



Doi No:
10.70431/UHAMAD.2024.1

Araştırma Makalesi
Research Article

Atıf/Citation

Sarmanho, A. R. (2024). Brezilya ritimlerinin yeniden uyumlaştırılmasında sürekli yapının keşfi: gelenek ve yeniliğin birleşimi. *Uluslararası Hisarlı Ahmet Müzik Araştırmaları Dergisi*, 1(1), 1-12.

EXPLORING CONSTANT STRUCTURE IN THE REHARMONIZATION OF BRAZILIAN RHYTHMS: A FUSION OF TRADITION AND INNOVATION

André Ricardo SARMANHO¹

ABSTRACT: This work investigates the application of reharmonization techniques in Brazilian rhythms, focusing on the theory of "constant structure," which allows chord substitution while maintaining a similar harmonic context. Inspired by jazz pianists Herbie Hancock and Bill Evans, this technique preserves the chord sequence, altering their qualities and extensions to provide harmonic continuity. The goal is to create a series of chords with the same quality, where the same scales can be used over each chord, regardless of its function. This approach causes the chords to lose their functional identity and sound more like part of a series. Reharmonizing Brazilian rhythms, such as bossa nova and samba, enriches the harmony by adding sophistication and new tonal colors. This technique requires a deep understanding of musical theory and stylistic sensitivity to maintain the authenticity of Brazilian rhythms. The practical application of this approach was investigated through musical examples and theoretical analyses. The study also considers harmonic perception, referring to comprehensive theories of harmonic structure that quantify chord functions. The research highlights the importance of understanding how listeners familiar with the musical tradition perceive harmony, suggesting that this understanding is crucial for characterizing musical perception. Additionally, the analysis of the property of tonality in Western tonal music, where the 12 pitch classes are organized around a reference pitch (tonic), provides a fundamental theoretical basis. This tonal organization is essential for musical structure and effective reharmonization. Overall, the work demonstrates how reharmonization with a constant structure can create more complex and exciting arrangements while preserving the essence of Brazilian rhythms. The research offers valuable insights for musicians and educators on the fusion of tradition and innovation in music.

Keywords: Brazilian Rhythms; Reharmonization; Constant Structur.

BREZİLYA RİTİMLERİNİN YENİDEN UYUMLAŞTIRILMASINDA SÜREKLİ YAPININ KEŞFİ: GELENEK VE YENİLİĞİN BİRLEŞİMİ

ÖZ: Bu çalışma, Brezilya ritimlerinde rearmonizasyon tekniklerinin uygulanmasını araştırmaktadır ve "sabit yapı" teorisine odaklanmaktadır. Bu teknik, akor dizisini korurken akorların kalitesini ve uzantılarını değiştirerek harmonik sürekliliği sağlar. Jazz piyanistleri Herbie Hancock ve Bill Evans'tan ilham alınarak geliştirilen bu yaklaşım, akorların işlevinden bağımsız olarak aynı akor skalalarının kullanılmasını mümkün kılar. Bu yöntem, akorların işlevsel kimliğini kaybettirir ve onları bir dizi parçası gibi seslendirir. Bossa nova ve samba gibi Brezilya ritimlerinin rearmonizasyonu, harmoniyi zenginleştirerek sofistike ve yeni tonal renkler ekler. Bu teknik, Brezilya ritimlerinin özgünlüğünü korumak için derin bir müzik teorisi bilgisi ve stilistik hassasiyet gerektirir. Bu yaklaşımın pratik uygulaması, müzikal örnekler ve teorik analizler yoluyla araştırılmıştır. Çalışma ayrıca armonik algıyı ele alarak akor işlevlerini nicelendirilen kapsamlı armoni yapıları teorilerine atıfta bulunmaktadır. Araştırma, müzik geleneğine aşina dinleyicilerin armoniyi nasıl algıladığını anlamının, müzikal algıyı karakterize etmek için önemli olduğunu vurgulamaktadır.

¹ Universidade Estadual de Maringá – UEM, baixistaonline@gmail.com, ORCID ID: 0009-0002-1186-8385

* Bu makale 23-26 Mayıs 2024 tarihleri arasında gerçekleştirilen “Hafıza, Mekan ve Müzik” temalı XIV. Uluslararası Hisarlı Ahmet Sempozyumu’nda sözlü bildiri olarak sunulmuştur.

Ayrıca, Batı tonal müziğindeki tonalite özelliği, 12 ton sınıfının bir referans ton (tonik) etrafında düzenlenmesi, müzik yapısının ve etkili rearmonizasyonun temel teorik temelini sağlar. Genel olarak, sabit yapı ile yapılan rearmonizasyonun daha karmaşık ve heyecan verici düzenlemeler yaratabileceğini, aynı zamanda Brezilya ritimlerinin özünü koruduğunu göstermektedir. Araştırma, gelenek ve yeniliğin müzikteki birleşimi konusunda müzisyenler ve eğitimciler için değerli bilgiler sunmaktadır.

Anahtar Kelimeler: Brezilya Ritimleri; Rearmonizasyon; Sabit Yapı.

INTRODUCTION

Brazilian music, with its rich tapestry of rhythms and harmonies, occupies a prominent place in the global musical landscape. From north to south, Brazilian rhythms reflect the country's cultural diversity, incorporating African, European, and Indigenous elements to create unique styles such as samba, bossa nova, chorinho, and baião. These musical forms not only define Brazilian cultural identity but also influence musicians and composers around the world. This article focuses on the technique of reharmonization with constant structure, an innovative approach explored by jazz musicians such as Herbie Hancock and Bill Evans, and its application to Brazilian rhythms.

Reharmonization with constant structure is a sophisticated technique involving the maintenance of the original chord progression of a piece while introducing variations in the qualities and extensions of those chords. This approach allows musicians to create more complex and dynamic harmonic arrangements without losing harmonic cohesion and continuity. Herbie Hancock and Bill Evans, pioneers in this technique, demonstrated its potential by applying it to various jazz compositions, resulting in innovative harmonic textures that continue to influence contemporary musicians.

The inspiration to apply this technique to Brazilian rhythms arises from the desire to explore new harmonic possibilities within these traditional styles. Brazilian music, with its rich rhythmic and melodic heritage, offers fertile ground for harmonic experimentation. Genres such as bossa nova and samba, with their already sophisticated harmonies, can be further enriched by applying innovative reharmonization techniques. The introduction of chords with additional extensions and tensions can create new dimensions of harmonic complexity, providing a richer and more engaging auditory experience.

The choice to explore this technique in Brazilian rhythms also aligns with the tradition of continuous innovation and evolution in Brazilian music. From the advent of bossa nova, which revolutionized the harmony and melody of Brazilian popular music, to more recent movements of fusion and experimentation, Brazilian musicians have excelled in incorporating new influences and techniques while maintaining the essence of their musical tradition. Reharmonization with constant structure represents a continuation of this tradition of innovation, offering new tools for musicians and composers to explore and expand the boundaries of Brazilian music.

This article seeks not only to apply the technique of reharmonization with constant structure to Brazilian rhythms but also to explore the implications of this approach for the evolution of Brazilian music. By analyzing in detail the harmonic possibilities offered by this technique, we aim to contribute to a deeper understanding of the intersections between tradition and innovation in Brazilian music. Furthermore, by sharing specific examples of reharmonization, we intend to provide musicians and educators with practical tools to explore new harmonic dimensions in their own compositions and performances.

The selection of musical pieces for this study was carefully considered to represent the diversity of Brazilian rhythms. "Asa Branca" by Luiz Gonzaga exemplifies baião with its distinct rhythmic pulse and simple yet effective harmonic progression. "Carinhoso" by Pixinguinha is a masterpiece of chorinho, known for its intricate melodic lines and rich harmony. "Querência Amada" by Teixeira represents the gaúcho rhythm, bringing the melancholy and strength of the music from southern Brazil. "Wave" by Tom Jobim is an iconic piece of bossa nova, with its sophisticated harmony and smooth rhythm.

Each of these pieces underwent detailed harmonic and rhythmic analysis to fully understand their underlying structures. Subsequently, the technique of reharmonization with constant structure was applied to create new arrangements that maintain the rhythmic and melodic integrity of the original pieces while introducing new harmonic dimensions. This process involved experimenting with various chord qualities and extensions, carefully evaluating the impact of each change on harmonic cohesion and overall auditory experience.

The reharmonization process was not without its challenges. One of the main challenges was ensuring that the new harmonic qualities did not compromise the rhythmic and melodic essence of the original pieces. To

overcome this, an iterative approach was adopted, experimenting with different chord qualities and assessing the impact of each change. Whenever a modification seemed to compromise the integrity of the original piece, the reharmonization was adjusted to ensure that the essence of the Brazilian rhythm was preserved.

Another challenge was the need for a deep understanding of musical theory to apply the technique effectively. This required detailed study of the harmonic progressions and chord qualities used by Hancock and Evans, as well as an understanding of the harmonic traditions of Brazilian rhythms. To address this challenge, various academic and practical sources were consulted, including detailed harmonic analyses and interviews with experienced musicians.

The results of this study demonstrate the potential of the reharmonization technique with constant structure to enrich and expand the harmonic tradition of Brazilian rhythms. In "Asa Branca," reharmonization added a harmonic richness that intensified the auditory experience while maintaining the characteristic rhythmic pulse of baião. In "Carinhoso," the technique brought a new harmonic depth, further highlighting the melodic beauty of chorinho. In "Querência Amada," reharmonization respected the gaúcho tradition while introducing new harmonic colors that enriched the piece. Finally, in "Wave," the constant structure technique enhanced the sophisticated harmonies of bossa nova, creating a richer and more engaging auditory experience.

It is concluded that this approach not only preserves the rich Brazilian musical tradition but also propels it in new, innovative directions. By merging tradition and innovation, reharmonization with constant structure offers an exciting path for the continuous evolution of Brazilian music, ensuring its relevance and vitality in the global landscape. Gratitude is expressed for the opportunity to share this work, with the hope that it inspires new horizons in the harmonic exploration of Brazilian rhythms.

METHOD

1. Reharmonization Technique

- **Freedom in Choosing Chords:**

"The technique of reharmonization can offer freedom as it allows choosing the type of chord to use, whether major 7th, minor 7th, dominant 7th, minor 7b5, diminished 7th, or even augmented 7th" (Mazlan, 2020: 54).

2. Creativity in Jazz

- **Higher Divergent Thinking and Creativity:**

"A study revealed that jazz musicians demonstrate higher divergent thinking ability and a greater number of creative activities and achievements in the musical domain compared to musicians from other genres such as classical or folk music. These findings support the view that the jazz music genre is highly associated with creativity, both in terms of musical activities and psychometric aspects of musicians" (Benedek et al., 2014: 120).

3. Subjectivity in Music Perception

- **Personal and Socio-Cultural Differences:**

"It is argued that personal and socio-cultural differences are important because the chances of two different people hearing a particular song in exactly the same way, despite different sets of background knowledge, are slim. Additionally, while popular music genres are entities with definitions, these definitions are more collections of suggested or fluid guidelines rather than rigid requirements. Due to this fluidity, some subjectivity occurs within these definitions based on the analyst's listening history, preferences, and background knowledge" (Seguin, 2023: 10).

4. Characteristics of Popular Music

- **Defining Elements of Popular Music:**

"Another important aspect to acknowledge is that popular music is not predominantly defined by harmony and melody. Instead, popular music and its sub-genres are characterized by musical elements such as instrumentation, lyrical content, rhythmic patterns, and recording techniques and effects used, among others" (Seguin, 2023: 6).

5. Chorinho and Brazilian Jazz

- **Respect for Chorinho:**

"Natives consider chorinho the great ancestor of Brazilian jazz, although the latter only properly emerged during the bossa nova period. Natives have much respect for chorinho performers, especially great masters like Pixinguinha, but they explain that contemporary chorinho has become too conservative in general terms. They accept this fact because they attribute to chorinho the role of 'root music,' which must be preserved from exotic influences" (De Camargo Piedade, 2003: 44).

- **Structural Characteristics of Chorinho:**

"It is believed that the seemingly conservative face of chorinho is actually a structural characteristic of this genre, evoking nostalgia, simplicity, virtuosity, and cosmopolitanism. This thematic stability makes chorinho subject to eclipse phases, as occurred from the 1940s, when it scarcely developed, until the 1970s, when choro festivals began boosting the resurgence of the genre" (De Camargo Piedade, 2003: 44).

6. Evolution of Bossa Nova

- **Post-War Jazz Influence and Birth of Bossa Nova:**

"During the post-war years, nationalism was on the rise in many countries, accompanied by an impressive consolidation of North American jazz on the international scene, and at this time many nationalized jazz styles emerged. In the midst of this scene, bossa nova was born, and artists like João Gilberto and Antônio Carlos Jobim appeared, constituting a landmark in Brazilian and world popular music" (De Camargo Piedade and Castro, 2003: 46).

- **'More Brazuca' Line in Jazz:**

"The 'more brazuca' line—a term obviously derived from 'Brazil'—consists of national rhythms like samba, baião, frevo, maracatu, and articulates the jazz language in dialogue with expressive elements of these rhythms. The greatest exponent of brazuca is Hermeto Pascoal, and its oldest reference is the legendary group Quarteto Novo, from the late 1960s" (De Camargo Piedade, 2003: 49).

- **Importance of Brazilian Music and Bossa Nova**

According to Almir Chediak (1986: 6), "In my research in the field of functional harmonic analysis, I have had the opportunity to analyze numerous foreign songs, and I must say, sincerely, that our music is undoubtedly the richest and most creative on this planet."

"Bossa Nova was the most important movement in our music and had a fundamental role: to accelerate the process of awareness, particularly in harmony. Both musicians and teachers had to study more, discover new chords, and new harmonic paths. It was no longer possible to notate the chords, for example, of 'Samba de uma nota só' and 'Desafinado,' by Tom and Newton Mendonça, merely with the traditional positions of first, second, third, and preparation, commonly used at the time."

7. Escaping Bebop and Hybrid Languages

- **Resources Beyond Bebop:**

"Other possible resources to escape bebop involve hybrid languages of the urban world—such as romantic lyricism from contemporary Brazilian songs—as well as the 'atonal moments' of outside scales, and the expression of other Brazilian musicalities connected to regional musical developments in the country, such as music from Bahia, the Amazon, and Rio Grande do Sul" (De Camargo Piedade and Lucas, 2003: 54).

8. Tonal Harmony and Substitution

- **Analogous Harmonic Contexts:**

- "A fundamental aspect of tonal harmony is that musicians can create similar harmonic environments using different chords, meaning that various chords can replace each other" (Cecchetti et al., 2023: 673).
- The significant achievements of comprehensive theories on harmonic structure and their ability to quantify abstract elements like chord functions suggest that studying how harmony is internally

represented can yield valuable insights. We believe that conducting experimental research on how this harmonic structure is perceived by individuals familiar with the musical tradition is crucial for understanding the process of musical perception (Bharucha and Krumhansl, 1983: 67).

- In Western tonal music, one of the key elements of musical structure is the concept of tonality. Tonality, or tonal structure, refers to how all 12 musical pitch classes (known as the chromatic set) are organized around a single reference pitch called the tonic. The other pitch classes are assessed based on their relationship to this tonic. (Smith and Schmuckler, 2004: 268)

9. Importance of Hymn Reharmonization

- **Impact on Congregational Singing:**

"It is crucial to study the importance of hymn reharmonization since it impacts the congregation's ability to sing. Done correctly, it can enhance singing, but done incorrectly, it makes the congregation stumble. It is important to separate music and lyrics" (Von Horn, 2020: 5).

10. Historical Context of Choro

- **Choro as a Brand and Hybrid Subgenres:**

"Around the 1930s, the term Choro was established and promoted by publishers to create a brand and popularize it. Since then, it has also been known under other related names, such as hybrid subgenres like Choro-Serenata. Before the 1930s, there was a high production of Tangos (in Brazil as well as in Argentina)" (Moss, 2020: 417).

- **Comprehensive Resource on Choro:**

"A recent comprehensive resource on harmony and form in Choro is 'A Estrutura do Choro' by Carlos Almada (Almada, 2006), a textbook containing theoretical descriptions as well as exercises for composition and improvisation. In its theoretical part, Almada (2006, pp. 7–26) describes various musical features such as harmony, form, and rhythm on different levels. For instance, Almada (2006, p. 10, apud Moss, 2020) observes that the most recurrent keys in Choro are F, C, G, and D for major keys, and Dm, Am, Em, and Gm for minor keys" (Moss, 2020: 417).

11. Chord Progressions

- **Sequences and Familiar Patterns:**

"Chord progressions are sequences of chords that occur in a particular form. Some chord progressions have familiar patterns, and it is well known in harmony theory that the occurrence of a chord is correlated to the previous one for a reason" (Wundervald, 2019: 2).

12. Predicting Music Genres

- **Harmonic Structures and External Variables:**

"With the results, it can be concluded that it is possible to predict music genres of Brazilian popular music by combining features extracted from their harmonic structures and external variables. The overall accuracy of the final model is 62%, with a confidence interval of [60%, 64%], with the best-classified genres being Brazilian Sertanejo, Samba, MPB (also known as Brazilian Popular Music), and Rock" (Wundervald, 2019: 9).

13. Harmonic Influence on Melodic Prediction

- **Improving Melodic Prediction:**

"This melodic/harmonic model is compared to a model that uses solely first-order melodic information to investigate the effect of harmony on the predictability of melodic continuations. To anticipate the results, it appears that melodic prediction is significantly improved when harmonic information is taken into account" (Arthur, 2017: 406).

14. Generative Theory of Tonal Music (GTTM)

- **Cognitive Processes in Music Perception:**

"The Generative Theory of Tonal Music (GTTM) seeks, in general terms, to describe and explain the cognitive processes involved in the perception of a piece of tonal music by an experienced listener who, based on their own intuition, would mentally organize the flow of melodic-harmonic and

rhythmic-metric events present in the piece at different hierarchical levels of structural importance" (Almada, 2012: 62).

15. Reharmonization and Structural Thoughts

- **Replacing Original Chords:**

"Reharmonization consists of replacing the original chord with one or more chords chosen by the arranger/composer. This choice can be pre-established or improvised during the performance of a piece. Various techniques are addressed, from the basic elements of tonal harmony to some structural thoughts of post-tonal harmony" (Nazario, 2022: 8).

16. Scales and Harmony

- **Construction of Melody and Harmony:**

"Scales are sets of notes that, when combined in different ways, form the melody. Scales are also related to the construction of harmony. Every chord has its corresponding scale" (Nazario, 2022: 17).

17. Cadences and Tonality

- **Affirmation of Tonalism:**

"Cadences are largely responsible for the affirmation of tonality. They delimit musical breathing and establish the key. The V7 chord (dominant) is fundamentally important in many cadential resolutions, carrying the tonal tensions that may or may not be resolved, creating the typical tension-relaxation sound perception of tonality" (Nazario, 2022: 26).

18. Unconscious Counterfeiting

- **Copying Harmonies:**

"Unconscious counterfeiting frequently occurs, where songwriters copy the harmony of other songs and create new songs based on those harmonies from common practice. This resource is interesting for several reasons: the songwriter memorizes both songs more easily, the listener enjoys the familiarity of the harmony, and thus, if the harmony of a well-known song is imitated, the new song has a better chance of becoming a hit, a success that imitates another success, like a formula" (Oliveira, 2021: 16).

19. Non-Tonal Chords

- **Chords Outside the Harmonic Field:**

"Non-tonal chords are chords that do not belong to the harmonic field of a key and are generated by altering a note. Modal borrowing chords (MBC) are chords that do not belong to the harmonic field of the key but belong to a neighboring key" (Oliveira, 2021: 23).

20. Empirical Study of Tonal Harmony

- **Symbolic Representations and Large-Scale Analyses:**

"The empirical study of sophisticated concepts related to tonal harmony depends on tractable representations of musical structure. However, since symbolic representations of musical pieces are scarce, large-scale analyses have been hindered due to the lack of large symbolic corpora" (Moss, 2019: 1).

21. Challenges in Jazz Harmony Theory

- **Open Questions and Extended Tonality:**

"Despite a substantial body of literature, challenges and open questions remain in the theory of (Jazz) harmony. Many theoretical accounts are mainly focused on the identification of families of chords or single chord relations. The principles of structure building of larger musical phrases and dependencies governing chord sequences with formally concise models are still barely explored. A second challenge comes from extended tonality and its harmonic implications. Music from the nineteenth century up to Jazz explores a range of new harmonic options, relations, and principles that still require further music-theoretical work" (Rohrmeier, 2020: 1).

22. Functional Harmony

- **Main Functions of Functional Harmony:**

"Functional harmony can fulfill three main functions: (1) it can prolong a harmony (such as I or V), (2) it can prepare a harmony, or (3) it can establish a contrast between two harmonies" (Rohrmeier, 2020: 13).

23. Intervals in Tonal and Post-Tonal Music

- **Naming Intervals in Music:**

"In tonal music, the interval between two pitches is named with reference to steps in a diatonic scale (e.g., major third, diminished fifth). Post-tonal music, however, does not necessarily refer to diatonic scales, so traditional interval names can be cumbersome or even misleading. Rather, intervals in post-tonal music are named by the number of semitones they contain. Just as A# and Bb are part of the same pitch class, the major third and diminished fourth are treated as the same interval, because both contain four semitones" (Straus, 2016: 7).

To investigate the application of the constant structure reharmonization technique in Brazilian rhythms, a systematic and detailed approach was necessary. This method involved several stages, starting with the selection of musical pieces representative of the chosen genres, followed by a detailed harmonic and rhythmic analysis of these pieces, and culminating in the practical application of the reharmonization technique. Each of these stages was carefully planned and executed to ensure that the results were precise and meaningful.

Constant Structures in Music

Constant structures are chord progressions that consist of three or more chords of the same quality. These structures were pioneered by musicians such as Herbie Hancock and Bill Evans. They provide a cohesive blend of functional and non-functional sounds, creating the effect of a free-moving tonal center (Rawlins, 2005: 131). This characteristic makes constant structures a versatile tool in both composing new music and reharmonizing existing pieces, adding a unique flavor to the music. For this project, I chose to focus on the use of constant structures for reharmonization.

According to Rawlins (2005), an extension of this concept involves alternating between two different constant structures. While this approach can be more challenging to play, it can yield impressive results, often including numerous "outside" notes. This technique is truly a form of reharmonization, as exemplified by the melody of the Christmas song "Joy to the World," harmonized with alternating constant structures (Bouling, 2004: 15).

However, as Paul Schmeling (2001) points out, sometimes the chords chosen for reharmonization may not fit perfectly with the melody. In such cases, slight adjustments to the melody can be made to fit the new chords, or the new progression can be used exclusively for solo sections.

The goal of using constant structures is to link a series of chords of the same quality. Consequently, the same chord scales can be used for each chord, regardless of their function. Functional harmony operates under the premise that chord scales are derived from chord tones and passing tones of the tonality (primary, secondary, or momentary tonality). Since this approach treats all chords the same way, they lose their functional identity and sound more like part of a series (Schmeling, 2001).

By employing constant structures in this project, the reharmonization technique chosen aims to enhance the harmonic texture and offer a fresh, dynamic interpretation of existing musical pieces.

Selection of Musical Pieces

The first stage of the method involved the selection of musical pieces representative of the Brazilian rhythms of interest, namely: baião, chorinho, ritmo gaúcho, and bossa nova. For baião, I chose "Asa Branca" by Luiz Gonzaga, an iconic composition that exemplifies the rhythmic and melodic characteristics of the genre. In the case of chorinho, "Carinhoso" by Pixinguinha was selected due to its harmonic complexity and historical significance. To represent ritmo gaúcho, I selected "Querência Amada" by Teixeira, which captures the essence of traditional music from southern Brazil. Finally, for bossa nova, "Wave" by Tom Jobim was chosen, being a widely recognized piece rich in harmonic possibilities.

Harmonic and Rhythmic Analysis

Once the pieces were selected, the next step was a detailed harmonic and rhythmic analysis of each one. This analysis involved transcribing the pieces, if necessary, to ensure that all harmonic and rhythmic nuances were understood. For "Asa Branca," for example, I identified the characteristic chord progression of baião, as well

as its distinctive rhythmic patterns. The analysis of "Carinhoso" involved identifying the typical harmonic progressions of chorinho and its complex melodic lines. For "Querência Amada," the analysis focused on identifying the chords and rhythms that define the gaúcho style, while the analysis of Tom Jobim's "Wave" highlighted the sophisticated chord progressions and smooth rhythms of bossa nova.

Application of the Constant Structure Reharmonization Technique

With the analysis complete, I proceeded to the practical application of the constant structure reharmonization technique. This process involved maintaining the original chord progressions of the pieces while introducing variations in the qualities and extensions of these chords. The constant structure technique, inspired by the works of Herbie Hancock and Bill Evans, involves the use of chord progressions that maintain harmonic cohesion even when the qualities of the chords are altered.

Constant structure can also follow a pattern, such as in thirds:

Cmin7 Emin7 Gmin7 Bmin7

Here, I used the sequence based on the notes of the C major arpeggio, but each note became a minor seven chord.

Or use whole tone symmetry, for example:

F7 G7 A7 B7

I used chords only of major quality with a seven.

Analysis and Examples

Example 1: Baião by Luiz Gonzaga

In Figure 1, we can see the song "Asa Branca" in its most commonly performed version, featuring basic chords following the key of C major.

Figure 1.

Asa Branca Original Version: Luiz Gonzaga



In Figure 2, we performed the reharmonization using Constant Structure. Note that we start with minor seventh chords, following an interval symmetry of one whole tone from one chord to the next, then a diminished chord to end that sequence. Afterwards, we begin a sequence of major seventh chords, concluding with another diminished chord. Some melody notes were slightly adapted to better fit the new harmony.

Figure 2.

Asa Branca Reharmonized

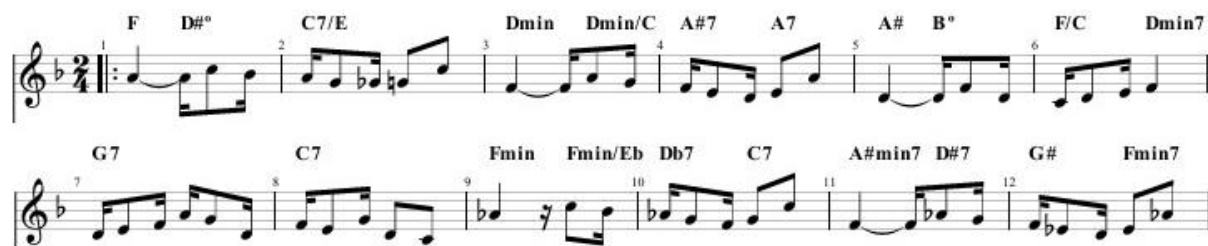


Example 2: Chorinho by Pixinguinha

In the song "Vou Vivendo," shown in Figure 3, note that the harmony is already rich in chords in its original composition. The chorinho genre inherently possesses this richness in its harmony.

Figure 3.

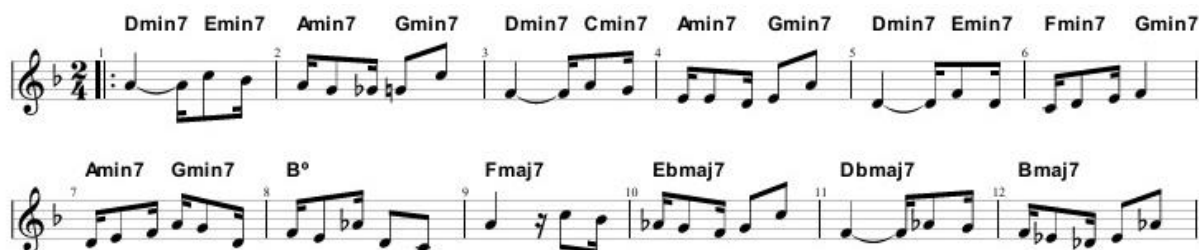
Vou Vivendo Choro-Serenade Original Version: Pixinguinha and Benedito Lacer



In Figure 4, we implemented a reharmonization using constant structure. We frequently used interval symmetry of a whole tone to the next chord. In the first sequence, we used only minor chords with minor sevenths, followed by a diminished chord that ends that sequence and starts a new one with major chords and major sevenths. This reharmonization style closely follows an algorithm similar to Figure 2.

Figure 4.

Vou Vivendo Choro-Serenade: Reharmonized

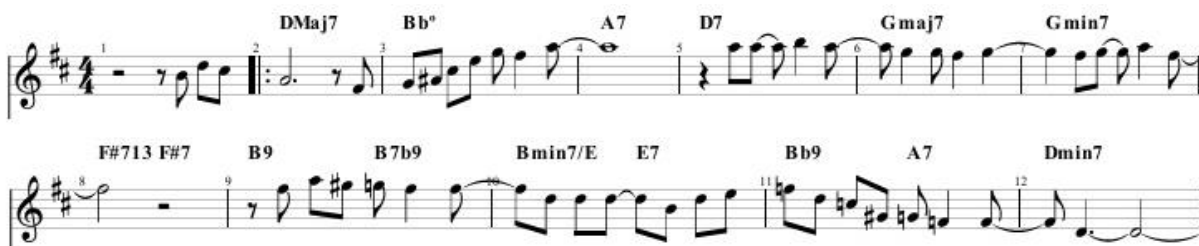


Example 3: "Wave" by Tom Jobim

The internationally known song "Wave" has a beautiful harmony. In Figure 5, we see it in its original and most played version.

Figure 5.

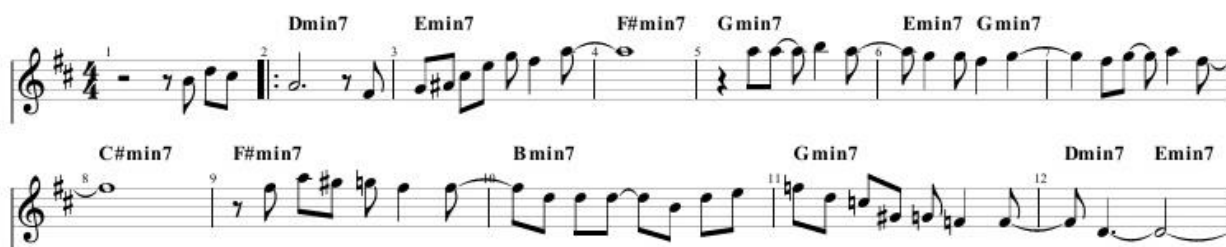
Wave Original Version: Antonio Carlos "Tom Jobim"



In Figure 6, we see the song "Wave" being reharmonized with constant structure. It was challenging to perform this reharmonization because this song already has a beautiful complex harmony, but with the reharmonization, it gained a new sound.

Figure 6.

Wave Reharmonized



Example 4: Querência Amada (Gaúcho Rhythm)

In Figure 7, we see a classic of the Brazilian Gaúcho rhythm in its most played composition. It follows simple chord qualities in D major.

Figure 7.

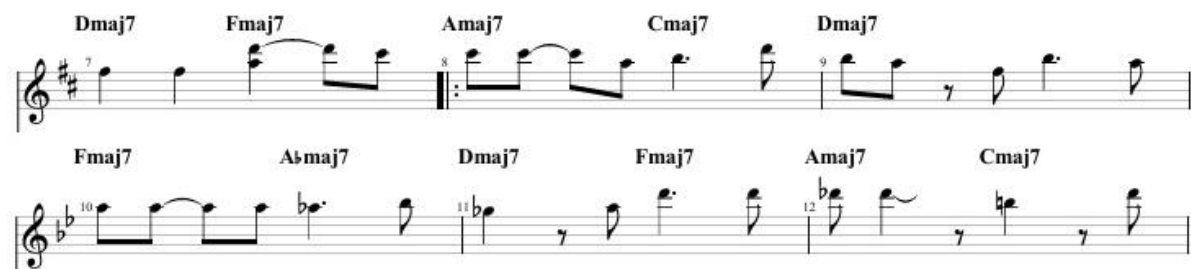
Querencia Amada Original Version: Teixeira



In Figure 8, we see the reharmonization of the song "Querência Amada." Since this song is based on a few simple chords, we made significant changes to its structure, and some notes of the melody were altered to better fit the harmony. We adhered closely to the symmetry of one and a half steps and used only major seventh chords.

Figure 8.

Querencia Amada Reharmonized



Challenges and Solutions

During the application of the constant structure reharmonization technique, several challenges were encountered. One of the primary difficulties involved maintaining the rhythmic and melodic essence of the original pieces while introducing new harmonic qualities. To address this, an iterative approach was adopted, experimenting with various chord qualities and carefully evaluating the impact of each alteration. Whenever a change appeared to compromise the integrity of the original composition, adjustments were made to the reharmonization to ensure that the essence of the Brazilian rhythm remained intact.

Another challenge involved the necessity for a profound understanding of music theory to effectively apply the technique. This required an in-depth study of harmonic progressions and the chord qualities employed by Hancock and Evans, alongside a comprehensive grasp of the harmonic traditions inherent in Brazilian rhythms. To overcome this, various academic and practical resources were consulted, including detailed harmonic analyses and interviews with experienced musicians.

RESULTS AND DISCUSSION

The application of the constant structure reharmonization technique resulted in arrangements that preserved the essence of Brazilian rhythms while introducing new harmonic dimensions. In "Asa Branca," for example, the reharmonization added harmonic richness that intensified the listening experience while maintaining the characteristic rhythmic pulse of baião. In "Carinhoso," the technique brought a new harmonic depth, further highlighting the melodic beauty of chorinho.

In "Querência Amada," the reharmonization respected the Gaúcho tradition while introducing new harmonic colors that enriched the piece. Finally, in "Wave," the constant structure technique enhanced the sophisticated harmonies of bossa nova, creating a richer and more engaging listening experience.

These results demonstrate the potential of the constant structure reharmonization technique to enrich and expand the harmonic tradition of Brazilian rhythms. Through the careful application of this technique, it is

possible to explore new creative possibilities while maintaining the integrity and authenticity of the musical genres.

Future Directions

Future research could explore the application of constant structure reharmonization in other Brazilian genres and styles, as well as its potential in fusion projects with other musical traditions. This ongoing exploration will continue to reveal the richness and diversity of Brazilian music, inspiring musicians around the world. By investigating the harmonic possibilities of constant structure reharmonization in a variety of musical contexts, we can gain a deeper understanding of its potential to enhance and enrich the musical landscape.

Conclusion

The practice of constant structure reharmonization in Brazilian rhythms represents a fusion of tradition and innovation. By maintaining the essence of the rich musical heritage while introducing new harmonic possibilities, musicians can contribute to the ongoing evolution of Brazilian music. This approach ensures its relevance and vitality in the global musical scene. The examples provided in this article highlight the potential of constant structure reharmonization to increase the harmonic complexity and depth of Brazilian rhythms, offering new perspectives and creative possibilities for musicians.

REFERENCES

- Almada, C. (2006). *A estrutura do choro: com aplicações na improvisação e no arranjo*. Da Fonseca Comunicação.
- Almada, C. (2012). *O choro como modelo arquetípico da Teoria Gerativa da Música Tonal*. *Revista Brasileira de Música*, 25(1).
- Chediak, A. (1986). *Harmonia & Improvisação-Vol. 1*. Irmãos Vitale.
- Arthur, C. (2017). Taking harmony into account: The effect of harmony on melodic probability. *Music Perception: An Interdisciplinary Journal*, 34(4), 405-423.
- Benedek, M., Borovnjak, B., Neubauer, A. C., & Kruse-Weber, S. (2014). *Creativity and personality in classical, jazz and folk musicians*. *Personality and Individual Differences*, 63, 117-121.
- Bharucha, J., & Krumhansl, C. L. (1983). *The representation of harmonic structure in music: Hierarchies of stability as a function of context*. *Cognition*, 13(1), 63-102.
- Boling, M. (2004). *Creative comping concepts for jazz guitar*. Mel Bay Publications.
- Cecchetti, G., Herff, S. A., Finkensiep, C., Harasim, D., & Rohrmeier, M. A. (2023). Hearing functional harmony in jazz: A perceptual study of music-theoretical accounts of extended tonality. *Musicae Scientiae*, 27(3), 672-697.
- de Camargo Piedade, A. T. (2003). *Brazilian jazz and friction of musicalities*. *Jazz Planet*, 41.
- Mazlan, C. A. N. (2020). Utilizing Pragmatism Approach in Learning Jazz Guitar Reharmonization Technique using Malay Asli Song. *Journal Seni Musik*, 9(1), 50-57.
- Moss, F. C., Neuwirth, M., Harasim, D. & Rohrmeier, M. (2019). *Statistical characteristics of tonal harmony: A corpus study of Beethoven's string quartets*. *PLoS One*, 14(6), e0217242.
- Moss, F. C., Souza, W. F. & Rohrmeier, M. (2020). Harmony and form in Brazilian Choro: A corpus-driven approach to musical style analysis. *Journal of New Music Research*, 49(5), 416-437.
- Nazario, L. D. C. (2022). Rearmonização: método de ensino visando a aprendizagem da harmonia através da criatividade musical.
- Oliveira, L. C. R. (2021). *Recorrências harmônicas na música popular*. Lume.ufrgs.br. <https://lume.ufrgs.br/handle/10183/223057>
- Rawlins, R. & Bahha, N. E. (2005). *Jazzology: the encyclopedia of jazz theory for all musicians*. Hal Leonard Corporation.
- Rohrmeier, M. (2020). *The syntax of jazz harmony: Diatonic tonality, phrase structure, and form*. *Music Theory and Analysis (MTA)*, 7(1), 1-63.
- Schmeling, P. (2001). *Reharmonization with Constant Structure Chords*. Berklee Today. Retrieved 25 September 2021. (<https://www.berklee.edu/berklee-today/summer-2001/Reharmonization>).

- Seguin, A. (2023). *Genre Experience Maps and Their Role in the Analysis of Post-2000s Popular Music* (Doctoral dissertation, University of Cincinnati).
- Smith, N. A. & Schmuckler, M. A. (2004). The perception of tonal structure through the differentiation and organization of pitches. *Journal of Experimental Psychology: Human Perception and Performance*, 30(2), 268.
- Straus, J. N. (2016). Introduction to Post-Tonal Theory [Review of Introduction to Post-Tonal Theory]. W. W. Norton & Company, Inc., 500 Fifth Avenue, New York, NY 10110-0017.
- von Horn, H. (2020). “Beautiful and bold!”-*Chorale-reharmonization at the organ reflected in a singing congregation*.
- Wundervald, B. D. & Zeviani, W. M. (2019). *Machine learning and chord based feature engineering for genre prediction in popular Brazilian music*. arXiv preprint arXiv:1902.03283.