SEA: Finding Common Ground for a Global Analytical Method

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Abstract

By investigating music as the outcome of interactions of many factors, each of which affects the energy of the whole – by using a process of analysis known as the Sound-Energy Aggregate (SEA) – one manages to encompass all of music in one's analysis or criticism.

The historical focus on pitch in most theories and analytical methods recognizes the subtlety achieved and the intensity of study necessary to deeply comprehend the world's revered musical traditions, but it blinds us to the much stronger factors at work in creating affective responses to the music, and to the possibility of establishing a global analytical approach built on powerful, shared forces that are the exclusive province of no musical culture. By moving our focus to a higher-level concept, that of the sonic and intellectual energies that music evokes, we establish a common ground for understanding music.

1. Introduction

Years ago, as I completed a doctorate in composition, I spent hours making long, evolving 'sounds' using a Synclavier. I began to realize that the totality which so fascinated me was in fact made up of elements that had other identities, for there were aspects of rhythm, there were discernible pitches, one might even hear harmony, register played a central role, and I called the whole thing 'a sound'. Thinking on it, I realized that I was interested in the whole, the aggregate, and that each element contributed some energy to the whole. I set out to compose from that point of view, and deemed my approach to be one using the Sound-Energy Aggregate, or SEA. Years have passed and I now use this approach to great success with graduate students in the analysis of modern music.

The process is fairly straightforward: by listening again and again to the music (a score is often necessary as well), one tracks the energy contributed by each parameter to the whole. Once all parameters have been tracked, documenting, studying and pondering their interaction in a variety of ways begins to penetrate the 'surface', to affirm the obvious and reveal insights into subtleties. One must strive to keep the analysis *real*, to check any flights of fanciful abstraction about what may be the case – especially those drawn from score study, from which one's favored ideas easily claim ascendency – by returning to listening.

2. Energy properties

My premise is that the basic properties of sound determine degree and type of impact.

The more rudimentary elements will be stronger in their ability to create affect, with the more culturally-determined ones capable of great impact for those sufficiently trained in the tradition, while completely passing by those not steeped in the culture. Factors normally need to make sense together, of course, so composers will tend to reinforce subtle aspects with more obvious ones. The great example of this coming-together is the cadence in western classical music (WCM): not everyone will hear the harmonic underpinning that musicians are trained to hear, so a cadence will feature a longer note, a pattern in a melody will be broken just beforehand, and perhaps a trill (a distinct pitch-rhythm interaction) will announce a coming cadence. Context arises from relationships, and this reality will typically prevent absolute interpretations of impact based on even the most clear and obvious factors.

2.1 Primal energy

Loudness (volume), quality of sound (timbre), register, and articulation have deep roots in human history, carrying the ability to communicate information of critical importance about our safety and surroundings. I theorize that these properties, which we might call primal, therefore bring the same kind of vital information to music, energizing our mind with an often kinetic sort of urge (i.e., they induce movement, whether we move or not). These aspects of sound are discretely measurable as well, providing a level of objectivity for our analysis. Every aspect of sound will be involved in making patterns (or insistently not making patterns), and thus every basic property will be intricately bound to other properties and reach into realms of abstraction. In music, as in life, virtually everything is related, and since a musical parameter can't operate without the existence of others, we will have no pure, one-dimensional reality to deal with here.

2.2 Lower-middle energy

Horizontal density (number of events per unit of time), vertical density (the number of events occurring simultaneously), and tempo (pace of pulse or change) are likewise tied to human experience, and are probably just a few degrees away from the primal level, edging into the more culturally-determined zone yet still fundamental enough to be widely shared and no culture's intellectual property. The energy of these parameters is clearly kinetic, while culturally-developed patterns and tendencies will incite internal comparisons (whether conscious or not) to experience and thus bring a type of intellectual energy (expectation, recognition) into play.

2.3 Upper-middle energy

Rhythm, meaning the phenomenon experienced by a listener and often cited as the most fundamental of musical parameters (despite the fact that it is a highly-developed part of any musical culture) is probably more widely understood across cultures due to its intimate connection to items in the lower-middle group just delineated. The energy of rhythm will of course be kinetic – the perceived energy of movement, in many ways – but an intellectual sort of energy becomes a factor as rhythm creates the expectation of all sorts of continuations, and as it calls up the memory of patterns of cultural significance, whether within a piece or across all pieces. Rhythm often involves interaction with a pulse of some kind, and this relationship is a fundamental producer of energy. It is worth a note that the subtleties of pulse-rhythm interaction are rarely successfully notated in WCM, being more the province of successful performance than a composer's work.

2.4 Subtle energy

Pitch is the great repository of intellect in musical cultures, with vast and subtle energies clearly stirred in the minds of listeners. The world's traditions have regulated how pitch is to be dealt with, and even the issue of deviance from the standard path is itself a property of a culture. Long training in a culture is necessary to fully comprehend a tradition, so it will necessarily be a highly-trained subgroup who experience the most predictably patterned responses to pitch subtlety. Various types of expectations are clearly an energy to be dealt with in the music: when we know what ought to come next, a performer or composer is able to toy with our expectations.

2.5 Relationship

Each parameter on its own has the potential to contribute energy to the aggregate. Some contributions seem straightforward, obvious – loud is generally higher energy, very low or very high register likewise create greater energy – but context rules in the details. That is to say, for instance, it is not difficult to imagine or think of existing examples which demonstrate a context that turns low volume into high energy. A context that immediately comes to mind is one where loud is the norm, so the different, the new, or the unexpected quiet raises the energy of wonder or expectation. Relationships between parameters, or even of action in one place related to action in another, is where complications and subtleties exist.

Some of these relationships have existed for so long that we hardly think of them as such, but rather have names for their interaction: the prime example is melody, which is the interaction of a series of pitches with rhythm. Change in one produces a new sense of the aggregate. Stability, recognizability of pattern is produced by a locked-in interaction such as that exhibited by motive in WCM, and shifts of either aspect bring the sort of same-yet-different process of change that we call development. To extend the premise of parametric interaction as energy generator, consider briefly that melodic analysis uses other parameters (high point, low point, articulation, harmony, increasing horizontal density, and so forth) as means of understanding a melody. I submit that these factors generate energy in the listener's mind: what is that energy? Energy exerted in search of patterns? Energy spent in comparison to other musical experiences? Traces of emotional energy connected to our experience of a particular sound? We may never know exactly what it is, but it certainly seems to happen.

3. Implications

Recognizing the role of interactions of fundamental properties of sound in generating the aggregate energy flow in music leads to a deeper understanding of both tonal and non-tonal WCM. By tracing the phenomena of such interaction into music history, the connections of new forms of sonic expression to the past become clear. Each parameter has an energy contribution to make, and with change, not change, expectation of change, long-range roots and short-range action all potentially present, the interactions are many and varied. Some parameters are primal, contributing energy similarly across cultures, while others are the province of tradition and training. The ongoing flux of what gains our attention, what we are paying attention to against what we are aware of, is where the magic of music lies.

In the analysis of WCM, the intensity of training required to understand what has been accomplished with pitch has led to an over-dependence on its analysis that has in turn led to theories loaded with abstraction that few to none hear, and to students of the discipline who learn that the only thing to analyze in music is harmony and melody. Clearly a corrective is needed: to recognize that composers in the modern era have used parameters other than pitch as the primary basis of organization in their music – especially timbre – necessitates devising a theory and method of analysis that puts proper emphasis on the full range of parameters. In so doing we begin to provide a means of reckoning all the world's music by the same set of tools, allowing the highly culturally-determined factors their sphere of influence while acknowledging the shared energies of parameters that are not yet the exclusive province of any tradition.

In the world of western music, polyphony has been the hallmark carried by all subdivisions, and that will probably remain true. In the last 100 years or so, however, I maintain that it is the focus on timbre which is the distinguishing feature. Sound art, sound mass music, computer music, rock and roll, jazz, hip-hop, bluegrass: all these types of music rely on quality of sound as a primary signal of formal function and are each identified by a particular sound quality above all. Timbre is not always *the* most important factor in all these styles, but it is always *an* important factor. Timbre will not yield a hierarchical structure, but it is clearly analyzable in terms of sound energy.

A SEA analysis will yield an outcome suited to our age: it will not produce a definite answer, nor a single account of energy, but will acknowledge that different listeners will hear different relationships, and even that a single listener will hear a piece differently on successive listenings. As such, then, the analysis will be a set of probabilities, just as in quantum physics we do not learn where an electron is but where it is likely to be. As the patterns of music heard interact with present conditions – in the listener, in the listening space, etc. – the analyzed outcome will unfold differently, a phenomenon known and studied now through chaos theory. SEA theory is open to absorbing any analytical tool which produces an account estimable in energy, and is therefore “open source”, no one’s province or turf.

The urge to comprehend and make expressive use of chaos would seem to be the pursuit of our age, and it is the same urge which leads to a dependence on timbre. It seems especially fitting that an analytical method should yield results aligned with the natural essence of the materials. SEA analysis is an approach that depends on immersion among a multitude of factors in an attempt to gain *insight* into organizing principles rather than *the answer*, so it may best be considered a *contemplative approach* to analysis. It requires the rigor of integrity, a deep honesty, an attempt to set aside prejudices and really listen to what comes to us.

4. The task

The modern age has witnessed steady growth in the use of timbre as the central organizing factor in music, and it has been my grounding principle as a composer, throughout my career, that *sound as such* is the medium of importance. I assert that timbre will be central to any theory that serves as a global analytical tool.

4.1 Starting point: sound

Embodied sound – sound in the real world, so-called sonic materiality – must be the starting point of analysis. The very quality of sound, its "suchness", with long connection to speech and the external world, rapidly communicates vital information about our existence, and carries the ability to energize our bodies and minds for quick action or decided non-action, engaging the full range of human endeavor. Of course, sonic information interacts with our knowledge, concepts, predispositions, our personal intellectual and emotional history. It is worth reminding ourselves that for many listeners, the impact, even the memory of a piece of music has more to do with the most basic aspects of sound – for instance, operations of dynamic level – than any of the more erudite aspects of musical traditions. Listeners to music from other cultures would be likely to make sense of what they hear based on those more basic properties of sound as well.

So, what do I mean when I say "sonic materiality"? To start with, I mean compressions and rarefactions in the air, the waves set off by vibrating objects. Beyond the obvious – and it is paramount not to overlook the obvious – sonic materiality includes any measurable feature of sound. Those features would include loudness, pitch, timbre (in the strict acoustical sense), register, and other basic properties, as opposed to aspects of sound that are culturally determined, such as triad, functional harmony, raga, meter, and so forth, the things that involve abstraction beyond physical reality.

4.2 Intention: holistic analysis of impact

Analysis is a sticky subject: the history of musical analysis in the west is rife with biases, and the primary bias regards music in a static, completed state whose structural characteristics are almost exclusively aspects of pitch. The aim of analysis for me, on the other hand, is distinct but not unrelated. I want analysis to explain what it is in the music, or sound, that accounts for the impact it has on listeners. History brings loaded terminology here, with lots of baggage – emotion, affect, impact, to name a few – and these concepts produce arguments regarding their existence and thus tend to be avoided by serious-minded theorists. To be fair, there are considerations that have made this study difficult until now. For the present moment, I will name only two: 1) the number of factors to be reckoned with in such a necessarily real-time analysis produces chaos (in the scientific sense), for which an understanding has only recently grown, and 2) for a very long time, the only aspect of music notated accurately at all was pitch, and notation is still lacking for important aspects of music. As composers came more and more to desire control over interpretation (and thus affect), notation has grown overburdened with additional symbols and verbal descriptions, making fluent sight-reading of today's music nearly impossible.

Great strides in the use and analysis of pitch did come, producing a hierarchical view of music capable of helping to articulate structure. (The *helping* part of that sentence is very important!) Despite Schoenberg's desire to create hierarchy with timbre, it seems abundantly clear now that timbre and other basic properties of sound will not yield hierarchy. Most realizations of impact or affect come as a result of discovered relationships, rarely to be found in one parameter alone. The aesthetic of the baroque period led to much categorization of affect, almost always the result of the interaction of two parameters, pitch and rhythm.

4.3 The obvious

We need a way to get at what it is about music as a whole that creates our internal reactions. I propose that the effects of pitch, while essential especially within cultural confines, are much more subtle, and research will show, of less importance in creating affect than the long-overlooked basic aspects of sound. For far too long, timbre, dynamic, register, and so forth have been dismissed as merely belonging to the "surface" of music. The real-world use of the same word (as in surface tension) refers to a phenomenon of great mathematical complexity – and of great importance – and I believe the same is true of the so-called musical surface. One may only overlook the obvious for so long without hobbling the very pursuit one engages in.

The attempt to understand what is happening as we experience music as listeners is fraught with difficulty, however. The result of many factors interacting is overwhelming if one is even to describe what is involved, much less analyze it. Yet our mind identifies important features, enabling us to pick out various aspects for comment and reflection. I believe it is possible to reduce the complexity of the task, moment-by-moment, using a fairly simple procedure, and that is to observe our actual experience both as a guide for where to put detailed analysis of a more ordinary sort and as a corrective when that detailed analysis leads us astray. One thing that is fascinating about music is how the various components come to the front of our attention only to be superseded by others, in a constant flux of foreground-background interaction. Clearly a parameter such as dynamic level does not cease to exist after grabbing our attention, so managing a continuous analysis of each parameter through a passage or piece and then striving to understand the rotation of what consciously registers through use of real-time, all-at-once experience (i.e. listening openly and honestly) is a viable pathway to such insight.

For me, the process will be the same for all types of music. The process is, in essence, to study the phenomenon of listening. The SEA analytical approach is grounded in the phenomenology of music.

5. Multiple dimensions

The point of this method of analysis is to remain as much as possible in the actual context of listening, and to draw insights directly from the phenomenon. In essence, this is a phenomenological approach to analysis which can be informed by any existing method of analysis. So-called interpretative phenomenological analysis is its analog in psychology, an approach which gathers a rich set of data from interviews, diaries, and personal accounts. As SEA analysis depends upon immersion in a multi-dimensional sea of awareness, the process is very much akin to meditation, wherein one exists in a context of multiple means of distraction, attempting to be unduly carried away by none, which fairly describes the Zen practice of *shikantaza*, or “just sitting”. The approach may therefore be considered a contemplative one, and contemplative methods are ideal for preparing the mind to listen deeply and with integrity. Just as methods of intense focus on single objects furnish the means of certain kinds of meditation, the process used to discern the energy contributions of given parameters in turn will require a series of focussed listenings.

The Zen references are significant, as maintaining balance, not giving in to one’s personal favorite interpretations, or ego, is a difficult practice requiring a type of rigor not always found in academic pursuits. Our attention is multi-dimensional, and in my opinion, our theory of music needs to be as well. Our focus for centuries has been to find “*the* answer” to questions, and it has served us well to limit our experiments to single factors: western science has depended on that practice. Even when there is a search for a single cause, that singular existence is not real, as a phenomenon most likely exists along a continuum, implying at least a pair in opposition. That of course yields at least a line, a defined single dimension. Opening the door to multiple causes creates a context of multiple dimensions. It is apparent that we need something along the line of the eleven spatial dimensions of string theory in order to fully understand and describe music.

I often describe our age in WCM as one that seeks to make expressive use of the aleatoric, the random, the chaotic, and thus needs to make sense of seeming disorder. It is only by using means suitable to the task, however challenging that may be, however unsettling it may be not to know a specific “right” answer, that we can hope to make sense of chaos. It is most likely that an analytical method that is truly up to the task of analyzing musical styles from across the globe will of necessity produce *probabilities* of impact or interpretation. In some ways, the reality has always been thus, and we have simply allowed ourselves to be coerced into believing the single answers of the loudest voices. The challenge of interpreting impact on listeners must take into account set and setting, the listener’s experience and the actual moment of the current experience. Aspects of chaos theory describe dynamic systems that fall into particular, usually cyclic patterns that are seemingly random when experienced “up close”, but which have very strong tendencies to click into repetitive states, themselves fairly predictable given the right initial conditions. (Gleick 1987: 35-80, 121-53) This sounds strikingly like a musical world of predictable affect when experienced by those trained in a given tradition (think WCM), or a burgeoning new idiom within a tradition (think dub-step).

Music is multi-dimensional not only by definition – pitch, dynamics, articulation: the so-called musical parameters are dimensions – but parameters themselves are often multi-dimensional. One only need think of pitch, within which we speak of local and global functions comprehended by the savvy, experienced listener. This multi-dimensionality is akin to the current understanding of how memories are stored, with the likely reality that a memory doesn't exist in a single location in the brain, but is farmed out, stored across many locations and reassembled as needed.

6. Form and process

When several parameters exhibit change at the same time, the result is a well-delineated section. This is how we find the structural role of pitch most often delivered in music; it is rare that a pitch event alone is strongly enough heard to create sectional change on its own, other parameters need to support pitch to create real clarity. It is extremely common for the subtle, culturally determined energies of pitch to be nurtured, supported, made clear by other parameters. And whether musical cultures use similar cues to reinforce sectionality, process, or progress in musical forms can be quickly discovered. One thing becomes clear here: while basic parameters might not yield hierarchy, parameters exist in relation to each other in a hierarchy (or at least on a continuum) of affective strength and intellectual abstraction.

Close scrutiny of counterpoint between parameters, or changes in different parameters paced against one another, yields significant insight into the workings of music. Changing one parameter while others remain consistent is a time-honored means of achieving transition, or of spreading the shifts of energy over a larger amount of time, rendering (for instance) a passage comprehensible rather than cataclysmic. Even the last description, "comprehensible rather than cataclysmic", carries a palpable description of energy management in imaginable pieces. The pacing of change, and especially the pacing of change in one parameter against changes in others, is an essential musical element in its own right. It can be chronicled, its component energies may be estimated if not exactly determined, and its interactions, then, are accurately estimable.

7. Examples: sound-based music

SEA analysis was developed primarily for modern music, sound mass and electronic music in particular, but some of the most compelling evidence of its importance can be witnessed by utilizing pitch-oriented music. So I will start with a brief example of sound mass music, and then proceed through a composed series of pitches, altering the passage's affect by changing the relationships of parameters.

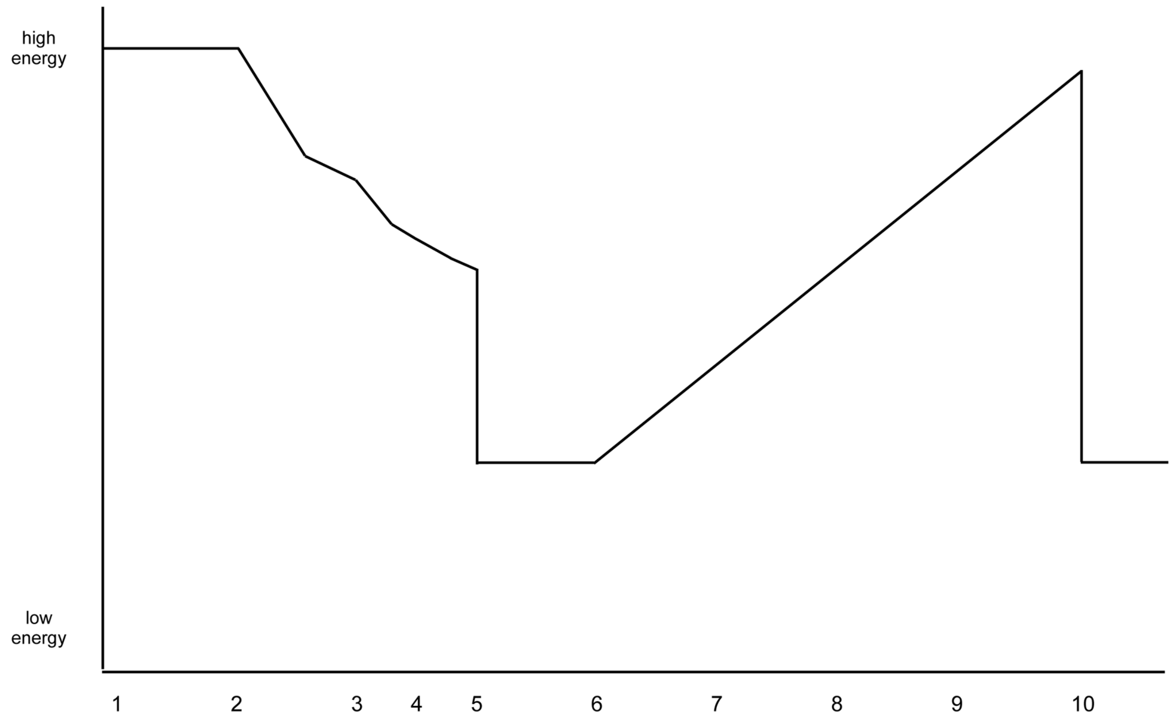
Penderecki's *Threnody for the Victims of Hiroshima* is a classic example of sound-mass music, using pitch only as it is subservient to timbre, texture, and overall musical energy. The examples I will describe are graphs of the energy I estimate to be contributed by four parameters – timbre, articulation, vertical density and horizontal density – over the first ten rehearsal numbers. One will notice in the graphs that rehearsal numbers are spaced to reflect duration of sections.

7.1 Timbre

Timbre in the piece carries most of the energy contributed by pitch, since harmonic entities are clusters of one variety or another. (Vertical density is the other parameter that carries pitch energy.) Timbral energy comes also from the manner of bowing, tessitura (range), and dynamic level. In some cases, one might graph each of these separately.

First of all, the strings enter playing as high as possible, a very high-energy timbral phenomenon. It takes about 15 seconds for all to enter, after which a sudden drop in volume occurs, releasing some timbral energy. Players in turn begin using wide vibrato, which to my listening spreads a gradual reduction of timbral energy through the ensemble. When that process is complete, virtually the entire ensemble drops suddenly in dynamic, producing a correspondingly sudden drop in timbral energy. Over the next six rehearsals (numbers 5-10), sections of strings move in turn to the execution of a series of extended techniques of a wide timbral range. As the phenomenon spreads, timbral energy gradually rises to the close of the portion to be considered. (See Graph 1.)

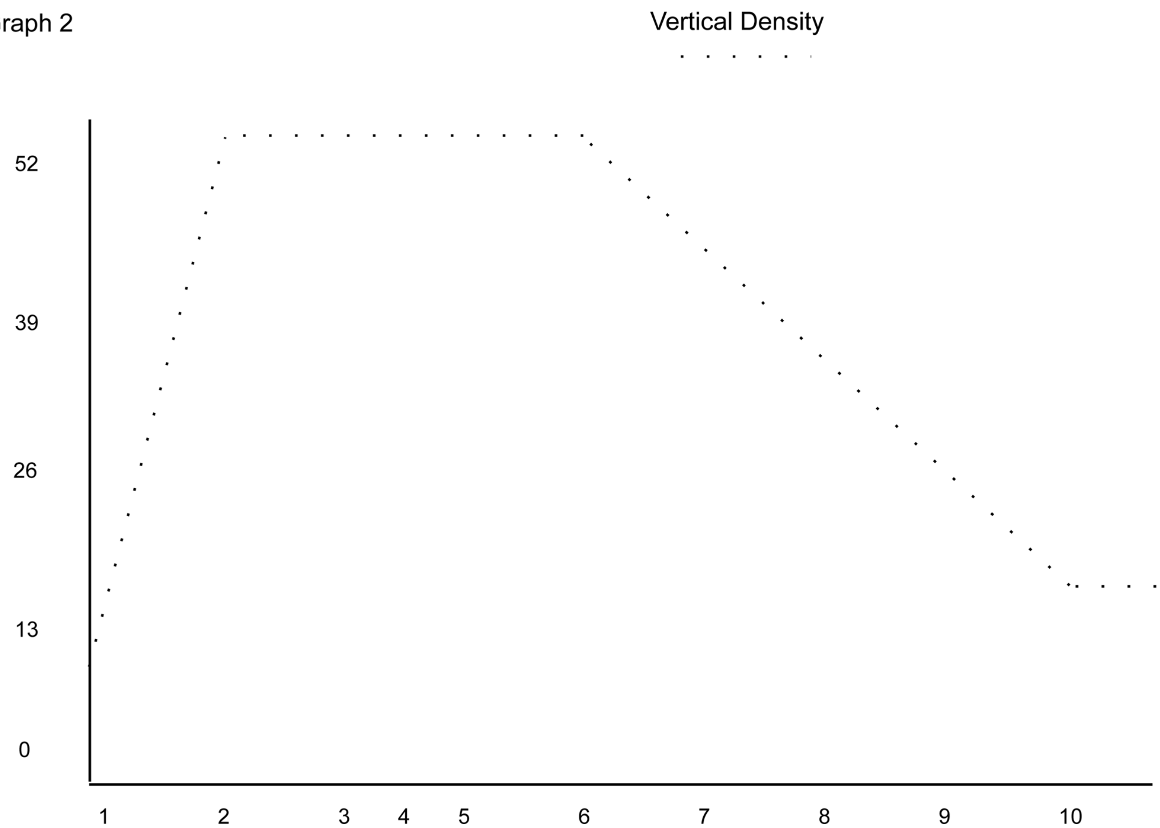
Graph 1 Timbre



7.2 Vertical density

Determining the energy contributed by vertical density is a seemingly simple matter of discerning how many players are sounding at a given time, and greater density is ranked as higher energy. Given the gradual entrance of players on their highest possible pitches, the opening gains a gradual boost to the aggregate energy, and the graph shows a steady rise from five players to fifty-two. No change in vertical density occurs until the process described above (moving to the extended techniques series) takes place, producing a steady decline in vertical density. One must estimate the number of simultaneous soundings of events at the end of rehearsal 9, for there is no precise number to be known. The process overlaps a new density profile at rehearsal 10, where vertical density drops to exactly ten, the cello section. (See Graph 2.)

Graph 2

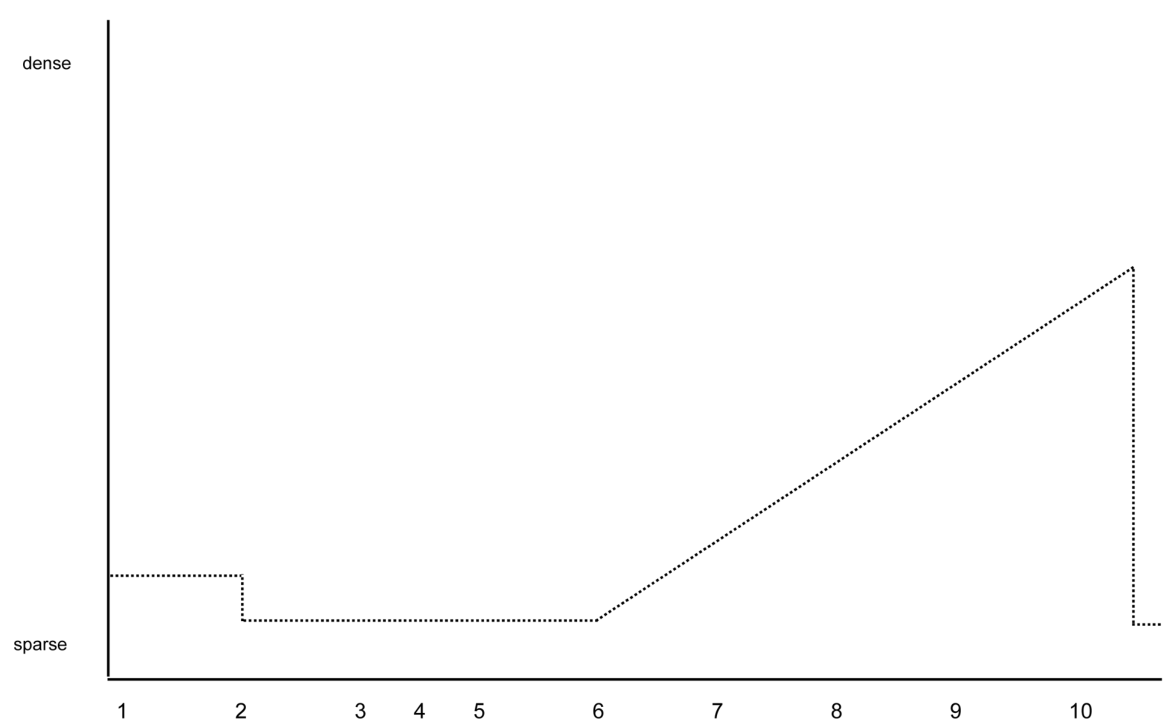


7.3 Horizontal density

I estimate the energy contributed by horizontal density, the number of events per unit of time, as follows. Greater horizontal density (things happening faster) produces a higher level of energy, while a slower pace of discernible, articulated events produces a lower energy level. Entries of players in the opening are discernible events, and depending on the choice of performers or conductors, re-articulations of notes might be as well. My graph acknowledges the new entries but does not give re-articulations a separate account since they do not strike the ear as such (though they are accounted for in articulation, below). The gradual emergence of more and more players performing the extended technique series produces higher and higher levels of horizontal density. Therefore, horizontal density starts out low and goes lower, and gradually rises in directly “inverted” counterpoint to vertical density during rehearsals six to ten. (See Graph 3.)

Graph 3

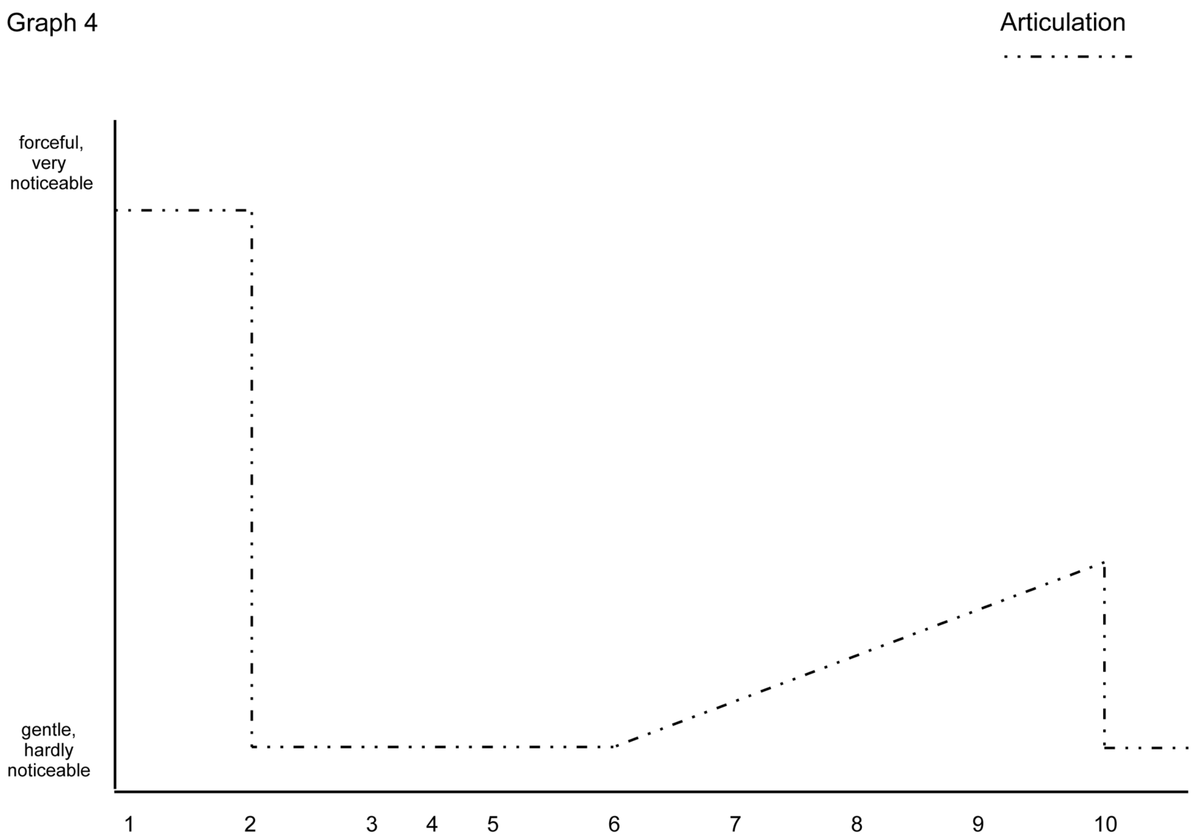
Horizontal Density



7.4 Articulation

Articulation, rated forceful (high energy) to gentle (low energy), starts out producing high energy and drops off as dynamic level drops. Though the notes are all sustained until rehearsal six, re-articulation will definitely produce a discernible energy in proportion to volume. The extended technique series is a growing panoply of articulation energy from rehearsal six through rehearsal nine. At rehearsal ten, articulations drop off quickly. (See Graph 4.)

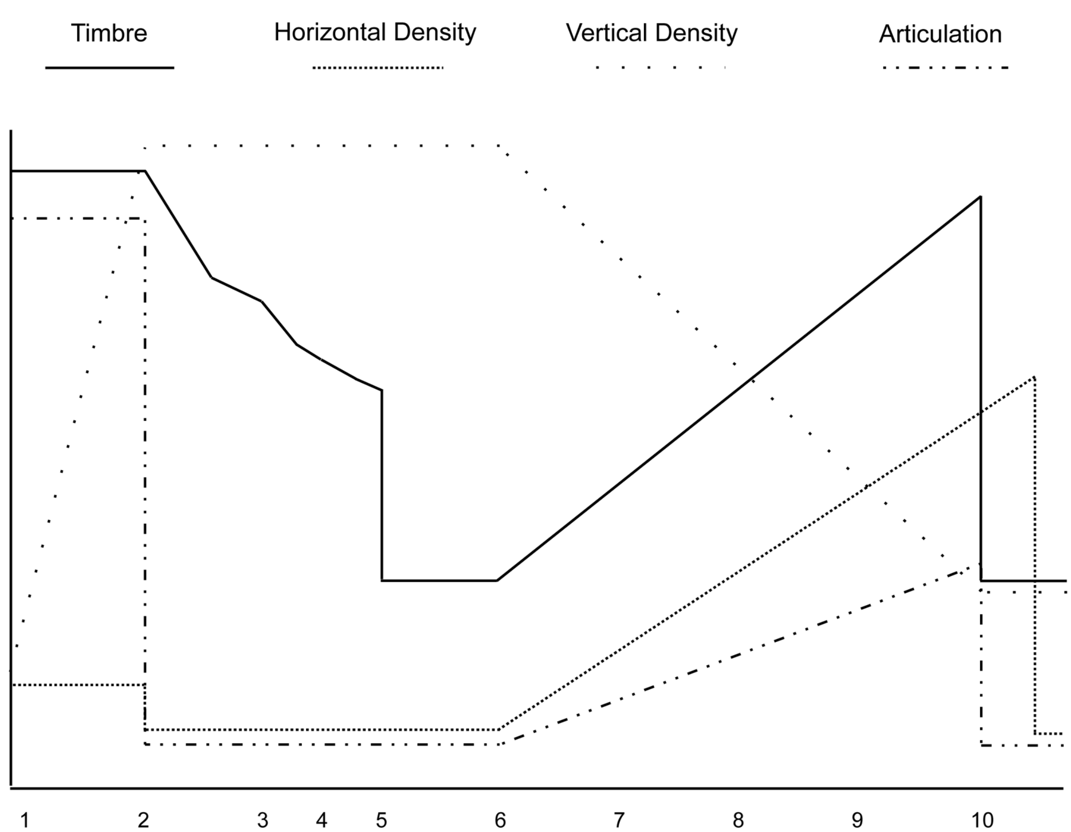
Graph 4



7.5 Aggregate

Overlaying all the graphs provides a visual representation of the inter-related nature of the parameters, and of the audible fact that there is a gradual, extremely well-managed drop and then rise of aggregate energy from the opening to rehearsal ten. The manner in which vertical density maintains steadily across drops in timbral energy and horizontal density, and then slowly decreases while all the other parameters graphed gradually rise, is of paramount importance in Penderecki's production of a natural-sounding, long, slow release of energy which then reverses to attain an aggregate energy almost equal to the opening. (See Graph 5.)

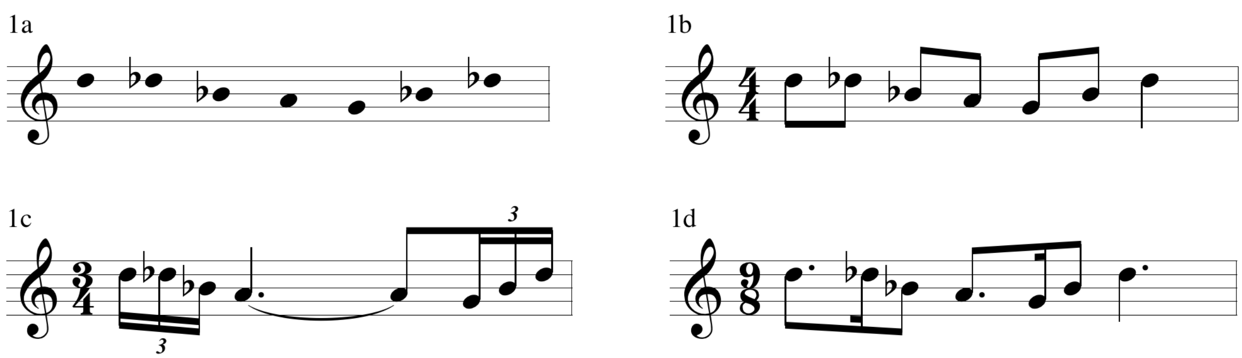
Graph 5



8. Examples: note-based music

As for music centered on pitches, it will not require much time to convince us of the importance of dynamics, articulation, and such elements to the life of music. Yes, it is the most obvious thing in the world to a composer: it's not just the notes, it's how the notes are played. Few would agree that the notes hardly matter, though it is often true, but it is clearly the case that *interaction* of notes with other parameters is the locus of affect. Taking a series of notes and producing different affect should make the case, as below.

First, a series of notes (ex. 1a) has a flavor, and already has an inherent energy derived from its use of register, the continuity of linear direction, and the smoothness of its motion as consisting of steps or skips. The flavor – modality, tonality, etc. – is a feature of some subtlety, to be discerned by those with reasonable experience in WCM, while the other factors are probably energies that most listeners could discern.



Examples 1a, b, c & d: pitch series transformed by rhythm

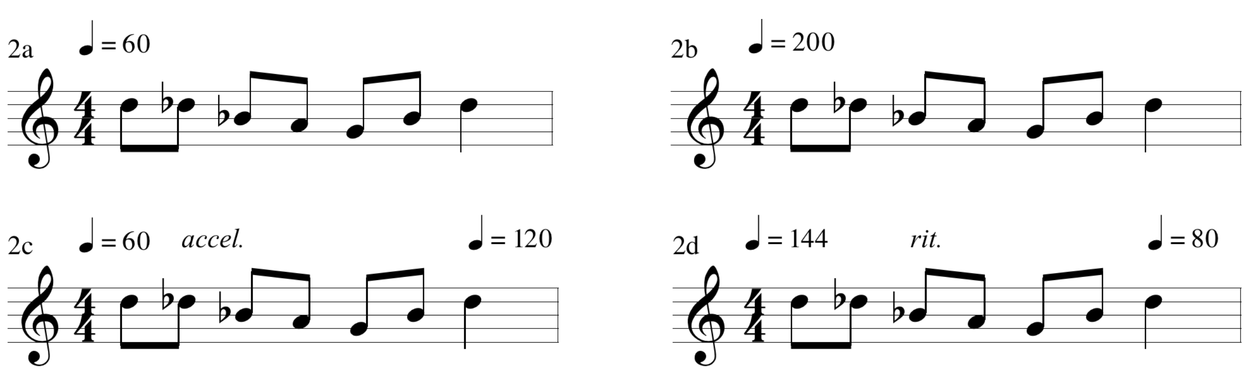
8.1 Pitch and rhythm

In WCM, the most important interaction of parameters is between pitches and rhythm.

Examples 1b, c, and d set the series in different meters, and the rhythms create differing approaches to low and high points, pattern formation, and more, creating a steady, almost boring outcome in Ex. 1b, a wild, almost out of control feel in Ex. 1c, and a perky, jaunty energy in Ex. 1d.

8.2 Tempo

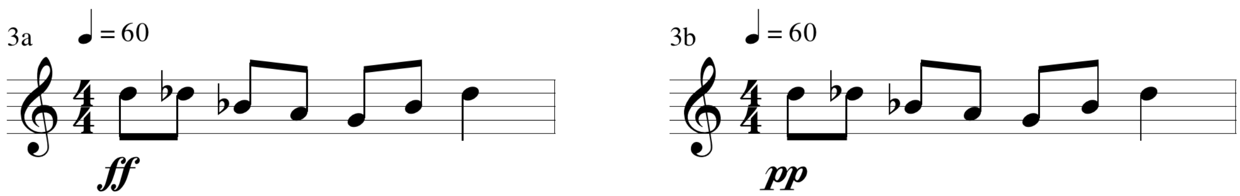
A substantial portion of the feel described above has to do with tempo, which of course hasn't been specified yet. I will proceed with the even-note example from here in order to save time and space, and trust that the reader will consider the other two rhythmic settings independent of the text. It is worthy of mention that using the even-note version removes drastic changes of horizontal density from consideration, allowing a less-complicated starting point for comparison. A fast version (ex. 2b) has much more energy than a slow one (ex. 2a), given no more information than notes, rhythm, and tempo. And a change from slow to fast (ex. 2c) or fast to slow (ex. 2d) puts differing emphasis on the end itself, as well as on the downward departure and rise to close. Change of tempo seems to alter the impact of register to a great degree.



Examples 2a, b, c & d: motive transformed by tempo

8.3 Dynamic

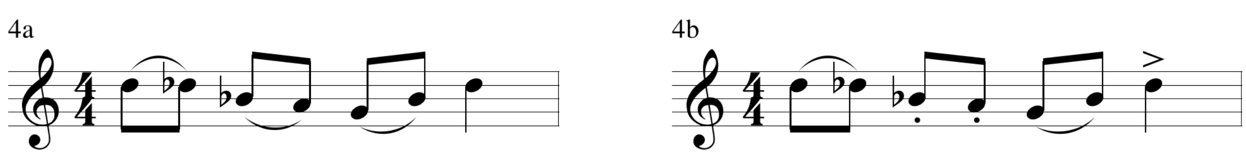
Dynamic makes a huge difference on perceived energy. Examples 3a and 3b present a slow version of the even notes loudly and softly, in a way that makes me want to know how one should approach articulation.



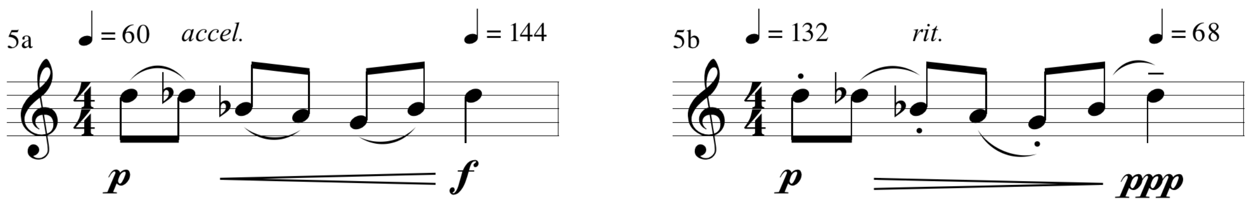
Examples 3a & b: motive transformed by dynamic

8.4 Articulation

Regardless of tempo and dynamic (but of course greatly altered by their use), Examples 4a and 4b will have different impacts, and I suspect that the impact of articulation is nearly global. Slurring prevents the bursts of attack transients; when many of those are present, the energy will be higher. Example 5a provides a rise in dynamic with a drop in speed, creating a distinctly different energy than Ex. 5b, which does the opposite. Example 5b does something new as well, using articulation to shift emphasis from on the beat to off the beat, creating a bit of a tumbling feel. I include it to hint at the incredible range of potential change in affect produced by a very short passage using only the parameters of pitch, rhythm, meter, tempo, dynamics and articulation.



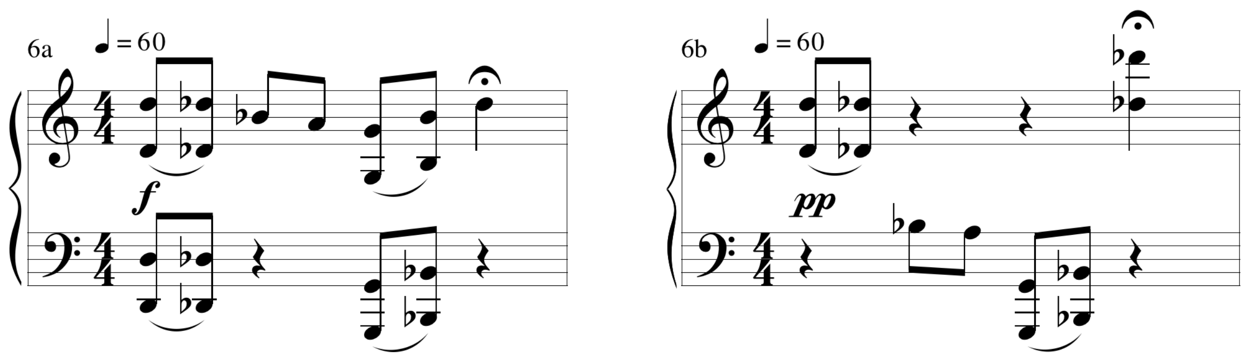
Examples 4a & b: motive transformed by articulation



Examples 5a & b: more complex transformations of motive

8.5 Vertical density

Two more quick examples: Note the difference density makes in Example 6a, in which the top line remains exactly the same and notes are simply doubled, and how much closer to the modernist style the example becomes when changes of register of a more drastic sort are used in Example 6b.



Examples 6a & b: transformations through density and register

The examples have carried significantly different energies, even though no use has been made of melody interactions with harmony, and all the complicated issues and subtle affective implications that brings. Arguably, this implies that the parameters examined are widely shared among styles and cultures. The door remains open to discerning energies through application of analytical techniques which deal with pitch. Straightforward harmonic analysis, for instance, with its understanding of non-chord tones and cadential preparation and elaboration bring information about energy if a person takes the initiative to do so. However accomplished, estimating the energy contributions of pitch places the parameter on more equal footing with the remainder of the musical experience.

9. Conclusions and Beyond

Despite all the potential insight into affect that SEA might bring, there is yet more to consider about energy and the aesthetic experience. Hearing the locations of sound, and movement in physical space both contribute energy to be reckoned with. Understanding the difficulty of a passage brings empathic energy to a listener. Grasping the counterpoint between film and music, or dance and music, or drama and music can be approached by estimating the energy contributed by each component as the whole progresses in time.

Allowing ourselves to grapple with the concept of energy in music and the other time-based arts with which it often unfolds produces a highly complex field of interaction shared across diverse musical types and traditions. Recognizing the multi-dimensional nature of music, and the continuum of primal affect and intellectual subtlety, we enable a sort of musical analysis and criticism that preserves a holistic conception both of the music studied and of the many varieties of music that exist in western culture and globally. Furthermore, as a contemplative analytical approach, SEA analysis has the advantage of being part of an alternative path of knowing, a means of attaining insight gained through engaging in the very act music is intended most fundamentally to induce, by listening.

Bibliographic references

Gleick, J. 1987. *Chaos: Making a New Science*. New York: Penguin Books.

Penderecki, K. 1961. *Threnody to the Victims of Hiroshima*. Boca Raton, FL: Kalmus, SB902.