

THE GRAMMAR OF THE MODAL JAZZ MUSIC: an Optimality Theory Approach.

Cosme R. Martins
*M.A. in Philology and Portuguese Language
University of São Paulo – USP*

ABSTRACT

Music is also a language. Based on linguistics' models such as "The Feature Geometry" (Clements&Hume, 1995), "The Prosodic Phonology" (Nespor&Vogel, 1986), "The Metrical Stress Theory" (Hayes, 1995) and "The Optimality Theory" (Lerdhal&Jackendoff, 1983) we propose in this article the creation of a musical model: "The Grammar of the Modal Jazz Music: an Optimality Theory Approach" (Martins, 2013) with the intent to describe the linguistics of this jazz style.

The Modal Jazz Music

The modal jazz music started on the 1960's through the music of Miles Davis, John Coltrane and others.

Modal jazz music is the style of music that uses musical modes. There are seven musical modes: *Ionian, Dorian, Phrygian, Lydian, Mixolidian, Aeolian and Locrian* modes.

Just as a painter that has at his disposal seven different kinds of colours to apply on his portrait the musician has also seven different kinds of musical modes to express himself.

"The Grammar of the Modal Jazz Music: an Optimality Theory Approach" (Martins, 2013).

Influenced by the "*Vedic Music*" (*Carnatic music*), (Diksita 2008, Vijaykrnsan 2012) we propose a new conception of modal jazz music which could be redefined as "*the style of music that is based on only one key center and that makes use of musical modes*" helping therefore, the musicians to express their sentiments.

What we suspect is that by changing the key center of a song attention and emotions are diverted from both musicians and listeners.

When we speak we don't produce isolated segments. As there is a grammatical hierarchy involved on languages so similarly when we play or sing a song we are not producing isolated musical notes but chunks of a superimposed structure of musical grammar. Based on linguistics' models such "The Feature Geometry" (Clements&Hume 1995), "The Prosodic

Phonology” (Nespor&Vogel, 1986), “The Stress Metrical Theory” (Hayes, 1995) and “The Optimality Theory” (Lerdhal&Jackendoff , 1983) we propose in this article a musical model: “The Grammar of the Modal Jazz Music: an Optimality Theory approach.” (Martins, 2013) that will be able capture the musical hierarchy of the jazz language as below:

Intonational Musical Phrase (IMP)

Musical Phrase (MP Φ)

Musical Word (M ω)

Musical Metrical Feet (M Σ)

Musical Syllable (M σ)

Musical Notes (MN)

The Geometry of the Harmonics (GH)

The Musical Note Inventory

Just as a phoneme inventory that exists to languages; music also has its own musical note inventory.

The whole inventory of a musical language comprises the twelve musical notes or the “*cromatic musical scale*”.

The Jazz Rhythm

The rythm of jazz played by a bass player has a swing feel of four beats. Its major stress is on the beats two and four while the beats one and three are weak (. * . *)(Friedland, 1995). In a linguistic term the jazz rythm has an iambic metrical foot (. * . *), (Martins, 2013).

The Jazz Harmony

“Sounding like a horn”

We propose here a harmonic conception that will greatly help musicians when comes to improvizing on a particular song:

“*The I – Vb degrees*” (Martins, 2013).

The “*I degree*” comprises the “*ionian mode*” while the “*Vb degree*” encompasses the “*Vb pentatonic scale*” altogether they form the twelve musical notes or the “*cromatic scale*”.

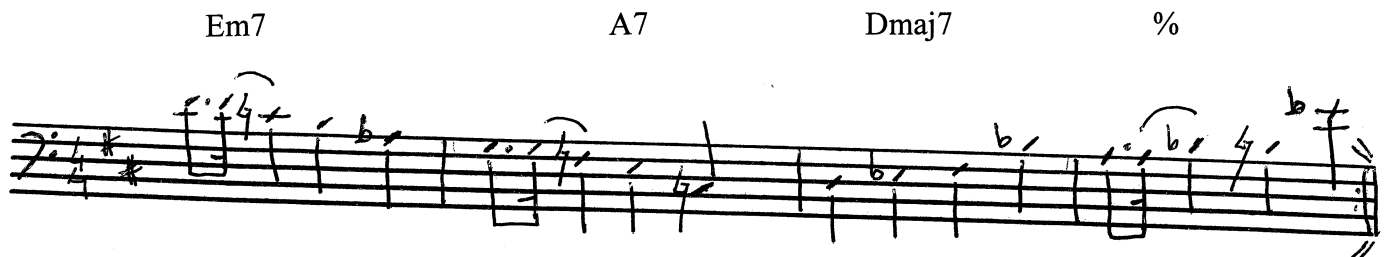
With this technique musicians will be sounding “*in*” and “*out*” on a jazz harmony.

“Walking Bass Lines”

Influenced by jazz bass players such as “Scott Lafaro, Ron Carter and Eddie Gomez”, this jazz harmonic conception above (*the I – Vb degrees*), (Martins, 2013) can be applied on a *walking bass line* as follows:

On the weak beats (one and three) jazz musicians can play the *I degree* or the *ionian mode*. For bass players it would be recommended to play *the chord tones* (root, 3rd, 5th and octave) while the strong beats (two and four) are filled by a “*Vb pentatonic scale*” (root, 2nd, 3rd, 5th and the 6th).

This musical conception can be demonstrated on a “*walking bass line*” (author’s composition) wich has a “*IIm7 – V7 – Imaj7 chord progression*” as below:



The *walking bass line* above has the key center on “*Dmaj7*”.

On the first bar (Em7): the weak beats (1 and 3) sounds the “*7th and 5th*” of this chord while on the strong beats (2 and 4) it sounds the “*3rd and root*” of *Ab (Vb) pentatonic scale*.

On the second bar (A7): the weak beats (1 and 3) sounds the “*7th and 5th*” of this chord while on the strong beats (2 and 4) it sounds the “*6th and 3rd*” of *Ab (Vb) pentatonic scale*.

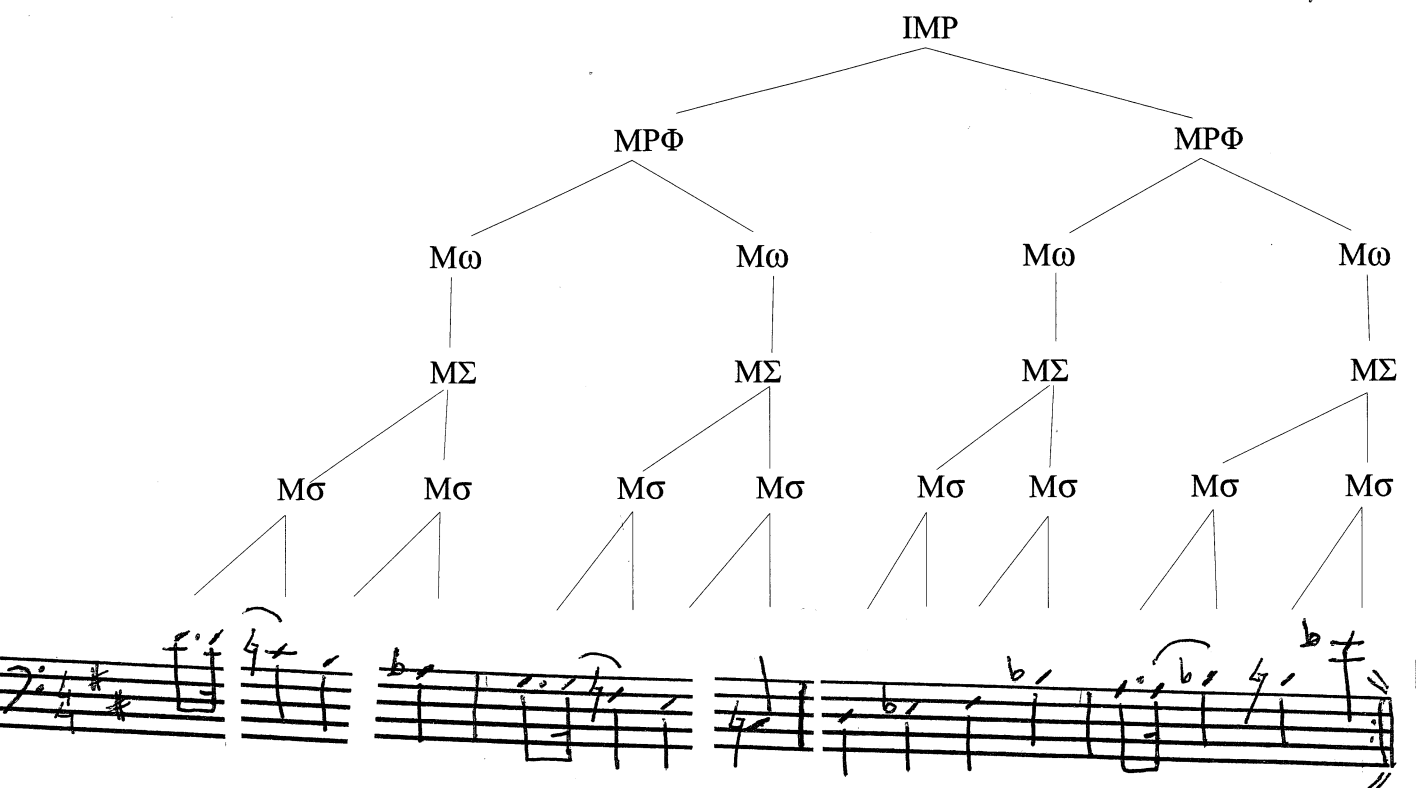
On the third bar (Dmaj7): the weak beats (1 and 3) sounds the “*root and 3rd*” of this chord while on the strong beats (2 and 4) it sounds the “*5th and 2nd*” of *Ab (Vb) pentatonic scale*.

On the fourth bar (Dmaj7): the weak beats (1 and 3) sounds the “*5th and 6th*” of this chord while on the strong beats (2 and 4) it sounds the “*2nd and 5th*” of *Ab (Vb) pentatonic scale*.

This “walking bass line” can also be demonstrated on our model:

“The Grammar of the Modal Jazz Music” (Martins, 2013):

Harmonic musical grammar: $\parallel \text{IIm7} \mid \text{V7} \mid \text{MP}\Phi \mid \text{Imaj7} \mid \% \parallel \text{MP}\Phi \mid \text{IMP}$



Notice above that an *intonational musical phrase* (IMP) or a “IIm7 – V7 – Imaj7 chord progression” consists of *two musical phrases* (MPΦ) and lasts four bars.

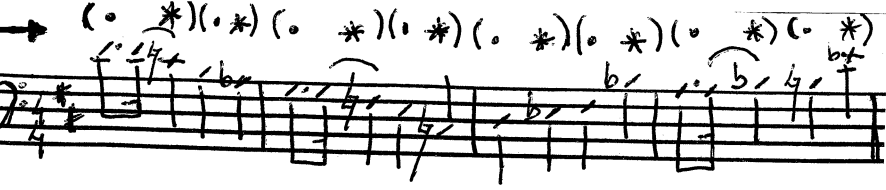
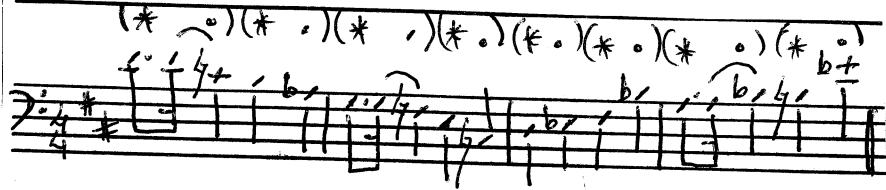
The grammar for the *walking bass line* above can be represented on the musical model of Optimality Theory (Lerdall&Jackendoff, 1983) as follows:

Constraints:

IIm7 – V7 – Imaj7: chord progression.

IAMBICFT(w:I – s:Vb): “iambic feet” – on the “*the weak beats*” (1 and 3) or “*off of the metrical feet*” – play the *I degree (ionian mode)* and on the “*the strong beats*” (2 and 4) or “*head of the metrical feet*” – play the *Vb pentatonic scale*.

TROCHFT: trochaic feet.

Input: <i>“walking bass line”</i> Em7 A7 Dmaj7 %	IIm7-V7-Imaj7	IAMBICFT (w:I – s:Vb)	TROHCFT
			!*
		!*	

Both *walking bass lines* above have the “*jazz harmonic constraint*”: “IIm7 – V7 – Imaj7 chord progression” but when it comes to a “*jazz rythm constraint*” it is the first candidate with an *iambic feet* that is “*the winner*”.

The musical grammar for the *walking bass line* above is: IIm7 – V7 – Imaj7>>IAMBICFT(w:I – s:Vb)>>TROHCFT.

A “*musical constraint ranking*” that takes into account statistical models such as the “*Normal Distributional*” model (De Moivre, 1738) a “*Stochastic Optimality Theory*” model (Boersma&Hayes, 2001) as well as a “*Gradient Optimality Theory*” model (Keller, 2000) will seem more realistic for our future musical reseaching.

REFERENCES

- BOERSMA, P.&HAYES, B. (2001). Empirical tests of the Gradual Learning Algorithm. *Linguistic Inquiry* 32: 45 – 86.
- CLEMENTS, G. N. & HUME, B. (1995). 'The Internal Organization of Speech Sounds'. In: Goldsmith, John (ed.), *The Handbook of Phonological Theory*. Cambridge: Blackwell Publishers.
- De Moivre, Abraham (1738). *The Doctrine of Chances*. Published by Woodfall.
- DIKSITA, Subbarama (2010). *Sangita Sampradaya Pradarsini*. Published by Narayanaswami and Vidya Jayaraman. India.
- FRIEDLAND, Ed (1995) *Building Walking Bass Lines*: Hal Leonard – USA.
- HAYES, Bruce (1995). *Metrical Stress Theory: Principles and case studies*. Chicago: University of Chicago Press – USA.
- KELLER, F. (2000). *Gradience in Grammar. Experimental and Computational Aspects of Degrees of Grammaticality*. PhD theses: The University of Edinburg – Scotland.
- LERDHAL, F. & JACKENDOFF, R. (1983) *A Generative Theory of Tonal Music*. The MIT press: Cambridge – USA.
- MARTINS, Cosme R. (2013). [to be published]. *The Grammar of the Modal Jazz Music: an Optimality Theory Approach*.
- NESPOR, M. & VOGEL, I. (1986). *Prosodic Phonology*. Foris, Dordrecht.
- VIJAYKRSNAN, K. J. (2012). *The Grammar of Carnatic Music*: Mouton Gruyer – Germany.