

Eurhythmy or Clash in the English Rhythm Rule*

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0. Introduction

In this paper, I argue that the rhythm rule phenomenon in English is best treated in terms of a theory incorporating the notion "stress clash" (Hammond, 1988), rather than the notion "eurhythmy" (Hayes, 1984). There are three central arguments. First, it is argued that the eurhythmy theory is intrinsically undesirable as it requires a theory of universal grammar that countenances arbitrary counting. Second, it is shown that the eurhythmy theory makes incorrect predictions about the behavior of words with initial stressless syllables. Third, it is shown that the clash-based theory, as opposed to the eurhythmy theory, generalizes nicely to account for the *Montana cowboy* phenomenon.

The organization of this paper is as follows. First, I review the traditional clash-based account of Liberman and Prince (1977). I go on to review the eurhythmy account of Hayes (1984). This includes three central claims/effects: the quadrisyllabic rule, the disyllabic rule, and the phrasal rule. It is next shown that each of these effects can be achieved with independently required principles and machinery and that there is no need for a specific theory of eurhythmy.

The following notation will be used in this paper. An acute accent will denote the strongest stress in a domain; a circumflex marks an intermediate stress; a grave indicates less stress; and an unmarked vowel indicates even less or no stress.

(1)	acute accent:	á	strongest stress
	circumflex accent:	â	intermediate stress
	grave accent:	à	weaker stress
	unmarked:	a	even less or no stress

1. The Basic Facts: Clash

The English Rhythm Rule has been discussed extensively, e.g. Chomsky & Halle (1968), Liberman & Prince (1977), Kiparsky (1979), Prince (1983), Hayes (1984), Halle & Vergnaud (1987), Hammond (1988). In this section, the basic facts are presented and a representation for stress is adopted.

Liberman & Prince (1977) observe that stress in a modifier is sometimes retracted before a following word. For example:

(2)	fòurtéen	fóurtèen wómen
	Míssissíppi	Míssissíppi législàture
	sèventy-séven	sèventy-sèven séals
	gòod-lòoking	gòod-lòoking lífeguàrd

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- (16) a. Àlabáma Âlabàma relatives
 b. Àlamogórdo ?Âlamogòrdo relatives
 c. Àpalàchicòla ??Âpalàchicòla relatives

Again, this follows from the quadrisyllabic rule. In (16a), rhythm results in the optimal interstress distance; in (16b) the distance goes from two to five--some improvement; while in (16c), the distance goes from two to six: no improvement.

- (17)
- | | |
|--|--|
| x
x----x
x x x x x x x
Alabama relatives (2->4) | x
x-----x
x x x x x x x
Alamagordo relatives (2->5) |
|--|--|

Summarizing, the quadrisyllabic rule accounts for the reduced likelihood of rhythm as the distance between trigger and target is increased beyond four syllables. There are three ways to get this effect. First, the distance between the mover and the edge can be increased. Second, the distance between the trigger and the edge can be increased. Finally, the distance between the mover and the target can be increased.

The second component of the eurhythm theory is the disyllabic rule. The disyllabic rule says that at the level below the level at which the quadrisyllabic rule holds, interstress domains are divided evenly. The level at which the quadrisyllabic rule holds is termed the level of scansion.

- (18) Level of Scansion: the level selected by the Quadrisyllabic Rule.

The disyllabic rule holds at the level below the level of scansion.

- (19) Disyllabic Rule
 The domains delimited on the level of scansion should be divided evenly by a mark on the next lower grid level.

The disyllabic rule is responsible for internal rhythm (Prince, 1983). These are cases where rhythm applies at two levels in the modifier. In a phrase like *a hundred thirteen men*, rhythm applies within the entire modifier, *hundred thirteen*, and also within the smaller modifier *thirteen*. The internal domains are underlined below.

- (20)
- | | |
|--|---|
| hùndred thirtéén
àlmost hard-bóiled
extrèmely unkínd | a hùndred <u>thirteen</u> mén
an àlmost <u>hàrd-boiled</u> égg
an extrèmely <u>ùnkínd</u> còmment |
|--|---|

The interstress interval at the level of scansion in (20) is four syllables. Hayes points out that internal rhythm is dispreferred if the interstress distance is three syllables.

(30)

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          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 x x x
a most unkind comment -> a most unkind comment ->

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```

          x
        x   x
      x---x   x
x x x x x x
-> *a most unkind comment

```

5. Extrametricality: The Quadrisyllabic Rule

As shown above, there are three sets of data to account for. In this section, we consider the paradigm created by varying the distance between the mover and the edge. It is argued that this can be accounted for straightforwardly if, as is standardly assumed, extrametrical material is invisible.

Following hordes of other researchers, e.g. Hayes (1981, 1982), Halle & Vergnaud (1987), Hammond (1988; 1989), etc., it is assumed here that extrametricality is assigned to the rightmost syllables of English nouns and suffixed adjectives.

(31) Stress is assigned in nouns and suffixed adjectives in English by making the rightmost syllable extrametrical and then building binary left-headed constituents over the span.

The standard interpretation of extrametrical material is that it is invisible with respect to metrical structure assignment. It would seem that the most natural interpretation of extrametrical material with respect to the determination of clash would be the same. An extrametrical syllable is invisible with respect to clash. If we make this assumption, then the effect in (12a,b) above, repeated as (32a,b), can be gotten straightforwardly. Rhythm is more likely in (32a), not because of the interstress distance, but because there are two clashes. Rhythm is less likely in (32b), because there is only one clash. Both cases are diagrammed in (33).

(32) a. Mississíppi Míssissippi Mábel
 b. Mínnéápolis ?Mínnéápolis Míke

(33)

```

          x                               x
        x----x                           x-----x
      x   x----x                         x   x-----x
(x x) (x) (x)                          (x x) (x) <x> (x) <x>
Tennessee Tim                          Mississippi Ma bel

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```

          x
        x-----x
      x   x   x
but: (x x) (x x) <x> (x)
      Minne apo lis Mike

```

There are two possible glitches to this story. First, it might be thought that at the phrasal level, the extrametrical syllable is no longer peripheral because it occurs inside a syntactic phrase. Loss of peripherality would mean loss of extrametricality and the now stray syllable would have to be adjoined to one of the neighboring feet. This would entail a loss of the explanation proposed here because the now metrical syllable would intervene in determining adjacency, causing *Mississippi Mabel* to have only a single clash.

However, there is no reason to believe that word-edge becomes inaccessible in the syntax. That is, within a theory like lexical phonology, there is no bracketing erasure in the syntax (Kiparsky, 1982). Since the edge of the word is still visible, the extrametrical syllable is still peripheral in its domain. Hence the explanation above can still go through.

A second potential problem for this line of explanation comes from the suffix *-ic*. Myers (1987) argues that this suffix is exceptionally not extrametrical. This enables it to always assign stress to the preceding syllable and to trigger trisyllabic laxing. (Myers conceives of trisyllabic laxing as shortening the first syllable of a binary trochaic foot.) If *-ic* is not extrametrical, then we would expect an adjective with *-ic* to behave like the longer modifiers in (12b)/(32b). This does not seem to be the case. Rather, such modifiers seem to behave like the shorter modifiers in (12a) and (32a).

(34)	phîlosóphic àntiséptic pùgilístic	phîlosòphic Fréd àntisèptic Árníe pùgilístic Pát
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This suggests that at the relevant point in the derivation *-ic* is extrametrical. (A similar issue is raised with unsuffixed adjectives.)

There are two possible responses to this problem. One possibility is to maintain some other treatment of trisyllabic shortening, e.g. Yip (1987). Yip proposes that the suffix *-ic* is underlying nonsyllabic. From this, she derives its stress properties and the fact that it triggers trisyllabic shortening.

Another possible response is to maintain that noncyclic stress assignment in English includes extrametricality. Halle & Vergnaud (1987) suggest that only primary stresses emerge from lexical stress assignment. Secondary stresses are assigned by the noncyclic Alternator. This accounts for the quantity-insensitivity of secondary stresses and the apparent absence of cyclically assigned secondary stresses (but see Hammond, 1989). If we assume that extrametricality is also reapplied as part of the noncyclic Alternator, then we can get the right results for adjectives containing *-ic*. First, *-ic* is added in the cyclic phonology. It is exceptionally not extrametrical, and therefore forces stress on the immediately preceding syllable and triggers trisyllabic shortening. Then, the noncyclic Alternator applies including noncyclic extrametricality which renders the final syllable extrametrical. In (35), the derivation of *tonic* is given.

- (35)
- | | | | | |
|--------|-----------|-----------|-----------|---------|
| x | x x | x | x | x |
| (x x) | (x x) | (x x) | (x x) | (x) <x> |
| ton -> | ton-ic -> | ton-ic -> | ton-ic -> | ton-ic |

What is crucial is that final stressless syllables be extrametrical when clash is determined. In the worst case, this could be accomplished by simply allowing for a postlexical rule of extrametricality.

Support for the two-clash approach to the quadrisyllabicity phenomenon comes from the treatment of the second class of cases adduced above. The relevant cases are repeated from (14) in (36). On the two-clash view, the contrast here is a straightforward consequence of the fact that (36a) has two clashes, while (36b) has only a single clash. Relevant examples are diagrammed in (37).

- (36)
- | | | |
|----|---------|----------------------|
| a. | Àlabáma | Âlabàma relatives |
| b. | Àlabáma | ?Âlabàma connéctions |

- (37)
- | | |
|---|--|
| x
x-----x
x x x
(x x) (x) <x> x (x) <x>
Ala ba ma connections | x
x-----x
x x-----x
(x x) (x) <x> (x x) <x>
Ala ba ma rela tives |
|---|--|

Moreover, the two-clash analysis predicts contrasts where the eurhythmy analysis does not. For example, the two-clash analysis predicts that even if the mover is at the edge, adding a stressless syllable between the trigger and edge should decrease the likelihood of rhythm. This is because addition of such a syllable will decrease the number of clashes. Consider the following contrasts where the mover is the ultima. There is a clear difference in the propensity for rhythm in the two cases. This cannot be accounted for on the eurhythmy analysis.

- (38)
- | | | |
|----|-----------|--------------------------------|
| a. | Kângaróo | Kângaròo Kím |
| | Tènnessée | Tènnessèe Tím |
| | Thirtéen | Thirtèen mén |
| | còmplèx | còmplèx stóry |
| b. | Kângaróo | ?Kângaròo connéctions |
| | Tènnessée | ?Tènnessèe congréssional dist. |
| | Thirtéen | ?Thirtèen consúltants |
| | còmplèx | ?còmplèx condítions |

Relevant examples are diagrammed in (39). Adding an extra syllable between the trigger and the edge results in fewer clashes. However, in terms of the eurhythmy theory, we would expect the opposite. The interstress distance in both cases from (38b) diagrammed in (39) more closely approximates the quadrisyllabic optimum. Hence, on the eurhythmy analysis, rhythm should be more likely in these cases. It is not and this must be taken as an argument in favor of the two-clash view specifically and the clash view generally.

- (39)
- | | |
|---------------------------------------|--|
| x
x--x
x x--x
(x x) (x) (x) | x
x-----x
x x x
(x x) (x) x (x) <x> |
| a. Kangaroo Kim (1->3) | Kangaroo connections (2->4) |
| | |
| x
x-----x
x x--x
(x) (x) (x) | x
x-----x
x x x
(x) (x) x (x) <x> |
| b. thirteen men (1->2) | thirteen consultants (2->3) |

6. Lexical Skewing

We are left with only one array of data in support of the quadrisyllabic rule to account for: (16) repeated as (40).

- (40) The Residue of the Quadrisyllabic Rule:
- | | |
|-----------------|--------------------------|
| a. Àlabàma | Âlabàma relatives |
| b. Àlamogòrdo | ?Âlamogòrdo relatives |
| c. Àpalàchicòla | ??Âpalàchicòla relatives |

Accounting for these in terms of the quadrisyllabic rule misses an important generalization however. The stress patterns that would result from application of the rhythm rule have a very different status in the three cases. Words with a basic stress pattern like *Ábernàthy* (cf. *Âlabàma*) are reasonably common; words with a basic pattern like *dísciplinàry* (cf. *Âlamagòrdo*) are far less frequent; words with the stress pattern of **Ápalàchicòla* are nonoccurring.

In a search of a computerized database of approximately 20,000 words I came up with the following counts.

- | | | |
|---------------|--------|-------------------------------|
| (41) pattern | number | examples |
| Àlabàma? | 348 | Ábernàthy, ágitàtor, etc. |
| Àlamogòrdo? | 20 | éxpiatòry, dísciplinàry, etc. |
| Àpalàchicòla? | 0 | NONE |

Thus accounting for the pattern in (40) in terms of the quadrisyllabic rule misses the generalization that the relative propensity of the rhythm rule correlates with the possibility of basic words with the derived stress pattern that the rhythm rule would produce.

Confirmation of this idea comes from two sources. First, it is not clear that phrasal modifiers work like (40). They would seem to undergo rhythm regardless of the distance between mover and target. This is what we would expect if (40) is a consequence of the avoidance of lexically dispreferred patterns.

- | | | |
|------|--------------------|------------------------|
| (42) | a. vèry háppy | vèry hàppy pèrson |
| | b. màjorly háppy | mâjorly hàppy pèrson |
| | c. màjorly unháppy | mâjorly unhàppy pèrson |

Judgments are precarious here, however.

Second, lexical skewing can also provide an explanation for the *Montana cowboy* effect. Recall that rhythm is dispreferred in modifiers like *Montana*. It turns out that words with the stress pattern of *hierarchy* (cf. *Môntàna*) are rather rare. In my database, there are only 229, most of which are compounds.

(43)	pattern	number	examples
	thirtèen	1492	cóbàlt, ápèx, etc.
	Môntàna	229	hierarchy, pínòchle, etc.

This would seem to suggest that a treatment of the *Montana cowboy* effect is better made in terms of avoiding dispreferred lexical patterns. This allows us to avoid the ad hoc (5b) above and provides for a treatment of (40).

7. Beat Addition

Hayes proposes that the theory of eurhythmly also applies to Beat Addition. Beat Addition is the process whereby beats are added to a phrase even when there are no clashes. For example, Hayes notes that the names *Mary-Ellen Mathers* and *Farrah Fawcett-Majors* both have the same output grids even though only the first undergoes rhythm per se.

(44)

		x				x
	x-----x			x		x
x	x		x		x	x
x	x	x	x	x	x	x
Mary-Ellen	Mathers	->	Mary-Ellen	Mathers		

						x
			x		x	x
x		x		x		x
x	x	x	x	x	x	x
Farrah	Fawcett-	Majors	->	Farrah	Fawcett-	Majors

The fact that there is a process of Beat Addition is not an argument against the clash-based theory of rhythm. It need only be assumed that beats are added up to clash. Consider, for example, the results of applying Beat Addition to either of the less prominent stresses in *Farrah Fawcett-Majors*. In the first case, no clash is produced; in the second case, a clash would result, so this latter application of Beat Addition is blocked.

(45)

						x
	x					x-----x
	x		x		x	x
	x	x	x	x	x	x
Farrah	Fawcett-	Majors		Farrah	Fawcett-	Majors

8. Summary

To summarize, it has been proposed that the eurhythmy theory of rhythm be abandoned in favor of a theory of rhythm in terms of clash. This latter theory has the following parts.

- (46) The proposal:
- a. Clash.
 - b. Move as far as possible (Halle & Vergnaud, 1987).
 - c. Extrametrical stuff is invisible (Hayes, 1982).
 - d. Don't make clashes (Hammond, 1988).
 - e. Don't make impossible words.

There are three central arguments in favor of this theory. First, the clash-based theory avoids the undesirable numerology of the eurhythmy theory. Second, the clash-based theory makes the right predictions with respect to the data in (38). Third, the clash-based theory provides for an account of the lexical skewing facts and allows us to dispense with the ad hoc (5b).

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