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Metaphors for understanding harmony*

Mauro Orsini Windholz**

Abstract

In this article, I discuss the limitations of the main conceptual metaphor for understanding harmony in Western music, namely, the metaphor HARMONY IS TENSION AND RELAXATION, and suggest alternative metaphors for this experience, that may aid in investigations about the expressive potential of harmony. I discuss how this metaphor acquired great importance in recent research in music cognition and has been considered fundamental in the experience of meaning and emotion in music but has had some shortcomings in accounting for this experience. I point out that the metaphor structures mainly the syntactical aspects of the harmony but is not sufficient to account for what more semantic aspects of this experience would be. Lastly, I suggest the metaphors of harmony as forces, color, and gesture as possibly exciting alternatives that may be promising in investigating how harmonic materials, such as chords, chord progressions, and key areas, become associated with different expressive meanings.

Keywords: conceptual metaphor, harmony, musical meaning, affect

Metáforas para o entendimento de harmonia

Resumo

Neste artigo, discuto as limitações da principal metáfora conceitual para o entendimento da harmonia na música ocidental, a saber, a metáfora HARMONIA É TENSÃO E RELAXAMENTO, e sugiro metáforas alternativas para essa experiência, que podem auxiliar nas investigações sobre o potencial expressivo da harmonia. Discuto como essa metáfora adquiriu grande importância em pesquisas recentes em cognição musical e foi considerada fundamental na experiência do sentido e da emoção em música, mas teve algumas deficiências na explicação dessa experiência. Ressalto que aquela metáfora estrutura principalmente os aspectos sintáticos da harmonia, mas não é suficiente para explicar quais seriam os aspectos mais semânticos dessa experiência. Por fim, sugiro metáforas da harmonia como forças, cores e gestos como alternativas possivelmente interessantes que podem ser promissoras em investigações sobre como materiais harmônicos, como acordes, progressões de acordes e áreas chave, tornam-se associados a diferentes sentidos expressivos.

Palavras-chave: metáfora conceitual, harmonia, sentido musical, afeto

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** CMPC-PPGM/Universidade Federal do Rio de Janeiro, Brasil
E-mail: maurowindholz@gmail.com

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Introduction

One of the main approaches to studying expression or arousal of affect and/or meaning by music in recent work in music cognition is the study of musical expectations and tension. The idea that "the rising and falling of tension is fundamental to the experience of music and may contribute to the emotional response" (Krumhansl & Cuddy, 2010, p. 76) is widespread in research in the field. It has prompted many investigations into how musical, and specifically harmonic materials, evoke tension. However, albeit its significant contributions, it is not entirely clear from this literature how exactly expectations and tension contribute to what might be called the many "expressive meanings" (according to Larson, 2012, p. 4: "that quality we experience in music that allows it to suggest (for example) feelings, actions and movements") of musical materials.

In this article, I intend to point out some limitations of this approach in accounting for the expressive meanings of musical-harmonic materials (such as chords, chord progressions, key areas, etc.) and suggest different approaches for future investigations that might be promising. First, drawing from concepts from the embodied cognitive sciences, I point out that this approach might be based on the conceptual metaphor HARMONY IS TENSION AND RELAXATION. Then, I discuss how this metaphor acquired great importance in the field of music cognition, starting with the seminal work of Leonard B. Meyer (1956), through more recent empirical studies on musical tension, and attempt to show a few shortcomings this body of work has had in enlightening how it is that music and harmony can generate expressive meanings. I point out that the metaphor of harmony as tension might account mostly for what might be called the syntactical aspects of harmony and attempt to show that, in the works of renowned theorists of Western tonal harmony, the metaphor has been present to establish a harmonic syntax, but is not sufficient to structure the understanding of what more *semantic* aspects of this experience would be. Lastly, I suggest some alternative metaphors for the understanding of harmony that might be promising in enlightening such semantic aspects (namely: harmony as color, forces, and gesture) and that might guide future research on the expressive meaning of harmony.

Harmony as Tension

It is commonplace among musicians and scholars to refer to musical-harmonic materials such as chords and chord progressions as having varying degrees of "tension." Certain chords often instill "tension," which is resolved or relaxed by subsequent chords. According to the embodied cognitive sciences, such linguistic expressions can serve as clues as to how a determined experience is understood and structured, and more often than not, they are structured in terms of an experience of a different kind. In this case, we understand chords and

chord progressions regarding our experience of tensing and relaxing muscles, among other possible source domains that involve tension. When such an understanding is employed, it is referred to as a "conceptual metaphor," an all-pervasive and essential device in human cognition to understand reality and many human experiences (Lakoff & Johnson, 1980, 1999). Therefore, it could be said that in our musical culture, we understand harmony according to the conceptual metaphor HARMONY IS TENSION AND RELAXATION.

This metaphor has been present in the modern tradition of Western music theory at least since Rameau (1722/1971), as when Ferris (1959, p. 243), discussing Rameau's harmonic theories, describes the progression between the chords of the dominant-tonic and tonic type as proceeding "from tension to repose." The metaphor is also pervasively present in the works of influential theorists such as Riemann (1893/1896) and Schenker (1935/1979), and many others. More recently, the metaphor has structured elaborate theories and empirical research in music cognition and has acquired great importance in the study of musical emotions and musical generation of meaning and affect. In the next section, I discuss the presence of this metaphor in the field of music cognition and attempt to show that it has a few shortcomings in contributing to the investigation of the expressive meaning of musical and harmonic materials.

The Metaphor of Tension in Music Cognition

The importance the metaphor of tension has acquired in research in the field of music cognition grew partly out of the influence of the work of Leonard B. Meyer. In his book *Emotion and Meaning in Music* (1956), Meyer argued that emotion and meaning are perceived in response to a musical stimulus as it plays with the expectations of listeners familiar with the particular musical style. The author states that:

> If (...) the sound succession fails to follow its customary course, or if it involves obscurity or ambiguity, then it can be assumed that the listener's tendencies would be inhibited or otherwise upset and that the tensions arising in this process would be experienced as affect. (Meyer, 1956, p. 31)

Therefore, in Meyer's theory, an important link exists between expectations, tension, and affect. In the following passage, this link is also evident, and meaning is added to the equation:

> Thus, in a very general way, expectation is always ahead of the music, creating a background of diffuse tension against which particular delays articulate the affective curve and create meaning. (Meyer, 1956, p. 59)

After Meyer's work, the notion that emotional responses to music and understanding of meaning in musical stimulus are intimately linked with expectations and tension became widespread in music cognition. This prompted a number of empirical studies that attempted to measure listeners' experience of tension in music-hearing tasks, such as

Nielsen (1983), Krumhansl (1996), Bigand et al. (1996), Bigand & Parncutt (1999), Lerdahl & Krumhansl (2007), and Farbood (2016), most of which focused on the tension caused by harmonic materials. However, exactly how different levels of tension verified in response to certain musical materials contribute to specific affects and meanings that might be experienced/understood in response to these stimuli is not clear from this literature. The results these studies have offered relate mostly to the memory listeners have of tonal centers and how well some recent theoretical models predict the tension levels measured in their experiments. Therefore, even though it is widely accepted that expectations and tension are fundamental to the experience of emotion and meaning in music, we do not as yet clearly understand how, precisely, and to what extent these factors contribute to specific expressive meanings of specific harmonic materials, which presumably should be accounted for by the theory proposed by Meyer.

Windholz (2018) offered a review of evidence from the field of music and emotion as to the limitations of the theory of musical expectations and, consequently, of the metaphor of tension, accounting for the expressive meaning of harmony. Some studies in the psychology of music, such as Juslin & Västfäll (2008), indicate that expectations are not enough to account for every type of emotional response of listeners to music. In the next section, I point out that the metaphor of tension relates mostly to the syntactical aspects of the experience of harmony but does not seem sufficient to account for its more semantic aspects.

Syntactical and semantic aspects of harmony

If we understand musical syntax, as Meyer did, as the "organization of sound terms into a system of probability relationships, the limitations imposed upon the combining of sounds, and so forth" (Meyer, 1956, p. 63), we can see that the metaphor of tension deals mostly with the syntax of harmony. The metaphor rules over how harmonic materials are organized in different musical styles to form tonal systems that are coherent and intelligible to particular cultural groups.

Already in Rameau (1722/1971), it is possible to observe that the metaphor of tension is mainly employed to clarify how to organize chord progressions. The author identifies the dominant chord as tense and the tonic chord as reposed, stating that the latter should always follow the former. He is, therefore, using the metaphor to determine how a chord progression must be written and which chords should follow which other chords. Rameau states that "the perfect cadence is a way of ending a strain which is so satisfying that we desire nothing further after it" (Rameau, 1971, p. 63). Therefore, the metaphor also determines tonal form by establishing ending points in the musical discourse. It can be seen that the metaphor of tension is employed to determine the organization of tonal discourse and its form, which may be understood as syntactic aspects.

In the work of Hugo Riemann, the relationship between tension and the syntactic aspect of harmony is also evident. In *Harmony Simplified* (1893/1896), Riemann introduces his harmonic function theory, in which any chord falls into one of three functions: tonic, dominant, or subdominant. The author defines "function" as the *harmonic meaning* a particular chord has in the context of tonality, and this meaning determines how the harmonic progression should be organized, which chords can follow which other chords, and which harmonic operations are admitted. In this manner, Riemann intends to provide the theoretical basis of an *intelligible* tonal harmonic discourse based on the meaning of notes and chords in relation to a center, the tonic. Thus, Riemann can be said to have established a syntax of tonal harmony. The notion of "conflict" and "resolution," or "rest," equivalent to tension and relaxation, are fundamental in Riemann's tonal syntax. In discussing the complete cadence, the author states:

> For this reason, the contra-fifth clang [subdominant chord] is generally not followed by the tonic itself, this simple solution of the conflict caused by its introduction is not (...) satisfactory or sufficient; rather, the contra-fifth clang is generally followed by the plain-fifth clang, which, then, leads back to the tonic in a thoroughly satisfactory manner, and closes restfully. The clang successions *T-S-D-T* and *ºT-ºS-ºD-ºT* are, therefore, really typical for harmonic motion in general; they are so-called *complete* (*bilateral*) *cadences*.

In Riemann's conception of tonality, it is possible to observe how the metaphor of tension (or in Riemann's case, "conflict") organizes the harmonic discourse and determines the organization and the limitations imposed on chord progressions.

In the work of Heinrich Schenker, possibly the most influential theorist of tonality of the twentieth century, the metaphor of tension is also markedly present. Discussing what he called the "fundamental structure," one of the main components of his theory, the author states that "we feel by nature that the fundamental line must lead downward until it reaches 1 and that the bass must fall back to the fundamental. With 1/I, all the tensions in a musical work cease" (Schenker, 1979, p. 13). The ceasing of tension in Schenker's theory is essential to organizing the tonal discourse and establishing form and hierarchy between tonal events. It is, therefore, once again a syntactical understanding.

Thus, it can be seen that in the understanding of harmony by three of the most influential theorists of Western tonal harmony, a marked presence of a metaphor of tension can be said to structure mostly the syntactical aspects of harmony. However, these authors do not extensively discuss processes of association between harmonic material and expressive meaning. Rameau dedicates a few chapters of the *Treatise on Harmony* (1722/1971) to the affects that different chords and progressions might express, but only briefly. In some passages of *Harmony Simplified*, Riemann mentions some associations between harmony and expressive meaning; such as, when discussing enharmonic changes, the author states that "effects of the most surprising beauty can be attained,

like mystical views of remote domains of the tone-world, inaccessible by ordinary paths" (1896, p. 157). Still, these are rare and have the character of poetic illustrations without much academic rigor. Therefore, it can be concluded that the metaphor of tension in our modern tradition of Western tonal music theory has been structuring mainly the syntactic aspects of harmony but does not deal as much with semantic aspects.

It is, therefore, not surprising that recent empirical studies on musical and harmonic tension do not have much to say about associations between harmonic material and expressive meaning. The fact that these studies have offered results mostly related to the memory listeners have of tonal centers, which relate to how listeners perceive tonal form, reveals the syntactical aspect that the metaphor of tension is structuring. The metaphor seems insufficient to structure more semantic aspects of the experience of harmony, despite the link Meyer advocated between tension, emotion, and meaning.

Budd (1985) discusses a few problems with Meyer's theory that reinforce the limitations of the metaphor of tension in accounting for many emotional responses of listeners to music. The author states, for example, that "tension is not the same as emotion, it is not included in each emotion, and it does not necessarily generate emotion" (Budd, 1985, p. 160). Budd also identifies Meyer's theory as dealing primarily with syntactical aspects of music because, for the most part, it ignores the association between musical material and extramusical phenomenon and deals mostly with the meaning that arises from strictly intramusical relations between musical sounds. Budd argues that this emphasis Meyer gives to the syntax of music in generating meaning and emotional response in listeners may be problematic and overestimated. Budd claims that Meyer ignores what he calls the "designative meaning" and the "sensuous appeal" of music, aspects that might be more related to musical semantics, in accounting for the emotional responses of listeners to music and for the understanding of meaning in musical material.

It is, therefore, evident that the metaphor of tension has some limitations in dealing with the more semantic aspects of harmony. It is perhaps necessary to explore alternative metaphors to understand harmony that may account for such aspects and guide future research to expand our knowledge of how harmonic materials are associated with expressive meanings. In the next section, I discuss three possible alternative metaphors to aid this investigation.

Alternative Metaphors for Harmonic Understanding

According to the embodied cognitive sciences, every conceptual metaphor necessarily highlights certain aspects of the experience it attempts to structure while at the same time "hiding" others (Lakoff & Johnson, 1980). As I have been arguing, the metaphor of tension for understanding harmony could be said to be highlighting mainly its

syntactical aspects. It rules over how harmonic materials can be organized into a coherent and intelligible discourse, which materials are to be expected (relaxed), and which ones are deviations from the norm (tense). It also establishes form and segmentation, as when the relaxations are understood as closure, a moment after which there is no expectation of continuation. However, the metaphor does not seem sufficient to establish a *semantic* theory of tonal harmony. It cannot fully explain many associations between harmonic material and expressive meaning, even one as pervasive and fundamental to our musical culture as the one between major harmonies and happiness and minor harmonies and sadness (Parncutt, 2014). It is perhaps necessary to seek out new metaphors for harmonic understanding to account for the more semantic aspects of this experience.

One possible such metaphor would be that developed by Steve Larson in his book *Musical Forces: Motion, Metaphor, and Meaning in Music* (2012). In this work, Larson argued that humans hear and understand music metaphorically as movements constrained by forces, which contribute to the many expressive meanings associated with different musical materials. In this manner, Larson could account for some expressive meanings of melodic figures, such as the *lamento* bass and the "hallelujah figure."

The first one, a chromatically descending bass line in minor mode, slow tempo, and triple meter (Figure 1), would thus be understood as "being pulled slowly and inevitably downward" (Larson, 2012, p. 84) by the forces of "melodic gravity" and "inertia," which could relate to feelings of sadness, which are themselves usually related metaphorically to a downwards orientation (as in expressions such as "feeling *low*" or "he *fell* into a deep depression," "down in the dumps," etc.). This could partly explain the widespread association in the baroque period of the *lamento* bass to texts that express mourning, sadness, and death. In contrast, the "hallelujah figure," which consists of a leap from the first degree of a major scale to the fifth degree, followed by a stepwise motion to the sixth degree, then back to the fifth, would be more commonly associated with lighter and gayer emotions. Larson offers an account of the beginning of the melody of *Twinkle, Twinkle, Little Star* (Figure 2), which contains a hallelujah figure:

> this leap suggests a quality of ease because it leaps from the most stable platform (the tonic) to the next-most-stable degree of the scale (the fifth scale degree). That ease, combined with the energy associated with an ascending leap of this size, suggests a kind of athletic quality that is effortless and secure. (...) And the simple repetition of each note in the melody gives the line a kind of simple-minded momentum that I associate with skipping motions expressive of unconcerned contentment. (Larson, 2012, pp. 83-84)

Therefore, the different melodic configurations of these two figures suggest different movements constrained by metaphorical musical forces in different ways, suggesting contrasting expressive meanings.

Figure 1
As Beginning of Purcell's "Dido's Lament," which contains a lamento bass.

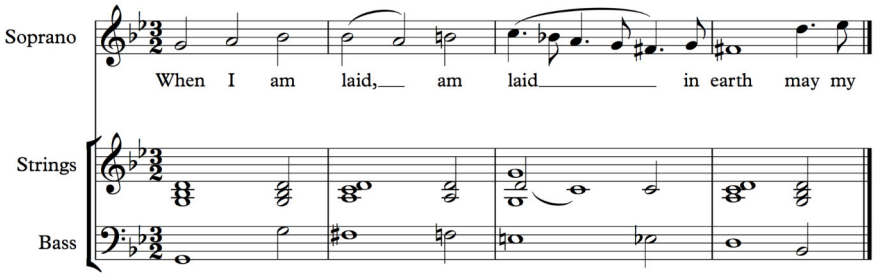
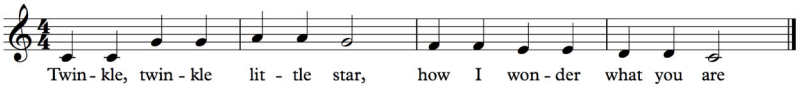


Figure 2
Beginning of the melody of *Twinkle, Twinkle, Little Star*. The first two measures consist of a "hallelujah figure."



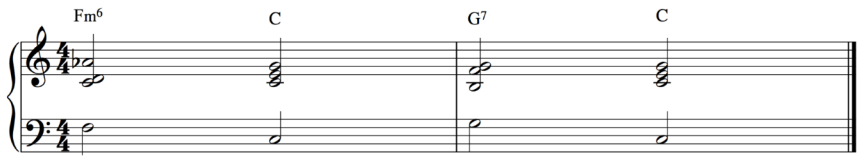
Thus, with a metaphor of musical forces, Larson was able to investigate how the particular characteristics of certain melodic materials contribute to the expressive meanings they are associated with. Larson applies his theory mostly to the analysis of melodies and melodic contours. Perhaps one interesting avenue of investigation for future research would be to use the metaphor of musical forces to harmonic materials such as chords and chord progressions.

Candace Brower (2002) briefly employed a metaphor of musical forces to discuss the expressive meaning of some harmonic materials, such as key areas. According to the author, modulations of key around the circle of fifths correspond metaphorically to either an upward or a downward movement. If a modulation occurs on the sharp side of the circle, an upward orientation is suggested, which would go against a harmonic gravity force and would thus result in lively and happy expressive meanings; conversely, a move to the flat side of the circle of fifths would result in a downwards orientation, giving in to the force of harmonic gravity and resulting in sad and languid expressive meanings. Perhaps Brower's ideas could be expanded to include a broader range of harmonic materials and expressive meanings (the author seems limited to a happy/sad dichotomy and still relies on a metaphor of tension).

It is interesting to note that contemporary musicians are already using a metaphor of musical forces to understand harmony and explore its expressive potential. Jacob Collier, one of the most acclaimed jazz musicians of the new generation, employed, many times, metaphors of forces (among others) to discuss harmony in a 2017 interview for the *YouTube* channel "June Lee." Discussing what he called "negative harmony," Collier states, for example, that a G seventh chord would have its polar negative in the F minor sixth chord. These two chords would have the "same amount of gravity" (Collier seems to mix a force of harmonic gravity with harmonic magnetism) to resolve in a C major chord;

however, since one is the polar opposite of the other, they would each articulate different expressive meaning. According to Collier, the plagal cadence of F minor sixth resolving in C major would be like "hugging" the key, and the perfect cadence of G seventh resolving in C major would be like "arriving" at the key (Figure 3). Thus, further investigations on a metaphor of forces for harmonic understanding could be interesting to account for the several expressive meanings of different chord progressions.

Figure 3
The plagal and perfect cadences in C major, which, according to Jacob Collier, have the same harmonic gravity but articulate different expressive meanings.



Another possible metaphor for the understanding of harmony would be *color*. Musicians often say that harmonic materials have different "colors," as when jazz musicians refer to intervallic additions to a structural chord as "coloring effects." In the same interview mentioned above, Jacob Collier also employed many metaphors involving color to discuss harmony. In one passage, for example, Collier (2017) states that "no chord with more [notes] is more valuable than a chord with fewer notes, but they can sure add some cool colors if you learn how to use them." LaRue (1992) understands that the two most basic functions of harmony are to promote tension and color and states that color has a connection with affect. According to the author:

> Harmonic color is, in many styles, the most instantaneous affective resource of music. We are immediately conscious of changes from major to minor forms of chords; open fourths or fifths vs. triads, sevenths, or higher complexities of vertical structure, open vc. close position (...); various doublings; and 'dark' (flat) or 'light' key relationships. (LaRue, 1992, p. 41)

Therefore, according to the metaphor of color, different pitch organizations suggest different "colors," which seem to have different expressive qualities. An empirical study by Isbilen and Krumhansl (2016) verified a consistent link between musical excerpts, colors, and emotional quality. In the first experiment, the authors requested the participants to assign one of eight colors to the beginnings of pieces from *The Well-Tempered Clavier* by Bach. The authors noted considerable consistency in associations between the musical excerpt and color and that musical characteristics of the excerpts, such as mode, tempo, register, and attack rate, significantly influenced these associations. In two subsequent experiments, the authors requested participants to assign emotional characteristics (from an emotional scale elaborated) to the same musical excerpts and colors employed in the first experiment. After the

results, the authors concluded that there is considerable consistency in associations between music, color, and emotion.

This study and other works cited therein suggest that a link exists between music, color, and affective response. Thus, there seems to be evidence that different musical-harmonic materials can suggest different colors and, through this relation, they are associated with emotional quality. Future research investigating the relationship between color and harmonic material may improve our understanding of how harmonic material relates to expressive meanings. As Isbilen and Krumhansl conclude: "this kind of analysis would extend our current understanding of how musical patterns evoke extramusical associations" (Isbilen & Krumhansl, 2016, p. 160).

One last possible metaphor for harmonic understanding that I suggest is that of *gesture*. The term "gesture" to refer to musical phenomena has occurred at least since 1910 and has been growing in importance in recent scholarly work on music and research in music cognition (Ben-Tal, 2012). It is common among musicologists, theorists, and other scholars to understand certain musical aspects as "gestures," thus employing a metaphor of music as body movement. Hatten (2005, p. 14) defines gesture in general as "significant (communicative) energetic shaping through time" and states that gestures form affectively loaded, intermodal, synthetic, functionally coherent, and intersubjectively developed temporal *gestalts* that possess emergent meaning. Thus, gestures would be source domains to the musical experience as they can create meaning understood as gestural. According to the author, for example, in Western musical styles, "a kind of *virtual gravitational field or vectorial space* provides an analog to the forces working on the human body in physical space, enabling the motivated opposition of downward grief vs. upward elation" (Hatten, 2005, p. 16). Hence, it is possible to understand an expressive gestural meaning in music.

Godøy (2011) put forth his theory of coarticulated gestural-sonic objects, which refers to how listeners divide musical stimuli into coherent and holistically-perceived *chunks*. According to the author, in listening to music, our cognition generates several chunks – gestural-sonic objects – which are units of musical meaning that contain the holistic information available to our short-term memory. These coarticulated gestures would function as "schemas in the perception of several important features of musical sound" (Godøy, 2011, p. 77), such as, for example, "tone semantic features." According to Godøy, sequentially musical notes would fuse in a "holistically-perceived chunk having distinct modal flavors" (Godøy, 2011, p. 77). Thus, it is possible to conceive musical-harmonic gestures: units of musical sound, the tonal content of which acquires semantic characteristics due to the configuration of their harmonic content. Depending on this content, different semantic characteristics would be articulated.

Hence, a possibly interesting avenue for investigation would be the study of how the harmonic characteristics of several musical gestures

contribute to the expressive meanings associated. Ben-Tal (2012) discusses the levels of harmonicity of what he called "expressive unit gestures" and how they contribute to their expressivity; Hatten (2005) discusses the traditional tonal relations between the harmonies of the gestures he identifies in his analysis of Beethoven and Schubert and how they might articulate several expressive meanings. Further investigation of this kind would be an exciting complement to understanding the expressive potential of the harmonic experience.

Concluding remarks

Thus, it can be seen that many possibilities of metaphors exist to understand harmony beyond tension and relaxation, which seem promising in enlightening its semantic aspects. New research on harmonic color, forces, and gesture might be important in advancing our knowledge of how harmonic materials become associated with expressive meanings. Moreover, other metaphors for this experience certainly exist (such as a metaphor of harmony as flavor, which Godøy briefly mentions in the passage cited above). Those I mention here are only preliminary suggestions.

All of this is not to say that tension, relaxation, and expectations do not play an important role in the perception and understanding of harmony; there is plenty of evidence that they do. What I point out, however, is that some recent research in music cognition might have over-emphasized this role and that there seem to be aspects of the harmonic experience that cannot be fully explained in terms of tension and relaxation and that are not as thoroughly investigated.

The alternative metaphors besides tension and relaxation I suggested here are not devoid of syntactical aspects. Color, forces, and gestures also elicit directionalities in the harmonic discourse, and tension and relaxation might also play a role in such directionalities and are thus present even when the understanding occurs through alternative metaphors. Therefore, I propose not to oppose syntactical understanding but to offer an extension thereof. As Zbikowski suggests, "musical syntax and semantics are better viewed as points along a continuum than discrete domains" (Zbikowski, 2002, p. 199). Hence, I propose expanding the syntactical understanding that has dominated our theoretical tradition in the investigation of harmony to include other aspects that are not as thoroughly studied today. I suggest that adopting alternative metaphors for its understanding may aid in this objective.

Therefore, I hope to have suggested interesting ideas that motivate future investigations on the expressive meaning of harmony and may help us understand more about this very powerful, affective, and meaningful experience.

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