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On the change from left to right word-edge main stress in Icelandic, Polish and Latin

Haike Jacobs

A shift from left to right word-edge main stress can be observed in a large number of languages. Three cases, Icelandic/Faroese, Polish and Latin are studied in this paper. In doing so, two descriptive rule-based models are compared in order to evaluate their descriptive and explicative adequacy. The causes that have been proposed for the observed changes are critically discussed. Finally, an OT-description of the case studies is provided.

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1. INTRODUCTION

In a large number of languages and language families a similar prosodic change can be observed: a shift in the orientation or the location of main stress from the left word-edge to the right word-edge. The change occurred in the historical phonology of, among others, Romance, Germanic, Slavic, Celtic and Arabic languages. In this paper we will discuss a number of these cases, concentrating on Icelandic, Polish and Latin. The goal of the paper is twofold: on the one hand, we will contrast possible analyses in two different well-established metrical frameworks in order to determine whether the facts allow for an evaluation between the two; on the other hand, we will discuss and evaluate possible causes that have been proposed for these changes.

2. METRICAL MODELS/THEORIES

Since the beginning of metrical phonology with Liberman and Prince (1977) research in metrical theory has led to the development of two restricted descriptive models. The first one, starting with Hayes (1981), is the model proposed by Hayes (1995), in which only three metrical constituents are allowed as the primitive elements of the descriptive vocabulary of metrical theory. These are

given in (1).

(1)   (x .)
    a. syllabic trochee   σ σ
                                (x .)
    b. moraic trochee   μ μ
                                (. x)
    c. iamb   μ σ

The second one, originating with Halle & Vergnaud (1987), is the model advocated by Halle & Idsardi (1995) and Halle (1997, 1998), in which feet or constituents are not recognized as theoretical primitives, but are derived from a limited set of instructions to build a metrical grid, among which we find the parameters for Edge-marking and Iterative Constituent Construction (ICC) in (2).

(2)   a.   *Edge Marking parameter*

           Place a {left/right} parenthesis to the {left/right} of the {left/right}most element. (Abbreviated as LLL, RRR, etc.)

      b.   *Iterative Constituent Construction parameter*

           Insert a {left/right}boundary for each pair of elements.

Both models have been originally proposed in the framework of derivational rule-based phonology, but either of them can in principle be reformulated in the currently popular non-derivational, constraint-based OT phonology (Prince & Smolensky 1993). The change from left word-edge to right word-edge main stress, which is the interest of this paper, has been studied in both models: Halle (1997) discusses the Slavic developments and the change in the Germanic languages is discussed in Lahiri, Riad & Jacobs (1999).

     This paper is organized as follows. In section 3, we will discuss the Icelandic case in relation to the causes that have been proposed by Lahiri et al. (1999) for Germanic. After that, section 4 will address the Slavic languages, focusing on the Polish evolution. Section 5 is devoted to the change in the Romance language family, where it took place between Pre-classical and Classical Latin. Section 6 discusses analyses in OT and, finally, section 7 summarizes and discusses the results.

3. FROM LEFT TO RIGHT IN ICELANDIC AND FAROESE

Lahiri et al. (1999) propose an account for the change from left word-edge to right word-edge stress in the Germanic languages, which is based on the typological observation that weight-sensitive trochaic systems can easily have a 'three syllable window' at the right word-edge (such as, for instance, Classical Latin), whereas at

the left word-edge such windows do not occur. Assuming that the unmarked situation for the left word-edge is a weight-insensitive (syllabic) trochee, they note:

> If the evidence for assigning stress on the left edge is indeterminate, or in other words, unless the evidence is transparent that the stress falls at the left edge, the window will be shifted to the right edge, which is what happened to Latin and the modern Germanic languages. Particularly in Germanic, once the stressed suffixes were incorporated, there was unambiguous evidence for the language learner that stress did not always fall at the left edge. Given that there were already non-initial patterns with certain prefixes and compounds, the shift to the right edge was simple. (Lahiri et al. 1999:402f.)

Weight-sensitive trochees at the left edge are not excluded (the Germanic systems had it), but to maintain it there, it is assumed that 'once the language learner decides that the language is quantity-sensitive (QS), it needs unambiguous evidence to maintain the left-edge setting' (ibid.). The friction between the two functions of stress: demarcative, signaling word or phrase boundaries, and morphological, providing information on the morphological structure of a word is thus considered to be the causative factor for the left to right shift. Lahiri et al. (1999:378) note the following correlation within the Germanic language family: 'for those languages that are no longer quantity-sensitive, the direction of parsing has not changed [left to right; HJ]; the languages that have maintained the quantity-sensitive structure of older Germanic have a different direction [right to left; HJ] of foot parsing'. The two languages that have not changed are Icelandic and Faroese exceptional among the Germanic languages in having retained initial stress. Interestingly, Árnason (cf. Zonneveld, Trommelen, Jessen, Rice, Bruce & Árnason 1999, henceforth: Árnason 1999) in his discussion of Icelandic and Faroese stress hypothesizes that a similar shift from left to right is currently taking place in Faroese (Árnason 1999:586). Let us briefly consider Icelandic first.

Word stress in Icelandic is regularly on the first syllable, as illustrated by the forms in (3), taken from Árnason (1999) and, where, following him, main stress is indicated by ' and secondary stress by ˌ, given that accent (which for clarity reasons we have omitted in (3)) is used in orthography to denote different vowel qualities.[1]

(3) 'hus   'house'
     'taska   'suitcase'
     'höfðinˌgja   'chieftain-Obl.'
     'akvaˌrella   'aquarelle'
     'bioˌgrafˌia   'biography'

Compounds have initial main stress as well, but secondary stress deletes or shifts under clash, as in (4b) and (4c).

(4) a. *'ferða˛maður*   'tourist' (*'ferða* 'travel-Gen-Pl' and *'maður* 'man')
     b. *'hundaskits˛legur* 'like dogshit' (*'hunda* 'dog-Gen-Pl', *'skits* 'shit-Gen' and -*'legur* 'like')
     c. *'stresstas˛ka*   'businessman's briefcase' (*'stress* 'stress, strain' and *'taska* 'suitcase')

Árnason (1999:576) notes that phrasal stress, in contrast to word and compound stress, is final and provides the contrast reproduced in (5). Definite Noun Phrases, on the other hand, follow the initial main stress pattern.

(5) a. *'gamal˛menni* 'senior citizen, old person' (compound: *'gamal* 'old' and *'menni* 'man')
     b. *gamal'maður* 'an old man' (Noun Phrase: *'gamal* 'old' and *'maður* 'man')

Two prefixes sometimes yield forms which do not obey the word-initial main stress: *o-* 'un' and *half-* 'half', as in *o'vitlaus* 'not stupid' and *half'hissa* 'half-surprised', but are regular in *'oboð˛legur* 'unpresentable' and *'halfbro˛ðir* 'half-brother'. Loan words and foreign words usually follow the initial stress pattern; Árnason (1999:578) notes but two deviant cases: a proper name and a trade mark that show antepenultimate stress, *Se'curitas* and *Ge'valia*.

Icelandic stress is thus by all accounts fairly regular. Assuming the model in (1), it can be described straightforwardly (cf. Árnason 1999:572) by constructing syllabic trochees from left to right and the End Rule Initial (recall fn. 1), as illustrated in (6).

(6) hus   tas   ka   a   kva   rel   la
     σ   σ   σ   σ   σ   σ   σ
     (x)   (x   .)   (x   .)   (x   .)
     (x)   (x   .)   (x   .)

Using the model in (2), (6) can be straightforwardly analysed as in (7).

(7) Line 0:   LLL
               ICC: L/L-R
               Head: L
     Line 1:   LLL
               Head: L

	hus	tas	ka	a	kva	rel	la
Line-0: LLL	(x	(x	x	(x	x	x	x
ICC: L/L-R	(x	(x	x	(x	x	(x	x
Head: L	(x	(x	x	(x	x	(x	x
	x	x		x		x	
Line-1: LLL	(x	(x	x	(x	x	(x	x
	(x	(x		(x		x	
Head: L	(x	(x	x	(x	x	(x	x
	(x	(x		(x		x	
	x	x		x			

If we consider the account discussed above for the change from left word-edge to right word-edge stress in the other Germanic languages, then, Icelandic nicely abides the assumption that the unmarked situation for the left word-edge is a weight-insensitive (syllabic) trochee. Loan words (except the two cases noted by Árnason) are generally adapted to initial stress. There are no non-initial patterns with compounds and the only non-initial patterns available to the language learner are the two prefixes *o-* 'un' and *half-* 'half', which, moreover, do not consistently display non-initial stress. So there seems to be no reason at all, given the account discussed above, to expect a change from left word-edge to right word-edge, and yet, this is precisely what Árnason (1999:586) hypothesizes to be taking place in Faroese. Faroese stress is basically similar to Icelandic. As in Icelandic, there are two prefixes *o-* 'un' and s*am-* 'together', which show variable stress: *o'tespi‚ligur* besides *'otespi‚ligur* 'unpleasant'. Faroese differs from Icelandic in having some compounds with non-initial stress and in having some more loanwords (2 in Icelandic and 8 in Faroese) that display non-initial stress. All the examples given by Árnason (1999) are listed in (8).

(8) *for'banna*   'to curse'   *laera'rinna*   '(female) teacher'
     fo'rargiligur   'annoying'   *euro'peari*   'a European'
     stu'dentur   'student'   *standardi'sering*   'standardization'
     drama'tik   'drama'
     ameri'kanari   'an American'

Árnason (1999:583) notes that certain forms 'may vacillate between right-strong and left-strong patterns' such as, for instance, *'burðar‚vektir* or *‚burðar'vektir* 'birth weight' (*'burðar* 'birth-Gen' and *'vektir* weight-Pl) and concludes his discussion of Faroese stress by remarking:

> It is possible to interpret this as an indication that a change is under way in Faroese, so that instead of having structure with syllabic trochees and 'End Rule Left' as the rule for word stress, it is developing into a system with 'End Rule Right'. It may be noted that a change of this type does not have as drastic an effect on the surface stress pattern of words in Faroese as might be expected, since the majority of Faroese words are disyllabic or monosyllabic, so that the only foot is the rightmost one as well as the leftmost one. Árnason (1999:586)

It is important to observe that replacing End Rule Initial by End Rule Final does not account for the compounds with non-initial stress, like *o'tespi‚ligur* besides *'otespi‚ligur* 'unpleasant' given above. Nor does it account for non-initial stress in the loans listed in (8). The five words in the left-hand column of (8) would, on the assumption of left-to-right syllabic trochees and End Rule Final, receive stress

on the wrong syllable. Even if the first two words are analysed as compounds, this still wrongly predicts stress in, for instance, *fo'rargiligur* 'annoying', to be: **forargi'ligur*. Only two words, *laera'rinna* and *euro'peari*, would be properly stressed, which points to lexical specification of stress in these loan words. This point is further motivated when we consider more closely trisyllabic words. Árnason's proposal predicts main stress on the initial syllable (assuming no stress on odd-numbered final syllables in Faroese), which seems to be the normal pattern, as in, for instance, *'hestarnir* 'the horses (horse-Pl-Def)'. This in turn means that the proposed analysis is not helpful in the stressing of trisyllabic loans like *stu'dentur* and *drama'tik*. The only case where there is clear evidence for an ongoing change from left word-edge to right word-edge is vacillating stress in the above-mentioned *'burðar‚vektir ~ ‚burðar'vektir* case. One could hardly claim, however, that the cause for this change is related to the fact that, compared to Icelandic, there are 'non-initial patterns with certain prefixes and compounds' given that they exist in Icelandic as well, nor can it be related to the fact that more loans in Faroese exhibit non-initial stress, given that stress in loans has to be lexically specified in both languages. If Árnason is right in assuming that Faroese can be characterized as undergoing a change from left word-edge to right word-edge stress, it shows, contrary to the claim by Lahiri et al. (1999), that the change can take place irrespective of quantity considerations. However, the strength of the argument is weakened by the fact that the only clear evidence for such a change is the vacillating stress in the *'burðar‚vektir ~ ‚burðar'vektir* case. It is therefore more prudent to assume that Faroese may be characterized as a case of incipient change. In order to show that the change from left to right can indeed take place independently from quantity, a much stronger case is required. In the next section, we will travel east and consider similar developments in Slavic, in particular the evolution of Polish, to further strengthen the argument.

4. FROM LEFT TO RIGHT IN POLISH

Halle (1997) proposes the set of core rules in (9) and shows how these applied in Sanskrit, Russian, Serbo-Croatian, Lithuanian and the Indo-European proto-language.

(9)   *Halle's* (1997) *core rules*

    Line 0:   Morphemes with idiosyncratic accents have a L parenthesis
                 RRR
                 Head: L
    Line 1:   LLL
                 Head: L

In (10) it is illustrated how the rules in (9) apply to Russian *gorodámi* (Instr-Pl) of *górod* 'town' and to *górodu* (Dat-Sg). The stem *gorod* and the dative singular suffix *-u* are unaccented, the instrumental plural suffix *-ami* is accented indicated by a left parenthesis.

(10)

	go	rod	+ a	mi	go	rod	+ u
	x	x	(x	x	x	x	x
Line-0: RRR	x	x	(x	x)	x	x	x)
	x	x	(x	x)	x	x	x)
Head: L			x		x		
Line-1: LLL	x	x	(x	x)	x	x	x)
			(x		(x		
Head: L	x	x	(x	x)	x	x	x)
			(x		(x		
			x		x		

Halle (1997:298), citing Garde (1976), observes that, if the lexical accentuation of morphemes is eliminated, the core rules assign initial stress exclusively:

> Many of the IE languages that lost mobile stress replaced it with initial stress. This is true of the Germanic languages. Initial stress is found also in Czech and Slovak, among the Slavic languages, and in Latvian and Prussian, among the Baltic languages, as well as in Irish and some other Celtic languages. We know also that Italic went through a stage when it had word-initial stress . . . and the same is true of Polish.

More recent corroborating evidence for this view can be provided. Halle (1997:298) cites Kashubian as the only West Slavic language that still has mobile stress. Dogil et al. (1999:839) note that the loss of lexical accent distinctions among morphemes in Slovincian (the northernmost dialect of Kashubian) has led to a system with initial stress further generalized in other Kashubian dialects (cf. also Baerman (1999) for a detailed overview). In the next section, we will first briefly consider stress in Czech and then consider the further development that took place in the historical phonology of Polish, the change from left word-edge to right word-edge stress.

4.1 Czech stress: main initial and secondary alternating

The first necessary step in order to obtain alternating secondary stress is to implement the ICC parameter (cf. (2b) above). Halle (1997:300) remarks that Czech also changed the Line 0 Edge Marking Parameter from RRR to LLL. If the ICC parameter is L, left to right, then words of 4 and 5 syllables will have the pattern illustrated in (11).

(11)

	x	x	x	x	x	x	x	x	x
Line-0: LLL	(x	x	x	x	(x	x	x	x	x
ICC: L/L-R	(x	x	(x	x	(x	x	(x	x	x
Head: L	(x x	x	(x x	x	(x x	x	(x x	x	x
Line-1: LLL	(x (x	x	(x x	x	(x (x	x	(x x	x	x
Head: L	(x (x x	x	(x x	x	(x (x x	x	(x x	x	x

Halle (ibid.), referring to Jakobson (1926), who cites Král, notes that this strictly binary pattern was the norm in the 1920s, but that a somewhat different stress contour prevailed earlier, when for five-syllable words, the pattern ('σ σ σ ˌσ σ) was considered to be the norm.[2] Halle further notes that changing the ICC from left-to-right to right-to-left will account for this pattern and 'machinery must be added to eliminate stress clash in word-initial position. This may be done by the adding of the 'avoid' condition [i.e. clash avoidance] suggested in Halle & Idsardi (1995)'. This is illustrated in (12).

(12)

	x	x	x	x	x	x	x	x	x
Line-0: LLL	(x	x	x	x	(x	x	x	x	x
ICC: L/R-L Avoid: (x(	(x	x	(x	x	(x	x	x	(x	x
Head: L	(x x	x	(x x	x	(x x	x	x	(x x	x
Line-1: LLL	(x (x	x	(x x	x	(x (x	x	x	(x x	x
Head: L	(x (x x	x	(x x	x	(x (x x	x	x	(x x	x

4.2 *From Czech to Polish: main penult stress and secondary alternating stresses rightward*

Halle (1997:301) considers the evolution from a Czech-like system in (12), which historically Polish had according to Garde (1976:295), to Modern Polish to be only

a small step. Two more modifications are required for the Line 1 parameter settings: the Edge Marking parameter has to be RRR instead of LLL, and Head: L has to be replaced by Head: R. Halle (1997:301) proposes the rules in (13) for Modern Standard Polish.

(13) *Polish stress*
> Line 0: LLL
> ICC: L/R-L
> Head: L
> Line 1: RRR
> Head: R

Although the step is small, there is an additional complication to the analysis. The 'avoid (x(' constraint is necessary in order to get secondary initial stress in pentasyllabic words such as *zàdowolóna* 'happy, satisfied (Fem.)', but this will incorrectly provide main stress for trisyllabic words, such as, *daléko* 'far away' or *dlaczégo* 'why', as illustrated in (14).

(14)

	dla	cze	go	za	do	wo	lo	na
	x	x	x	x	x	x	x	x
Line-0: LLL	(x	x	x	(x	x	x	x	x
ICC: L/R-L Avoid: (x(	(x	x	x	(x	x	x	(x	x
No Avoid: (x(	(x	(x	x	(x	(x	x	(x	x
Head: L	(x x	x	x	(x x	x	x	(x x	x
Line-1: RRR	(x x)	x	x	(x x	x	x	(x x)	x
Head: R	(x x) x *dlá	x cze	x go	(x x zà	x do	x wo	(x x) x ló	x na

Changing the Line 0 Edge Marking parameter from LLL to RRR is not an option, as it predicts a secondary stress on the second syllable in all odd-numbered polysyllabic words of more than three syllables. An analysis without the avoidance constraint (as in the shaded part of (14)) faces the following problem: destressing has to be made

sensitive to whether or not the offending stress, that is the stress that is coming in by the ICC, is main stress or secondary stress. If main, as in trisyllabic words, the initial secondary one has to disappear, if the incoming stress by ICC is a secondary stress, as in pentasyllabic words or other (more than three) odd-numbered polysyllabic words, the initial secondary stress remains and the incoming secondary stress has to disappear itself. The problem is that when applying the ICC the distinction between main and secondary stress is not yet visible, as it is dependent on the Line 1 parameter settings. In a way, the problem is due to the fact that Polish main stress is accounted for by the ICC parameter and that the parameter can therefore not be stated independently from it. In the next section, we will briefly discuss the available evidence for secondary stress distribution in Polish.

4.3 Polish secondary stress

Dogil (1999) investigates whether auditory qualities of stress such as length, loudness, pitch and vowel quality have acoustic correlates such as duration, intensity, fundamental frequency and spectral structure in Polish, and finds that 'the only significant parameter correlating with the penultimate syllable (main stress) is the occurrence of the highest F0 together with a sharp slope' (Dogil 1999:286). For secondary stress, but only for secondary stress on the initial syllable, the experiments show that
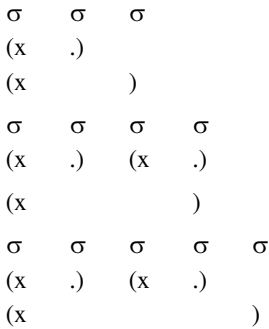
> the length of the syllable and the fully articulated vowel appear to mark the relatively higher prominence of this syllable. None of the investigated acoustic parameters correlate with the syllable [la] [in *marmoladowymi* 'marmalade-Loc-Pl'; HJ] which, according to some metrical descriptions is supposed to carry a rhythmic secondary stress' (Dogil 1999:286f.).[3]

Dogil et al. (1999) present an account of Polish stress which involves stressing words without the clash avoidance (that is, along the lines of the shaded part in (14)) followed by the deletion of all parentheses before main stress which, for Polish, must again be followed by ICC L/L-R and a reapplication of the Line 1 instructions. It should be observed that this produces secondary stresses for which no acoustic evidence apparently is available. Alternatively, in order to get only one single initial secondary stress, but no alternating secondary stresses, one could, after deletion of all parentheses before main stress, reapply the Line 0 LLL marking instruction with the 'avoid (x(' constraint followed by a reapplication of the Line 1 instructions.
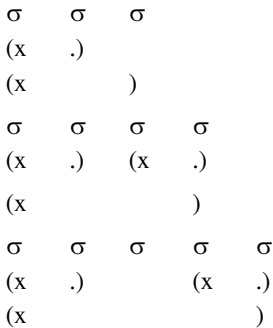
Compared to the core rules in (9) and to Czech (11) or (12), the change from left-edge main stress to right-edge main stress in Polish seems to have led to a more complicated analysis if described in the Halle & Idsardi framework. The same holds true for the Hayes framework. Using the model in (1), Czech (11) could be accounted for by syllabic trochees from left to right and End Rule Initial. Both Czech

(12) and Polish also require a more complicated analysis: Král's/Dogil's colloquial Czech (12) could be done by a non-iterative initial syllabic trochee followed by iterative syllabic trochees from right to left and the End Rule Initial; Polish by the mirror image: a non-iterative final syllabic trochee followed by iterative/non-iterative syllabic trochees from left to right and End Rule Final, as schematically illustrated in (15)–(17) for words of three, four and five syllables.
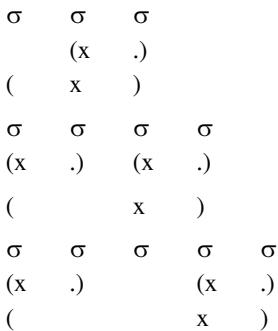
(15)   *Jakobson's Czech in the Hayes framework*

```
σ      σ      σ
(x     .)
(x            )

σ      σ      σ      σ
(x     .)     (x     .)
(x                   )

σ      σ      σ      σ      σ
(x     .)     (x     .)
(x                         )
```

(16)   *Král's/Dogil's colloquial Czech in the Hayes framework*

```
σ      σ      σ
(x     .)
(x            )

σ      σ      σ      σ
(x     .)     (x     .)
(x                   )

σ      σ      σ      σ      σ
(x     .)            (x     .)
(x                         )
```

(17)   *Polish in the Hayes framework*

```
σ      σ      σ
       (x     .)
(      x      )

σ      σ      σ      σ
(x     .)     (x     .)
(             x      )

σ      σ      σ      σ      σ
(x     .)            (x     .)
(                    x      )
```

The change from left word-edge to right word-edge stress that occurred in the history of Polish can be described in both models, but in neither of them as a simplification of the grammar. In both models, Polish stress requires a more complicated analysis, if compared with its 'Czech' initial stress ancestor. More clearly and more convincingly than Icelandic and Faroese, Polish shows that the change from left word-edge to right word-edge stress took place irrespective of quantity considerations. Furthermore, the Slavic evidence shows that it can also take place irrespective of morphological considerations: on the one hand, the co-existence of left word-edge main stress and stressed morphemes is in itself (as the Russian examples demonstrate) not sufficient to trigger the change, and, on the other hand, in the historical phonology of Polish, the change occurred without morphology playing a role. In the next section, we will travel south and further back in time to consider similar developments in Italic.

5. FROM LEFT TO RIGHT IN LATIN

In the evolution from Pre-classical to Classical Latin, the change from left word-edge to right word-edge stress went through an intermediate stage in Early Classical Latin. Early Classical Latin had a stress pattern identical to Classical Latin, except for having a quaternary pattern in tetra-syllabic words with the first three syllables light, as in *fácilius* 'easy', *básilicus* 'royal', *bálineum* 'bath' and *ópitumus* 'optimal', that is, initial stress only in words of four syllables of which the first three syllables are light, but not in words of four, but with the first syllable heavy, as in *compositus* 'composed'. Evidence for this system can be provided on the basis of syncope: *compósitus > compostus* 'composed' versus *bálineum > balneum* 'bath' and *ópitumus > optumus*. Words with more than four syllables obey the antepenultimate maximum, such as *malefícium* 'crime', *domicílium* 'house' and *similitúdinem* 'similarity' (cf. Lindsay 1894, among others). It is this intermediate stage that we focus on in this section, in order to compare and evaluate the models in (1) and (2).

In order to account for quantity-sensitivity, model (2) uses a Syllable Boundary Projection parameter, which projects a left or right boundary of certain syllables onto Line 0. For Latin, it is assumed to be Project L of heavy syllables. The Line 0 Edge marking setting RLR is responsible for final syllable extrametricality. The setting for the ICC has to be L, right-to-left without a Clash-avoidance option, as illustrated in (18), in order to get main stress on the second syllable in words of four syllables with the first syllable heavy and the second and third syllable light, that is, words such as *compósitus* 'composed', *pērículum* 'danger' and *artículum* 'joint'. Line 0 constituents are subject to Head marking L. On Line 1, the Edge-marking setting is RRR and Head marking is R. As shown in (18), the derivation for *opitumus* now incorrectly predicts **opítumus*.

(18)

	ar	ti	cu	lus	o	pi	tu	mus
	x	x	x	x	x	x	x	x
Line-0: RLR	x	x	x	)x	x	x	x	)x
Project: L	(x	x	x	)x	x	x	x	)x
ICC: L	(x	(x	x	)x	x	(x	x	)x
Head: L	(x	(x	x	)x	x	(x	x	)x
	x	x				x		
Line-1: RRR	(x	(x	x	)x	x	(x	x	)x
	x	x)				x)		
Head: R	(x	(x	x	)x	x	(x	x	)x
	x	x)				x)		
		x				x		
	ar	tí	cu	lus	*o	pí	tu	mus

Applying an additional Edge-marking setting LLL on Line 0 does not seem helpful. The ICC parameter then still has to be L, right-to-left fashion, without Clash-avoidance, in order to stress correctly *articulus*, which still does not provide the correct pattern for *opitumus* cases, as illustrated in (19).

(19)

	ar	ti	cu	lus	o	pi	tu	mus
	x	x	x	x	x	x	x	x
Line-0: RLR	x	x	x	)x	x	x	x	)x
Project: L	(x	x	x	)x	x	x	x	)x
LLL	(x	x	x	)x	(x	x	x	)x
ICC: L	(x	(x	x	)x	(x	(x	x	)x
Head: L	(x	(x	x	)x	(x	(x	x	)x
	x	x				x		
Line-1: RRR	(x	(x	x	)x	(x	(x	x	)x
	x	x)				x)		
Head: R	(x	(x	x	)x	(x	(x	x	)x
	x	x)				x)		
		x				x		
	ar	tí	cu	lus	*o	pí	tu	mus

There are two ways in which to get correct stress placement in *ópitumus*. The first one is by stipulating that in the relevant tetrasyllabic words with the first three syllables light, either the second or the third vowel is specified as being unable to bear stress. At first sight, this may seem an arbitrary move, but it is independently required (within model (2)) for other languages. Halle (1998), discussing stress in English nouns ending in *-ure* and *-y* (as well as some other classes of words), shows that an elegant account can be provided if it is assumed that certain syllables are unstressable, formally described by not projecting them on Line 0 of the grid. All

the Early Classical Latin examples showing this quaternary pattern in tetra-syllabic words with the first three syllables light that I am aware of have the high short vowel *i* in the antepenultimate syllable. If we assume that the high vowel in this position is unstressable, the cases of initial stress in tetrasyllabic words with the first three syllables light are no longer problematic for an account along the lines of (18) or (19). What still needs to be stipulated, though, is that antepenultimate high vowel *i* is only unstressable in words of this specific prosodic shape, that is, antepenultimate short *i* is normally stressed in words like, *màlefícium* 'crime', *dòmicílium* 'house'or *dígitus* 'finger'.

A second, less stipulative way would be to assume a destressing rule, which has to destress the main stressed syllable, but only if it is preceded by a single light syllable. As a consequence destressing will take place in the derivation of *optimus*, but not in the derivation of *màlefícium* 'crime' or *dòmicílium* 'house' or *artículus* 'joint'. Destressing the syllable with main stress might seem odd, but as a matter of fact, within the model in (2), it can be motivated independently from the *ópitumus* case for Latin. We formulate destressing as in (20).

(20)   (x   (x   →   (x x   Line 0
         | |
         L   L

As it is formulated in (20), destressing will take place not only if the main stressed syllable is concerned, as in the derivation of *ópitumus*, but also if the same configuration obtains elsewhere. In this respect, it is interesting to contrast *discipulína* 'education, knowledge' and *similitúdinem* 'similarity'. Destressing is predicted to take place in the derivation of *similitudinem*, but not in that of *discipulina*, as illustrated in (21).

(21)

	dis	ci	pu	li	na	si	mi	li	tu	di	nem
	x	x	x	x	x	x	x	x	x	x	x
Line-0: RLR	x	x	x	x	)x	x	x	x	x	x	)x
Proj: L	x	x	x	(x	)x	x	x	x	(x	x	)x
LLL	(x	x	x	(x	)x	(x	x	x	(x	x	)x
ICC: L	(x	(x	x	(x	)x	(x	(x	x	(x	x	)x
rule (20)	(x	(x	x	(x	)x	(x	x	x	(x	x	)x
Head: L	(x	(x	x	(x	)x	(x	x	x	(x	x	)x
	x	x		x		x			x		
Line-1: RRR	(x	(x	x	(x	)x	(x	x	x	(x	x	)x
	x	x		x)		x			x)		
Head: R	(x	(x	x	(x	)x	(x	x	x	(x	x	)x
	x	x		x)		x			x)		
				x					x		

Evidence that this correctly represents the prosodic structure of Early Classical Latin can be provided by looking at syncope by which the vowel in the weak position of a foot is deleted, as in *sŏlĭdus > soldus* 'solid', *lāmĭna > lamna* 'plate', *ārĭdére > ardére* 'to burn', and *călĕfacere > calfacere* 'to heath'. In (22) we have provided the prosodic structures of these words according to the rules in (21).

(22)

	so li dus x x x	la mi na x x x	a ri de re x x x x	ca le fa ce re x x x x x
Line-0: RLR	x x)x	x x)x	x x x)x	x x x x)x
Proj: L	x x)x	(x x)x	(x x (x)x	x x x x)x
LLL	(x x)x	(x x)x	(x x (x)x	(x x (x x)x
ICC: L	(x x)x	(x x)x	(x x (x)x	(x x (x x)x
rule (20)	(x x)x	(x x)x	(x x (x)x	(x x (x x)x
Head: L	(x x)x x	(x x)x x	(x x (x)x x x	(x x (x x)x x x
Line-1: RRR	(x x)x x)	(x x)x x)	(x x (x)x x x)	(x x (x x)x x x)
Head: R	(x x)x x) x	(x x)x x) x	(x x (x)x x x) x	(x x (x x)x x x) x

Syncope can now be stated as the rule in (23) which targets weak positions of feet.

(23)   V → Ø / (x x   Line 0
                                    |
                                    —

Syncope also took place in *discipulína* yielding Classical Latin *disciplína* and, as predicted by its formulation in (23), to words like *bálineum > balneum* and *ópitumus > optumus* (cf. Allen 1973, Jacobs forthcoming). For the proper application of rule (23), it is crucial that the destressing rule (20) takes place in the derivation of *ópitumus*, but not in that of *discipulína*, as illustrated in (19) and (21). Notice that syncope is predicted to take place in words like *compósitus > compóstus* 'composed'.

Before turning to a description of the changes discussed so far in Optimality Theory (cf. Prince & Smolensky 1993), let us, just as we did at the end of the previous section, first evaluate the two descriptive models in (1) and (2). This is an appropriate point for an evaluation, given that the two rule-based models can be compared with each other, whereas they cannot readily be compared with OT.

The model in (2), the Halle/Idsardi framework, allows for a straightforward description of the evolution from Pre-classical Latin via Early Classical Latin to

Classical Latin. The change from Pre-classical Latin to Early Classical Latin can, apart from extrametricality and quantity-sensitivity, be described in much the same way as the evolution from Czech with initial main stress to Polish with main penultimate stress. The difference with respect to Polish is essentially that instead of the deletion of all parentheses before main stress followed by ICC L/L-R and a reapplication of the Line 1 instructions (the Polish reaction to clashes produced by the ICC parameter), Early Classical Latin had a destressing rule, (23), which was shown to be independently motivated by syncope, as it allowed for a uniform description of it. The further evolution from Early Classical Latin to Classical Latin can be understood as a restrictive change of rule (23) in such a way that destressing of the syllable with main stress is no longer possible. This effectively rules out pre-antepenultimate stress in Classical Latin.

For the model in (1), the Hayes framework, the description of Early Classical Latin is highly problematic. There are two possible descriptions available in that framework. One is foot extrametricality as proposed by Hayes (1995) for a similar pattern in Hindi. Another possible description would be to assign first a non-iterative initial moraic trochee, then final syllable extrametricality, followed by iterative moraic trochees from right to left and End Rule Final. As argued in Jacobs (2002), either account is problematic. Besides being complicated, they both fail to account for a typological directional asymmetry within the model in (1): foot extrametricality occurs only in rightward stressing systems, never in leftward stressing systems. Moreover, the change from Pre-classical initial stress, via Early Classical Latin to Classical Latin hardly seems a natural change. Finally, as shown in Jacobs (forthcoming), the model in (1) is unable to provide a uniform description of the structural context of syncope in words such as *aridére*, *discipulína* and *similitúdinem*. After main stress assignment, the remaining syllables will be metrified as in (24a) if moraic trochees are assumed, and, as in (24b) if uneven trochees are assumed.

(24) a. a   ri   dére   b. a   ri   dére
          μμ   μ   μμ   μ
          (x)   (x   .)

          dis ci   pu   lína   dis ci   pu   lína
          μμ   μ   μ   μμ   μ   μ
          (x) (x   .)   (x   .)

          si   mi   li   túdinem   si   mi   li   túdinem
          μ   μ   μ   μ   μ   μ
          (x   .)   (x   .)

The only way in which the Hayes framework can get the same prosodic representations as the Halle/Idsardi framework for words like *aridére* and *discipulína* is by assuming that stressing, after main stress assignment, does not take place

left-to-right, as in (24), but right-to-left, which will, however, incorrectly stress *similitúdinem*.

In the next section, we will examine how the changes from left word-edge to right word-edge stress can be accounted for in Optimality Theory.

6. FROM LEFT TO RIGHT IN OT

The change from Pre-classical Latin initial stress, via Early Classical Latin to Classical Latin, has been described in an OT-framework by Jacobs (2002). We briefly recapitulate the description here. The change from Pre-classical to Early Classical Latin is described by keeping intact the ranking W/L (Word starts with a foot) and W/R (Word ends with a foot) and by reranking the constraints H/L (main stress is initial) and H/R (main stress is final), as illustrated in tableaux (25)–(26), where main stress is indicated by boldface and secondary stress by underscore. The constraint NONFINALITY (NONF) penalizes a foot in word-final position and the constraint PARSE-σ demands that syllables are parsed into a foot.

(25) *Pre-classical Latin stress*

/σσσ/ fénestram 'window'	NONF	W/L	W/R	H/L	H/R	PARSE-σ
☺ (σσ)σ			σ		σ	*
σ(σσ)	*!	σ		σ		*
/σσσσ/ ópitumus 'optimal'	NONF	W/L	W/R	H/L	H/R	PARSE-σ
(σσ)σ(σ)	*!				σσ	*
(σσ)(σσ)	*!				σσ	
☺ (σσ) σσ			σσ		σσ	**
σ (σσ)σ		σ!	σ	σ	σ	**
/σσσσσ/ máleficium 'crime'	NONF	W/L	W/R	H/L	H/R	PARSE-σ
☺ (σσ)(σσ)σ			σ		σσσ	*
(σσ)(σσ)σ			σ	σ!σ	σ	*
σσ(σσ)σ	σσ!		σ	σσ	σ	***
(σσ)σ(σσ)	*!				σσσ	*
/σσσσσσ/ similitudinem 'resemblance'	NONF	W/L	W/R	H/L	H/R	PARSE-σ
☺ (σσ)σ(σσ)σ			σ		σσσσ	**
(σσ)σ(σσ)σ			σ	σ!σσ	σ	**
σσ(σσ)σσ	σσ!		σσ	σσ	σσ	****
(σσ)(σσ)(σσ)	*!				σσσσ	

The constraint ranking (25) invariably produces initial stress. As shown in Jacobs (2002), reranking of H/L and H/R straightforwardly accounts for Early Classical Latin, illustrated in tableau (26). The constraint QS (quantity-sensitivity) requires heavy syllables to be stressed. The further reranking of W/L and W/R accounts for Classical Latin.

(26) *Pre-antepenultimate stress in Plautinian Latin*

/LHσ/ fenéstram 'window'	NonF	QS	W/L	W/R	H/R	H/L	Parse-σ
☺ L(H) σ			σ	σ	σ	σ	**
(L H) σ		*!		σ	σ		*
/LLLH/ ópitumus 'optimal'	NonF	QS	W/L	W/R	H/R	H/L	Parse-σ
(LL)L(H)	*!				σσ		*
L(LL)H		*	σ!	σ	σ	σ	**
(LL)(LH)	*!				σσ		
☺ (LL)LH		*		σσ	σσ		**
/HLLσ/ compósitus 'composed'	NonF	QS	W/L	W/R	H/R	H/L	Parse-σ
H(LL)σ		*!	σ	σ	σ	σ	**
☺ (H)(LL)σ				σ	σ	σ	*
(H)(LL)σ				σ	σσ!σ		*
(HL)Lσ				σσ!	σσ		**
(HL)(Lσ)	*!				σσ		
/LLLLσ/ òpifícina 'atelier'	NonF	QS	W/L	W/R	H/R	H/L	Parse-σ
(LL)(LL)σ				σ	σσ!σ		*
☺ (LL)(LL)σ				σ	σ	σσ	*
L(LL)(Lσ)	*!		σ		σσ	σ	*
(LL)L(Lσ)	*!					σσσ	*

In (25) and (26) two more alignment constraints FT/L (every foot is left-aligned with the left word-edge) and FT/R (every foot is right-aligned with the right word-edge) are left out of consideration. They play a role only in words of

eight syllables and decide between (xx)x(xx)(xx)x and (xx)(xx)x(xx)x. If they are both ranked above PARSE-σ only an initial and a final foot will be produced.[4] It should also be observed that in (25) the relative ranking of NONF does not affect initial stress. No matter where it is ranked, main stress will be placed on the initial syllable. If this constraint is ranked below the other constraints in (25), we straightforwardly derive Král's/Dogil's colloquial Czech, as illustrated schematically in (27).

(27) *Král's Czech/Dogil's colloquial Czech*

/σσσ/	W/L	W/R	H/L	H/R	PARSE-σ	NONF
☺ (σσ) σ		σ		σ	*	
σ (σσ)	σ!		σ		*	*
/σσσσ/	W/L	W/R	H/L	H/R	PARSE-σ	NONF
☺ (σσ)(σσ)				σσ		*
(σσ) σ σ		σ!σ		σσ	**	
σ (σσ) σ	σ!	σ	σ	σ	**	
/σσσσσ/	W/L	W/R	H/L	H/R	PARSE-σ	NONF
(σσ)(σσ)σ		σ!		σσσ	*	
☺ (σσ)σ(σσ)				σσσ	*	*
(σσ)(σσ)σ		σ!	σσ	σ	*	
σσ (σσ)σ	σσ!	σ	σσ	σ	***	
(σσ) σ σ σ		σ!σσ		σσσ	***	
/σσσσσσ/	W/L	W/R	H/L	H/R	PARSE-σ	NONF
(σσ)σ(σσ)σ		σ!		σσσσ	**	
(σσ)σ(σσ)σ		σ!	σσσ	σ	**	
σσ(σσ)σσ	σσ!	σσ	σσ	σσ	****	
(σσ)σσ(σσ)				σσσσ	*!*	*
☺ (σσ)(σσ)(σσ)				σσσσ		*

In OT the different stages and the different developments in the languages discussed can thus be described as involving constraint reranking. Reranking H/L and H/R starting from (25) thus derives Early Classical Latin. Reranking both H/L-H/R and W/L-W/R accounts for Classical Latin and without quantity-sensitivity (the QS constraint) describes the standard stress pattern of Macedonian (cf. Baerman 1999). Finally, reranking both W/L-WR and H/L-H/R, starting from (27), derives Polish, as illustrated in tableau (28).

(28) *Polish stress*

/σσσ/ zmęczona 'tired (Fem.)'	W/R	W/L	H/R	H/L	PARSE-σ	NONF
(σσ)σ	σ!		σ		*	
☺ σ(σσ)		σ		σ	*	*
/σσσσ/ telewizor 'television'	**W/R**	**W/L**	**H/R**	**H/L**	**PARSE-σ**	**NONF**
☺ (σσ)(σσ)				σσ		*
(σσ)(σσ)			σ!σ			*
(σσ) σσ	σ!σ		σσ		**	
σ(σσ)σ	σ!	σ	σ	σ	**	
/σσσσσ/ zadowolony 'happy, satisfied (Masc)'	**W/R**	**W/L**	**H/R**	**H/L**	**PARSE-σ**	**NONF**
(σσ)(σσ)σ	σ!		σσσ		*	
☺ (σσ)σ(σσ)				σσσ	*	*
(σσ)σ (σσ)			σ!σσ		*	*
(σσ)(σσ)σ	σ!		σ	σ σ	*	
σσ (σσ)σ	σ!	σ σ	σ	σ σ	***	
(σσ) σσσ	σ!σσ		σσσ		***	
/σσσσσσ/ marmoladowymi 'marmalade (Loc.Pl)'	**W/R**	**W/L**	**H/R**	**H/L**	**PARSE-σ**	**NONF**
(σσ)σ(σσ) σ	σ!		σσσσ		**	
(σσ)σ(σσ)σ	σ!		σ		**	
σσ (σσ) σσ	σσ!	σσ	σσ		****	
(σσ)σσ (σσ)				σσσσ	*!*	
(σσ)σσ (σσ)			σ!σσσ		**	*
(σσ)(σσ)(σσ)			σ!σσσ			
☺ (σσ)(σσ)(σσ)				σσσσ		*

It should be observed that, if words like *marmoladowymi* 'marmalade-Loc-Pl' only have an initial and a final foot, there is evidence for the relative ranking of the constraints FT/L and FT/R with respect to PARSE-σ.

In the last and final section, we will briefly summarize our findings and return to the discussion and evaluation of possible causes for the observed changes.

7. ARE WE ANY WISER? SUMMARY AND SPECULATION

In this paper we have compared two descriptive rule-based models and we have demonstrated that the change from left to right word-edge main stress in the languages that we have discussed allowed for an evaluation to the extent that only the Halle/Idsardi framework allowed for a straightforward descritpion of the facts. Finally, we have shown that a straightforward description can also be provided in OT. What is still painfully lacking, though, is an account for the Why of the changes

(or, for that matter, of the constraint rerankings, cf. McMahon 2000). We share with Lahiri et al. (1999) the assumption that language change and language acquisition go hand in hand, but we hasten to point out that acquisition in an OT-model is different from acquisition in a rule-based model in the sense that in the former, but not in the latter, markedness considerations don't play any obvious role. That is, in the model in (1) or (2), marked and unmarked parameter settings (such as End Rule Final or Line 1: Head: R) can be identified, which as such may be called upon as guiding principles determining acquisition. In OT, acquisition consists of inferring the correct ranking of a set of universal and violable constraints (cf. Tesar & Smolensky 1998, Kager 1999). In the remainder of this section, we will try to discuss the possible causes of the changes as theory-neutrally as possible.

We started out the discussion of Icelandic and Faroese by recapitulating Lahiri et al.'s (1999:402f.) account for the change from left word-edge to right word-edge stress in the Germanic languages. Assuming the correctness of Árnason's assumption that Faroese manifests an ongoing change from left word-edge to right word-edge stress, it was argued that the cause for this change could not be related to existing 'non-initial patterns with certain prefixes and compounds', given that they exist in Icelandic as well, nor to the presence of some more loans in Faroese than in Icelandic exhibiting non-initial stress, given that stress in loans has to be lexically specified in both languages. Also, the Faroese case showed that the change might take place irrespective of quantity considerations. Polish showed this much more clearly and convincingly. Furthermore, the Slavic evidence showed that the change took place irrespective of morphological considerations. The co-existence of left word-edge main stress and stressed morphemes (as in Russian) is in itself not sufficient to trigger the change, and, in the historical phonology of Polish, the change occurred without morphology playing a role. For the evolution from Pre-classical to Classical Latin, the only type of suffixes that might have led to unambiguous evidence for the learner that stress was not always on the first syllable are the enclitic suffixes (with a stress behavior possibly borrowed from Greek), like -ve, -ne (question particles), -ce (emphasis), -met 'even' and -que 'and' which were pre-stressing (cf. Jacobs 1997). If they were pre-stressing at the early period, then forms such as *itáque* 'and so', *utíque* 'and how' and *virúmque* 'and the man' (cf. *íta*, *úti* and *vírum*) might be considered as possible triggers for the change from left word-edge to right word-edge.

Still, assuming that language acquisition and language change are inextricably linked, is there another way in which the changes discussed might be interpreted as originating from 'imperfect' learning? Is there other evidence on the basis of which the language learner might decide to abandon the left-edge setting?

For the Latin case discussed here, there is another way in which the change from left word-edge to right word-edge stress might be understood. The reranking of H/L and H/R or the change of the Line-1 parameter settings does not affect the stressing of a large number of words. Monosyllabic, bisyllabic, trisyllabic and tetrasyllabic

words consisting of light syllables will be initially stressed under either ranking of H/L and H/R and under either Line-1 parameter settings, as their stressing is consistent with either ranking. The difference shows up in words of five or six light syllables, where the two rankings differ (cf. (25) and (26) above), not in the location of the stresses, but with respect to the not too salient distinction of which syllable bears primary stress and which syllable bears secondary stress. We tentatively suggest that it is this indeterminacy in the data, possibly reinforced by the emerging quantity-sensitivity and the enclitic suffixes, which actually caused the changes and led to the expression of them in the phonological grammar in the form of reranked constraints or reset parameters. In order to make this more precise, let us look again at the Polish evolution, where a highly similar situation obtains.

Tableaux (27) for Czech and (28) for Polish show that, as in Early Classical Latin (but now for all word types), the relative ranking of H/L and H/R does not change the location of stress, but only the nature of stress: primary or secondary. Furthermore, the only prosodic word type where the relative ranking of W/L and W/R matters in tableaux (27) and (28) are words of three syllables. In all other words, their ranking is irrelevant, given that the optimal output candidates violate neither of these constraints. Crucial, then, for the reranking of W/L and W/R, a step in the evolution from historical Polish with initial stress (cf. tableau (27)) to modern Polish in (28), is ambiguity in the stressing of trisyllabic words. This is so because, if trisyllabic words are always and invariantly stressed on the first syllable (as predicted by (27)), the language learning child will simply never come across data available to him or be confronted with positive evidence that might led him to change the parameters or constraint rankings. In other words, it is crucial that besides trisyllabic words with initial stress, there are also trisyllabic words that have penultimate stress. Although clearly a lot more research is needed, we would like nevertheless tentatively to provide two possible situations showing ambiguity in the data with respect to trisyllabic words. The first is from contemporary Czech. Garde (1976) notes that in modern Czech there is a tendency to place the stress of a proclitic on the initial syllable of the following word: *do rúky* 'in the hand' instead of *dó ruky*. If a similar situation did exist in the history of Polish, this might have been the ambiguous evidence for the ranking of W/L and W/R we are looking for. The second is from Polish, with respect to which Garde (1976:295) remarks:

A l'accent fixe sur l'initiale, commun aux autres langues sl.[aves] occ.[identales], le polonais a substitué plus tard un accent fixe sur la pénultième. Cet accent peut, comme dans les autres langues sl.[aves] occ.[identales], remonter sur un proclitique si le mot est monosyllabique. . . . En revanche, les enclitiques n'entrent pas en ligne de compte dans la détermination de la pénultième, qui est comptée à partir de la fin du mot plein.

Examples of stressed proclitics followed by a monosyllable are *nié wiem* 'I don't know' and *koło mnie* 'around me'. An example of an enlitic not triggering penultimate stress is, for instance, *kócham cię* 'I love you'. Garde (1976:295) further notes, with respect to cases such as *kócham cię*:

> De ce fait la langue connaît aussi des unités accentuelles accentuées sur l'antépénultième. L'accentuation sur l'antépénultième s'est étendue de là à certains mots d'emprunt étranger comme *múzyka* 'musique', *ídea* 'idée', et même à certaines autres expressions comme *wógole* 'en général'.

For the language learning child, the existence of a trisyllabic stress domain with penultimate stress, as in *koło mnie*, and with antepenultimate stress, as in *kócham cię*, might be considered to have been the type of data not only showing unambiguously non-initial stress, but also to constitute ambiguous evidence for the ranking of W/L and W/R, and eventually to form the basis for imperfect learning for the language learning child.

ACKNOWLEDGEMENTS

NOTES

1. Final odd-numbered syllables receive a secondary stress in (3). We will not go into the details of Icelandic stress here, but refer the reader to Hayes (1995) and Árnason (1999).

2. Dogil et al. (1999:821) considers this pattern to be the norm for contemporary colloquial Czech.

3. Dogil (1999:289) further observes that, in narrow focus the prominence value for secondary and main stress are switched.

4. I know of no such words in Latin. The relative ranking of these constraints is also relevant for words of seven syllables in Král's/Dogil's colloquial Czech, illustrated in (12) above and, as Halle (1997:301) remarks, for the similar stress system of Garawa.

REFERENCES

Allen, W. Sidney. 1973. *Accent and Rhythm*. Cambridge: Cambridge University Press.
Árnason, Kristján. 1999. See Zonneveld et al. 1999.
Baerman, Matthew. 1999. *The Evolution of Fixed Stress in Slavic*. Munich: Lincom Europa.

Dogil, Grzegorz. 1999. The phonetic manifestation of word stress in Lithuanian, Polish, German and Spanish. In van der Hulst (ed.), 273–311.

Dogil, Grzegorz, Jadranka Gvozdanović & Sandro Kodzasov. 1999. Slavic Languages. In van der Hulst (ed.), 813–876.

Garde, Paul. 1976. *Histoire de l'accentuation slave*. Paris: Institut d'études slaves.

Halle, Morris. 1997. On stress and accent in Indo-European. *Language* **73.2**, 275–313.

Halle, Morris. 1998. The stress of English words 1968–1998. *Linguistic Inquiry* **29.4**, 539–568.

Halle, Morris & William Idsardi. 1995. General properties of stress and metrical structure. In John Goldsmith (ed.), *Handbook of Phonological Theory*. Oxford: Blackwell, 403–443.

Halle, Morris & Jean-Roger Vergnaud. 1987. *An Essay on Stress*. Cambridge, MA: MIT Press.

Hayes, Bruce. 1981. *A Metrical Theory of Stress*. Ph.D. dissertation. [Distributed by the University of Indiana Linguistics Club.]

Hayes, Bruce. 1995. *Metrical Stress Theory: Principles and Case Studies*. Chicago: Chicago University Press.

Jacobs, Haike. 1997. Latin enclitic stress revisited. *Linguistic Inquiry* **28.4**, 48–61.

Jacobs, Haike. 2002. Why preantepenultimate stress in Latin requires an OT-account. In Paula Fikkert & Haike Jacobs (eds.), *Development in Prosodic Systems*. Berlin & New York: Mouton de Gruyter, 395–418.

Jacobs, Haike. Forthcoming. Rhythmic Vowel Deletion in OT: syncope in Latin. In Jean-Pierre Montreuil (ed.), *Probus* (special issue).

Jakobson, Roman. 1926. Review of F. Trávníček (1924). Příspěvky k nauce o českém přizvuku [Contributions to the study of Czech accent]. *Slavia* **4**, 805–816. [The English translation of the article is in Roman Jakobson, 1926, *Selected Writings* (vol. 1). The Hague: Mouton, 614–625.]

Kager, René. 1999. *Optimality Theory*. Cambridge: Cambridge University Press.

Král, Josef. 1923. *O prosodii ceské* [On Czech prosody]. Prague: Ceská akademia.

Lahiri, Aditi, Tomas Riad & Haike Jacobs. 1999. Diachronic prosody. In van der Hulst (ed.), 335–422.

Liberman, Mark & Alan Prince. 1977. On stress and linguistic rhythm. *Linguistic Inquiry* **8**, 249–336.

Lindsay, Wallace. 1894. *The Latin Language* (2nd ed., 1963). New York & London: Hafner.

McMahon, April. 2000. *Change, Chance and Optimality*. Oxford: Oxford University Press.

Prince, Alan & Paul Smolensky. 1993. Optimality Theory: constraint interaction in generative grammar. Ms., Rutgers University.

Tesar, Bruce & Paul Smolensky. 1998. Learnability in Optimality Theory, *Linguistic Inquiry* **29.2**, 229–268.

van der Hulst, Harry (ed.). 1999. *Word Prosodic Systems in the Languages of Europe*. Berlin & New York: Mouton de Gruyter.

Zonneveld, Wim, Mieke Trommelen, Michael Jessen, Curt Rice, Gösta Bruce & Kristján Árnason. 1999. Word stress in West Germanic and North Germanic languages. In van der Hulst (ed.), 477–603.