Overcoming Inertia:
Using Energetics as a Fresh Approach for Conducting and Conducting Pedagogy

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Abstract

Outside of the field of music theory, energetics is an analytical tool that is not widely known or utilized. Employing energetics in the field of choral conducting encourages natural, embodied movement that is compatible with principles of Dalcroze and Lában and encourages students to use innate mind-body connections when interpreting a score. Performers and teachers of performers can use energetics as a lens to discover fresh interpretations of familiar pieces, uncover meaning in new scores, and encourage critical thinking in students.

At some point in every conductor's career, certain pieces are encountered often enough to convince us that we know how they should be performed. Acute familiarity makes it all but impossible to experiment with or discover unexplored ideas. Sometimes, however, viewing a well-known piece through a different lens brings to light ideas previously unimagined. Energetics is just such a unique lens: an analytical tool allowing performers to reimagine the music they know and love, and one which offers perspectives on newly encountered scores as well. As teachers of performers we can incorporate energetics in our pedagogy to encourage critical thinking and enhance the interpretive skills of students.

The term "energetics" was coined in 1934 by Rudolf Schäfke, an historian of aesthetics, to characterize the work of music theorists such as Heinrich Schenker (1868–1935), August Halm (1869–1929), and Ernst Kurth (1886–1946). Schäfke found common characteristics between these theorists, including "thematization of force" and "musical logic." Speaking in metaphor, Schenker discussed a "biology of tones," Halm described a "drama of forces," and Kurth explored the potential and kinetic energies in music. These energeticists described music as proceeding logically as a series of events transpiring due to properties of the tones themselves, without the influence of extramusical factors, such as text or program.[1] While energetics is known and widely accepted by music theorists, it is largely unknown—and therefore not utilized—by performers and teachers of performers.

[1] Lee Rothfarb, "Energetics," in *The Cambridge History of Western Music Theory*, edited by Thomas Christensen (Cambridge: Cambridge University Press, 2002), 927–928.

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Energeticists of the nineteenth and twentieth centuries described musical events based on their empirical knowledge, but scholars working later in the twentieth century and in the twenty-first century, such as Fred Lerdahl (b. 1943), Carol Krumhansl, and Steve Larson (1955–2011) have combined modern understanding of psychology with computer models to test the energetic properties of music. Steve Larson's theories were influenced by the Gestalt Laws of Perceptual Organization and the work of the cognitive linguists, George Lakoff (b. 1941) and Mark Johnson (b. 1949), who explain that human understanding is achieved through metaphor as a result of cross-domain mapping, whereby a less familiar or more abstract idea is grasped in terms of a more familiar or more concrete idea.[2]

Metaphor

In his book, *The Body in the Mind: The Bodily Basis of Meaning, Imagination, and Reason*, Johnson explains that people understand the world in terms of how their bodies experience it: through movement, orientation in time and space, and interactions with objects.[3] This orientation, he argues, is literally built into the fabric of language; it is not something merely added to grammar or syntax, but how our language works. Lakoff and Johnson argue that to a significant degree people construct language to reflect their physical embodiment in the real world. For instance, the sense of the relationship of up-down reflects one's physical experience of vertical orientation, evidenced in metaphorical language, such as using the phrase *higher* salary to mean increased income—also referred to as a "raise."[4] A price is not higher, in terms of elevation, but people map their understanding of quantity (more liquid in a glass is higher) to conceptualize amounts of money. The mercury in a thermometer may rise when temperatures increase, but the temperature itself is not "climbing." "Mood elevating" drugs treat depression when people are feeling "down," but human emotions do not change in vertical space. *More is Up* is a metaphor not only used to describe prices, temperature, and emotional states, but it is a way of translating one's physical experience in the world into an intellectual means of measuring and orienting.[5]

People talk about music as if it moves, such as: the *passage* is *ascending*; the tenor line *leaps* to a dissonance. The notes, however, are not moving; each pitch is replaced by a succession of different tones. It is the listeners who *interpret* the succession as motion. Because people experience the world through their own sense of physical motion, they often think about music using the metaphor *Musical Succession is Physical Motion*. It is the "analogous physical motions—and the forces that shape those physical motions" that help listeners interpret musical movement.[6] For instance, melodic lines often include longer note values after leaps. This is especially true when the disjunct motion results in a dissonance. For singers, the lengthened note helps stabilize the pitch of the dissonant sonority. An analogous physical motion would be if a person leapt to an unstable rock and needed a few moments to regain balance before continuing along the path.

Musical Forces

Steve Larson's major contribution to energetics was defining three specific musical forces: "musical gravity," "musical magnetism," and

[2] Steve Larson, *Musical Forces: Motion, Metaphor, and Meaning in Music*, ed. Robert Hatten (Bloomington, IN: Indiana University Press, 2012), 328.

[3] Mark Johnson, *The Body in the Mind: The Bodily Basis of Meaning, Imagination, and Reason*, (Chicago: University of Chicago Press, 1987), xix.

[4] George Lakoff and Mark Johnson, *Metaphors We Live By*, (Chicago: University of Chicago Press, 1980), 14.

[5] Ibid., 17–19.

[6] Larson, 10.

"musical inertia."[7] In his book *Musical Forces: Motion, Metaphor, and Meaning in Music*, Larson states his central idea: "our experience of physical motion shapes our experience of musical motion in specific and quantifiable ways—so that we not only *speak* about music as if it were shaped by musical analogs of physical gravity, magnetism, and inertia, but we also *experience* it in terms of 'musical forces.'"[8] Larson's musical forces are metaphorical, reflecting the "tendencies that our minds attribute to the sounds we hear."[9] As Larson asserts, our experiences cause us to infer "that motion requires an *object* that moves… motion will take place along a *path*…motion will have a *manner*."[10] This is evident in the way people speak about music, as in this sample analytical statement: The melody *crosses below* the countermelody as it *leaps* to the dominant.

Figure 1. Definition of Principal Terms as Defined in Steve Larson's Musical Forces [11]

Musical Forces: metaphorical tendencies we attribute to music. Although we may be unaware of these attributions, they contribute to the meanings given to the music by our minds. (p.329)

Melodic Gravity: the tendency of notes above a reference platform to descend. (p.328)

Melodic Magnetism: the tendency of unstable notes to move to the closest stable pitch, a tendency that grows stronger as the goal pitch is closer. (p.328)

Musical Inertia: the tendency of pitches or durations, or both, to continue in the pattern perceived. (p.329)

Rhythmic Gravity: that quality we attribute to a rhythm, when we map its flow onto a physical *Gesture*, that reflects the impact physical gravity has on that physical *Gesture*. (p. 332)

Metric Magnetism: the pull of a note on a metrically unstable attack point to a subsequent and more metrically stable attack point, a pull that grows stronger as the attracting attack point grows closer. (p.328)

Gesture: Robert Hatten defines musical gesture as meaningful and expressive "significant energetic shaping through time." Hatten's theory of gesture draws on the theory of musical forces to describe what he calls the "virtual environmental forces" that contribute to the shape and meaning of musical gestures.[12] (p. 326)

[7] Rothfarb, 949.

[8] Steve Larson, 1–2.

[9] Ibid., 22.

[10] Larson, 68.

[11] Steve Larson, *Musical Forces: Motion, Metaphor, and Meaning in Music*, ed. Robert Hatten (Bloomington, IN: Indiana University Press, 2012).

[12] Robert Hatten, *Interpreting Musical Gestures, Topics, and Tropes: Mozart, Beethoven, Schubert*, (Bloomington, IN: Indiana University Press, 2004), 95.

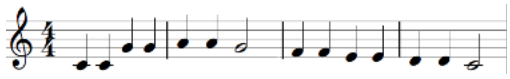
The tendency of many cultures' music to follow an ascending leap with a "tumbling" melody of descending steps reflects melodic gravity. This return to a neutral range is a reduction in tension that listeners have "come to associate with a giving in to musical gravity."[13] In example 1 the tonic note (C4) is the referential platform from which the melody departs and is pulled down to rejoin.

Melodic magnetism is evident when leading tones resolve up to tonic, when chordal sevenths resolve down, and when passing tones resolve their dissonance by stepping to a chord tone (see the circled notes of ex. 2).

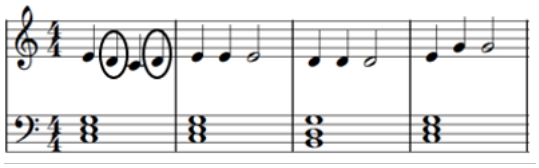
While not technically considered a force in physics, Larson includes inertia in his list of musical forces. Inertia is a "property of a body," whereby the body opposes any attempt to change its state, whether it is at rest or moving.[14] One expects ascending lines to continue ascending, descending lines to continue descending, and musical patterns to continue repeating, like the *lamento* bass line of "Dido's Lament" (see ex. 3). The effects of musical inertia are experienced when a musician fails to execute a change of direction while sight-reading.

Rhythmic gravity is felt when marching, with one's foot striking the ground on the pulse, or the common conductor's gesture of a descending motion on the downbeat. Metric magnetism is the pull toward a strong beat experienced during moments of syncopation, as one experiences when listening to Scott Joplin's "Pine Apple Rag" (see ex. 4).

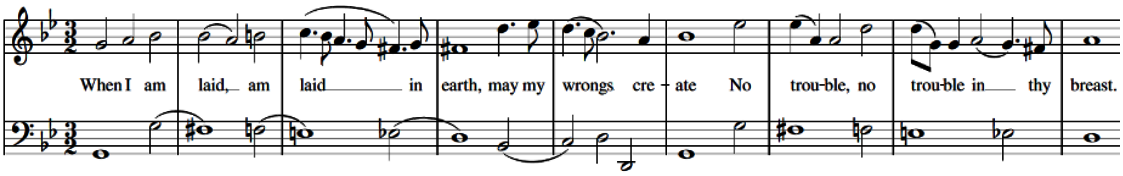
Example 1. Melodic Gravity in "Twinkle Little Star," mm. 1–4.



Example 2. Melodic Magnetism in "Mary Had a Little Lamb," mm. 1–4.



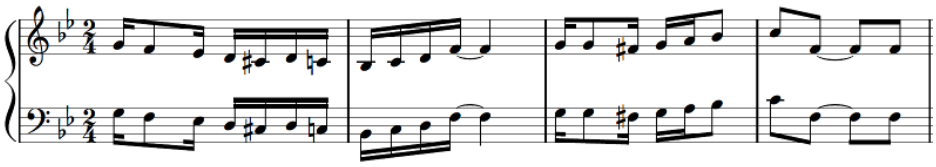
Example 3. Musical Inertia in Purcell's, Dido and Aeneas*, "Dido's Lament," mm. 6–14.*



[13] Ibid., 86.

[14] "Inertia," *Encyclopedia Britannica*, last modified November 30, 2015, accessed January 7, 2020, https://www.britannica.com/science/inertia.

Example 4. Metric Magnetism in Scott Joplin's "Pine Apple Rag," mm. 1–4.



Like physical forces, musical forces can act simultaneously, reinforcing each other or working against one another.[15] In "Dido's Lament" (ex. 3), the *lamento* bass is affected by inertia, but also by gravity, as it sinks lower. The pull between the notes that are a semitone apart in both the bass and vocal line demonstrates musical magnetism. While text painting could be a factor influencing composers, Larson includes musical examples that are purely instrumental, ruling out the possibility of this compositional device as the sole explanation of musical events.

Drawing from Leonard Meyer's theory that people have an emotional response when music departs from their expectations, Larson aims to identify how music "moves" the listener. Larson asserts people's preconceptual experiences with gravity, magnetism, and inertia—not their intellectual understanding of physics—cause such expectations (seeing a ball fall to the ground when released, running faster the closer one gets to home base, running past the base due to one's continued momentum).

Since music is a diverse and complex art, one cannot rely on only one metaphor to understand it. Larson lists several other metaphors used to think about and think in (Larson's term for audiating) music, including *Music as Moving Force* to describe how music affects people emotionally (see fig. 2). "Based on this generic metaphor for causation, music is conceived as a force acting on listeners to move them from one state-location to another along some path of metaphorical motion. You can actually feel yourself being…*moved* by the music."[16]

Figure 2. Music as Moving Force *Metaphor (adapted)*[17]

Source (Physical Motion) ⟶ Target (Musical Experience)
Locations ⟶ Emotional States
Movement (from Place to Place) ⟶ Change of Emotional State
Intensity of Force ⟶ Intensity of Musical Impact

[15] Larson, 7.

[16] Ibid., 75.

[17] Adapted from Larson, 75.

Larson does not claim that gravity, magnetism, and inertia are the only forces that shape musical expectation, nor does he assert that the musical forces are universal or follow the natural laws as physical forces. In fact, he warns against the "single-mechanism fallacy," because associations between musical material and musical meaning are too complex to be determined by one force.[18] He acknowledges that rote learning of conventions and statistical learning (i.e., frequency of experiences) can be additional factors influencing how a listener creates meaning since one expects an outcome based on how many times one has heard music follow a specific pattern.[19]

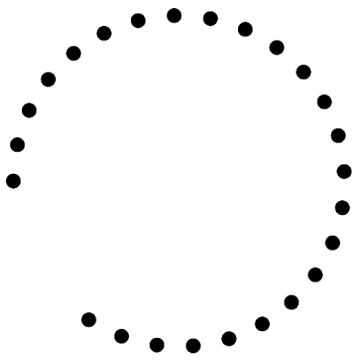
Patterns

Steve Larson defines meaning as "something that our minds create when they group things into patterned relations."[20] He draws on Gestalt Laws of Perceptual Organization and discusses pattern recognition in visual and auditory modalities. Figure 3 shows an example of the Gestalt Law of Closure. Most people create meaning out of the dots and perceive a circle, even though the pattern is incomplete and not a circle, as it is a series of discrete dots, rather than a continuous shape.[21]

Human brains seem conditioned for pattern recognition. This is discernable in language and in visual and auditory stimuli. Larson posits that common melodic patterns show the influence of musical forces.[22] To test his theories, he created algorithms used in computer models to evaluate the interaction of musical forces and also to compose "completions" for the beginnings of phrases. He then asked experienced listeners to create completions for the phrases. After comparing the results of the computer models with those of the psychological experiments, Larson found "strong support" for the theory that the forces of gravity, magnetism, and inertia influence melodic expectations.[23]

Given how people process patterns visually and aurally, how they use metaphor to relate to the world, how they have an *embodied* understanding of physics, and how music often mimics the way physical objects move in space, it is logical to use energetics as a lens through which to study a musical work. As Larson says, "music study might be one of the best ways to understand that it is the fusion of our minds, bodies, and souls that allows us to make sense of what is important to us."[24]

Figure 3. Law of Closure



[18] Ibid., 7.

[19] Ibid., 6 and 9.

[20] Ibid., 328.

[21] Ibid., 34.

[22] Ibid., 156.

[23] Ibid., 113.

[24] Ibid., 321.

Energetics in Practice

While many choral conductors perform harmonic and structural analyses as part of the score study process, the information gleaned from such practices is limited by the nature of the exercises. An energetics approach to score study reveals greater richness in the piece, expanding interpretive possibilities and pedagogical considerations. New ideas can be uncovered in a piece that is familiar to us, such as Rosephanye Powell's "The Word Was God."[25]

Powell sets the different lines of text motivically and layers the motives between the different voices during the A sections. She indicates staccato and accented articulation, and employs staggered entrances, creating a polyphonic texture. The B section is legato and more homophonic. The additive construction of the vocal entrances and growing dynamics create a sense of forward movement, so the piece seems propelled within and between the sections.

The submetrical pattering notes of the opening motive contribute to the sense of forward motion (see ex. 5). Powell creates an agogic accent with the tied note, but the inertia is so strong, this momentary syncopation does not overpower the pull of rhythmic gravity to the next downbeat. It does, however, create a *feeling* of stretch as it slows the patter rhythm. The common technique of asking choirs to walk as they sing, their steps aligning with the pulse will help singers connect to the rhythmic gravity pulling toward the downbeat of measures 2 and 4. Conductors can also use metaphor to maximize the effect of the agogic accent by describing the music in terms of motion, asking students to imagine a roller coaster completing a loop. The top of the loop has a feeling of suspension before continuing along the path, the energy gaining momentum as the loop completes and returns to a horizontal plane. The top of the metaphorical loop is the tied note (see fig. 5).

Figure 4. Sectional divisions in Rosephanye Powell's "The Word Was God."[26]

"The Word Was God" by Rosephanye Powell (Gentry Publications) SSAATTBB *a cappella* Text: John 1:1-3 A minor; Duple meter; Ternary		
A mm. 1-28	B mm. 29-44	A^1 mm. 45-78
In the beginning was the Word, and the Word was with God, and the Word was God. The same was in the beginning with God.	By Him, all things were made that have been made. Nothing was made, He has not made.	All things were made by Him. In the beginning was the Word, and the Word was with God, and the Word was God.

[25] For the purposes of this article, the composer's original SSAATTBB *a cappella* score will be referenced.

[26] Rosephanye Powell, "The Word Was God," SSAATTBB (Gentry Publications, 1996).

Such imagery helps the choir understand how the music creates text stress, bringing us to, and thereby emphasizing "Word." Feeling the tied note as the suspension before the "plunge" will add excitement to the performance, instead of merely "holding this note longer." Singers will have a bodily connection to this imagery if they move their hands in the shape of the loop as they rehearse (those familiar with Dalcroze Eurhythmics may see the potential in this activity for students to "learn, know, feel, and express music through meaningful movement activities").[27] Rather than using a 2-pattern, incorporating the loop into one's conducting gesture is a more accurate depiction of what the music is doing melodically, as it shows the effects of melodic gravity that are present in the descending line. Conductors can use the loop gesture for each of the motives' entrances as a visual cue to remind the ensemble of their work on this motive.

Example 5. Opening motive of Powell's "The Word Was God," mm. 1–4.

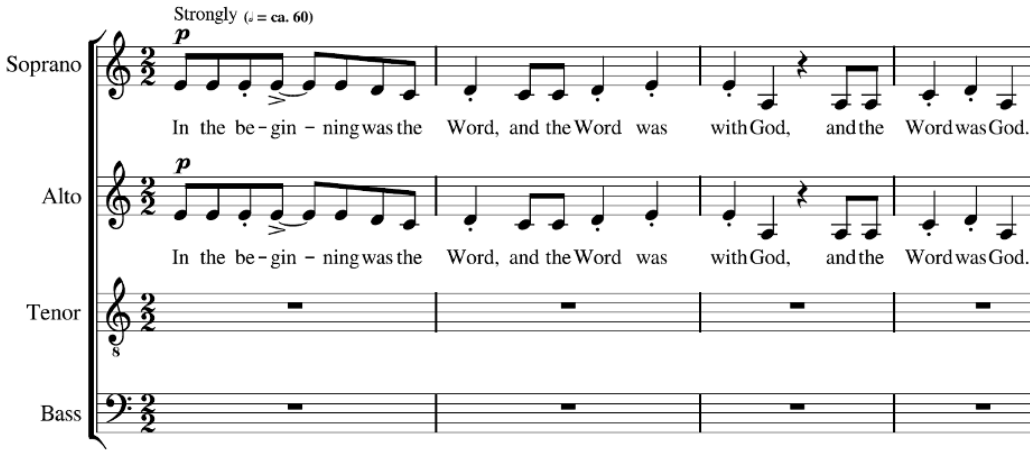
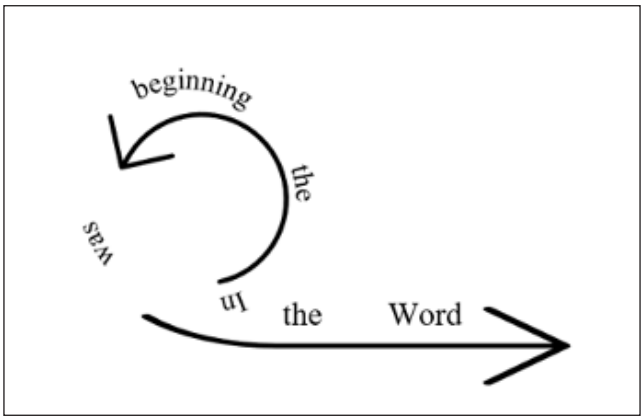


Figure 5. Loop Metaphor with text.

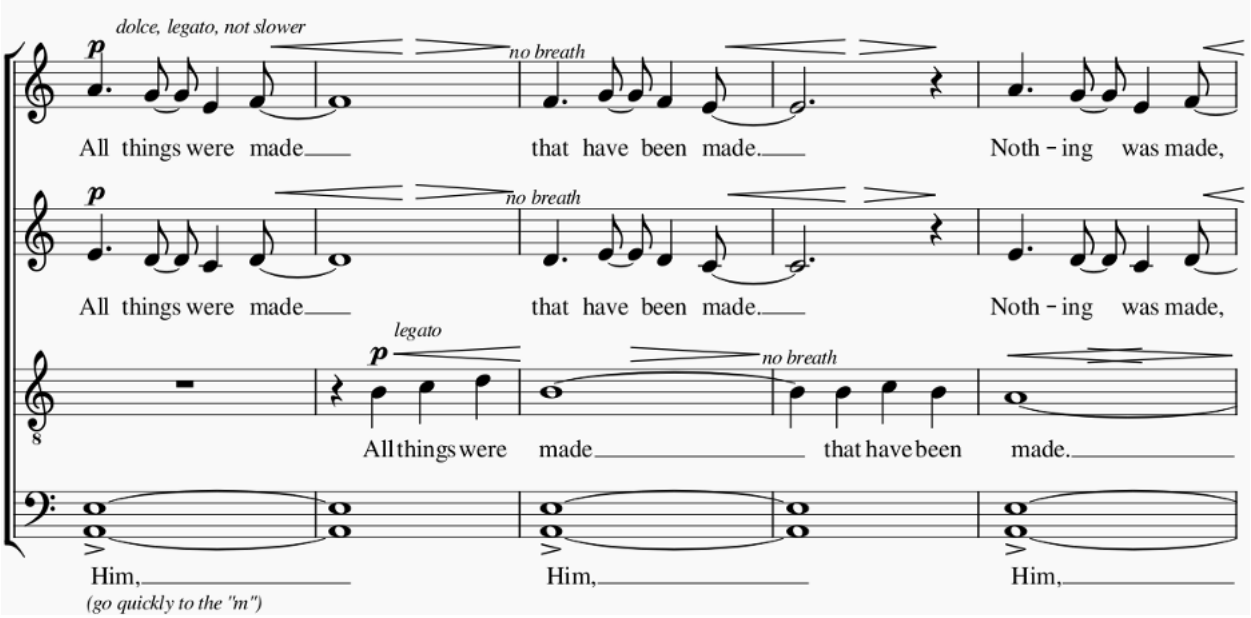


[27] "What is Dalcroze?" Dalcroze Society of America, last modified December 18, 2020, accessed December 21, 2020, https://dalcrozeusa.org/about-dalcroze/what-is-dalcroze.

The B section features a dichotomy between the soprano and alto lines and the tenor response (see ex. 6). Powell highlights the duality through dynamic markings, allowing voices to swell and recede back into the texture in a continuous ebb and flow. The upper voices obscure the meter through pervasive syncopation, while the tenor line acts as an anacrusis figure, emphasizing beat one. If unaware of their part's function, the tenors could turn their line into a bland exercise. They are not merely echoing the text of the upper voices. The tenors bring metric stability to the B section, but their tonal function is to create harmonic dissonance, often forming the root of a half-diminished seventh chord (see ex. 6, m. 31). The pull to the consonant resolution is the result of melodic magnetism as the tenors' B3 in measure 31 is drawn to the A3 in measure 33. This tonal instability does not allow the music to rest. Instead, the tenors move the music forward, working against the metric stability of their rhythmic function.

The extended rhythmic dissonance in the upper voices opposes the force of metric magnetism, which naturally attracts emphasis on the metrically strong beats. This conflict can interfere with the internal pulse of the singers. A conductor's steady two-pattern can help the ensemble maintain the pulse but may not encourage the tenors to perform their function of continuing the forward momentum of the piece. A separate gesture with the non-dominant hand can show the tenors' drive to beat one. While changing pattern size to show dynamic contrast is a common technique, in a section that is built on rhythmic dissonance, changing pattern size, and therefore speed of the gesture may be counterproductive to the steady tempo one is trying to maintain. Changing gestural density—as if the arm/hand is moving through air, water, molasses, etc.) can achieve the desired results without altering the speed of one's gesture and has the added benefit of mimicking the adjustment of air flow through engagement of the core muscles the singers are activating to produce dynamic changes (those familiar with Lában philosophy as applied to conducting may think in terms of changing the effort levels of *flow* and *weight*).

Example 6. B section of Powell's "The Word Was God," mm. 29–33.

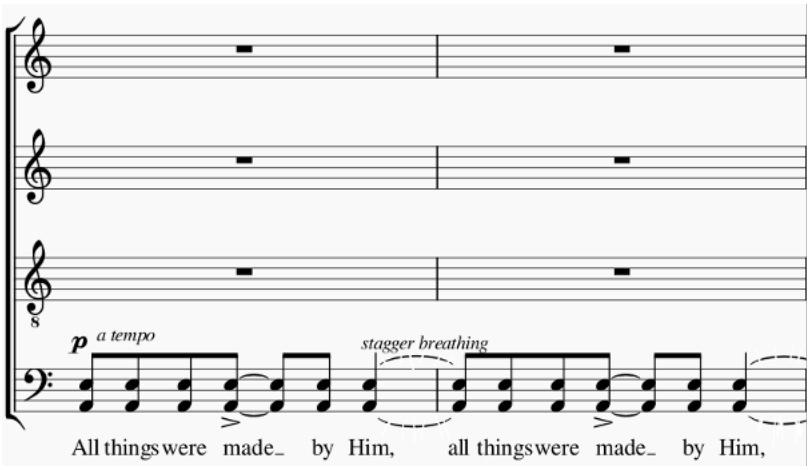


When the A section returns at measure 45, the basses sing the initial rhythmic motive, but incorporate the open fifth drone from the B section, instead of the melodic material that accompanied the motive in the original statement (see ex. 7). Instead of the melodic gravity that is observable in the initial motivic statement, the bass line shows the effects of inertia. They continue droning until the weight of the full divisi is present, breaking apart the texture into subsets of the ensemble. Depending on interpretation, the lack of melodic contour in the bass line might influence the conductor to avoid the "Loop" gesture until the tenors enter with the opening melodic material in measure 47.

Teaching with Energetics

Training in physics is not a prerequisite for teaching with energetics. The musical forces at work in a piece can be identified without using Larson's energetics terminology. If students are not yet familiar with energetics, they can discover the concepts on their own. Through discussion, they might intuitively use the terms gravity, magnetism, or inertia! A conductor may lead students to these ideas by asking questions such as: "In the A section, how does the tied note affect the motion of the line?" Singers might mention that it slows down the line before returning to the eighth note rhythm, or that it creates syncopation, which works against the metric pattern. Appealing to the more visually oriented students, conductors may reference a well-known painting: "Many people say they experience movement in the swirling brush strokes of 'Starry Night.' Can you follow the motion with your finger, as Van Gogh takes us from one side of the painting to the other? If we focus on the circular motion of Van Gogh's stars, we are also mimicking the way a roller coaster loops. What happens to our speed at the top of the loop?" Singers may respond that it slows down, or that the momentum changes, which can then be related to how the tie momentarily slows the eighth note rhythm. Using the gesture of Van Gogh's swirling stars or a looping roller coaster while singing Powell's opening motive will aid students in their cross-domain mapping—experiencing the concept kinesthetically, visually, and cognitively—which will map on to their auditory experience, helping them sing with understanding.

Example 7. A1 section of Powell's "The Word Was God," mm. 45–46.



Continuing with the discussion of the A section, students may be asked where the music is going next. Students may say "with" because it occurs on the downbeat, or "God," because that is an important word and integral to the meaning of the text. The music's forward movement toward "God" can be shown with a sweeping motion, showing the direction laterally without a downward motion for beat one, to avoid emphasizing "with" (see fig. 6). Throughout the discussion, ensembles can be asked to perform the motions, which will later become the conductor's gestures. These activities foster critical thinking and will prime the students to analyze the B section, possibly planning their own gestures to evoke the musical forces at work in this contrasting section.

Figure 6. Sweeping motion to deemphasize the "down beat."

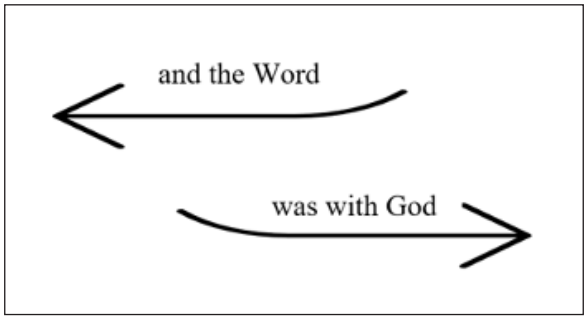
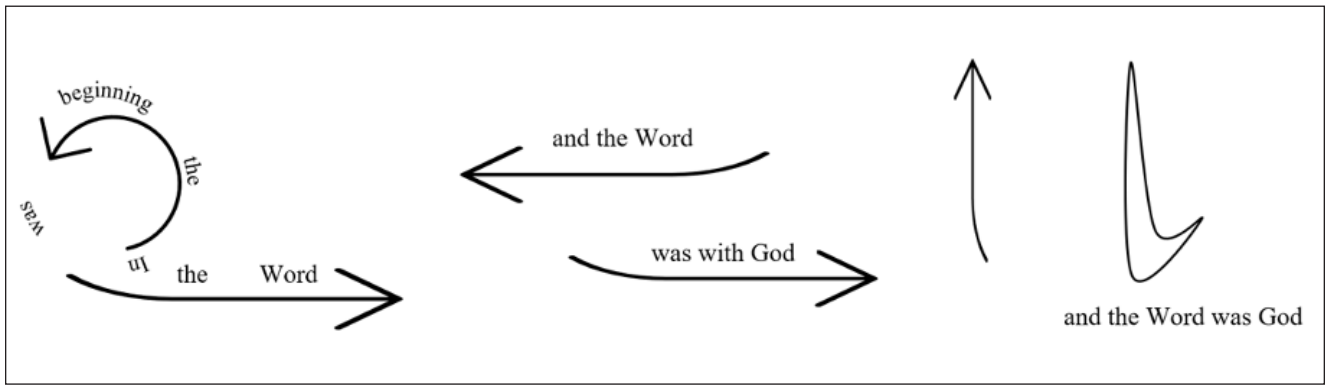


Figure 7. Possible right-hand gestures for the opening motive of Powell's "The Word Was God."



Conclusion

Given how music often mimics the way physical objects move in space, energetics offers an immediate, intuitive way to understand musical events and help our ensembles make unique connections with their repertoire. It encourages natural, embodied movement that is compatible with the principles of Dalcroze and Lában and encourages singers to use their innate mind-body connections when studying music. As conductors, we are the physical embodiment of the sound we want produced. As such, our gesture should be congruent with our aural ideal. Incorporating movement that evokes the musical forces at work empowers ensembles to perform the ideas inherent in the score and allows them to bring the music's meaning to life.

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