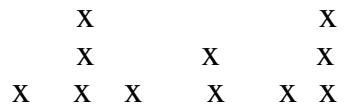

The Rap of Young M.C.:

A Case Study of Eurhythmic Textsetting

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INTRODUCTION

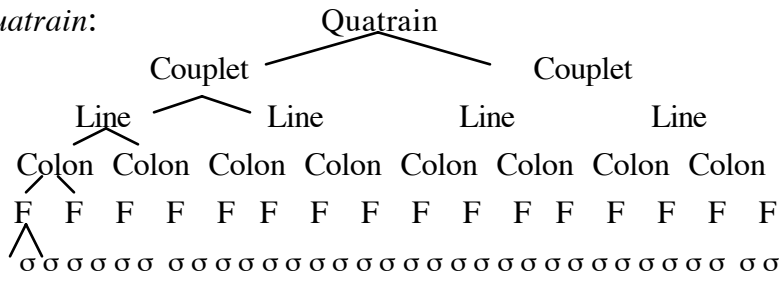
Hayes (1984) suggests that especially at normal speech rates, speakers strive to be eurhythmic; language attempts to conform to an abstract rhythmic pattern. The "rules of eurhythmy" essentially consist in changing the relative stress output generated for a linguistic string by the prosodic hierarchy, according to "rhythmic adjustment rules." In the following example, *Mìssissíppi* becomes *Míssissìppi* when concatenated with *Mábel*, such that stresses are spaced in a eurhythmic way:

If this is true, important questions to be answered include: what is the rhythmic template which speech approximates; in what ways is this achieved; and, given that a tension exists between more general eurhythmic constraints and the stress pattern assigned by the prosodic hierarchy, what are the limits of the drive to fit speech into this extralinguistic template? Hayes (1984) begins to answer the first two questions. This study will address the last.

This paper will examine several ways in which prosodic patterns are shifted in the interests of eurhythmy, in two songs of the artist M. Young ("Young M.C.") In rhythmic speech, such as nursery rhymes, choral poetry and rap music, eurhythmic constraints are stronger than in natural language, and freedom from the stress assignments dictated by the prosodic hierarchy is accordingly greater. Rap music is especially interesting, because unlike other forms of poetry, the rhythmic target in question is actually overt in the background beat. This target, for the texts examined here (and I believe for most of rap music) is the quatrain.

Hayes(1984), Attridge (1982) and others refer to this pattern as “fully unmarked meter”, because the alternating stresses in its hierarchy are based on powers of two:

Rap Music Quatrain:



Thus: “I Come Off”, the first song examined here, has the following structure: (please refer to appendices 1a, b for full transcriptions of the songs.)

Cola:	W	S	W	S
Feet:	W S	W S	W S	W S
Syllables:	s w s w	s w s w	s w s w	s w s w
First couplet:	Now I wrote –	this – record	– for when I	perform – –
Second couplet:	Lonely nights –	in – side a	un i ver si	ty dorm – –

In grid form we may represent the first couplet as follows:

	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
Now I	wrote -	this -	re cord	- for	when I	per	form - -

“Principal’s Office”, the second song examined here (please refer to appendices 2a, b for full transcriptions) stresses odd cola, rather than even ones:

Cola:	S	W	S	W
Feet:	W S	W S	W S	W S
Syllables:	s w s w	s w s w	s w s w	s w s w
First couplet:	Now - as I	get to school I	hear the late -	bell - ringing
Second couplet:	- Run - ning	thru the hall I	hear the glee -	club - singing

In grid form:

			x										x										
			x						x				x						x				
x			x				x			x				x						x			
x	x		x	x			x	x		x	x			x	x					x	x		
Now	-		as	I			get	to		school	I			hear	the		late	-			bell	-		

ring	ing																						

BACKGROUND

This paper will draw on some important groundwork in the fields of rhythm, verse and natural speech. A brief summary of important concepts follows:

Rhythm:

Liberman and Prince (1977, cited in Hayes, 1984 and elsewhere) characterize rhythm as a "hierarchy of intersecting periodicities." The two most important rules about rhythm for our purposes follow:

1.) The Continuous Column Constraint (formulated by Prince 1983, cited in Hayes, forthcoming): A beat on a given level in a rhythmic hierarchy implies a beat on any level lower down in the hierarchy.

2.) Beats are equally spaced in time.

The rhythmic grid for the songs discussed here is shown below:

Tactus level:	x						x						x						x				
2° Stress :	x			x			x			x			x			x			x				
Terminal level:	x	x	x	x			x	x	x	x			x	x	x	x			x	x	x	x	

Cooper and Meyer (1960) [cited in Hayes (forthcoming)] suggest another reason why this structure is the most unmarked possible rhythm: "durational differences ... tend to produce end-accented groupings; intensity differentiation tends to produce beginning accented groupings."

Verse:

"Textsetting" rules for verse, culled from Attridge (1982), Halle and Lerdahl (forthcoming) and Hayes (1983 and elsewhere) include the following:

1.) Associate stressed syllables with strong positions.
2.) "Fill" strong positions with relatively stressed syllables.

3.) The left edges of intonational phrases (or other prosodic groupings) are free; right edges are strict. This means that metrical rules must be obeyed at the right edge of the prosodic domain upon which the rule acts, but are freer to violate rules at the left edge.

Natural speech:

Hayes (1984) discusses two types of "rules" which govern eurhythmy in natural speech:

1.) Rhythmic Preference Rules evaluate the relative eurhythmy of prosodically bracketed grids:

a.) *Quadrisyllabic rule:* "A grid is eurhythmic when it contains a row whose marks are spaced close to four syllables apart." Four syllables seems to be the optimal distance between stresses.

b.) *Disyllabic rule:* "The domains delimited on the level of scansion should be divided evenly by a mark on the next lower grid level." In other words, once a grid row has been defined as the row whose marks are about four syllables apart, the next lower level should optimally have stresses every two syllables.

2.) Rhythmic Adjustment Rules such as "Move X" and "Beat Addition" implement rhythmic preference rules (Hayes' [forthcoming] formulations are used):

a.) *Move X:* "Move one grid mark at a time along its row."

b.) *Beat Addition:* "Apply Domain Generation pretonically within a domain."

Let us return to *Mississippi Mabel* as an example of how the quadrisyllabic preference rule actuates *Move X*. Below, the circled *x* moves leftward because a four-syllable interval is better than a two-syllable interval.

```
(          x  )                (          x  )
(    (x)  ) (x  )              ((x)       ) (x  )
(x  .) (x  .) (x .)            (x  .) (x  .) (x .)
Mississippi  Mabel             Mississippi  Mabel

(2-syllable spacing on         (4-syllable spacing on
highlighted level of grid)     highlighted level of grid)
```

Move X can also work to satisfy the disyllabic rule, as in the following example, which gives stress to alternating syllables:

[a HUNdred thirTEEN MEN] ---> [a HUNdred THIRteen MEN].

Beat Addition is also actuated by a move toward a more eurhythmic structure: below, adding a beat to the first syllable "*Far"* yields a stress at a 4-syllable interval, instead of just a 2-syllable interval:

Initially there is no level of the grid with beats at close to 4-syllable intervals. After beat addition, the highlighted row has beats spaced at 4 syllables.

The *Quadrisyllabic rule* looks very suspicious when we look at the metrical grid for rap, because the "tactus" (foot-tapping) beat which is most perceptually salient is precisely the level which has four equally spaced beats under it. Thus, it is natural to assume an artist will try to place stressed syllables under these tactus beats, because that way the speech will sound most eurhythmic. In natural language, syllables do not have to superimpose themselves on a rhythmic superstructure, so these definitions are on the syllables themselves. For our purposes here, we will convert these definitions to "4-beat" and "2-beat" rules, respectively.

THE CASE STUDY: M. YOUNG'S RAP

Seven "rules" governing Young's rhythmic textsetting will be discussed below. These are not rules in the strict sense of defining an algorithm to derive the couplets, but rather well-formedness constraints or preference statements. As such, it may be that they are weighted with respect to one another, but generally they are not ordered. One exception to this is *Syncopation.* I believe syncopation is a late implementation operation, analogous to a phonetic rule, which follows the other rules discussed here.

1.) Syllable Satisfaction:
Every syllable must be associated with at least one full beat at the terminal (lowest) level of the grid.

Since our metrical line has 16 terminal beats, this means a couplet cannot exceed 16 syllables in length. This is true of 100% of the corpus examined here. Such a constraint may seem a tautology, since we have defined the terminal grid on the basis of the syllables that must be mapped to it. However, Young sometimes does map a word with *n+1* syllables

to a metrical interval with only *n* grid marks, and in this case a rule applies to delete the most unstressed syllable, in order to avoid mapping more than one syllable to a beat.

2.) Syllable Deletion:
Delete the most unstressed syllable in an interval which violates Syllable Satisfaction.

Example: "I Come Off", couplet: 7.4

```
                                                                  [And
        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
when the rhymes are     fin' ly fin ished   peo ple say God     - Damn - [Cause
```

Here, "*rhymes*" and "*fin*" have been mapped to the strongest beats in the metrical line to satisfy the *Stressed-to-Strong* rule (below.) Now we have four potential syllables "*are.fi.na.lly*" that must be fit into the three highlighted metrical slots. Since two syllables would have to share a beat if we mapped them all, the most unstressed syllable [n´] is deleted.[2]

---

[2]Note that in couplet 7.4 above, the beat pattern on cola is shown as 2131 rather than 3121. In all cases of the songs I have analyzed, the musical beat begins and continues with the following structure (i.e., 3121).

```
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
```

However, the verse associated with the musical beat is often arranged so that it is "out of phase" with it; i.e., the first syllables of the couplet may not begin on a downbeat. The transcriptions that appear in appendices 1 and 2 are arranged in "absolute" terms; i.e., in terms of musical grids such as the one above. Each page shows 32 tactus beats, or "counts" of the music. On the other hand, for the text of this paper I established the most frequent lyrical beginning in each song, and used it to determine foot structure. Thus, since in the first line of "I Come Off" the first syllable does not coincide with the strongest metrical beat,

```
                                                                  (Now I)
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
wrote - this -      re cord - for       when I per form     - -  (Lonely)
```

we will consider the couplet to actually be:

```
        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
Now I wrote -           this - re cord      - for when I        per form - -
```

3.) Anchoring:

Associate the nuclear stress of the last intonational phrase (IP) in the couplet with the final tactus beat (hereafter "downbeat") in the metrical grid.

```
      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
                                              *  ]IP
```

A couplet usually consists of one or two intonational phrases. This rule seems to follow right strictness, in that the last downbeat of the metrical line must be filled, while the requirement is more lax at the beginning of the line. If we leave aside the effects of syncopation for the moment, the last downbeat is filled 100% of the time in this corpus, while as a comparison, the first downbeat is filled only 89.82% of the time.

Example of Anchoring: "I Come Off" couplet 2.3:

```
                                    ([suf  fe          ring pa  ra   ly)
      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
sis] -  -  [Of     - the mouthIP] [of   -  the  lipIP] [of     -  the tongueIP] -
(Downbeat is optionally empty)                    (Downbeat is obligatorily full)
```

Example of Anchoring with syncopation: "Principal's Office" couplet 4.5:

```
      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
-  -  -  For    get -  class -    I'm ´ shoot -    some ball -  -
```

(Downbeat is optionally empty) (Downbeat is obligatorily full)

In 4.5 above, I am claiming that at a phonological level, *"ball"* is associated with the last downbeat position, even though on the surface it has been moved leftward by syncopation. This will be discussed further under *Syncopation*, below.

4.) Stressed-to-Strong Mapping:
The most prosodically stressed syllables in the couplet tend to be mapped to the four strongest beats (the downbeats) in the metrical line.[3]

This is reminiscent of Lerdahl and Jackendoff's (1983) *Metrical Preference Rule 4:* "Prefer a metrical structure in which beats that are stressed are strong beats", implying again that this is a rule which is inclusive of, but not limited to linguistic structure.

Example of Stressed-to-Strong Mapping: "I Come Off" couplet 1.5

```
(                                   x  )
(                  x  )    (        x  )
(        x)  (     x  )    (x)   (  x  )
(x) (x)  (x)  (x)  (x  .)   (x)   (x)  (x  .)
 I  get  raw  like Eddy,  rough like Freddy.
```

Metrical mapping of stressed syllables:

```
        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
        raw                 Ed                  rough               Fred
```

A combined effect of the four rules mentioned so far is that syllables may not be exhaustively mapped from left to right, nor from right to left. Gaps may be left where no speech is mapped to the metrical line. A eurhythmically set couplet will have between 0 and 3 syllables interpolated between each of the downbeat syllables. More than three syllables is ill-formed, because in that case not every syllable will be associated to a full beat at the terminal level of the grid.

Example of 4 constraints so far: "I Come Off" couplet 1.1: (11 syllables)

```
(                                                   x)
(                        x  )    (                  x)
(x)  (       x)   (      x  )    (                  x)
(x)  (x)   (x)    (x)   (x  .)   (x)   (x)   (x)  (  .   x)
[Now  I  wrote  this  record]IP [for  when  I  perform]IP
```

First, "undoing" the effects of syncopation, which is yet to be discussed, note that the in the metrical mapping below, the nuclear stress on "*form*" is associated with the last downbeat of the metrical line (*Anchoring).* Next, the relatively stressed syllables "*wrote*"

[3]Again, syncopation is not considered an exception to this. Please refer to the discussion of syncopation, below.

and "*re*" are associated with downbeats. This leaves several syllables to be interpolated, as shown below:

	x				x				x				x		
	x				x				x				x		
	x				x				x				x		
Now I	wrote			this	re		cord	for	when		I	per	form		
(2 σ)				(1σ)			(2σ)				(2σ)				

The option chosen is the one in which there are no more than three syllables to interpolate between each downbeat (in order to meet *Syllable Satisfaction)* rather than, for example, the following:

	x				x				x				x		
	x				x				x				x		
	x				x				x				x		
		Now I	wrote			this			re	cord	for	when	I	per	form
		(2σ)				(1σ)				(5σ)					

5.) Stress Promotion

Promote the stress of a <u>stressed</u> syllable which falls in downbeat or secondary strong position. (Analogously, demote the stress of a stressed syllable in weak position.)

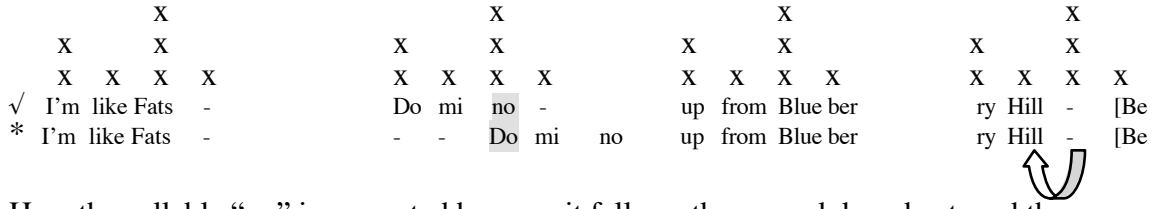
I have suggested that linguistic stress is more malleable (and eurhythmic constraints more rigid) in rhythmic speech. It is possible to promote a stressed syllable's degree of stress if it falls in a strong rhythmic position, and to demote it if it falls in a weak rhythmic position, in order to keep an alternating rhythm going. Note that if a syllable is to be promoted, it must already bear some level of stress (although rare exceptions to this exist in the corpus, mainly in order to avoid violating other constraints.) Completely unstressed syllables do not tend to be mapped to strong positions in the first place; as a diagnostic, the corpus was scanned for "*the*" (a reliably unstressed word) in downbeat or secondary strong position. Of 64 occurrences in the 108 lines of the corpus, "*the*" occurred 52 times (81.25%) in weak position (grid column height 1), 12 times (18.75%) in secondary strong position (grid column height 2), and never occurred in downbeat position (grid column height 3). An example of "*the*" in secondary strong position follows:

"I Come Off" couplet 4.4:

		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	
Peo	ple's	hands	-		go	-	up	-		when	I	en	ter		the	place	-	[I	

In all 12 occurrences in secondary strong position, "*the*" immediately precedes a syncopated strong element. Thus, it may be that clitics cannot be separated from their strong elements.[4] Aside from this behavior of clitics, the resistance of completely unstressed elements to being promoted suggests a limit on the malleability of prosodic stress.

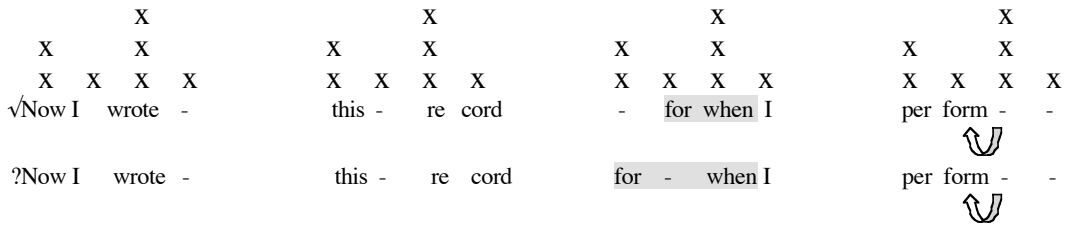
Example of *Stress Promotion* in strong position: "I Come Off" couplet 1.7:



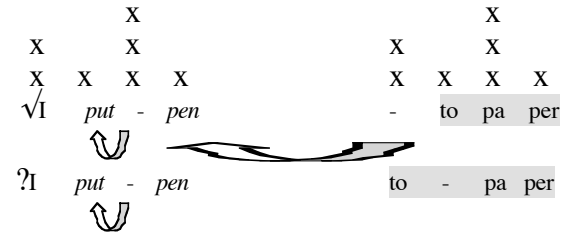
Here the syllable "*no*" is promoted because it falls on the second downbeat, and the syllable "*Dom*" is demoted because it falls in secondary stress potion. This is the optimal

[4]Additional evidence that clitics are normally placed as close as possible to the following stressed word is given below:

"I Come Off" couplet 1.1:

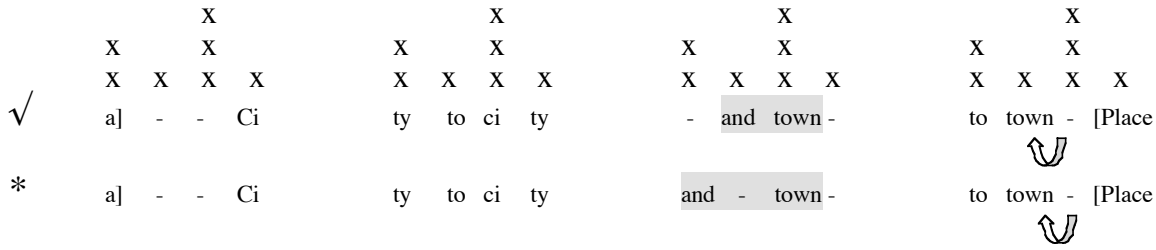


"I Come Off" couplet 1.3, first two cola:



but:

"I Come Off" couplet 6.5:



textsetting here. We cannot place "*Dom*" on the downbeat, because *Syllable Satisfaction* would be violated. (Apparently syllable deletion is not possible for "Domino".)

It is also possible to consult our intuitions about what constitutes a well-formed line. Constructs for "I Come Off" couplets 1.5 and1.6 follow:

			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
√1.5a	I	get	raw	-	like	-	Ed	dy	-	-	rough	-	like	-	Fred	dy
*1.5b	I	get	raw	-	like	-	Ed	dy	rough	like	Fred	dy	-	-	-	-
*1.5c	I	get	raw	-	like	-	Ed	dy	-	-	rough	-	like	Fred	dy	-
?1.5d	I	get	raw	-	like	-	Ed	dy	-	-	rough	like	Fred	dy	-	-

			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
√1.6a.	-	-	Kru	ger	with	a	Lu	ger	turn	the	men	in	to	spa	ghet	ti
*1.6b.	-	Kru	ger	-	with	a	Lu	ger	turn	the	men	in	to	spa	ghet	ti
*1.6c.	-	-	Kru	ger	with	a	Lu	ger	turn	the	men	to	spa	ghet	ti	-

Option 1.5a is well-formed. Option 1.5b is ill-formed because there is no syllable associated with the "anchor" position. (Compare couplet 3.2 of "I Come Off", which is well-formed, although it also leaves a whole colon unrealized.) Option 1.5c is ill-formed because it places the second, unstressed syllable of "*Freddy*" in anchor position. Option 1.5d is questionable, because it is unclear whether anything is associated with the anchor position, unless a two-space syncopation has taken place, and it does not give "r*ough*" enough duration (syllable lengthening is discussed below.)

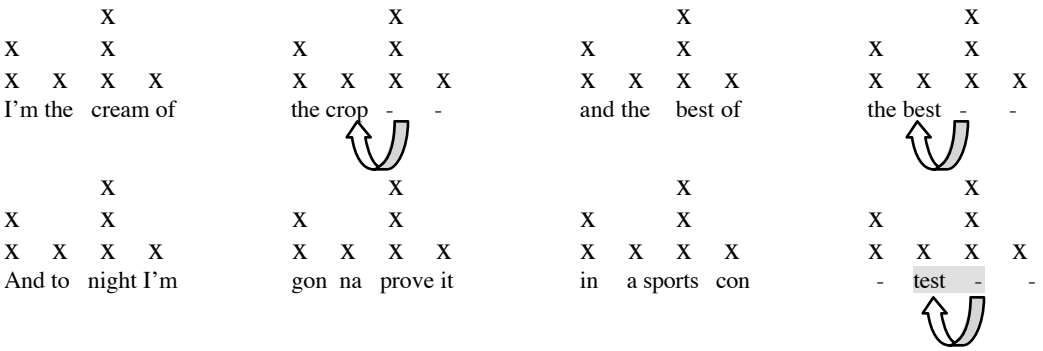
In the same way, options 1.6b and 1.6c are both ill-formed, because both place a completely unstressed syllable in strong position: in 1.6b the second syllable of "*Kruger*" violates our rule, and in 1.6c, the last syllable of "*spaghetti*" violates the rule.

Promotion and demotion of syllables with some degree of stress help to keep the eurhythmic alternation going. Natural speech cannot normally take this option[5], but the metrical grid in rap provides for it. In normal speech, listeners would probably rule out the stress shift from CONtest to conTEST in "I expèct this spórts contèst to get líve". However, my intuition is that this would be acceptable as a rap couplet. Eurhythmic stress promotion and demotion in rap may also observe right strictness, in that the ends of lines

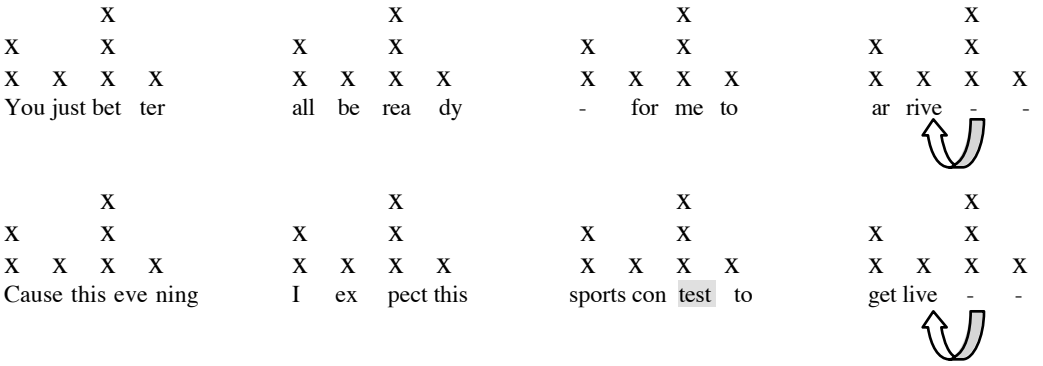
[5]However, Bruce Hayes (personal communication) has suggested that strings at the end of intonational phrases do have this option in natural speech - perhaps the *Quadrisyllabic rule* is right strict. His example is: "álligàtor", but "See you láter, àlligátor".

may enforce them more stringently. My judgments are not clear on this. Two examples follow.

Intonation phrase <u>final</u> shift (construct, due to Bruce Hayes):



Intonation-group <u>medial</u> shift (construct):



Syllable Lengthening

The Syllable *Satisfaction* rule ensures that each syllable is associated with at least one beat at the terminal level of the grid. However, stressed syllables can be associated with more than one terminal grid mark. This is reminiscent of both natural speech, in which stressed syllables have longer durations than unstressed ones, and music (cf. Lerdahl and Jackendoff's *Metrical Preference Rule 5:* "Prefer a metrical structure in which relatively strong beats occur at the inception of notes of relatively long duration."

I have already noted that the most unstressed syllable of a word or clitic group can be deleted in order to meet *Syllable Satisfaction.* We turn now to *Syllable Lengthening* as a eurhythmic tool. Hayes (1984) offers a "Phonetic Spacing Hypothesis" in which eurhythmic preference rules in normal speech refer to both syllable count and duration. Thus, [KorBEL teQUIla] undergoes *Move X* (i.e., [KORbel teQUIla] more readily than [KorBEL chamPAGNE] (i.e., [??KORbel chamPAGNE]) because a larger phonetic

distance is covered by "*cham*" than "*te*". Adjacent stresses can also be mitigated by lengthening the first "clashing" syllable, to effectively increase the time lag between it and the next stress. Thus, two ways to resolve the stress clash in [fourTEEN WOmen] are, a) [FOUR teen WOmen], or b) [fourTEEEEN WOmen].

The hypothesis that "a monosyllabic or disyllabic interval on the level of scansion [the tactus level] is more tolerable when it is phonetically longer" (Hayes [1984] p.70) is borne out in rap. My lengthening rule may be formulated as follows:

6.) Syllable Lengthening:
A stressed syllable may lengthened (associated to more than one terminal grid mark) in order to satisfy eurhythmic constraints of stressing every fourth beat, and alternating stress every second beat. Texts are judged to be better set if stressed syllables are expanded, rather than unstressed syllables.

Thus, stressed syllables lengthen into the spaces of what Attridge calls "implied offbeats."

Returning to an example from natural speech, Hayes (1984) mentions that certain linguistically bracketed input grids may not lend themselves to *Beat Addition* or *Move X* in order to achieve a 4/4 pattern. Thus, in natural speech [ONE thirTEEN MAIN Street] does not undergo the disyllabic rule to yield [ONE THIRteen MAIN Street], because the shift in stress could not create alternating stress. However, in rap, even this example becomes tractable. If, by virtue of being stressed, [ONE] is expanded in duration to occupy two beat slots, it makes sense to say that stressing [THIR] would eurhythmicize the string. Indeed, there would be two ways to make the string eurhythmic: a) involves the stress shift; b) involves retaining stress on [TEEN], but giving it an extra beat, to create an alternation with [MAIN].

a.)

```
x                   x
x       x           x       x
x   x   x   x       x   x   x   x
one - thir teen     Main - Street -
```

b.)

```
x                   x
x       x           x       x
x   x   x   x       x   x   x   x
one thir teen -     Main - Street -
```

Example of Syllable Lengthening: "Principal's Office" couplet 3.4

```
(                                                        x    )
                                (                        x    )
(                      x)            (                   x    )
(       x     )   (        x)   (x   )  ( <--------x)  (x     )
(x)   (x   .)   (x  .)   (x)   (x   .)  (x)      (x)   (x   . )
I'm   running   up the  stairs  with a  front    tooth  broken
```

```
1   2   3   4        5   6   7   8        9  10  11  12        13  14  15  16
        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
I'm -   run ning     up the  stairs -     with a front -       tooth - bro ken
```

The *Anchor* and *Stressed-to-Strong* rules apply to this couplet to map "*run*", "*stairs*", "*front*" and "*bro*" to the four downbeats. *Syllable Satisfaction* also ensures that all the syllables of the couplet will be able to interpolate themselves between these downbeats, unless they can be licitly deleted. However, just how these syllables are interspersed is the matter under consideration. In this couplet, either "*run*" or "*I'm*" could potentially expand to fill terminal grid mark 2 - each has some level of stress.

Now there are three potential ways to map text into terminal grid marks 8, 9 and 10:

```
          7    8      9   10              7    8     9   10              7     8       9   10
a.)  [stE˘˘®z] with  a   b.)  stairs [wI˘˘D]   a   c.)  stairs  with   [√˘˘ ]
```

Options (b) and (c) seem to be less well-formed than (a) because they maximize the durations of unstressed clitics, rather than stressed syllables.

Similarly, we have three possibilities for textsetting to grid positions 11,12, 13, and 14:

```
      11    12      13 14          11 12  13     14                 11       12 13 14
a.) [f®√˘nt]   [tʰu˘T] b.)  [f®√˘˘˘nt]   [tʰuT]        c.)   [f®√nt]   [tʰu˘˘˘T]
```

Option (b) is less than optimal because *tooth* is demoted into completely unstressed position. Option (c) is even less satisfactory: it reduces the length of a stressed syllable in downbeat position. The best option is (a), which allows both stressed syllables to lengthen, and gives "*front*" greater prominence by virtue of its downbeat position.

Syncopation

Many constraints in Hayes (1983) are of the form: Do not put a stress peak into a weak position at the end of a phrase. On the contrary, however, Young's rap lines require this. Syncopation can be formulated as follows:

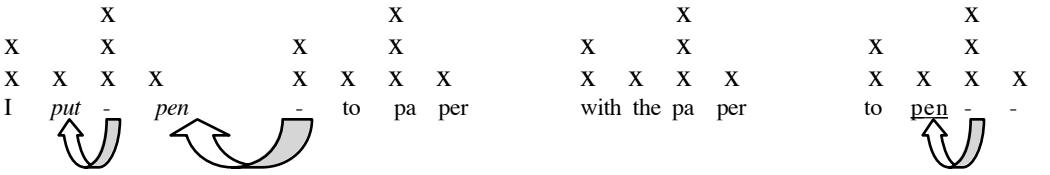
7.) Syncopation:

Associate a stressed syllable in strong position with the weak position one grid mark to its left.

This rule is optional but right-strict; if we exclude from consideration anchor positions in which the rule is blocked due to another well-formedness rule (as discussed below), this rule takes place 100% of the time. The breakdown is as follows: in the 108 lines of the corpus, syncopation of the nuclear stress inhabiting the anchor occurs 73 times (67.59%). All of these are cases in which the nuclear stress falls on a monosyllable (e.g., "I Come Off" 1.2) or stress is word-final (e.g., *perform,* "I Come Off" 1.1). However, twenty-four lines of the corpus (22.22%) involve nuclear stress on a polysyllabic word in which stress is not on the ultima (e.g. *Freddy,* "I Come Off" 1.5; *ringing,* "Principal's Office" 1.1). In these cases, syncopation is blocked by the *Stress Promotion* constraint (do not promote a completely stressless syllable.)[6]

In the remaining 11 lines of the corpus, *Syncopation* is blocked by the *Syllable Lengthening* rule. Each case involves two relatively stressed adjacent syllables, in which the weak grid mark before the anchor position is used as an implied offbeat. *Syncopation* would decrease eurhythmy here (examples are "Principal's Office 1.5 and 7.7.)

As mentioned, *Syncopation* observes right strictness; it is rarer in non-downbeat position. "I Come Off" couplet 1.3 provides examples:



[Optional syncopations italicized] [Obligatory syncopation underlined]

[6]There are several exceptions to this, in which *Syncopation* is applied anyway, e.g. "I Come Off" 3.3, 3.7, 3.8. In these cases, extrametrical and anacrusis elements (discussed below) force syncopation, in order to obey *Syllable Satisfaction.*

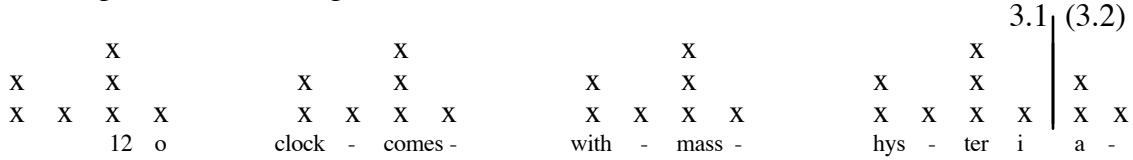
I believe *Syncopation* is a late rule which occurs after the "psychologically accessible level" at which listeners perceive meter. That is, syncopation creates a surface representation that appears to violate metrical constraints such as the *Anchor* and *Stressed-to-Strong* constraints formulated above. Nevertheless, my intuition is that listeners associate a syncopated syllable with the strong beat even after syncopation has occurred; they "undo" this rule to reach their metrical perception. This is reminiscent of Kiparsky's (1968) examination of Finnish epic poetry, in which he implies that there is a psychologically real level at which linguistic forms are represented, after which other rules can apply. A further argument for syncopation as a late rule is given below in the discussion of anacrusis and extrametrical elements.

Anacrusis and extrametricality:

Anacrusis elements are syllables like "*And*" in "I Come Off" couplet 7.4, that must borrow grid marks from the preceding line in order to be properly mapped to a metrical position. Given the *Anchor* rule and the structure of Young's metrical line, we would predict that anacrusis elements could only be monosyllabic in these two songs. This is true 100% of the time (30/30 occurrences.)

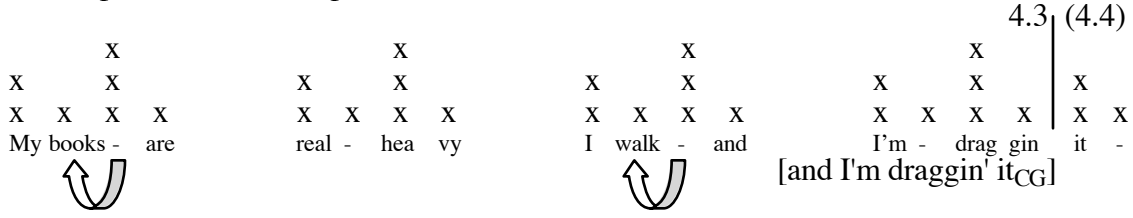
Extrametrical syllables belong to the couplet in question but occupy grid marks of the following metrical line. This phenomenon is clitic-group bounded, as it happens. Again, given the *Anchor* rule we would predict that only the portions of the immediate clitic group following the nuclear stress would be able to occupy extrametrical positions. This is true 100% of the time for the corpus examined here. (Of 11 occurrences, 6 are word-bounded; 5 are clitic-group bounded.) Examples follow:

"Principal's Office", couplet 3.1:

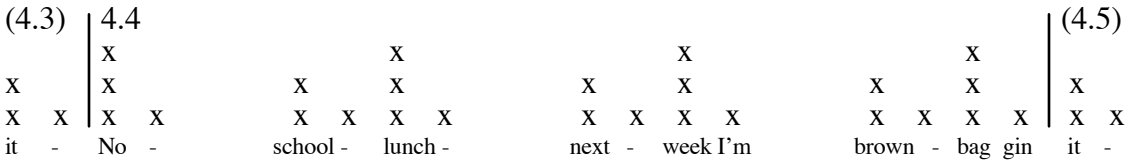


[with mass [hysteria$_W$]$_{CG}$]

"Principal's Office", couplets 4.3, 4.4



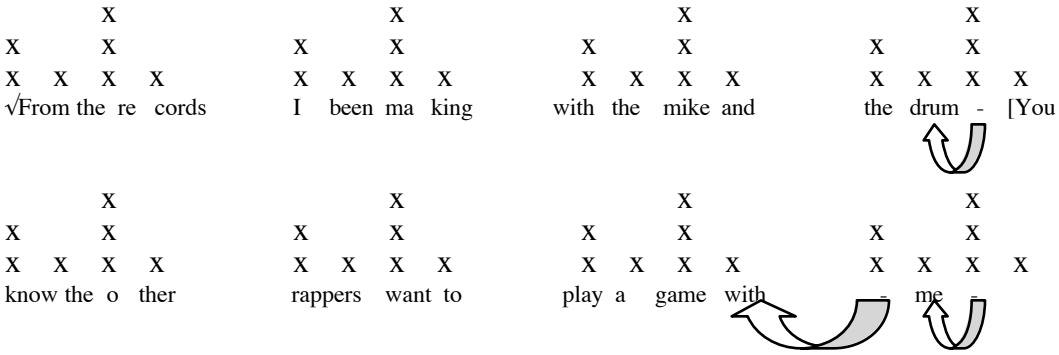
[and I'm draggin' it$_{CG}$]



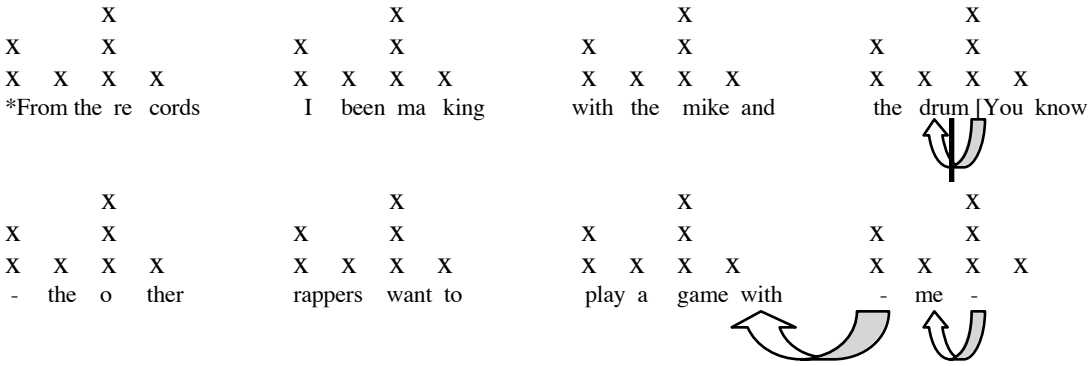
[I'm brown-baggin' it$_{CG}$]

It is important to observe that it is impossible to fill a final downbeat with an anacrusis element after syncopation has occurred. Such a line would be ill-formed. No exceptions to this occur in the corpus. In the ill-formed construct 5.4 below, my intuition is that if the anchor position is filled after syncopation, the nuclear stressed "*drum*" loses its stress as well as its association with the final downbeat, even though it has not moved.

"I Come Off" couplets 5.4, 5.5. Well-formed:



Ill-formed:



This difference in well-formedness suggests *that in the well-formed version, even after syncopation has taken place, "*drum*" is still associated with the downbeat position.* In addition, the fact that final downbeats are kept "empty" after syncopation has occurred supports the idea that syncopation is a late rule, analogous to a rule of phonetic implementation.

A Word on Compounds:

I would like to speculate that compounds follow a 2-beat rule rather than a 4-beat rule; i.e., the stresses of compound words are optimally two syllables apart. The following example looks like an instance of "left freedom," but is not, since there is only one option, namely 3.1a:

"I Come Off": couplet 3.1:

√3.1a) Well-formed

```
        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
            Four -  score n     sev n   years -     a   go  -   -
```

*3.1b) Ill-formed

```
        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
        Four -      -   score n     sev n   years -     a   go  -   -
```

Textsetting with the Seven Rules

Let us consider the "derivation" of a fairly complicated line, now that we have seven rules in hand:

"I Come Off" Couplet 4.6: (16 syllables)

```
(                                                       x)
(                       x       ) (                     x)
(       x       ) (             x       ) (                 x       ) (       x)
(       x       ) (x)   (       x       ) (x)   (               x       ) (       x)
( x ) (x)  (x)  (x)  (x)  (x  .   .  ) (x)  (x  .   .) (x   . ) (x ) (x)
But  I  can  rock  the  microphone  like  Dorothy  Hamill  can  skate.
```

The syllable bearing nuclear stress "*skate*" is associated by the *Anchor* rule to the final downbeat of the line.

```
x               x               x               x
x               x               x               x
x               x               x               x
                                                skate
```

However, the other highly stressed syllables, "*I*", "*mic*" and "*Ha*", are not all mapped into the other downbeat positions, as maximally satisfying the *Stressed-to-Strong* rule would predict. This eurythmic constraint is overriden here by the need to meet *Syllable Satisfaction*. Since the underlying couplet has 16 syllables, the syllables must be closely mapped to the terminal grid without leaving much space. The first syllable "*But*" is placed

in an anacrusis position so that it may borrow a space in the grid from the preceding line. Next, Young has taken the option to place "*rock*" and "*Ha*" in the first and third downbeats, since each is a relative stress peak, and this meets *Stress-to-Strong* mapping more optimally than mapping the clitics "*can*" or "*the*" to downbeat positions.

```
                                                                  [But
x                   x                   x                   x
x                   x                   x                   x
x                   x                   x                   x
rock                                    Ha                  skate
```

Next we have stress shifts involving demotion of the syllables "*I*" and "*mic*" and promotion of the secondarily stressed syllable "*phone*".

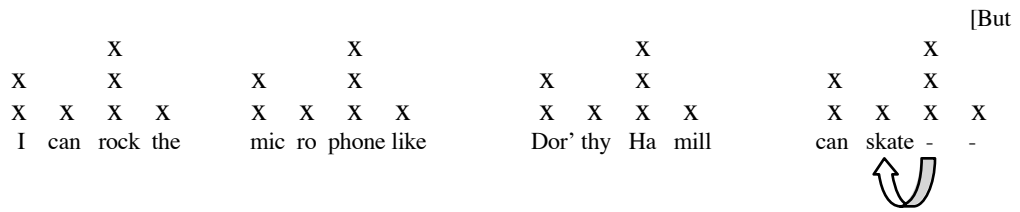
```
                                                                  [But
        x                   x                   x                   x
x       x           x       x           x       x           x       x
x   x   x   x       x   x   x   x       x   x   x   x       x   x   x   x
I   can rock the        mic ro  phone               Ha              skate
```

Alternative (ill-formed) mappings are shown in 'a' and 'b' below. The first maps "*mic*" into the second downbeat slot. This yields six syllables "*ro.phone.like.Do.ro.thy*" to map into only three slots. The second alternative pushes syllables downstream in the grid, violating the *Anchor* preference rule.

```
                                                                  [But
          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.) *I  can rock -      -   the mic ro.phone.like.Do.ro.th.yHa mill  can - skate
b.) *I  can rock the    -   - mic ro        phone like Dor' thy      Ha mill can skate
```

In 'b', this leads to the additional problem that, in order to fit what syllables we can into the metrical line, we must allow "*Dor*" rather than "*Ham*" to receive compound stress, and we must allow "*can*" to fall into the anchor position, rather than nuclear stressed "*skate*". These are far more complex lines than the one actually used.

In the well-formed version, once we have "*phone*" and "*Ha*" in place in the second and third downbeats, we have four syllables "*like. Do. ro.thy*" to interpolate between them. As there are only three slots in the grid between the two downbeats, we delete the most unstressed syllable, [®´]. Finally, obligatory *Syncopation* of "*skate*" associates this syllable with the weak position to the left of the final downbeat.



CONCLUSION

I have examined a few of the ways in which rap artist M.Young alters the linguistic stress in his couplets to simplify their metrical complexity with respect to the rigid metrical grid provided by his musical beat. I have found that since the meter is inalterable here, the linguistic stress is more malleable. In natural speech we would expect the reverse: for the inherent stresses assigned by the prosodic hierarchy to be more rigid than the abstract rhythm.

The rules formulated here have only touched the tip of a huge iceberg. As Attridge mentions, "the relationship between meter and language is a highly complex one, not to be reduced to a few simple rules" (p.215). Even so, examination of the ways in which forms of chanted speech are allowed to manipulate stress and syllable duration can serve as a foil against which to compare what speakers may or may not do in normal speech. The preference rules and constraints described above have shown parallels with, as well as departures from the behavior of natural speech. In this comparison, more questions are brought to mind: for instance, if it is true that language has quadrisyllabic and disyllabic rules (e.g., "see you later àlligátor") why don't some of these rules apply so that natural speech sounds more rhythmic (chanted) than it does? It seems intuitive to suggest that eurhythmic rules and prosodic rules are differently weighted along a continuum of speech styles (a midpoint in the continuum might be rhetorical speechmaking.) The difference may be foregrounding of meter in rhythmic speech, and foregrounding of prosodic rules in natural speech. Further examination of case studies may help bring to light the eurhythmic and prosodic preference rules and constraints used in natural language.

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