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Body, Forces, and Paths: Metaphor and Embodiment in Jean-Philippe Rameau's Conceptualization of Tonal Space\*

**KEYWORDS:** metaphor, Rameau, analysis, harmonic theory, Mark Johnson, George Lakoff, cognitive science, Roger Scruton, tonal motion, linguistic theory, embodied meaning, image schema, mental representation, discourse

**ABSTRACT:** Studies by George Lakoff and Mark Johnson in the field of cognitive linguistics give rise to a theory of meaning that bestows a central role on metaphorical thinking and the body. This essay explores the ramifications of physical embodiment on Jean-Philippe Rameau's conceptualization of tonal harmony. My examination will show that Johnson's theory of the bodily basis of metaphor is not sufficiently adequate to account for all the aspects of Rameau's harmonic theory, and additional sources for metaphorical projection should be taken into account for its full rendering.

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## 1. Introduction

[1.1] The most influential account of the nature of musical meaning is probably to be found in Eduard Hanslick's *Vom Musikalisch-Schönen* of 1854. In this famous essay, the music critic argues that the meaning of music lies in its form rather than in its affective aspects. He criticizes the romantic aesthetics that take emotion to be an authority in matters of art and suggests that the unique beauty of music should be investigated using the methods of the natural sciences. In his words, he aims "to get alongside the thing itself, seeking whatever among our thousandfold flickering impressions and feelings may be enduring and objective."<sup>(1)</sup> That being said, he goes on to assert that in music the stable and objective factors are the "tonal moving forms" that are present in musical composition independent of the listener or observer who perceives them. To be sure, Hanslick does not deny the ability of music to arouse

feelings but this ability, in his opinion, has no relation to artistic value. Music is pure form and therefore one should evaluate its significance in terms of its technical means.

[1.2] To a great extent, Hanslick's assumption regarding the objective nature of the musical structure defines the interests of music theorists up to the present day.<sup>(2)</sup> In recent years, however, an alternative view of the nature of formalistic preoccupation with music has emerged. The studies of the linguist George Lakoff and the philosopher Mark Johnson in the field of cognitive linguistics were conducive in this development. In a series of publications, both joint and independent,<sup>(3)</sup> they propose a theory of meaning that bestows a central role on metaphorical thinking and the body.<sup>(4)</sup> This theory undermines the objectivist notion of musical meaning as something that is inherent in the music itself and suggests a new framework for the analytical discussion of music, as well as a refreshing perspective on traditional theoretical models.

[1.3] This essay focuses on Johnson's theory of embodied meaning and its application to eighteenth-century harmonic theory. First, I will discuss the role of metaphor in Roger Scruton's aesthetics of music and the work of Lakoff and Johnson on metaphor, which supports some of Scruton's conclusions. Later, I will present the theory of embodied meaning and explore the ramifications of physical embodiment on musical thinking through a close inspection of Jean-Philippe Rameau's conceptualization of tonal harmony. This examination will emphasize the interplay between metaphors of various sources in Rameau's musical discourse.

## 2. Metaphor and Music as an Intentional Object

[2.1] In his article "Understanding Music," the neo-Kantian philosopher Roger Scruton claims that the understanding of music *as music* necessarily involves metaphorical thinking, a claim that is based on an assumption regarding experience and its verbal representation.<sup>(5)</sup> Scruton says that the descriptive language of listeners discloses the concepts and categories they apply while listening to music. Accordingly, he distinguishes between two forms of understanding reflected in the difference

between the description of material (or acoustic) characteristics of sound and *musical* description: scientific understanding, and a type of understanding that he calls, following the phenomenologists, “intentional understanding.”<sup>(6)</sup> Scientific understanding approaches the world as a material object and seeks to explain it in terms of causal connections; intentional understanding, on the other hand, considers the world as it appears to our direct awareness (in Husserl’s idiom, *Lebenswelt*) and brings to light only those connections and relations that are already implied in one way or another by our concepts. “Because all our perception is informed by concepts,” says Scruton, “and those concepts in their turn determine our understanding and practical reasoning, a critic or philosopher can bring system to an appearance, by drawing out the implications of the concepts through which it is described. This description need not be one that the person who perceives with understanding can provide. But when he understands it, he will recognize it immediately as a description of the experience that is his.”<sup>(7)</sup>

[2.2] Musical understanding is thus a special case of intentional understanding.<sup>(8)</sup> As such, it is dependent on our intellectual abilities, education, concepts, analogies and expectations, whose origins are in the musical culture. The understanding that we acquire from this culture is not expressed only in the way we think of music, but also in the way we hear it. This is reflected in the way we hear, for instance, the change of a note in a phrase as “melodic motion”; when we perceive a note as being “low” or “high”; or when we interpret a combination of individual notes as “harmony.” In all these cases, the object of the description is not material fact but a phenomenal aspect of our musical experience. This idiosyncrasy leads Scruton to the conclusion that music belongs exclusively to the intentional sphere and not to the scientific realm.<sup>(9)</sup>

[2.3] Scruton invokes metaphor in order to account for the intentional character of musical experience. What appears in all the above mentioned cases, in which auditory events are understood in terms of musical categories, is metaphorical transference, that is, taking concepts from one domain and applying them to another. At the basis of our musical understanding, Scruton argues, lies a complex system of metaphor that causes us to hear tones (as opposed to sounds) as being in motion. Scruton rejects

various suggestions according to which this motion is in fact literal;<sup>(10)</sup> yet, he stresses that one cannot dispense with it. The metaphor of space and motion within it is an integral part of the intentional object of our musical understanding and without it a true description of musical experience is not possible.<sup>(11)</sup> Therefore, he establishes, against the traditional formalistic view, that “any analysis of music must be an exercise in intentional rather than scientific understanding.”<sup>(12)</sup> His conclusion finds empirical confirmation in the cognitive studies of Lakoff and Johnson who claim in *Metaphors We Live By* (1980) that metaphor is the *modus operandi* of our thought as a whole.

### 3. Metaphor and the Construction of Meaning

[3.1] Lakoff and Johnson begin by drawing attention to the fact that metaphor is not restricted to literary usage, as is often supposed, but it is actually a prevalent element in ordinary language as well. Consider for instance the expression “I have no time,” suggesting that time is a material thing, or “your claim is indefensible,” assuming that the claim is taking part in a battle. Such expressions are so much a part of our daily speech that we tend to forget that they are really metaphorical. But metaphor is not just a matter of words. From the discovery of the frequency of metaphor in day-to-day language, Lakoff and Johnson go on to argue that metaphor structures and defines our conceptual system, and, as a result, also has an effect on our behavior. Their claim is supported by analysis of linguistic expressions that reveal a shared deep-structure called “conceptual metaphor.” I shall demonstrate this through the conceptual metaphor LOVE IS A JOURNEY.

[3.2] It is well known that love is an emotion or a feeling, not a “journey” in the literal sense of the word. Nevertheless, we tend to describe this emotion and its development in terms of a “journey.” We say of those who are in love that they are in a state of “smooth sailing”; or that they are “on the rocks? they are likely to “pass through the years” or to “go their separate ways”; they might “get stuck in a rut” or find that their relationship is “going nowhere.” Underlying all these expressions is an association of the emotion of love with a journey. LOVE IS A JOURNEY is therefore a conceptual metaphor that defines a broad range of linguistic metaphors.<sup>(13)</sup>

[3.3] The example of LOVE IS A JOURNEY proves that we systematically borrow terms from one domain, a “source domain,” in order to clarify aspects of another, the “target domain,” with the first domain usually being concrete and familiar (a journey, for instance) while the second is abstract and ambiguous (such as love).<sup>(14)</sup> This phenomenon indicates the metaphorical character of our conceptual system, and influences our functioning; our concepts, which are partly metaphorical, structure our perceptions, our behavior, and the way we communicate with one another. It can be assumed that in a society in which love is understood primarily as “war” and not as a “journey,” successful couplehood would have a different meaning from the one we are familiar with. I will examine this somewhat monolithic interpretation of metaphor more closely in my discussion of Rameau’s harmonic theory.

#### 4. Musical Space and Orientational Metaphors

[4.1] In the case of LOVE IS A JOURNEY, a certain concept has been structured metaphorically in terms of another concept. Another type of metaphorical concept is one that organizes a whole system of concepts with respect to one another. Lakoff and Johnson call these cases “orientational metaphors” because most of them have to do with spatial orientations such as up-down, in-out, front-back, on-off, deep-shallow, central-peripheral. These spatial orientations arise from the way our bodies are constructed and function in our physical environment. Orientational metaphors give a concept spatial orientation. A number of orientational metaphors and some linguistic expressions derived from them follow:

##### HAPPY IS UP; SAD IS DOWN

I’m feeling *up*. That *boosted* my spirits. My spirits *rose*. You’re in *high* spirits. Thinking about her always gives me a *lift*. I’m feeling *down*. I’m *depressed*. He’s really *low* these days. I fell into a *depression*. My spirits *sank*.

##### HEALTH AND LIFE ARE UP; SICKNESS AND DEATH ARE DOWN

He’s at the *peak* of health. Lazarus *rose* from the dead. He’s in *top* shape. As to his

health, he's *up* there. He *fell* ill. He's *sinking* fast. He came *down* with the flu. His health is *declining*. He *dropped* dead.<sup>(15)</sup>

[4.2] Orientational metaphors are evident in our ideas about musical space as well. Like Scruton, Lawrence Zbikowski, a theorist influenced by Lakoff and Johnson, points out that our characterization of the relative height of a pitch does not rest on empirical data related to actual location in space, but on metaphorical transference; there is no literal significance to the statement that D4 on the piano is "higher" than C3; after all, both of them are located on the same horizontal plane of the keys.<sup>(16)</sup> The same applies to "vertical" instruments: to play the "higher" D4 on the cello, we have to slide our left hand downwards, in such a way that in fact brings it closer to the ground. Zbikowski's conclusion is that our culturally induced conceptualization of musical space is based on the conceptual metaphor PITCH RELATIONSHIPS ARE RELATIONSHIPS IN VERTICAL SPACE which maps spatial orientations such as "up-down" onto the pitch continuum.<sup>(17)</sup> The cognitive theory of metaphor therefore confirms Scruton's fundamental insight regarding the metaphorical character of musical understanding and paves the way towards its explanation.

## 5. Image Schemas and Physical Embodiment

[5.1] Metaphorical transference plays a central role in the constitution of meaning but in itself is insufficient to provide a comprehensive explanation of the nature of our understanding. Immediately, questions arise: Why does the metaphorical mapping happen to be from a concrete domain to an abstract one? How is the understanding of the source domain possible in the first place? In *The Body in the Mind*, Mark Johnson approaches these questions with a surprising suggestion, one with far-reaching implications for the philosophical discussion of the problem of body and mind: the ultimate grounding of our understanding, he claims, lies in the body, in its movements and orientations.

[5.2] According to Johnson, our perception of the world involves image schemas, which are experiential gestalts emerging from fixed patterns of our physical activity.<sup>(18)</sup> Image schemas operate at a pre-conceptual level and provide the

fundamental framework on which concepts and relationships that are essential to metaphor are based. The hypothesis of image schemas whose source is physical explains the direction taken by metaphorical mapping (from the concrete to the abstract), and offers a platform for understanding the constraints that determine our understanding of reality. In order to better comprehend the notion of image schemas, two examples will be presented below: the path schema and the force schema. The diagrams are for demonstration purposes only—to concretize the principal elements of the schemas; they imply nothing about mental pictures or representations we “carry” in our heads.

[5.3] As in any image schema, the path schema (Fig. 1) has an inner logic or structure loyal to its source in physical experience. Paths are a very familiar thing for us. There is a path that leads from the bedroom to the bathroom, from the fridge to the kitchen table, from the Earth to the Moon, from the master’s degree to the doctorate, and from the doctorate to a professorship; some of these paths are real and some exist only metaphorically. In which case, they all share a recurring image-schematic pattern with a definite internal structure: (1) a source, or starting point; (2) a goal, or end-point; and (3) a sequence of contiguous locations connecting the source with the goal.

**Figure 1.** Johnson’s path schema



(click to enlarge)

[5.4] As a consequence of these parts and their relations, the path schema has certain typical characteristics:

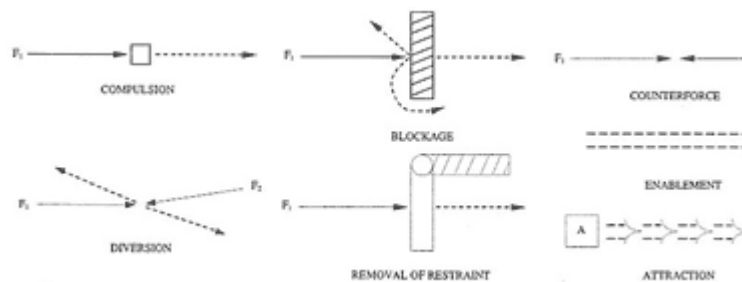
- a. Continuity. Because the beginning and end points of a path are connected by a series of contiguous locations, it follows that, if you start at point A and move along a path to a further point B, then you have passed through all the intermediate points in between.
- b. Directionality. Paths are not inherently directional—a path connecting point A with point B does not necessarily go in one direction. However, since human beings have purposes in traversing paths, they tend to experience them as directional.
- c. Temporality. I start at point A (the source) at time  $T_1$ , and move to point B (the goal) at time  $T_2$ . In this way, there is a time line mapped onto the path. Such a linear spatialization of time gives rise to one important way we understand temporality. <sup>(19)</sup>

[5.5] While the path schema derives from our experience of paths, the second, the force schema, derives from our experience of forceful activity. Johnson says:

In order to survive as organisms, we must interact with our environment. All such causal interaction requires the exertion of *force*, either as we act upon other objects, or as we are acted upon by them. Therefore, in our efforts at comprehending our experience, structures of force come to play a central role. <sup>(20)</sup>

[5.6] The force schema is in fact a number of image schemas that constitute a radial category, that is, a category that contains

**Figure 2. Johnson's force schemas**



(click to enlarge)



a prototype  
or typical  
member and  
a number of  
less typical  
members.<sup>(21)</sup>

Johnson lists  
the following  
features of  
the force  
schema

prototype: (1)  
interaction;  
(2) vector or  
directionality  
; (3) path of  
motion; (4)  
origins or  
sources; (5)  
degrees of  
power or  
intensity; and  
(6) a  
structure or  
sequence of  
causality.

Figure 2  
shows the  
visual  
representatio  
ns of the

most  
common  
members of  
the force  
schema  
category:  
compulsion,  
blockage,  
diversion,  
removal of  
restraint,  
enablement,  
and  
attraction.

The solid  
lines  
represent  
actual force  
vectors and  
broken lines  
represent  
potential  
force vectors.

In all the  
illustrated  
schemas,  
some  
elements of  
the prototype  
are  
maintained,

but others  
may change.

[5.7] The path schema and the force schema offer a basis for a wide variety of metaphorical interpretations in different fields, among them, as Janna Saslaw has shown expansively, the field of music theory.<sup>(22)</sup> In what follows, I will examine the role of the path schema and the force schema in Jean-Philippe Rameau's *Traité de l'Harmonie* of 1722, while taking issue with Lakoff and Johnson's theory of embodied meaning and its assumptions.<sup>(23)</sup> My examination will show that the hypothesis of image-schema is not sufficiently adequate to account for all the aspects of Rameau's theory, and additional sources for metaphorical projection should be taken into account for its full rendering.

## 6. Metaphor and Embodiment in Rameau's *Traité de l'Harmonie*

[6.1] Rameau's musical conception includes both the force schema and the path schema.<sup>(24)</sup> Both are expressed in his general view of music as an interaction between physical entities we call chords following one another in temporal succession.<sup>(25)</sup> Chords and the relationships between them play a central role in Rameau's musical thinking. He conceives harmony as the cause of voice leading, not its product. Chord progressions govern the melodic events and facilitate the course of music. In Book 2 of the *Traité*, he says:

Harmony then is generated first, and it is from harmony that the rules of melody must be derived; indeed, this is what we do by taking separately the aforementioned harmonic intervals, and forming from them a fundamental progression which is still not a melody. But when these intervals are put together above one of their component sounds, they naturally follow a diatonic course.<sup>(26)</sup>

[6.2] According to Rameau, the source of harmony in music is the undivided string.<sup>(27)</sup> Its division produces the perfect chord (*accord parfait*) or “*harmonie consonante*”;<sup>(28)</sup> the addition of a third above it produces the seventh chord, or “*harmonie dissonante*.” All harmony is based on the perfect chord, the seventh chord, or an inversion of either of them.<sup>(29)</sup> The voice leading is guided by the progression between these sonorities

which are structured as self-contained, yet functionally related, entities. Thus, Rameau's conception of musical motion invokes the force schema and the path schema by means of two conceptual metaphors: HARMONIES ARE OBJECTS IN INTERACTION and HARMONIC PROGRESSION IS PATH. These define Rameau's approach to cadences, dissonances and other aspects of composition.

[6.3] Before we proceed, it is necessary, however, to examine the actual relationships between these metaphors and Rameau's theory. As previously noted, Johnson's theory of conceptual metaphors posits that the body is the ultimate source of metaphor with embodied image schemas working as a limiting framework for concepts. This hypothesis is not without difficulties when applied to Rameau's harmonic theory. For one, it is unable to account for all of Rameau's theoretical concepts.<sup>(30)</sup> The problem we face in attempting to apply Johnson's hypothesis to Rameau's theory, and to music theory in general, is twofold: on the one hand, there is an obvious need to account for all the peculiarities of a theoretical model if one is not to avoid its special features; on the other hand, the metaphor theory will lose much of its explanatory force if it cannot be proven that musical conceptions are constructed by metaphorical operations in any systematic way. In order to solve this problem, I will attempt to distinguish between those aspects of Rameau's theory that are presumably grounded in embodied experience, and those which seem to suggest other, or additional, sources for their projection.

[6.4] Rameau's harmonic theory cannot be adequately understood without his notion of inversion. As is well known, one of Rameau's central tenets is that certain harmonies are in fact "inversions" of some chord or other consisting of a pile of thirds.<sup>(31)</sup> At the bottom of this pile is the fundamental tone, or the root, of the chord. A succession of root tones gives rise to the "fundamental bass" (*basse-fondamentale*), the theoretical bass line that clarifies the harmonic progression. As Allan Keiler has observed, this part has two conceptual aspects: on the one hand, it may appear as an actual voice in the musical texture; on the other, it serves as an underlying structural foundation that explains the other parts.<sup>(32)</sup> The notion of "inversion" is a metaphorical

concept (chords are not objects to be inverted), consistent with Rameau's conceptualization of chords as objects in space.

[6.5] Though the notes of the fundamental bass can appear anywhere in the musical texture, Rameau insists that the fundamental bass is "always the lowest and deepest part."<sup>(33)</sup> In support of his claim, he quotes from Gioseffo Zarlino's *Le institutioni harmonische*, interpreting the Italian theorist's "bass" as fundamental bass:

Just as the earth is the foundation for the other elements, so does the bass have the property of sustaining, establishing, and strengthening the other parts. It is thus taken as the basis and foundation of harmony and is called the bass—the basis and support, so to speak ... if the bass were to disappear, the whole piece of music will be filled with dissonance and confusion.<sup>(34)</sup>

Rameau's employment of the quotation from Zarlino suggests that the fundamental bass, whether or not it occurs as an actual voice, supports all the harmonic and melodic events and determines the functional relations between the chords. Like the earth, the fundamental bass functions as a coordinating force which keeps everything above it in harmony.

[6.6] Rameau argues that the progression of the fundamental bass is based on the structure of the vertical sonorities. Arnold Schoenberg once described the "two or more dimensional space in which musical ideas are presented" as a "unit."<sup>(35)</sup> He was referring to the notion that the totality of events in a composition, whether melodic, rhythmic, or harmonic, derive from the same source and reveal their structural meaning through their interaction.

[6.7] Rameau applies a similar notion of unity to the relation between chords and the fundamental bass. In his view, the progression of the fundamental bass and the chord structures are based on the same divisions of the monochord. As he says:

When we give a progression to the part representing this undivided string [i.e. the fundamental bass], it can only proceed by those consonant intervals obtained from the first divisions of this string. Each sound will consequently harmonize with the sound

preceding it. As each can bear in its turn a chord similar to the chord obtained from the first divisions, it will easily represent the undivided string, the source and foundation of the chord.<sup>(36)</sup>

Rameau conceptualizes musical space as a homogeneous field in which the intervals of the harmonic progression derive from the structures of the vertical sonorities. He maintains that the most natural progression of the fundamental bass is carried out in those intervals from which the chords are constructed, the third and the fifth.<sup>(37)</sup>

[6.8] The equation of the vertical structures of the chords with the horizontal progressions of the fundamental bass contradicts our experience of physical space as well as the phenomenal character of music.<sup>(38)</sup> From a bodily perspective, moving along a horizontal path would seem to be vastly different from moving up against the force of gravity. Similar structural differentiation exists also among parts in a musical texture. Under normal conditions, musical space is not at all homogenous but rather fraught with formal distinctions, which might suggest a deeper connection with gravity. Manfred Bukofzer once noted that “It is no mere metaphor if tonality is explained in terms of gravitation. Both tonality and gravitation were discoveries of the baroque period made at exactly the same time.”<sup>(39)</sup>

[6.9] Admittedly, Bukofzer’s aim was to point out two analogous manifestations of the Baroque culture in order to emphasize its essential coherence; yet the suggestion is significant here for pointing out the hierarchical nature of both musical and physical spaces. The experience of high and low in music has already been indicated. It is important to note that in the context of tonal music this distinction has consequences for the functional significance of the parts in the texture. There is no question of the importance of the bass part, in comparison to other parts, in establishing harmonic sense and directionality. Rameau’s geometrical view of musical space clearly does not admit such distinctions despite his appeal to the metaphor of the fundamental bass as “earth.”

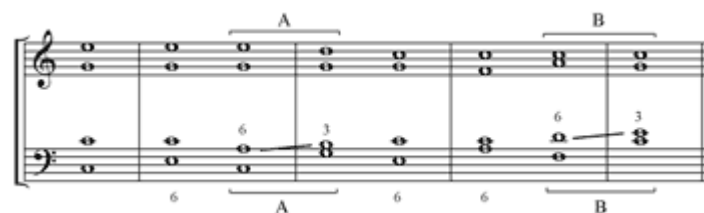
[6.10] Given Rameau’s acknowledgment of the importance of the bass as the carrier of harmony, it might be interesting to ask why he adheres to a conception of musical

space that runs contrary to both experiential space and aural perception of tonal music. Put differently, what is the source of Rameau’s notion of musical space? According to the theory of embodied meaning, the choice of a source domain for metaphorical mapping is determined by body-based experience which correlates a concrete source domain with an abstract target domain. “Schemas that structure our bodily experience preconceptually,” says Lakoff, “have a basic logic. Preconceptual structure correlations in experience motivate metaphors that map that logic onto abstract domains.”<sup>(40)</sup> The contradiction between Rameau’s view of musical space and our common experience of physical space suggests an alternative basis for metaphorical mapping.

[6.11] As recent studies of Rameau’s harmonic theory have demonstrated, the notion of musical space introduced in the *Traité* is based on the Cartesian view that construes physical space as a two or three-dimensional undifferentiated field.<sup>(41)</sup> This suggests a cultural source in the form of a scientific model for Rameau’s notion, rather than one which is grounded in concrete musical and physical experience. The affinity between his and Schoenberg’s view of musical space by no means implies otherwise; Schoenberg’s compositional conception has been a subject for dispute rather than agreement.<sup>(42)</sup> From this case, it is clear that selected source domains of metaphorical mapping can contradict expectations derived from common experiences, and even arise from abstract domains such as scientific theories.

[6.12] Though the fundamental bass can move in different ways, Rameau ascribes central importance to cadences. In

**Figure 3.** A. Irregular cadence from the tonic note to its dominant. B. Irregular cadence from the fourth note to its tonic.



his harmonic theory, the cadence is not (necessarily) a closing gesture, but a specific progression of the fundamental bass. He recognizes two types of cadences:<sup>(43)</sup> the “perfect cadence,” a leap of a fifth down or a fourth up (from dominant to tonic), the first chord being a seventh and the second a triad;<sup>(44)</sup> and the “irregular cadence,” a leap of fifth up or a fourth down (from

(click to enlarge)



tonic to  
dominant or  
from the  
subdominant  
to the tonic)  
with the first  
chord being an  
added-sixth  
chord (Fig.  
3).<sup>(45)</sup> Both  
kinds of  
cadences may  
appear  
anywhere in  
the phrase.  
Music,  
according to  
Rameau, is  
nothing but a  
chain of  
cadences in  
different  
inversions and  
variations. In  
terms of the  
path schema,  
they connect  
adjacent points  
along the path,  
and guarantee  
the continuity

of the  
harmonic  
process.

[6.13] In the *Traité*, Rameau explains the cadential progressions of the fundamental bass other than by third and fifth due to “license” (Rameau’s term for deviation from the norm). In later writings, however, he proposes that the progression of a second between the subdominant (or added sixth chord) and dominant (V) is a result of “double usage” (*double emploi*). The subdominant, he suggests, can be interpreted as a chord on the fourth scale degree, or, alternatively, as the first inversion of a seventh chord on the second degree (II<sup>6</sup>), depending on the context. In a typical cadential progression (in modern terms: I-IV-V-I), the subdominant will function as an added-sixth chord in relation to the tonic and as a second degree first-inversion chord in relation to the dominant. In this way, Rameau establishes a fifth relation with the chords both preceding and following the subdominant.

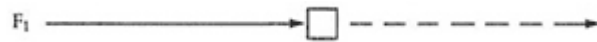
[6.14] At first sight, Rameau’s speculative notion of the double usage was meant to force the subdominant chord into the scheme of fifth-based progressions. To that extent, however, it is revealing for the systematicity of his metaphor of musical motion. In Rameau’s theory, cadential progressions function as a model, or a basic category. Music is nothing but a series of continuous cadential progressions, and a digression from this model calls for correctives. The notion of “double usage” makes it possible for Rameau not only to “assimilate” the problematic aspect of the subdominant into his theory, but also to reinforce the metaphor of harmonic motion as path consisting of interlocking cadences.

[6.15] Rameau’s concept of cadences also indicates structuring by the force schema. He claims that each cadence has its typical dissonance: for the perfect cadence it is the seventh of the dominant, and for the irregular cadence, the added-sixth (*sixte ajouté*) of the first chord, which forms a dissonance with the fifth of the bass. In both instances, the dissonance generates the force that propels the chords towards their resolution.

[6.16] Rameau extended this idea to all the harmonic progressions in order to explain the kinetic character of music.<sup>(46)</sup> “Far from dissonance being an embarrassment in composition,” he says, “it facilitates its course;”<sup>(47)</sup> elsewhere he refers to the seventh chord of the perfect cadence, saying that “It seems that dissonance is needed here in order that its harshness should make the rest which follows more desired.”<sup>(48)</sup> For Rameau, the dissonance is not an exceptional event but a condition for musical continuity. Dissonances, he claims, even if they are not actually present, are present implicitly and drive the music forward.<sup>(49)</sup>

[6.17] Rameau’s view of the function of dissonance attests to the influence of another contemporary intellectual model on his harmonic theory, that is, mechanistic philosophy. For him, dissonances work as a mechanistic force that pushes each chord to the following one. Significantly, this view is compatible with the compulsion schema (Fig. 4) which complements his cultural source in

**Figure 4.** Compulsion schema



(click to enlarge)

a way that suggests mutual support between the physical experience of force and his deliberate choice of this intellectual model as a framework for his theory. Rameau's metaphor of dissonance as force is both a metaphorical elaboration of a concept derived from prevalent eighteenth-century scientific ideas and an embodied source domain.

[6.18] Rameau concretizes his view through an analogy between the behavior of dissonances and that of colliding objects.<sup>(50)</sup> In the “Supplement” part of the *Traité*, Rameau quotes two propositions from a text on physics by Ignace-Gaston Pardies, a famous seventeenth century physician:

*A moving body meeting another body which is at rest gives the body at rest all its motion and remains immobile itself.*

*A hard body which strikes an immovable body will be reflected together with its motion.*<sup>(51)</sup>

[6.19] Rameau attempts to show that the first effect parallels that of the prepared dissonance, and the second, that of the unprepared dissonance. To do so, he analyzes two progressions, the first containing perfect cadences, the second with irregular ones. His analysis is presented in Figure 5. The slanted lines between pitches indicate the direction of the dissonances. The notes marked B are prepared dissonances, those marked F are unprepared. To see the similar effect of the collision between physical bodies and dissonances, Rameau asks us to notice that “dissonance B is at rest when consonance A

**Figure 5.** Rameau’s analysis

The figure consists of two systems of musical notation, each with three staves: Treble, Second treble, and Bass. The top system shows a progression of chords: A, A, D, G, F, G. The bottom system shows a progression: D, A, G, F, G, B, C. Slanted lines between notes in adjacent staves indicate the direction of dissonances. Fingerings (8, 7, 3, 5, 6) are indicated below the notes.

(click to enlarge)

strikes it (*la frapper*).”

And he continues:

Immediately after the collision [*choc*], the consonance becomes immobile and obliges the dissonance to pass to C. This is effectively the place to which the consonance itself could have passed but can no longer do so, since the dissonance has taken its place. The consonance seems to have given all its motion to the dissonance. Then, Consonance D, which seems to be unshakable [*inébranlable*], after having received a strike from dissonance F, obliges it to return to G, from where it started. The dissonance here seems to be reflected with all its motion, after having

struck an immovable  
consonance.<sup>(52)</sup>

[6.20] Rameau's analysis clarifies in a far more tangible way than any theoretical statement his perception of music as a forceful activity. At the same time, the mechanistic-compulsive nature of the entire harmonic process attests to his view of music as having a defined structure of causality. Such a structure is an additional element of the force schema.

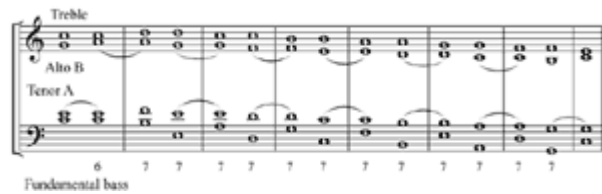
[6.21] Rameau's conceptualization of the dissonance also includes the element of vector or directionality of the same schema. Our experience of force involves directional motion of an object in space. For Rameau, I surmise, the mobile object is the chord, which "moves" to the following chord, repeating this process up to the final tonic. The whole process is activated by the dissonance, music's source of force. As a musical event that demands a defined and agreed upon resolution, the dissonance is responsible for the directionality of the harmonic progression.

[6.22] Rameau's view of musical motion as a whole is predicated upon the dissonance as a source of tension. The preparation and resolution of all types of dissonance, he argues, is identical to that of the seventh of the dominant seventh chord: "The rules concerning dissonance should always be derived from the fundamental bass and from the fundamental seventh chord. We shall see, furthermore, that the seventh chord alone reigns in all the different dissonant chords we may use."<sup>(53)</sup> In his view, each seventh chord contains at least one of the following two types of dissonance: "minor dissonance," produced by the addition of a minor third above the fifth of the chord in root position (i.e. a minor seventh above the tonic) and "major dissonance," referring to the leading tone. (Rameau noted that the chord presently known as the dominant seventh chord contains a dissonant interval, a tritone, between its seventh and the leading tone.) Because both these tones demand a clearly marked resolution, the first downwards, and the second upwards, Rameau interprets both as dissonances.

[6.23] In order to explain  
how these rules apply to

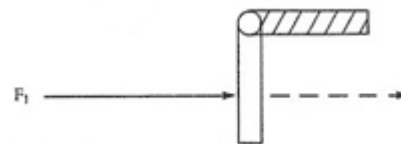
other types of dissonance, for instance, “suspensions,” Rameau introduced a new concept in music theory: supposition. This term refers to a process in which a part is added either a third or a fifth below the fundamental bass of a dissonant chord, in order to explain various dissonances as “major dissonance” or as “minor dissonance” above the chord in the supposition.<sup>(54)</sup> Being based on the same harmonic formation, real or theoretical, all dissonances behave in an identical way. Ideally, music, in Rameau’s view, is structured as a chain of seventh chords which resolve one into the other in a regular manner (Fig. 6).<sup>(55)</sup> The ideal chain of seventh chords ends on the tonic. As the only chord that does not

**Figure 6.** Chain of seventh chords



(click to enlarge)

**Figure 7.** Removal of restraint schema



(click to enlarge)



contain the kinetic element of dissonance, the tonic is the starting and ultimate ending point of every harmonic path. At the same time, it is also the conclusion of the mechanistic process activated by the dissonance.

[6.24] Finally, the qualitative difference between the tonic and all other chords implies the element of the degree of power or intensity essential for the prototypical force schema. From the distinction between “dynamic” chords that contain dissonances and a “static” tonic, it appears that Rameau’s system admits at least two levels of intensity: the first, active tension produced within the phrase by progression between chords that are not the tonic, and, second, the

total lack of tension intrinsic to the tonic. To these, one might add a third, intermediate level that results from the deceptive cadence which delays the musical flow by a temporary interruption, but does not bring it to a standstill:

“If we change the progression of one of the sounds in the first chord of a perfect cadence, we shall undoubtedly interrupt the conclusion.”<sup>(56)</sup> The deceptive cadence is apparently parallel to the case in which a temporary physical obstacle interferes with the advancement of a moving object, thereby invoking the removal of restraint schema (Fig. 7). This schema, like the aforementioned force schemas, resonates with Rameau’s contemporary scientific notion of mechanistic causation.

## 7. Conclusion

[7.1] This paper has focused on the metaphorical character of our musical understanding and investigated the influence of physical embodiment on Rameau’s harmonic theory as this is expressed in the application of two image schemas: force and path. These provide a basis for metaphorical interpretations that bear on his conceptualization of harmonic processes. The path schema is expressed in Rameau’s view of harmonic progression as a directional and continuous process that begins and ends at specified points; the force schema is indicated by his view of the chords as entities in interaction, of the dissonance as a source of force, and the complete harmonic process as a structure of causality. These two schemas are essential to Rameau’s theory and to other systematic conceptualizations of music as well.

[7.2] But to what extent are Rameau’s ideas the product of universal physical experience and to what extent are they based on individual choice and cultural influences? Or, to formulate the question in psychological terminology, what part is

played by nature and what by nurture? According to the theory of embodied meaning, the choice of a specific verbal representation of reality is not arbitrary but based on an underlying image schema that best fits the event or experience to be represented.<sup>(57)</sup> As we saw, however, the range of application of each schema and the degree of its systematization may change from case to case in accordance with personal and cultural preferences. Moreover, the force and path schemas interact in Rameau's harmonic theory with additional sources for metaphorical projection. Most notable was Rameau's attempt to bring the scientific notions of his time to the theoretical discourse of music, which resulted in a certain perspective on musical space and tonal motion.

[7.3] This paper advocates a pluralistic approach to metaphor, one which acknowledges that metaphorical mapping can draw on a variety of sources simultaneously. For Rameau, the choice to conceptualize harmony in terms of the path and force schemas derives, apparently, from the temporal character of music that invites a discussion in terms of path on the one hand, and the mechanistic philosophy of the Enlightenment that encourages images of force and motion on the other. Yet, even if such a separation is feasible in theory, we have seen how, in reality, the various components of the two schemas, and concepts deriving from Rameau's intellectual models, combine with one another, rendering any separation between them artificial.

[7.4] As an attempt to explain an aspect of reality, Rameau's theory offers a good example of the fact that the borders between nature and culture, between subjective and objective meaning, and between literal and figurative description are not as clear as is commonly accepted. The new awareness of the metaphorical character of musical discourse and thought may not radically change the way music has been and continues to be discussed and analyzed, but it certainly raises profound questions about the relation between music and other fields of our experience.