spanish is moving away from its characteristics of quantity sensitivity.

[11] Word-final stress in monosyllabic nominals are easy to model. See *fé* in Table 1.

example, given the word-final stressed *comité*, a Class A analysis would predict **comíte* as the winning candidate, while the Class B analysis would predict **cómite*.

Although stressed vowel-final nominals are extremely rare (Harris, 1983; Lipski 1997), they do exist. It has been pointed out that the majority of word-final stressed nominals are names of individuals or place names. In order to test the abundance of these words, I wrote a computer program using Perl to test a corpus of 612,240 Spanish tokens.[12] The program searched for word-final vowel stress and resulted in 54 types. The types are listed in Table 13 and support the claim that nominal vowel-final stress relates mostly to proper names.

Table 13

Perú	Madugandí	Tacuarembó
Comité	incapié	Piauí
Panamá	André	bebé
Canadá	Iguazú	Macapá
José	Ijuí	antimalá
Subcomité	Nechí	Juradó
Haití	zafó	acné
Bogotá	ajonjolí	Estribí
Café	Sinú	Haití
Pará	Bendezú	Apuí
Estelí	Potosí	Taubaté
Fé	Santafé	Condomblé
Paraná	societé	Galá
Moscú	electrobisturí	maní
Quilalí	Sololá	coatí
Amapá	Urabá	Manabí
René	Quiché	Mortí
clí	Martí	Guaymí

Harris (1983) also points out the following oxytones: *papá, israelí, dominó, sofá* while Lipski (1997) identifies *caló, capó, baladí*, and *sefardí* as a "residue of elements introduced into Peninsular Spanish centuries ago."(582) Roca (1997) points out the additional words *maná* 'manna' and *colibrí* 'hummingbird'.

The current OT analysis might account for word-final stress, if the extrametricality rule could somehow be adjusted to only affect terminal nodes and not the derivational stem, as described by Harris (1983). For example, Harris states that word-final stressed vowels are not unmarked and carry no special labeling in the lexicon. In effect, they simply lack a terminal element. Hence, *pipa* is *[pip]a* while *papá* is *[papá]*.

This paper has been unable to account for Spanish stress data given the current constraints and their rankings; however, a second, approach may result in a more elegant approach. In accordance with Pater (2000) and English secondary stress, instead of invoking two separate hierarchies as shown in this paper's analysis, the constraint RH-TYPETROCHAIC could be placed above RH-TYPEIAMBIC and be lexically specified only for Class B nominals. Thus, the awkward need for two separate hierarchies could be eliminated; however, polysyllabic oxytones would still require some form of lexical stress.

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[12] The corpus is known as the PAHO (Pan-American Health Organization) Corpus. The corpus was originally a compilation of hundreds of documents and letters in Spanish related to health care issues from all over Latin America

5. SUMMARY

This paper has attempted to account for an OT analysis of Spanish stress. Two different rankings have been proposed to account for the majority of Spanish nominals. Class A nominals conform to a hierarchy in which RH-TYPEIAMBIC >> RH-TYPETROCHAIC while Class B nominals conform to the hierarchy of RH-TYPETROCHAIC >> RH-TYPEIAMBIC.

A serious drawback of the current OT proposal is that the Spanish grammar requires two different rankings to account for most nominals. Furthermore, a small yet important group of nominals remains unaccounted for given the current constraints and rankings (proparoxytones with a branching word-final rhyme and vowel-final oxytones); however, the current proposal does account for the inability of proparoxytones to have a heavy penult.

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