

Issues in the Phonology and Morphology of the Major Iberian Languages

Edited by

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Georgetown University Press ♦ Washington, D. C.

Spanish word stress: the interaction of moras and minimality

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1 Introduction

1.1 Stress assignment has benefitted from the largest single share of the research paradigm on Spanish (phonology (cf. Halle and Vergnaud 1987; Harris 1983, 1991, 1992, forthcoming; Roca 1988, 1991; Den Os and Kager 1986 for representative analyses). Leaving aside technical details, the principal bones of contention are (i) the nature and extent of extrametricality (e.g. of consonants, vowels, entire syllables); (ii) the domain of stress assignment (word, derivational stem, etc.); (iii) quantity sensitivity or the lack thereof. Less frequently mentioned in the context of Spanish stress assignment, but crucial in order to situate Spanish phonology in a universal perspective, is (iv) the extent to which Spanish metrical structures can be accommodated in proposed universal typologies of foot-types and relative markedness of specific configurations.

1.2 The present remarks are offered as a contribution to the first, third, and fourth points. It will be claimed below that extrametricality in Spanish stress assignment plays a far lesser role than in most contemporary proposals, being limited in effect to final consonants in those consonant-final words in which stress does not fall on the final syllable. Under the assumption that extrametricality, like any other formal expression of exceptionality, should be eschewed whenever possible, this severe reduction of extrametricality is highly desirable. Quantity sensitivity also plays a more diminished role than suggested by recent studies. Spanish did not inherit the Latin Stress Rule directly, and syllable weight is relevant only in the last two syllables of a word. The interaction between metrical parameters and Spanish stress has changed significantly during the evolution from Classical Latin to modern Spanish. With

very few exceptions, Spanish stress is based on (a slightly modified version of) the moraic trochee (Hayes 1985, Harris 1992, Dunlap 1991).

2 General principles of Spanish stress assignment

2.1 By nearly all modern accounts of Spanish stress assignment (cf. Harris 1983, 1991, 1992; Roca 1988, 1991), Spanish metrical feet are left-headed (trochaic), and iteratively formed from right (end of the word) to left, thus accounting for the predominant penultimate stress. In a recent modification, Harris (1992) postulates that word-final vowels are regularly extrametrical. Spanish vowel-final words with penultimate stress in effect end in a monosyllabic foot, for purposes of initial metrical assignment, while words with antepenultimate stress end in a bisyllabic (trochaic) foot. Within this framework, penultimate stress in vowel-final words follows from a stress-assigning algorithm which assigns main stress at the right edge of the metrical domain. Left-headed binary constituents (trochaic feet) are then formed from right to left, on the remaining material. Word-final inflectional consonants are extrametrical, accounting for regular penultimate stress in plurals such as *libros* 'books,' as well as in verb forms such as *hablas* 'speak (2s.),' *hablan* 'speak (3pl.),' etc. Other final consonants are not extrametrical, so that the basic rule assigning stress at the right edge of the metrical domain correctly assigns final stress. Consonant-final words with penultimate stress, as well as (vowel-final) words with antepenultimate stress are handled by an identical mechanism; such words are lexically-marked exceptions to the rule assigning stress to the right edge of the relevant domain. The only remaining part of the stress-assigning algorithm is the (iterative) formation of left-headed feet; hence a trochee will be formed at the right edge of the metrical domain. For a word ending in a metrical consonant, this results in penultimate stress, while in vowel-final words, antepenultimate stress results.

2.2 This use of extrametricality is significantly different from the proposals in Harris (1983), the seminal application of metrical theory to Spanish stress assignment. In the latter, antepenultimate stress was effected by making the penultimate syllable extrametrical. Since extrametricality is only possible at the periphery of the relevant domain, this requires the decomposition of the corresponding words into 'stem' and 'word-marker,' with extrametricality

applying at the periphery of the former domain. Non-final stress in consonant-final words follows from the extrametricality of the final consonants involved. The 'dual' use of extrametricality has been challenged by several investigators, and was replaced in Harris (1992) by a single use of extrametricality (word-final vowels), which is peripheral by any definition.¹

2.3 Harris (1992) avoids most of the needless complexities and exceptions of earlier theories. The model makes predictions of relative markedness of stress configurations which accord with both statistical distributions and native speakers' intuitions regarding 'typical' Spanish words. However, once quantity sensitivity is added to the model, some internal inconsistencies emerge, which motivate the search for additional refinements, and a more detailed study of quantity sensitivity in modern Spanish.

3 Quantity sensitivity in the models of Harris (1983, 1992)

3.1 Quantity sensitivity has been built into most generative models of Spanish stress assignment. Harris (1983) noted that words with antepenultimate stress could not have a branching rhyme in the penult: **teléfosno*, **átasca*, **retrópiolo*, etc. Most native speakers find such nonce forms to be ill-formed. Similarly, words ending in a falling diphthong must have final stress: *carey* 'tortoise' and *mamey* 'type of fruit' are allowed, but **cárey*, **mámei* are not. These observations were generalized to the notion that 'weak nodes cannot branch.' In a counterproposal, Roca (1988) cites the Spanish place name *Frómista*, and assimilated Anglicisms such as *Wáshington* and *Máncchester* in defense of the claim that quantity sensitivity no longer exists in Spanish, if it ever did (i.e. past the Late Latin stage). Harris (1992) is justifiably skeptical about the relevance of foreign borrowings in determining the phonological structure of Spanish, especially in view of the widespread rejection by native speakers of nonce-forms like **teléfosno*, **dinósauro*, etc. Moreover, the overwhelming statistical preference for antepenultimate stress with light penults, with at most 1-2 exceptions in any single dialect of Spanish, is powerful evidence in favor of quantity sensitivity; similar quantitative trends have been accepted as evidence of Obligatory Contour Principle constraints against co-occurrence in such languages as Arabic (e.g. McCarthy 1986) and Javanese (Mester (1986).

3.2 Harris (1992) brings the issue of Spanish quantity sensitivity within the framework of moraic phonology: stress is assigned to the penultimate (metrical) mora, if it is a syllable head. This revised claim brings both dividends and difficulties. Among the advantages is an instant account of the impossibility of proparoxytones with branching (bimoraic) penults: the first of the two morae of the penultimate syllable must receive stress, thus precluding stress assignment any further to the left. This also accounts for the impossibility of words like **cárcia*, with a rising diphthong in the final syllable. Words ending in a falling diphthong such as *carey* must receive final stress, since the final semivowel cannot be extrametrical. This explains the impossibility of penultimate (or antepenultimate) stress in words ending in a falling diphthong. The requirement that the stressable mora be a syllable head permits forms like *farmacéutico* 'pharmacist,' *vástago* 'scion,' and *náufrago* 'shipwrecked person.' Although Harris does not explicitly discuss this extension of bimoraicity (except to illustrate why the above words are allowed), this model allows both monomoraic and bimoraic syllables to serve as the head of a bisyllabic foot.

3.3 Consonant-final words with penultimate stress, such as *túnel* 'tunnel,' *cóndor* 'condor,' etc. are handled by a subtle interpretation of the Spanish multi-stage syllabification algorithm (cf. Harris 1989a). It is claimed, in effect, that these final consonants are not syllabified at the time the initial stress-assigning algorithm is applied. However, if all final consonants are unsyllabified at the time the original stress-assigning algorithm applies (and Harris 1992: 37 is explicit in this regard: 'word-final consonants cannot make branching rhymes for (lexical) stress rules'), then there is no ready accounting for final stress, e.g. in *papel* 'paper,' *disfraz* 'disguise,' *cortés* 'courteous,' etc. For these words, Harris (1992: 36) only makes oblique reference to the original proposal, that of assigning stress to the right edge of the metrical domain. Similarly, if the stressing of the penultimate metrical mora is a rule rather than a tendency (or a permitted combination), then there is no accounting for penultimate stress in vowel-final words (which, in this model, end in an extrametrical vowel, hence mora) that contain a light penult. Such stress, rather than being maximally unmarked (as in the original proposal), is somehow exceptional, in need of additional justification. In Harris (1992)'s account of quantity sensitivity, the left-headed bimoraic requirement represents a window or filter, rather than a template which must be exactly filled. At the same time, while correctly accounting for certain excluded combinations, the introduction

of quantity sensitivity complicates the theory, in previously straightforward cases of penultimate stress in vowel-final words and final stress in consonant-final words.

4 Trochaic feet within a moraic framework

4.1 At the outset of research into the metrical structures involved in stress assignment, it was assumed that complete symmetry obtained between right-headed (iambic) and left-headed (trochaic) feet, in both quantity-sensitive and quantity-insensitive systems. Hayes (1985) demonstrated that iambic systems are more frequently quantity-sensitive, often exhibiting vowel lengthening under stress, while trochaic systems are more frequently quantity-insensitive, with intensity rather than length being the primary concomitant of stress. From this standpoint, Spanish might be predicted to be quantity-insensitive, both because of its clearly trochaic rhythm and since noticeable lengthening of stressed vowels does not normally occur. Among quantity-sensitive feet, the combination [L, H] or [μ [μ]] is preferred for iambic feet, while the combination [L L] or [μ μ] is the preferred trochaic type. Hayes (1985), Prince (1992), and others have proposed the '(bi)moraic trochee' for quantity-sensitive systems. This template can be satisfied either by a bisyllabic foot [[μ μ]], or by a single heavy syllable [$\mu\mu$]. The strongest versions (e.g. McCarthy and Prince 1986), categorically disallow a trochaic foot of the form [[$\mu\mu$] μ], i.e. a heavy syllable followed by a light syllable. Other versions (e.g. Prince 1992) propose that [H, L] trochees, while not categorically excluded, are highly marked and disfavored.

4.2 Spanish stress assignment is consistent with the moraic trochee, as already adumbrated by Harris (1992) and Dunlap (1991). However, the bimoraic trochee is not compatible with extrametricality of final vowels and the unsyllabified status of final consonants: the existence of words like *casa* 'house,' *mañana* 'morning,' etc. (presumably with a single metrical mora) together with words like *casta* 'caste,' *carta* 'letter,' etc. would imply that monomoraic feet are not only tolerated in Spanish, but are even preferred. This goes against the comparative evidence analyzed by Prince (1992), who ranks monomoraic [L] feet at the very bottom of the scale of acceptability. If final vowels are extrametrical, then Spanish would allow monomoraic feet without restrictions, and a statistical sweep of the Spanish lexicon would probably reveal that [μ] or [L] feet are at least as frequent as [[$\mu\mu$]] or [H] feet.

5 Secondary accents and quantity sensitivity in Spanish

5.1 The issue of quantity sensitivity in Spanish is also tied to the assignment of secondary stresses. Harris (1983) offered a model in which primary and secondary stresses are assigned via a single algorithm, essentially creating trochaic feet from right to left (but with the apparently unconstrained option of having 'ternary' or dactylic feet word-internally, possibly through stress retraction). Many immediate responses to Harris (1983) made similar claims. Roca (1986) offered evidence that secondary stress in Spanish is assigned after primary stress, in a separate process. In turn, Harris (1992), modifying the model of Halle and Vergnaud (1987), allows for erasure of the secondary stresses originally created as part of the alternating trochaic grid structure; the secondary stresses which emerge on the surface presumably are derived as per Roca (1986).

5.2 Harris (1992) establishes quantity sensitivity as a criterion for the assignment of primary stress, but the remainder of his stress-assigning algorithm only refers to the creation of binary trochaic feet from right to left. Implicitly, quantity sensitivity is shown to be crucial only in the rightmost foot. Although Spanish does exhibit various patterns of secondary stress, these are of an alternating sort (with a possible alternative of simply giving a secondary stress to the word-initial syllable in polysyllabic words). Nothing in the observed patterns of Spanish secondary stress suggests a correlation with syllabic quantity. At the same time, the alternating non-final trochees formed in the models of e.g. Harris (1983, 1992), Halle and Vergnaud (1987), etc. are subsequently erased or conflated, thus making the entire question of quantity sensitivity of non-final feet for stress assignment a moot point.

5.3 Irrespective of whether or not secondary stresses in Spanish are formed as part of the initial iterative foot formation process, a look at the Spanish lexicon reveals that reducing the issue of quantity sensitivity to a statement such as 'weak nodes cannot branch' (e.g. Harris 1983) only accounts for penultimate and final syllables. The well-formedness of hundreds of words with branching rhymes in pretonic syllables makes it clear that more is at stake than a simple yes-no answer to the question of quantity sensitivity. Assuming right-to-left iterative formation of trochaic feet, branching rhymes in non-final feet would be found both as the head of non-terminal feet (e.g. *astronómico* 'astronomical,' *artificio* 'artifice'), and as non-heads (e.g. *Anastasio*, *envoltura*

'wrapping'). Harris (1983: 122) offers the initial suggestion that quantity sensitivity only affects strong feet (i.e. dominated by the strong node of the word tree), and cites Hayes (1980) as a theoretical antecedent. However, nothing in Hayes' work directly corresponds to the notion that quantity sensitivity is something which is turned 'on' and 'off' within the expanse of a single word.²

5.4 In addition to the existence of branching rhymes in what would be the weak branch of non-final trochaic feet, several Spanish dialects exhibit compensatory lengthening phenomena which suggest that iterative foot formation is not part of the basic stress-assigning algorithm. One case involves compensatory vowel lengthening in Cuban Spanish, following loss of word-internal preconsonantal /s/ (Hammond 1986; Núñez Cedeño 1987, 1988a, 1989). Assuming that final vowels are not extrametrical, if the foot $[[\mu\mu] \mu]$ or $[H L]$ were less 'harmonic' than the bimoraic trochee $[L L]$, vocalic CL should be highly disfavored in words like *bosque* [bo:ke] 'forest,' since complete elision of the /s/ should increase the harmonicity of the foot. Contrary to these expectations, vocalic CL regularly occurs in such words.³ Moreover, if foot formation were iterative, words such as *talismán* and *protestante* would contain a recessive bisyllabic trochee, with a heavy second syllable: $[\mu, \mu\mu]$. This is highly disfavored as a trochee; indeed, Prince 1992 and others strictly exclude trochees of the form $[L, H]$. Even if it were accepted, for purposes of argument, that Spanish allows such 'backwards' trochees, since such combinations are highly disharmonic, vocalic CL should seldom or never occur following loss of /s/ in such words. Quite to the contrary, loss of the coda consonant and concomitant loss of the associated mora would have a harmonic effect, and should be favored. However, this prediction is not borne out, and CL freely occurs in these words.⁴

5.5 A closely related phenomenon is hypercorrect /s/-insertion in vernacular Dominican Spanish (cf. Núñez Cedeño 1986, 1988b). Essentially, epenthetic /s/ is inserted as a coda consonant in open syllables, the same environment in which syllable-final /s/ is routinely lost in Dominican Spanish. The hypercorrect /s/ can appear in any coda position, except in the penultimate syllable of proparoxytones: **párpasdo*, **teléfosno*, etc. It also is barred from syllables which are already bimoraic: **harsto*, **cansto*, except word-finally,

where, e.g. *flors* < *flor* 'flower' can occur.⁵ The epenthetic /s/ is frequent in the stressed syllable of paroxytones, which, if Spanish metrical structures were quantity-sensitive, would represent the disharmonic shift [L L] > [H L]: *isno* < *ino* < *himno* 'hymn,' *dipusta* < *diputa* < *disputa* 'dispute,' *yusca* < *yuca* 'yucca,' etc.⁶ Moreover, if Spanish words contained iterative trochaic feet, epenthetic /s/ in the second syllable of words like *invistado* < *invitado* 'guest,' *afestado* < *afetado* < *afectado* 'affected,' would strongly contravene the Weak Branching Constraint by turning a $[[\mu] \mu]$ trochee into $[[\mu] \mu\mu]$. Like Cuban vocalic CL, Dominican /s/-epenthesis suggests that iterative foot formation does not occur in Spanish.

5.6 Non-iterativity of foot formation is compatible with parameterized models of stress assignment (e.g. Hayes 1985, 1987; Hammond MS; Crowhurst 1992). Other Spanish dialects exhibit harmony processes conditioned by the existence of a single foot. Certain Montañés/Bable dialects studied by Hualde (1989b) exhibit harmony processes which extend from the final vowel up to and including the stressed vowel. In other dialects, harmony only obtains between a final vowel and the stressed vowel; this process targets the head of the metrical foot. In this dialect cluster, harmony to the left of the stressed vowel is sporadic or nonexistent, regardless of the pattern of secondary accents. This suggests that only a single metrical foot is created, which in turn channels the effects of [-ATR] and height harmony.

Eastern Andalusian dialects exhibit vowel harmony (cf. Lieber 1987, Zubizarreta 1979), in which [-ATR] spreads leftwards from a final vowel, originally following the loss of a final consonant (typically /s/). In the great majority of instances, spreading of [-ATR] does not spread to the left of the tonic vowel, once more indicating that only a single metrical foot is in place, through which the harmonic process operates.

6 Reassessing Spanish quantity-sensitivity: minimality parameters

6.1 Hayes (1985, 1992), McCarthy and Prince (1986), Prince (1992), etc. claim that the only type of trochaic foot possible in quantity-sensitive systems is the bimoraic trochee $[\mu \mu]$. This template can be satisfied either by a bisyllabic foot $[[\mu] \mu]$, or by a single heavy syllable $[\mu\mu]_o$. These same theories disallow $[[\mu\mu] \mu]$ trochees. Spanish, however, provides large numbers of

paroxytones with heavy penults, filling a trimoraic $[[\mu\mu] \mu]$ template; dialectal data which manipulate the moraic structure show no signs of eliminating this configuration in favor of a more 'harmonic' bimoraic trochee. Moreover, Spanish proparoxytones with heavy stressed syllables (e.g. *álgebra*) arguably include as many as four morae in a single foot. The discrepancies between the Spanish data (and Spanish has never been regarded as an 'exotic' language) and well-reasoned foot typologies require additional inquiry. The details of Spanish foot formation are best handled by parameterizing the requirement that head and foot templates be completely filled.

6.2 Crowhurst (1992) establishes a repertoire of universally available foot templates, in which headedness is not yet assigned. One of the universal templates is $[\mu\mu \mu]$, which generates all Spanish (primary stress) feet. In quantity-sensitive systems, the *Head_{min}* parameter can be set either to **Off** (requiring a bimoraic head) or **On** (allowing a monomoraic head). Similarly, the *Foot_{min}* parameter can be set to **Off** (requiring a minimally bimoraic foot) or **On** (allowing a monomoraic foot).

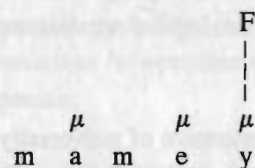
In Spanish, *Head_{min}* is normally set to **On**, allowing monomoraic heads such as *cama* 'bed,' *casa* 'house.' However, *Foot_{min}* is set to **Off**, requiring a minimally bimoraic foot, which can be satisfied either by a single heavy syllable $[\mu\mu]$ (e.g. *papel*, *carey*), or via penultimate stress, if the final syllable is light (*casa*, *carta* 'letter'). The full range of Spanish feet is: $[\mu\mu]$, $[[\mu] \mu]$ and $[[\mu\mu] \mu]$. The parametric settings are:

(1)	Template:	$[\mu\mu \mu]$
	Directionality:	right to left
	Headedness:	left
	Iterativity:	non-iterative
	Minimal structure:	
	Foot _{min} :	off
	Head _{min} :	on

We also assume that foot construction is maximally binary.⁷

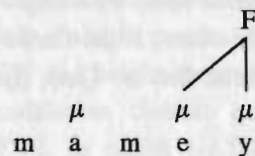
6.3 The proposed model generates all and only the set of Spanish stress patterns. Words ending in a final heavy syllable (e.g., falling diphthong, or non-inflectional consonant) fully fill the bimoraic foot template. The first step is association of the template to the right edge of the metrical domain:

(2) *Associate template:*



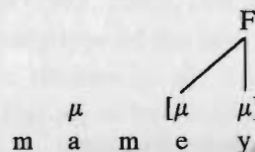
The next step is maximization of the foot. Since in Spanish the $Foot_{min}$ parameter is set to **Off**, a minimal foot must contain at least two morae (in words ending in a semivowel or consonant, the preceding mora must be incorporated in any case, in order to ensure the presence of a syllable head):

(3) *Maximize foot:*



The final step is projection of the head. Since Spanish sets the $Head_{min}$ parameter to **On**, a head can consist of a single mora. However, in words ending in a heavy syllable, with the syllable head coming first, both morae are incorporated into the head:

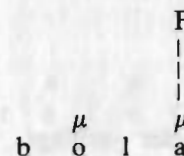
(4) *Project head:*



Penultimate stress is impossible in such words, since the foot template is fully satisfied by taking only the final two morae into account. Penultimate stress would result in a branching recessive node, which is universally prohibited. Words like *túnel*, *cóndor*, etc. contain an extrametrical final consonant. The impossibility of **cárey*, **máney*, etc. is presumably due to the fact that the final segment is **semivocalic** rather than consonantal. This is an idiosyncrasy of Spanish grammar, and does not follow directly from universal phonological principles.

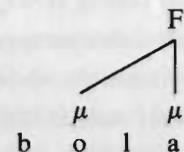
6.4 The derivation of penultimate stress in words ending in a vowel or extrametrical consonant is straightforward. Taking as an example *bola* 'ball,' the first step is association of the template to the right edge of the word:

(5) *Associate template:*

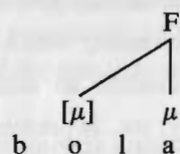


Since this single mora does not satisfy the minimally bimoraic requirement of $Foot_{min} = \mathbf{Off}$, foot maximization will incorporate the preceding mora:

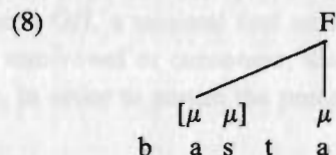
(6) *Maximize foot:*



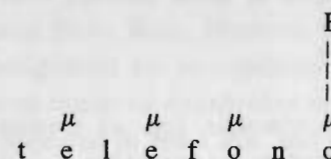
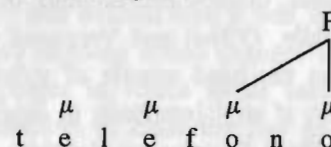
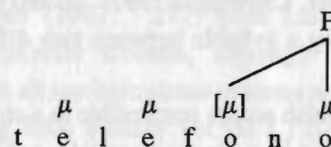
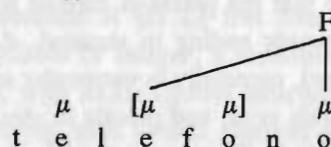
Finally, since $Head_{min} = \mathbf{On}$ allows for a monomoraic head, projection of the head will target the penultimate syllable:

(7) *Project head:*

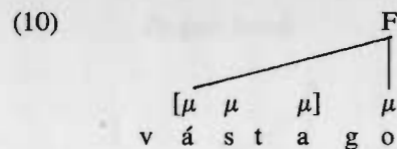
If the penultimate syllable is bimoraic (heavy), as in *basta* 'suffice (3s.)', the derivation proceeds in the same fashion. Association of the template will target the final mora; foot maximization will incorporate not only the preceding mora (associated to an element in the coda), but also the accompanying syllable head; head projection will embrace both morae of the penultimate syllable:



6.5 Assuming the minimality parameter settings given above, antepenultimate stress cannot be generated at all. The bimoraicity required by the Spanish foot template will be exhaustively satisfied by the final syllable of words ending in a heavy syllable, and by the penultimate syllable of vowel-final words. Harris (1983, 1992) and others have generated Spanish antepenultimate stress through liberal use of extrametricality. However, within the parameterized minimality framework, antepenultimate stress, which by any account must carry some sort of lexical mark, involves the parameter setting $Head_{min} = \text{Off}$. This requires a bimoraic head. It is thus not coincidental that antepenultimate stress is incompatible with heavy penultimate or final syllables (modulo the occasional extrametricality of final consonants, as in *régimen*). Antepenultimate stress can be generated only in words of three or more syllables which (i) bear the lexically altered parameter setting $Head_{min} = \text{Off}$, and (ii) have light syllables in both the penult and final positions. Consider a typical derivation (*teléfono* 'telephone'):

(9) *Associate template:**Maximize foot:**Project head:**Satisfy head:*

Finally, proparoxytones with heavy antepenults (e.g. *vástago*, *álgebra*, etc.) receive a similar derivation. The template is originally associated to the final mora; projection of the head incorporates the penultimate vowel, but satisfaction of the bimoraicity requirement for the head requires incorporation of an additional mora. However, the immediately preceding mora is a coda consonant, so the syllable head must also be incorporated, giving a foot with four morae:



This is not an indictment of the trimoraic $[\mu\mu\mu]$ template, since the incorporation of the coda consonant and its accompanying mora is required by the principles of prosodic licensing (e.g. Itô 1986). The mora associated with the coda consonant cannot be licensed except by a syllable node, which in turn requires the presence of a syllable head, thereby necessitating the presence of the immediately preceding vowel. Halle, O'Neil and Vergnaud (1993: 530) observe that 'Stressable elements are the head vowels of syllables *and the immediately following rhyme segment*, if any' [emphasis in original]. Dunlap (1991: 19) calls this condition the Head Prominence Relation: 'If stress is assigned anywhere in a syllable, it will be realized on the syllable head.' In the general case, this exoneration holds of all mora-counting templates, as part of the condition of 'prosodic integrity' (cf. Crowhurst 1992: 26 and the references therein), a prohibition against splitting a syllable between two different feet.

6.6 The most marked set of Spanish words susceptible to a stress-assigning algorithm are non-verbal forms ending in a stressed vowel: *rubí* 'ruby,' *café* 'coffee,' *maní* 'peanut,' *dominó* 'domino(es),' etc. All such words are of extra-Romance origin, and exhibit considerable variability in plural formation. Grammatical treatises usually decree that the plural is formed by adding *-es*, except for *mamá*, *papá*, *sofá* and words ending in stressed *-é*. In practice, variant forms are more frequently heard, especially in vernacular speech; typical alternatives include zero plurals, plurals in *-s*, and plurals in *-ses* (e.g. *cafeses* '[cups of] coffee,' *manises* 'peanuts'). In the present model, such words are lexically marked for $Foot_{min} = \text{On}$, allowing a monomoraic foot, which together with the usual Spanish setting of $Head_{min} = \text{On}$ ensures that stress falls on the final vowel. Plurals in *-es* and *-ses* have the effect of creating a bimoraic foot. In Harris (1992: 44), the exceptionality of these forms is handled by lexically marking them so that the final vowel is not extrametrical. Harris (1983) had noted that the stems of such words end in a vowel, and contain no class marker; it may be, as suggested by Harris (1992) and others, that exceptional stress is at least partially predictable based on this morphological peculiarity.

7 Historical excursus: stress and quantity sensitivity in Classical Latin

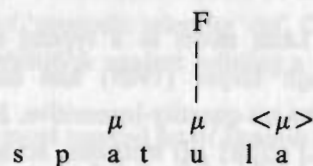
7.1 Modern Spanish stress is often described as a direct heir of the (Classical) Latin Stress Rule. However, the differences between Spanish and Latin stress assignment are as significant as the similarities; modern Spanish stress assignment cannot be an unbroken continuation of Latin patterns. Quantity sensitivity disappeared in late Latin, and played no role in Old Spanish stress assignment. At some point during the medieval period, quantity sensitivity again came to characterize Spanish stress assignment, as a result of several independent sound shifts in the language. Quantity sensitivity in modern Spanish is considerably less evident than it was in Latin, and a combination of foreign borrowings and ongoing sound changes may once more return Spanish to the ranks of languages in which stress assignment is quantity-insensitive. It is therefore instructive to trace the rise and fall of quantity sensitivity in the transition from Latin to modern Spanish, as this enterprise promises to shed some light on the interaction between parametric settings and learnability.

7.2 Hayes (1987: 277) cites Latin stress as a typical example of a non-iterative moraic trochee, although Hayes (1985) had come close to suggesting that all trochaic stress systems are quantity-insensitive. Prince (1992), while showing little affinity for [H L] ($[[\mu\mu]\mu]$) trochees, acknowledges the widespread existence of such feet in Latin proparoxytones (assuming extrametricality of final syllables in Latin). Prince accounts for the Latin Stress Rule (which produces, e.g. *ín.te. <ger>* vs. *per.fec. <to>*) as exhibiting the harmonic preference of [H L] feet over [L]. If stress were to fall on the penultimate syllable of *integer*, a monomoraic foot would result. Presumably, *spá.tu. <la>*, with its [L L] foot structure, would be harmonically preferable to proparoxytones with closed stressed syllables; however, Prince cites no evidence of phonological processes in Latin which might facilitate the change from [H L] to [L L].

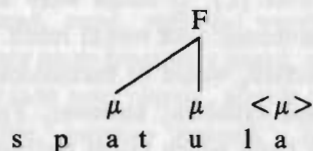
7.3 In the parametric minimality framework, Latin stress assignment shared with modern Spanish the use of a $[\mu\mu\mu]$ template, as well as the parametric settings $Foot_{min} = \text{Off}$, $Head_{min} = \text{On}$. These settings require a minimally bimoraic foot, while allowing a monomoraic head. Since final syllables were extrametrical, template satisfaction began with the penultimate

syllable. If this syllable was heavy (bimoraic), both the head and the foot requirements were satisfied, and a monosyllabic bimoraic trochee was formed. Modulo extrametricality, this is the same process as in modern Spanish words ending in a heavy syllable (e.g. *mamey*, *papel*). Latin words with a light penult required incorporation of the preceding syllable head to satisfy the bimoraic foot condition. This is the same configuration that occurs in modern Spanish vowel-final words. In Latin, since the final syllable was extrametrical, this automatically resulted in antepenultimate stress. If the antepenult was also light, a bimoraic $[[\mu] \mu]$ foot resulted.⁸ If the antepenult was heavy, the same requirement of prosodic integrity required incorporation of the syllable head (in the case of a syllable with a coda consonant), or the entire prosodic structure of the syllable head (in the case of a long vowel). In these cases, a $[[\mu\mu] \mu]$ foot resulted.⁹ Consider the derivation of a word like *spatula*:

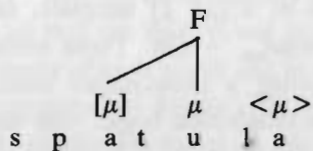
(11) *Associate template:*



Maximize foot:

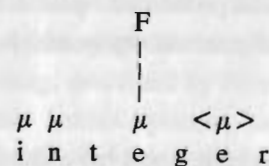


Project head:

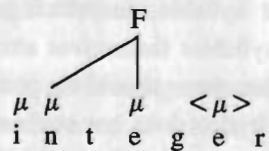


In words with a light penult and heavy antepenult (*integer*), a similar derivation ensues:

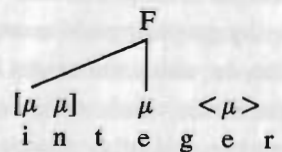
(12) *Associate template:*



Maximize foot:



Project head:



7.4 The critical difference between Spanish and Latin foot formation lies in the fact of final syllable extrametricality in Latin, and the metrical relevance of (most) final syllables/morae in modern Spanish proparoxytones are also characterized by the lexical diacritic *Head_{min}* = **Off**, an option that did not exist in Latin, but which indirectly reflects Latin antepenultimate stress. Finally, Latin contained no proparoxytones with heavy penults, which would be the equivalent of Spanish consonant-final paroxytones (e.g. *túnel*, *árbol*). In other respects, the processes were identical. Both Spanish and Latin use the $[\mu\mu \mu]$ foot template, both require a minimally bimoraic trochee, and both allow for a monomoraic head. It would seem, from looking only at the two diachronic endpoints, that at

some intermediate stage, final syllables lost their extrametricality and entered into the moraic count for foot formation. Obviously, the process was not as simple as merely 'turning off' extrametricality. What really happened was a complete loss of quantity sensitivity before Spanish emerged as a separate language, followed by later events which targetted Old Spanish final syllables, and which created a new system of quantity sensitivity in which final syllables play a central role.

7.5 Earlier treatments of Latin stress assignment have usually made direct or indirect reference to moraic structure, without focusing on the interplay of minimal structure parameters and foot formation. Implicit in many descriptions was the idea that the Latin Stress Rule made penultimate stress the default: stress the penult unless it was a light syllable, in which case stress the antepenult. The inference is that heavy syllables themselves attract stress, and it is therefore unclear why antepenultimate stress should be preferred in Latin words whose antepenult was also light. It also does not explain why a heavy syllable in the pre-antepenult cannot attract stress (cf. Basbøll 1989). Beginning at least as far back as Jakobson (1936), a moraic-based stress assignment rule was proposed: disregarding the final syllable, stress the (syllable head of the) penultimate mora of the word. Allen (1973: 177-8) comes closer to the contemporary notion of minimal structure by proposing an 'accentual matrix,' a span of one heavy or two light syllables, in which the accent will fall. For Allen, 'the accent occupies the last matrix in the word, exclusive of the final syllable ...' (cf. also Vincent 1988). However, this proposal does not directly account for antepenultimate stress in words with a heavy antepenult, such as *integer*. Jakobson's proposal, to stress the syllable head of the penultimate mora, is descriptively adequate, but needs to be fitted against contemporary typologies of universal foot templates.

8 Quantity sensitivity in old and modern Spanish

8.1 Spanish differs prosodically from its Latin antecedents in two fundamental ways. First, distinctive vowel and consonant length has disappeared.¹⁰ There is no longer a direct encoding between the mora count and the precise temporal duration of the segmental string. Spanish 'heavy' syllables

are exclusively those closed by a consonant or containing a semivowel; the physical duration is often less than that of a long vowel. Most of the (relatively rare) quantity-sensitive trochaic stress systems studied by Hayes (1985, 1987), Prince (1992), etc. contain distinctively long vowels. In fact, quantity-sensitive trochaic systems with distinctive vowel length are relatively rare, and those based on a $[\mu\mu\mu]$ template are even fewer.¹¹ This leads to phenomena such as trochaic shortening, described by Prince (1992) for English. This contrasts with quantity-sensitive iambic systems, in which gemination of a consonant is a frequent means of achieving a maximal head (cf. Crowhurst 1992: chap. 2). The fact that bimoraic vowels (and consonants) are not present in Spanish inherently weakens the system of quantity sensitivity, in comparison with other languages in which phonological weight is openly manifested in both vowel and consonantal length distinctions.

8.2 Spanish stress assignment shows none of the instability or variation which might be expected of a highly marked configuration. Nothing suggests that children acquiring Spanish pass through less 'marked' configurations en route to acquiring the correct patterns —e.g., there is no tendency to assign antepenultimate stress to polysyllabic words with light penults (see Hochberg 1987, 1988).¹² Modern Spanish stress assignment is a hybrid system, combining both quantity-sensitive and quantity-insensitive components. All Spanish morphological phenomena use prosodic templates in which only syllables, not morae, are the key elements (cf. Crowhurst 1992, Lipski forthcoming). Only in cases where a heavy syllable could conceivably appear in the weak node of a trochaic foot does quantity sensitivity enter into the picture, in a negative fashion. Even here, the extent to which quantity sensitivity actively overrides the syllabic template is open to discussion. Spanish tolerates loanwords in which antepenultimate stress is combined with heavy penults; while loanwords do not constitute a basis for rejecting quantity sensitivity, they do suggest the transitional status of the last redoubt of Spanish quantity-sensitivity: the prohibition against antepenultimate stress with branching penults (and of penultimate stress in words ending in a falling diphthong). Spanish consonant-final paroxytones (e.g. *árbol*) end in a stressed syllable followed by an unstressed heavy syllable, which regardless of proposed extrametricality, provides a ready model for a [H H] or [L H] trochee.

8.3 In the transition from Latin to Spanish, the disappearance of distinctive vowel length concurrently made the old Latin Stress Rule opaque. The fact that certain words with open penultimate syllables had antepenultimate stress while others had penultimate stress became a purely arbitrary lexical marking, which ultimately led to orthographic conventions indicating unexpected stress patterns. In Latin, word-final syllables were always extrametrical for purposes of stress computation, but the initial stages of Old Spanish exhibited neither quantity sensitivity nor extrametricality. Spanish had inherited the Latin stress patterns, but quantity sensitivity had disappeared, as witnessed by the lack of a bilateral correlation between antepenultimate stress and a light penult. Old Spanish contained vast numbers of words with penultimate stress and light (vowel-final) syllables, and this configuration became the default. Antepenultimate stress was no longer predictable, but was rather a lexical exception. It was observationally true that Old Spanish contained no proparoxytones with branching penults, but this type of negative evidence would be difficult if not impossible to be naturally learned as part of the language acquisition process. At the same time, nearly all non-inflectional final consonants had disappeared. These events motivated a gradual shift toward penultimate stress as the unmarked –indeed highly preferred– Spanish pattern.

8.4 At this stage in the development of Spanish, there were only two stress patterns: penultimate stress (in words which ended in a vowel or an inflectional consonant), and antepenultimate stress (also in vowel-final words), inherited directly from Latin. Some of the latter words eventually gravitated toward penultimate stress, while the opposite shift occurred less frequently. There was no direct test of residual quantity sensitivity in the form of potential proparoxytones with heavy penults. There was no source of words which might trigger a prohibition against antepenultimate stress with a branching penult. Nothing suggests that native speakers of Old Spanish were aware of the purely statistical fact that no proparoxytone had a penultimate syllable with a branching rhyme. Awareness of the impossibility of such proparoxytones would constitute ‘negative evidence’ of the most questionable sort, and there was no positive evidence which pointed to quantity sensitivity. Thus there was no sense in which a heavy syllable ‘attracted’ stress. Many words with antepenultimate stress gravitated toward penultimate stress, a process which had begun in late Latin

and perhaps even earlier. At the same time, widespread syncopation of posttonic vowels in proparoxytones created an ever-larger stock of paroxytones, furthering the momentum in favor of penultimate stress as the unmarked option. In this system, the foot template was bisyllabic [$\sigma \sigma$], but the minimality parameters remained the same as in Latin: $Foot_{min} = \text{Off}$ (requiring a bisyllabic trochaic foot), and $Head_{min} = \text{On}$, allowing monomoraic heads (e.g. in words like *mañana*). As in modern Spanish, words with antepenultimate stress were lexically marked for $Head_{min} = \text{Off}$, requiring bimoraic or heavy syllables as heads, in this case, spread over two syllables. The only difference between old and modern Spanish is that Old Spanish used a quantity-insensitive syllable-based template, which could therefore only be satisfied by counting syllables, and not morae. In late Latin and Old Spanish, final stress in words ending in heavy syllables was not regularly available; only bisyllabic feet were acceptable, and therefore the quantity of the individual syllables was irrelevant.

8.5 Word-final stress in Spanish did not become an option until widespread apocope of final vowels (beginning around the 11th-12th centuries) in originally paroxytonic words created a new stress category for Sp: consonant-final oxytones: *amore* > *amor* ‘love,’ *razone* > *razón* ‘reason,’ etc. Final apocope in words with antepenultimate stress created another new category: paroxytones ending in non-inflectional consonants (e.g. *árbore* > *árbol*). At this juncture, Spanish had expanded the possibilities of (non-verb) word stress to encompass the ‘three-syllable window’ which characterizes the modern language. There were no legitimately Spanish words ending in a stressed vowel (except for verb forms, which require a morphologically-informed stress analysis –but cf. Harris 1987, 1989b), so that in a very real sense Spanish had developed a stress system in which the first heavy syllable, counting leftward from the end of the word, ‘attracted’ stress. However, unlike Arabic (which contains a similar conditioning environment), or Latin (modulo final syllable extrametricality), in Spanish the checking normally stopped at the penultimate syllable, resulting in default paroxytonic accent. In this scenario, extrametricality of certain final consonants became a necessary concomitant, to account for penultimate stress in words like *árbol* and *régimen*. However, unlike Latin, no vowels/syllables were extrametrical.

8.6 The (re-) introduction of quantity sensitivity into Spanish meant that the foot template shifted from the bisyllabic [$\sigma \sigma$] back to the moraic template [$\mu\mu \mu$] which had existed in Latin. The parameter settings characterizing Latin and Old Spanish remained unchanged: $Foot_{min} = \text{Off}$ (requiring at least a bimoraic syllable), and $Head_{min} = \text{On}$, allowing a monomoraic head. The only readjustment occasioned by the creation of new stress configurations was the substitution of a moraic foot template for a syllabic template. This is a minimal shift, consistent with the subtle change in accentual patterns occasioned by the development of consonant-final oxytones. These words define the major point of difference between the syllable-based and mora-based templates. Oxytones were simply not possible under the Old Spanish bisyllabic template, while in the later, quantity-sensitive stage, all (excluding extrametricality in a handful of words such as *árbol*, *túnel*, etc.) and only bimoraic final syllables attracted stress. At the same time, if the final syllable was light, all (but not only) heavy penults attracted stress. These data constitute sufficient positive evidence to deduce quantity-sensitivity, with stress assigned to the first of the final two syllables (counting right to left) which was heavy, or to the penult by default. Words with antepenultimate stress were, then as now, exceptional, in requiring 'more' metrical structure. In such words, bimoraicity is not sufficient; three morae (or four, in the case of words like *álgebra*) are needed to make an acceptable foot. A parameter setting of $Head_{min} = \text{Off}$ is easily learnable from such words.

Proparoxytones such as *vástago*, *álgebra*, etc. actually group four morae into the metrical foot, in apparent violation of even the [$\mu\mu \mu$] template. However, this violation is more apparent than real, since the third mora from the end is a coda consonant, incapable of being a syllable head and therefore receiving stress. In such circumstances, the syllable head must be incorporated into the foot, regardless of the total number of morae. The same phenomenon occurred in Latin, which freely admitted proparoxytones with heavy antepenults. Thus, the possibility of a foot with four morae is a normal consequence of stress assignment, and does not violate the fundamental trimoraic template. In the realm of template satisfaction, consonantal morae are treated with more flexibility than vocalic morae, since in Spanish, no consonant can form a syllable head. The absolute number of morae present in a prosodic template must be tempered by the overriding need to couple the template with well-formed and fully licensed syllables, which in turn necessitate the first

available vowel, counting from right to left. A word like *carey* fully satisfies the trochaic template, thus making penultimate stress impossible. On the other hand (assuming that prevocalic glides are in the rhyme/nucleus, just as postvocalic glides), penultimate stress is possible in words ending with a rising diphthong: *tapia*. Although the two morae of the final syllable satisfy the minimally bimoraic requirement for a well-formed Spanish foot (word), the leftmost mora cannot be a syllable head, thus requiring that the next available syllable head (the preceding vowel) become the head of the trochaic foot.

9 Is modern Spanish losing its quantity sensitivity?

9.1 The preceding remarks have postulated that Old Spanish inherited the late Latin quantity-insensitive trochaic stress system, in which such facts as the impossibility of antepenultimate stress with a branching penult were largely irrelevant and not learnable through positive evidence. An independent prosodic innovation, large-scale final vowel apocope, not only created numerous consonant-final words with final stress, but in the process created a new quantity-sensitive stress system, in many ways significantly different from its Latin predecessor, and not logically descending from the latter. In the transition from Latin to modern Sp, quantity sensitivity has disappeared and then reappeared again, suggesting that the phonological equilibrium responsible for the bases of the stress system is relatively fragile, and is susceptible to alteration by independent phonological changes. It is therefore of interest to consider developments which could return Spanish to a quantity-insensitive stress system. This question is particularly relevant since in contemporary Spanish, the only exceptionless evidence of quantity-sensitivity, and negative evidence at best, is the impossibility of non-final stress in words ending in falling diphthongs, and of antepenultimate stress in words with a heavy penult. In other respects, the general rule that the first heavy syllable counting from the right edge receives stress has enough exceptions as to possibly open the door to a weakening or removal of the requirement of quantity-sensitivity.¹³

9.2 Spanish contains many consonant-final words with penultimate and occasionally even antepenultimate stress (e.g. *árbol*, *túnel*, *régimen*). Many of these words have very high frequencies of occurrence, form part of the core vocabulary, and in no way strike native speakers of Spanish as strange or

exceptional (except for the presence of an orthographic accent). Spanish has also absorbed many words ending in a stressed vowel, largely geographical names of non-Hispanic origin but also a residue of elements introduced into Peninsular Spanish centuries ago (e.g. *Bogotá*, *Panamá*, *caló*, *capó*, *baladí*, *sefardí*, etc.). It is increasingly difficult to dismiss oxytonic stress in vowel-final words as a marginal idiosyncrasy to be swept away by the liberal assignment of 'extrametricality.' Spanish routinely accommodates proparoxytones with heavy penults, including place and personal names such as *Washington*, *Mánchester*, *Wínchester*, etc., apparently without significant difficulties of pronunciation (as opposed, e.g. to the nearly total inability to cope with borrowed words beginning with /s/ + CONSONANT). Such words are still regarded as foreign, and since Spanish has never exhibited a tendency to convert penultimate stress into antepenultimate stress, it is impossible to observe the spontaneous creation of new proparoxytones within Spanish¹⁴

9.3 Modern Spanish has no words ending in a falling diphthong with penultimate stress, and many Spanish speakers reject forms like **mámey*, **cáray*, etc. However, there does not appear to be a systematic reason why Spanish should not have such words, as witnessed by the occasional pronunciation *cónvoy*, instead of the more usual *convoy*. In Peninsular Spanish dialects retaining second person plural verb forms, unstressed final *-ais* and *-eis* routinely occur (e.g. *hablastais* 'you {pl.} spoke' *comisteis* 'you {pl.} ate'), and in those Peninsular dialects which combine use of these forms with loss of final /s/ (e.g. much of eastern Andalusia, Alicante, Murcia, Extremadura, etc.), unstressed final falling diphthongs do occur. In Latin America, popular Chilean Spanish combines *voseo* forms retaining the etymological diphthong with loss of final /s/, thus giving rise to combinations such as *séai(s)*. Similar combinations are found in Maracaibo, Venezuela, and residually in the rural Spanish of western Panama. Vocalization or 'liquid gliding' of syllable-final /l/ and /r/ in the Dominican Cibao region often elides final /l/ and /r/ after an unstressed vowel (e.g. *revólver* > *revóive* 'pistol'), but occasionally produces final unstressed falling diphthongs. Finally, Spanish does not demonstrate a major aversion to borrowed names ending in unstressed falling diphthongs, such as *Bólchoi*, *Dísney*, etc.

9.4 Contemporary Spanish is becoming ever more cosmopolitan,

absorbing words from a variety of languages as well as regional dialects of Sp; the language may be poised on the verge of a return to quantity-insensitivity. In such a new system, trochaic stress would be the default in vowel-final words, and final stress would be the default in consonantal-final words; any deviations from this pattern would be lexically-marked exceptions. Some idiolects may have achieved this state of affairs already, particularly in areas characterized by bilingualism with languages exhibiting greater prosodic flexibility. For example, many bilingual Sp-English speakers in the United States do not share the strong aversion to quantity-sensitive violations, such as proparoxytones with heavy penults. The combination of circumstances reviewed above may actually create dialect differences, between quantity-sensitive (e.g. more conservative, isolated) dialects, and quantity-insensitive (more cosmopolitan, and/or in a bilingual environment) dialects. This is a promising area for future research.¹⁵

10 Summary and conclusions

The preceding remarks yield the conclusion that contemporary models of Spanish main stress are substantially correct, but require some additional refinements in order to avoid both under- and overgeneration, and to fit Spanish into universal typologies of metrical structures.¹⁶ The principal conclusions can be summarized as follows:

- (1) Spanish main stress assignment is non-iterative.
- (2) The only extrametrical elements in Spanish are word-final consonants in consonant-final words with non-final stress.
- (3) Spanish stress assignment is quantity-sensitive, but this is computed only in the final two syllables.
- (4) Spanish quantity sensitivity is not a direct continuation of the Latin Stress Rule, but is rather an independent development, coming after a quantity-insensitive stage represented by late Latin and Old Spanish.
- (5) Spanish requires that all feet be minimally bimoraic, and a single moraic trochee is formed at the right edge of a word.
- (6) Antepenultimate stress is effected by a lexically-specific requirement that the head of the metrical foot be bimoraic, thereby requiring incorporation of the antepenultimate syllable. Vowel-final oxytones are lexically marked to allow a monomoraic foot.
- (7) Coda consonants are automatically incorporated into the feet whenever it is necessary to target the nuclear vowel of the syllables to which they belong.

Notes

1 A slightly different approach was developed independently by Inkelas (1990: 180f.):

a. Terminal elements are invisible

b. Final Stress Rule (FSR): stress final syllable in domain

The terminal elements are essentially the final vowels which follow the derivational stem; thus *mesa* is [[mes]a], *aspirante* is [[aspirant]e], *animal* is [animal], etc. Inkelas' proposal automatically accounts for final stress in words like *papá*, *Perú*, *caló*, etc., which do not contain a terminal element, and which are therefore affected by the FSR. This is an advantage over Harris's model, in which stressed final vowels are handled stipulatively. Inkelas handles antepenultimate stress via the lexical prespecification of a foot, together with stray syllable adjunction: 'adjoin an unstressed syllable to a preceding nonbranching foot' (p. 182). This lexical diacritic gives no account for the paroxytonic restrictions noted by Harris (1983).

2 Hayes (1980) hints that Spanish is not quantity-sensitive, and Hayes (1985: 440) makes this claim explicitly for Spanish secondary stress. However, this does not exclude the possibility that Spanish primary stress is assigned via a quantity-sensitive metrical structure, as claimed by Harris (1983). Hayes (1992: 93) says of Spanish that 'the stress pattern is basically the Latin type, but with degenerate words allowed,' but Hayes (1992: 94) states categorically that 'Main stress in Spanish is phonemic, though it can be predicted to a fair extent by complex lexical rules, whose character continues to be debated ...' In any event, the schema proposed for Spanish by Hayes (1992: 93) would seem to require antepenultimate stress in words of 3 or more syllables, with a light penult. This is because Hayes assumes final syllable extrametricality in Spanish, as in Latin, while disallowing degenerate feet (and also disallowing trimoraic trochees of the form [[$\mu\mu$] μ]. Thus:

$$\dots - \sim < \sigma > \# \quad \rightarrow \quad \dots - \overset{(x)}{\sim} < \sigma > \#$$

where (x) represents a bimoraic monosyllabic trochee. However, Spanish does not require antepenultimate stress in words like *bosquejo*, *cartero*, *tembleque*, *astilla*, etc.

3 If it were assumed, once again for purposes of argument, that word-final vowels were extrametrical, then a word like *bosque* would end in a monosyllabic, bimoraic trochee [$\mu\mu$]. Assuming the scale of harmonicity of Prince (1992), vocalic CL could be seen as preserving the preferred [H], instead of the highly disharmonic [L] or monomoraic foot. In this case, however, the vast number of Spanish vowel-final words with a light penult, e.g. *cama*, *casa*, etc., would be without explanation.

4 Another common occurrence in several Caribbean dialects (including much of the Caribbean coast of Colombia, central Cuba, and occasionally the Dominican Republic) is loss of syllable-final liquids /l/ and /r/ combined with gemination of a following consonant: *porque* > *pocque* 'because,' *salga* > *sagga* 'leave (imp.),' *curba* > *cubba* 'curve,' etc. Word-internally, since gemination represents the same sort of mora-conserving CL as vocalic CL occasioned by loss of /s/, similar contradictory predictions obtain if iterative trochaic foot formation and the disharmonicity of a [H L] foot are presumed. For example, gemination is quite frequent at the end of the first syllable of bisyllabic paroxytones (this being statistically one of the most frequent instances of the environment in question): *algo* > *aggo* 'something,' *porque* > *pocque*, *tarde* > *tadde* 'late,' *puerta* > *puetta* 'door,' etc. Gemination in words like *desammado* < *desalmado* 'without a soul,' *musummán* < *musulmán* 'Moslem,' *anaquista* < *anarquista* 'anarchist,' etc. is also incompatible with iterative foot formation, since a strongly disfavored [μ , $\mu\mu$] trochee would be preserved by liquid gemination.

5 In New Mexico Spanish, another /s/-weakening dialect (although not as extreme as Caribbean Sp), the present writer has observed hypercorrect epenthetic /s/ in *burla* > *bursla*.

6 In the case of stressed word-final vowels, the addition of an epenthetic /s/ creates a more desirable bimoraic foot [$\mu\mu$]. Thus while loss of a syllable-final consonant creates a possibly more unmarked open syllable, epenthetic /s/-addition in the syllabic coda increases the mora count in favor of a harmonically more preferred foot-type. This development is consistent with the incorporation of Spanish stressed syllables into a prosodic foot.

7 A somewhat different approach to quantity-sensitive stress assignment in Spanish comes from Dunlap (1989). She accepts Hayes' (1987) moraic trochee, together with the extrametricality of most word-final vowels, and inflectional consonants. However, she computes moraicity with respect to the *derivational stem*, essentially the word minus the final vowel. Thus in a word like *calabaza* 'pumpkin,' the morphological analysis is [[kalabas]a]. In Dunlap's interpretation, the final syllable of the derivational stem is /bas/, which is bimoraic. The moraic trochee is satisfied by this syllable, and penultimate stress results. Words with antepenultimate stress (e.g. *sábana* 'sheet') also mark the final mora (of the derivational stem) as extrametrical. Thus *sábana* is morphologically and metrically [[saba(n)]a]; the last metrizable syllable is the monomoraic /ba/, so the requirement of the moraic trochee requires incorporation of the preceding syllable into the foot. This proposal is problematic for several reasons. First, it presupposes a resyllabification following stress assignment which fundamentally alters the syllabic constituency, hence the moraicity, of certain consonants. This is inconsistent with contemporary notions of prosodic invariability

etc.), these typically do not receive a lengthened pronunciation except in artificial diction (when an actual bisyllabic pronunciation may be attempted).

11 Crowhurst (1992) lists only Old English, Chugash and Cayuvava, all of which are subject to alternative analyses.

12 Both diachronically and in popular speech at the synchronic level, there is a well-documented tendency toward conversion of antepenultimate stress to penultimate stress (e.g. *océano* > *oceanó*, etc.). Otero (1986), however, makes precisely the opposite claim, namely that shifts from penultimate to antepenultimate stress are more characteristic of the evolution of Spanish (Roca 1990 disputes some of the Otero's data). For Otero, antepenultimate stress is unmarked, providing that the penultimate syllable is not heavy. Otero believes that Spanish basically continues the Latin Stress rule, except that in Latin all final rhymes are extrametrical, while in Spanish only the final consonants of derivational stems are regularly extrametrical. This is not the appropriate place to discuss Otero's counterproposals, but if his observations on stress retraction are indeed characteristic of contemporary Spanish, then the 'new' (i.e. post-medieval) Spanish quantitative stress system may be gravitating toward a general setting of $Head_{min} = \text{Off}$, requiring all metrical heads to be bimoraic.

13 Cf. Roca (1990) for some illuminating proposals on the historical development of Spanish stress, from Latin antecedents. Roca (1990) continues to affirm that modern Spanish is quantity insensitive, citing the large number of exceptions to any approximation of the Latin Stress Rule (e.g., consonant-final paroxytones, vowel-final oxytones), the lack of distinctive vowel length, and the ease with which foreign proparoxytones like *Mánchester* are accepted into Spanish. However, he concedes (p. 160) that 'some evidence that the constraint has had and probably still has some synchronic force in Spanish does however exist.' Roca's alternative solution (p. 161) is: '... interpreting the diachronic residue of Latin quantity sensitivity in the synchronic Spanish system as a redundancy.' This procedure is instantiated by a redundancy rule that blocks an otherwise general stress retraction rule just in case the penultimate rhyme is branching (or contains a palatal consonant). This is merely begging the question, however; postulating a quantity-sensitive constraint to a general rule is just a restatement of quantity sensitivity. In other respects, Roca's theory fares well in accounting for a wide range of regular and seemingly irregular Spanish data, and is deserving of more detailed consideration than can be afforded here.

14 Núñez Cedeño (1986) observes that hypercorrect /s/-insertion in vernacular Dominican Spanish never occurs in the penultimate syllable of proparoxytones: **sábasdo*, **órgasno*, etc. For what it is worth, the present writer has observed occasional hypercorrect /s/ in this context, in Caribbean Spanish dialects and in New Mexico Spanish. These occurrences are sporadic and very rare, but when combined with the growing store of borrowed proparoxytones with heavy penults, as well as

vowel-final oxytones, this may signal the first glimpses of an eventual return to a quantity-insensitive stress system, in which the bisyllabic template $[\sigma \sigma]$ is primordial, but in which extrametricality and other forms of exceptionality play a greater role. This state of affairs should not be surprising, given that the absorption of borrowed words from a variety of sources has been instrumental in determining the intricacy and complexity of stress assignment in languages such as English and Dutch (cf. Kager 1989).

15 The present study is compatible with the quantity-sensitive trimoraic trochee (the Germanic Foot) postulated by Dresher and Lahiri (1991) to account for Old English data: 'From left to right, build binary, quantity-sensitive left-headed trees whose left branch contains at least two moras.' The combination of binarity and a bimoraic head means that each foot will have at least two syllables; it will have three if the first syllable is light, since the following syllable will have to be incorporated as part of the (branching) head. Given the left-to-right parsing, Germanic feet can actually contain four morae: $[[L H] L]$ (e.g. *cyninga*), etc. Although sharing with the moraic trochee of Hayes (1987) the requirement of a bimoraic head, the Germanic foot differs from the bimoraic trochee in its required binarity. A syllabic sequence H L would be parsed (left-to-right) as $[H] [L]$ (where the second foot is degenerate) under a moraic trochee analysis; the same sequence would be parsed into a single Germanic foot: $[[H] L]$. Historically, the Germanic foot eventually became opaque, but the requirement of binarity became transferred from the foot to the stressed syllable, requiring that the latter be bimoraic. The present analysis has proposed that Spanish shares with Old Germanic the binarity requirement (except in the case of word-final heavy syllables). However, heads are not required to be bimoraic in Spanish, except in the case of words with antepenultimate stress. Since Spanish foot construction takes place from right to left, in the normal case no Spanish foot will have more than three morae. A final sequence ...H will be parsed ... $[H]$; a combination ...L L will be footed as ... $[[L] L]$, a sequence ...H L will be footed as $[[H] L]$, etc. However, since Spanish has $Foot_{min} = \text{Off}$, if the final syllable is light, the penultimate syllable must necessarily become the head, thus making for a trimoraic foot. Only in words for which $Head_{min} = \text{Off}$, requiring a bimoraic head, does a configuration isomorphic to the Germanic foot appear: ...L L L is parsed $[[L L] L]$, and ...H L L is parsed $[[H L] L]$, with four morae in the latter foot.

16 The trimoraic $[H L]$ template proposed by Dresher and Lahiri (1991) for Old English, as well as the examples examined by Crowhurst (1992) all involve cases where trimoraicity was maintained even when the requirement that each branch of a foot dominate a syllable head need not be invoked. In other words, bimoraicity of the head was frequently satisfied by a long vowel, with some vowels even lengthening under stress (much as occurs in modern Italian). Spanish, on the other hand, is based on the bimoraic trochee, and incorporates a third mora into the foot only when this

represents a non-syllabic element, semivocalic nuclear segment or coda consonant. In words with penultimate stress, there is no overwhelming tendency towards a $[[\mu\mu]\mu]$ foot (although at the same time there are no general processes which actively change a $[H\ L]$ foot to $[L\ L]$). The extra mora in trimoraic feet is in a sense accidental, required only in order to ensure that each syllable will have a head consisting of a vocalic nucleus. This is different from the situation in Old Germanic, in which trimoraic trochees were actively selected for. Despite the existence of trimoraic feet, Spanish is still characterized by the bimoraic trochee template. The bimoraic template could be easily maintained if coda consonants received their accompanying mora via the Weight by Position (WP) rule, applying after the initial foot formation. Processes such as vocalic CL are low-level phonetic processes, and conserve moraic structure precisely because they operate after WP has assigned morae to coda consonants. This would be ideal from the point of view of universal typologies, but runs into trouble on two fronts. First, it would not account for default final stress in consonant-final words; the mora associated with the final consonant must be in place prior to foot formation. At the same time, there would be no excluding antepenultimate stress in words with coda consonants in the penultimate syllable. Thus, even if Spanish does have a WP rule, all morae associated with coda consonants must be in place before footing occurs. This does not eliminate the need to postulate a $[\mu\mu\mu]$ template, but the fact that low-level processes such as CL preserve a trimoraic structure does not constitute evidence that trimoraic feet are preferred in Spanish.

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