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I. INTRODUCTION

The rotation of the universe and the motion of the planets could neither begin nor continue without music . . . for everything is ordered . . . according to the laws of harmony.
-Plutarch

Mediation is music. The primary purpose of this article is to explore the validity of this verbal equation. Similar to other articles in the Pracademic Series,[1]

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1. The ninth in the author's "Pracademic Series," this article grew out of ten years of interacting with music and music teachers and of reading, thinking, and talking about the relationship between music and mediation. It emerged, of necessity, from a lifetime interest in performing and writing music and from a career in conducting mediations. The other eight articles in the Pracademic series are: *The Art of Clear Imaging in Legal Writing*, APPELLATE LAW REVIEW (Appellate Lawyers Asso-

this article began with a simple concept, and then, curiosity drove my efforts to see relationships, to perceive the obscure, to discover the obvious (always more difficult), to test and to make connections, to find possible answers, to mine for common essences, to make sense of and to merge seemingly incongruous ideas—that is, to mediate. To be more accurate, ... to mediate between disciplines—between paradigms. This is what a mediator does as a profession. A mediator seeks to do the seemingly impossible. A mediator seeks to find sameness in differences, to find commonality among diversity, to find beauty in dissonance, to find treasure in abandoned effects, to find correspondence in incongruity, but more than anything, a mediator seeks to find even the slightest notion of resonance—that which is considered to be the essence of everything.[2]

It is my thesis that to be an effective mediator, one needs to be a musician at heart (if not in fact)—both a composer and performer. Music is what a mediator does—what a mediator makes. To design or perform well, a mediator must at least *understand* music composition and performance in all its aspects. A mediator has no choice in the matter, because music, in a broad sense, permeates nature[3] and is considered to be the quintessential ingredient of all matter and energy—of everything or unthing in the universe. To understand how music relates to what he or she does, the mediator must first comprehend its pervasiveness and its power in nature.[4] The mediator must become acquainted with the superstring theory of elementary particles, a theory that describes the basic building block of all matter, of nature itself.

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ciation—Illinois 2000); *Mediation and Joke Design: Resolving the Incongruities*, 1992 J. DISP. RESOL. 249; *A Classical Approach to Mediation—Part I: Classical Rhetoric and the Art of Persuasion in Mediation*, 19 U. DAYTON L. REV. 83 (1993); *A Classical Approach to Mediation—Part II: The Socratic Method and Conflict Reframing in Mediation*, 19 U. DAYTON L. REV. 589 (1994); *Descartes' Analytic Method and the Art of Geometric Imagineering in Negotiation and Mediation*, 28 VAL. U. L. REV. 83 (1993); *The Geometries of Situation and Emotions and the Calculus of Change in Negotiation and Mediation*, 29 VAL. U. L. REV. 1 (1994); *Mediation Magic: Its Use and Abuse*, 29 LOY. U. CHI L. J. 1 (1997); *Joke Structure: A Source of Creative Techniques for Use in Mediation*, 33 U.S.F.L. REV. 85 (1998). Most of the quotations appearing in this article are drawn from NOTATIONS: QUOTATIONS ON MUSIC (Sallye Leventhal ed., 2003).

2. The great violinist Yehudi Menuhin wrote: "Music creates order out of chaos; for rhythm imposes unanimity upon the divergent; melody imposes continuity upon the disjointed, and harmony imposes compatibility upon the incongruous." ANTHONY STORR, MUSIC AND THE MIND 33 (1993).

3. A noted American ornithologist and philosopher points out that bird-song shows variation of both pitch and tempo: accelerando, crescendo, diminuendo, change of key, and variations on a theme. STORR, *supra* note 2, at 4. Some birds, including the Wood thrush, have a repertoire of as many as nine songs which they can sequence in a variety of combinations. *Id.* "Every simple musical device, even transposition and simultaneous harmony, occurs in bird music." STORR, *supra* note 2, at 4-5 (quoting CHARLES HARTSHORNE, BORN TO SING 56 (1973)).

4. As one author has noted, "music can penetrate the core of our physical being. It can make us weep, or give us intense pleasure. . . . [It] can temporarily transform our whole existence." STORR, *supra* note 2, at 4.

II. SUPERSTRING THEORY AND UNIVERSAL HARMONY: AN OVERVIEW

A. Early Concepts of Music and World Harmony

Mathematicians are able to break down into measure and figure what musicians do intuitively. The art of music is endowed with a supernatural origin and a divine purpose, more so than any other art.
-Gottfried Leibniz

Before embarking on a brief tour through superstring theory, it is helpful first to review a 400-year old scientific theory, similar to that posed here, that music is at the core of world harmony, both acoustically and relationally.[5] A little known fact is that mathematician and astronomer Johannes Kepler, widely acclaimed for discovering the three laws of planetary motion in the early 1600s, was obsessed all of his life by a single idea that gave his work its direction. He was strongly convinced that Pythagoras was correct in his view that the order and harmony in nature had a tie to music and musical tones. Kepler was eventually able to amass sufficient evidence to demonstrate that world harmony and musical laws were connected. His proof is contained in his *Harmonices Mundi Libri V* or "Five Books on World Harmony." His proof of world harmony was contained in the Fifth Book, chapter three of which also contained his third planetary law.

Kepler used music theory to conduct his proof of planetary laws. As one author has observed:

> The first two books deal with geometrical fact. The third book, the most comprehensive, . . . contains music theory (and few know that here Kepler was the first to use the terms "major" and "minor" in the modern sense); and the fourth finally treats astronomical problems. Naturally, the fifth book has astronomical content, because it contains the presentation of the planetary orbits, but at the same time it is a synthesis of the problems broached in the previous four books, and refers most of all to the third book since Kepler uses music theory to conduct his proof.[6]

Kepler's first book opened with a brief explanation of the five platonic solids (cube, tetrahedron, octahedron, dodecahedron, and icosahedron). He then alluded to the relationship between the harmonic proportions and these five regular solids. After examining data relating to the planetary orbits, including their distances from the sun, their durations, the daily arcs, he extrapolated the measurements into interval ratios.[7] Then he stated his most important discovery. By comparing the

5. The information contained in this subsection is adapted from Rudolf Haase, *Kepler's World Harmony and its Significance for Today*, *in* COSMIC MUSIC: MUSICAL KEYS TO THE INTERPRETATION OF REALITY 111-30 (Joscelyn Godwin ed., 1989).

6. *Id.* at 116 (citation omitted).

7. We now know that interval ratios permeate the laws of nature. For example, harmonic relationships between crystal structure and musical laws; the laws of multiple proportions in chemistry yield musical consonances; in biology, numerical laws apply to cell division of algae corresponding to the

values of the angles as measured from the sun and formed by the planets at their extreme positions (aphelion and perihelion) in the time period of 24 hours, he demonstrated that a whole system of simple intervals emerged, that with two exceptions, were musical consonances, mostly triadic ones. "From the resulting planet-tones, he . . . [musically] construct[ed] scales, largely major and minor, and also counterpoints, polyphonic phrases, and individual melodies to characterize the various planets. . . . [H]e even formulates a hypothesis for how the harmony of all the planets together must have sounded on the first day of creation."

The principal features of Kepler's view of music and world harmony might be summarized as follows:[8]

1. Kepler's world harmony consists of musical laws, in particular of simple, largely consonant intervals with a clear preference for major and minor.
2. As we know today, these intervals are in accord with the disposition of human hearing in both the physiological and, as Kepler assumed, the psychological domain.
3. Analogical thinking plays a considerable part in Kepler, insofar as analogies between various sciences are brought out, the analogy between cosmic and musical laws is established, and also the analogy to human disposition is asserted and later proven. All these analogies are constructed with the help of simple proportions.
4. Teleological or finalistic thinking is Kepler's second important method of reasoning, so that an additional analogy exists to traditional Western music, which is unconsciously formed in this way.
5. To sum up, Kepler's harmonic world picture rests upon scientifically provable laws and on methods that are in accordance with the nature of hearing and the foundations of music. The sense of hearing is included in our knowledge of nature, and psychological perceptions, such as those engendered by the intervals and other fundamentals of music, become essential elements of this worldview.[9]

Kepler's macro-harmonic view of the world and indeed the planetary universe, including his perception of the pervasiveness of rhythmic order and interval proportion in nature, provides the perfect platform to launch our exploration into the musical relationships and harmonic possibilities in micro-particles through an examination of the relatively new theory about the nature of matter—the superstring theory.

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major triad in music; the discovery of rhythmic ordering in the human organism, whereby intervallic proportions govern the circulation of blood, breathing, pulse, and blood pressure. *Id.* at 126.

8. *Id.* at 124-25.

9. *Id.* at 118.

B. Superstring Theory's Role in Advancing the Concept of Music and World Harmony

Theorists now describe atoms in terms of harmonics; molecules vibrate; each substance is "tuned" to a unique pitch; plants and animals undergo cycles of growth and rest; planets fall into resonant orbits; stars oscillate, and gallaxies whirl a majestic spiral dance.
-Richard Heinberg

Over the last two decades a new theory has emerged in modern physics, challenging cherished notions about the nature of matter in the universe, unifying certain physics theories, neutralizing others, and substituting a new mathematics of majestic beauty and elegance.[10] This new theory called "superstring theory" (or "string theory" for short)[11] presents a comprehensive, mathematical framework that actually mediates between and unifies quantum mechanics[12] and Einstein's theory of gravity, called general relativity.[13] Without specifically addressing its complex mathematical underpinnings, we can derive information from the nature of the theory quite useful to our present discussion.

The superstring theory posits that the ultimate building blocks of nature consist of infinitesimal vibrating strings. The theory's proponents contend that protons and neutrons in all matter, indeed everything from the human body to the farthest star, are composed of unobservable strings, about 100 billion times smaller in size than a proton.[14] Many scientists believe that the superstring theory, embracing principles of both symmetry and supersymmetry,[15] provides an elegant

10. F. DAVID PEAT, SUPERSTRINGS AND THE SEARCH FOR THE THEORY OF EVERYTHING (1988); MICHIO KAKU & JENNIFER THOMPSON, BEYOND EINSTEIN 9-131 (1995); JOHN GRIBBIN, THE SEARCH FOR SUPERSTRINGS, SYMMETRY, AND THE THEORY OF EVERYTHING 167-90 (1998); BRIAN GREENE, THE ELEGANT UNIVERSE (1999).

11. It was in 1970 that distinguished physicist Yoichiro Nambu originated the striking new concept of "string theory" and in the late 1970s, the concept of "supersymmetry" emerged. These concepts followed the discovery and paralleled the study of a multitude of new elementary particles. Early in the twentieth century, physicists believed that all matter was built on three elementary particles—the electron, proton, and neutron. By the middle of the twentieth century, physicists generally concluded that there were two hundred or so elementary particles. Eventually, elementary particles were classified according to their spin: particles with a fractional spin were called fermions and those with whole spins (like a photon with a spin of 1) were called bosons. The aim of supersymmetry was to relate bosons to fermions, and under that theory, these particles could be transformed into one another so that all particles could be gathered into a single great family. By the early 1980s, physicists Michael Green, from the California Institute of Technology, and John Schwartz, from Queen Mary College at the University of London, ushered in their "superstring theory" which folded in the concepts of supersymmetry and fermions and bosons and accommodated both open and closed strings in a ten dimensional space, compacted to four dimensions. *See* PEAT, *supra* note 10, at 1, 32-33, 49, 92-93, 100-01, 213-14.

12. Quantum mechanics is the field of physics that explains the functioning of the very small—atoms, molecules, protons, and neutrons.

13. General relativity is the field of physics that explains the functioning of the very large—the planets, stars, galaxies, cosmos, and the universe generally.

14. KAKU & THOMPSON, *supra* note 10, at 5.

15. Symmetry is a "property of a physical system that does not change when the system is transformed in some manner. For instance, a *sphere* is rotationally symmetrical since its appearance does not change if it is rotated." GREENE, *supra* note 10, at 423. Supersymmetry is "a symmetry principle

and comprehensive explanation for why there can be billions of different types of particles and substances in the universe, each with astoundingly diverse characteristics. As one Columbia University professor of physics and mathematics has observed about this new theory:

> If [the scientists] can work out precisely the allowed resonant vibrational patterns of fundamental strings—the "notes," so to speak, that they can play—we should be able to explain the observed properties of the elementary particles. For the first time, therefore, string theory sets up a framework for *explaining* the properties of the particles observed in nature.[16]

In the same way that Descartes linked two problem solving processes of geometry and algebra to produce analytical geometry[17] and that Leibniz coupled algebra with analytical geometry to yield integral and differential calculus,[18] the creators of the superstring theory have found a way to reconcile the relationship between the atomistic and kinematic concepts of matter. According to superstring theory, matter is composed of atoms containing protons and neutrons, which are comprised of quarks and electrons. These particles are actually in turn comprised of tiny loops of vibrating string. Consider Figure 1, below:[19]

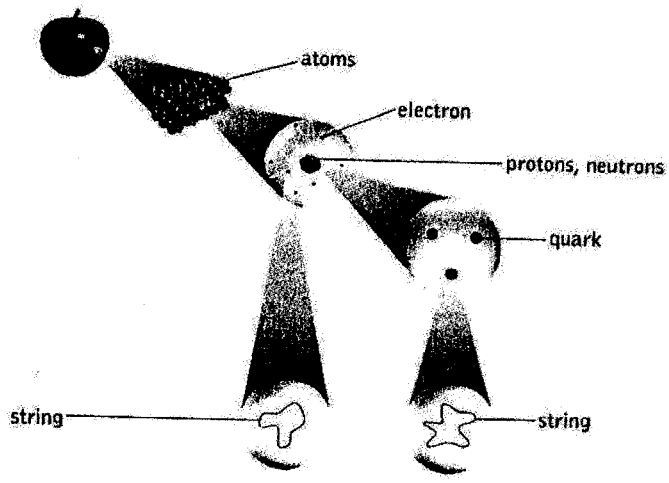

Figure 1

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that relates the properties of particles with a whole number amount of spin (*bosons*) to those with half a whole (odd) number amount of spin (*fermions*)." *Id.* at 423.

16. GREENE, *supra* note 10, at 146-47.

17. *See* John W. Cooley, *Descartes' Analytic Method and the Art of Geometric Imagineering in Negotiation and Mediation*, 28 VAL. U. L. REV. 83, 90-92 (1993) [hereinafter Cooley, *Descartes*].

18. *See* John W. Cooley, *The Geometries of Situation and Emotions and the Calculus of Change in Negotiation and Mediation*, 29 VAL. U. L. REV. 1, 16-18 (1994) [hereinafter Cooley, *Geometries*].

19. Figure 1 is taken from THE ELEGANT UNIVERSE, GREENE, *supra* note 10, at 14. (Reprinted from The Elegant Unvierse by Brian Greene. Copyright (c) 1999 by Brian Greene. With permission of the publisher, W.W. Norton & Company, Inc.).

Figure 1 shows an ordinary piece of matter, an apple, and the particles of which it is comprised on a progressively microscopic scale. Superstring theory asserts that the smallest particles are not point-like, but rather consist of tiny one-dimensional loops. These loops—which scientists have labeled "strings"—are like infinitely small rubber bands, each being a vibrating, oscillating, dancing filament. This "simple replacement of point-particle material constituents with strings resolves the incompatibility between quantum mechanics and general relativity . . . , [and] thereby unravels the central Gordian knot of contemporary theoretical physics."[20] But this concept of a single harmonious framework incorporating and unifying two theories of the nature and behavior of all matter is the progenitor of perhaps an even more important scientific theory. The offspring theory is that music, long used as a metaphor for explaining nature and the cosmos, may in fact be the essence of all matter and, thus, of all reality as we know it. A noted professor of physics and mathematics has observed:

> Music has long since provided the metaphors of choice for those puzzling over questions of cosmic concern. From the ancient Pythagorean "music of spheres" to the "harmonies of nature" that have guided inquiry through the ages, we have collectively sought the song of nature in the gentle wanderings of celestial bodies and the riotous fulminations of subatomic particles. With the discovery of superstring theory, musical metaphors take on a startling reality, for the theory suggest that the microscopic landscape is suffused with tiny strings whose vibrational patterns orchestrate the evolution of the cosmos. The winds of change, according to superstring theory, gust through an aeolian universe.[21]

Pythagoras taught that *tetrakyts* or fourness is mystical and holds the secret to the universe.[22] He and his followers used tetrakyts to construct the perfect triangle as shown in Figure 2.[23]

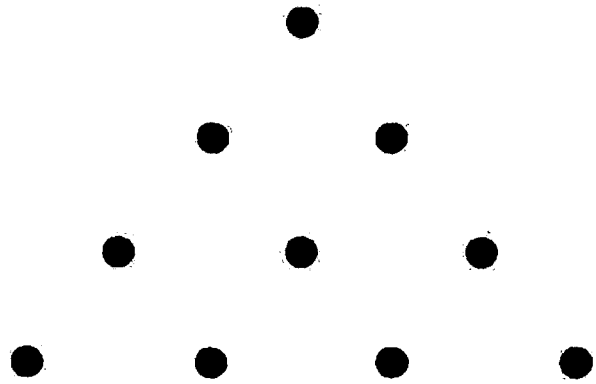

Figure 2

20. *Id.*
21. *Id.* at 135.
22. PEAT, *supra* note 10, at 51.
23. Figure 2 is taken from SUPERSTRINGS AND THE SEARCH FOR THE THEORY OF EVERYTHING, PEAT, *supra* note 10, at 52.

Pythagoras sought to create all manner of ratios and harmonies of the number four. He believed that the harmonies resonated throughout the universe, and in particular, in music.[24] He also discovered that a pleasing-to-the-ear harmony could be developed from the diatonic scale (discussed in detail *infra*), and that the harmony was generated by simple numerical ratios of the length of a string. There was something magical about this discovery of a deep link between music and number.[25] Pythagoras extrapolated this theory of musical harmony to the universe. He contended that the distances between the planets lay in the simple numerical ratios of the diatonic scale and that the whole universe moves with an abstract celestial music—"the music of the spheres." Later, Kepler confirmed the accuracy of Pythagoras' intuition about the cosmos when he discovered the laws of planetary motion which revealed that simple ratios hold between the length of each planet's year and its distance from the sun.[26] Over intervening thousands of years, physicists have gradually realized that there is some basic truth in the specialness of the number four. They have determined, for example, that only four fundamental forces exist in the universe: gravity, electronmagnetism (light), and two types of nuclear forces which they call "the weak" and "the strong."[27] They have also recently become aware of some powerful properties that apply only in a four-dimensional space, signaling some compelling reasons that a four-dimensional space-time is the true dimensionality of space.[28] Other scientists have noted the peculiarity of nature's division of human voices (vocal cords, or strings) into four categories covering different ranges in pitch—soprano, alto, tenor, and baritone/bass. They also note the correlation of these categories to the four sizes of strings in use today—violin, viola, cello, and double bass.[29]

The superstring theory has the potential of defining and explaining the confluence and interaction of the laws of harmony both in music, in nature, and in the whole universe. As a noted professor of theoretical physics has remarked:

> The superstring theory can produce a coherent and all-inclusive picture of nature similar to the way a violin string can be used to "unite" all the musical tones and rules of harmony. Historically, the laws of music were formulated only after thousands of years of trial-and-error investigation of different musical sounds. Today, these diverse rules can be derived easily from a single picture—that is a string that can resonate with differ-

24. *Id.* at 51-52.

25. Many parallels have been drawn between music and mathematics. As one author put it: "The patterns of mathematics convince us that there must be some order in the universe, and so do the patterns of music. But music promotes order within ourselves in a way which mathematics cannot because of music's physical effects." STORR, *supra* note 2, at 183. Another author has noted, "In the final analysis, when all educational preconceptions are removed, music is really a set of numbers, in varied modes or sequences." R.J. STEWART, MUSIC AND THE ELEMENTAL PSYCHE 76 (1987). As Pythagoras himself said: "There is geometry in the humming of strings. There is music in the spacing of the spheres." Leventhal, *supra* note 1, at 55.

26. PEAT, *supra* note 10, at 52-53.

27. KAKU & THOMPSON, *supra* note 10, at 6. Physicists explain other forces identified by the ancients—such as fire and wind—in terms of these four forces. *Id.*

28. PEAT, *supra* note 10, at 49, 319-21 (asterisked footnote).

29. A. Askenfelt, *Voices and Strings: Close Cousins or Not, in* MUSIC, LANGUAGE, SPEECH AND BRAIN 252 (Johan Sundberg et al. eds., 1991); A. Askenfelt, *The Human Voice as a Biological Musical Instrument, in* MUSIC, LANGUAGE, SPEECH AND BRAIN 252 (Johan Sundberg et al. eds., 1991).

> ent frequencies, each one creating a separate tone of the musical scale. The tones created by the vibrating string, such as C or B flat, are not in themselves any more fundamental than any other tone. What is fundamental, however, is the fact that a single concept, vibrating strings, can explain the laws of harmony.[30]

The late ethnomusicologist John Blacking, Professor of Social Anthropology at the Queen's University of Belfast and an accomplished musician in his own right, once observed, "[m]any, if not all, of music's essential processes can be found in the constitution of the human body and the patterns of interaction of bodies in society. . . . [M]usic can become an intricate part of the development of mind, body, and harmonious social relationships".[31]

In accord with Blacking's above-quoted insight, my primary motivation for developing this article is to encourage scientists—particularly behavioral and social psychologists—to take the superstring theory, and its enfolded notions of musical tones and harmony, to the next step. My challenge to them is to explore and to study the relationships between music (in its broadest sense) and interpersonal behaviors with the goal of developing principles, methods, and techniques for producing universal harmony in the world.[32]

III. MUSIC AND MEDIATION AS PROBLEM SOLVING ARTS

A. Mediation as a Problem Solving Art

Mediation is a form of problem solving.
-James J. Alfini

Mediation has been described as a process of assisted negotiation in which a neutral third party helps disputing parties "to engage in negotiation and cooperative problem solving."[33] As some experts have stated:

> [T]he mediators are not there to make a decision, nor to say who is right and who is wrong, nor to say what should happen to the parties or to the issues in dispute. The mediators are there to promote the disputants' use of constructive problem-solving skills. The mediators do this by guiding the parties through a structured process which has been developed to enhance their ability to achieve a resolution which is fair, satisfying, and durable.[34]

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30. KAKU & THOMPSON, *supra* note 10, at 5.

31. STORR *supra* note 2, at 6, 24 (quoting John Blacking).

32. John Blacking in his book, A COMMONSENSE VIEW OF ALL MUSIC, wrote: "Thus music can become a universal language when individuals are acquainted with all forms of artistic musical expression, and through the transformation of individuals it becomes 'a vehicle for world peace and the unification of mankind.'" STORR, *supra* note 2, at 51.

33. MARK D. BENNETT & MICHELE S.G. HERMANN, THE ART OF MEDIATION 8 (1996).

34. *Id.* at 7.

A dispute is merely a problem that is susceptible to resolution through the application of problem-solving techniques.[35] Resolution of any dispute requires the solving of three separate design problems:

> (1) the problem of designing (or, if you prefer, defining) the problem itself; (2) the problem of designing the process for solving the defined problem; and (3) the problem of designing the solution to the defined problem by using the process you designed. Sometimes, depending on the particular situation, the mind operates to solve these three design problems in sequence; at other times it resolves the design problems simultaneously.
>
> **Designing the problem.** The concept of *designing* a problem may be difficult for [some people] to grasp at first. But if [they] think about it, [they] will realize that every time [they] attempt to solve a problem, the problem has already been designed in [their] mind. If the problem is a dispute, [the] perception of the disputants' [character], [of the] disputants' conduct, and [of] related events plays a significant role in this design process; so [do their] assumptions, emotions, and probably, in most cases, [their] cliche patterns of thinking. [Their] interpretive "design" of the dispute may occur instantaneously; and may be only one of myriad designs available, [depending on the root needs and interests of the disputants]. What [their] instantaneous design powers produced as a problem may, in fact, if viewed or perceived from a different angle, be an opportunity for change—a betterment of some kind.

Thus, their initial design of the problem may have to be restructured or redesigned in order to find satisfactory resolution.

> **Designing the process.** After [re]designing the problem— [determining] the parties' root needs and interests—the next step is to design the process for solving [the redesigned problem]. The number of approaches one can take to solve a problem is limited only by the extent of one's insight and creativity. . . . When assisting parties in designing an appropriate [mediation process] for their dispute, [a mediator seeks, at a minimum, to ensure that all parties]:
>
> - have a sufficient opportunity to evaluate the design proposals;
> - have a sufficient opportunity to offer design input and to collaborate in fashioning the ultimate design;
> - [believe that] the ultimately selected design is fair to them individually and collectively;

35. The remainder of this subsection is an adaptation of material from JOHN W. COOLEY, THE MEDIATOR'S HANDBOOK: ADVANCED PRACTICE GUIDE FOR CIVIL LITIGATION 210-12 (2000) [hereinafter COOLEY, HANDBOOK].

- [believe that] the ultimately selected design gives them a reasonable opportunity to negotiate a result for themselves rather than have a result imposed on them . . . .

Designing the solution. After [re]designing the problem and the process for solving [the redesigned problem], the next step is to design the solution. . . .[Designing a solution to a redesigned problem] is greatly facilitated if the first two design problems (problem-design and process-design) are properly solved. In most problem solving situations, there are many types of solutions possible.[36]

These solutions range from super-malimum to super-optimum.[37] Designing a solution in mediation has direct parallels to mathematical problem solving.[38]

B. Music as a Problem Solving Art

[The theory of relativity] occurred to me by intuition, and music was the driving force behind that intuition. My discovery was the result of musical perception.
-Albert Einstein

Music and mathematics have long been compared as problem solving disciplines.[39] As one author notes:

> Musicians . . . have invoked mathematics to describe the orderliness of their art. Chopin said, "The fugue is like pure logic in music." Bach, the fugue's most eminent explorer, also had a predilection for its precise relative, the canon, which he often treated as a puzzle. In the twentieth century, mathematical language has pervaded much musical thinking. Schoenberg's serial system for manipulating the scale's twelve tones has exercised enormous influence. Musicologists have evoked "set theory," "Markov chains," and other mathematical concepts. Iannis Xenakis applies sophisticated mathematical theories in his compositions.[40]

In a fictional dialogue between a mathematician (Math) and a composer (Com), one writer compares the problem solving aspects of music and mathematics as follows:

> **Math:** . . . [referring to a just-completed mathematical proof] This proof can be generalized without any problem to show that for any prime number Pr, the square root of Pr is an irrational number. Just repeat the proof, replacing 2 by Pr. . . .

36. *Id.* at 211-13.
37. *Id.*
38. *See* Cooley, *Descartes*, *supra* note 17, at 117-29; Cooley, *Geometries*, *supra* note 18, at 68-80.
39. *See* EDWARD ROTHSTEIN, EMBLEMS OF MIND: THE INNER LIFE OF MUSIC AND MATHEMATICS (1995).
40. *Id.* at xvi.

> But, generality [of the proof] is not sufficient. In some sense, the result must be "deep". . . . The proof I have just given fulfills this condition: when it was found almost 25 centuries ago, it caused a crisis in the mathematics of those days. That is a clear indication of deepness.
>
> . . . The proof I have just given is short and clear, yet it is of fundamental importance. I am sure you must be familiar with this feeling that a specific musical idea can be expressed, say, by a few notes.
>
> **Com:** That is true. There is something strange, to give a very common example about the theme of the Fifth Symphony of Beethoven. Just four notes, with one note repeated three times!
>
> **Math:** Precisely. All the properties . . . of "good" mathematical results can be brought together in a single framework, if we look at it from a problem-solving perspective. A problem is well-solved if the solution is easy (to understand) and at the same time, general and deep. . . .
>
> **Com:** . . . If we go on like this, we will end up believing that there is no difference between mathematics and music.[41]

Disciplines such as music, mathematics, and mediation can be best analyzed as problem solving arts through the prisms of Gestalt psychology and metaphor. Gestalt psychology originated in the early twentieth century and its problem solving techniques focus on understanding the relations between the components of the problem or situation and the whole. Often this understanding requires seeing the problem in a new light, or a new configuration. Seeing, in this manner, is normally accomplished by a reorganization or restructuring. When this restructuring occurs relatively suddenly, the process is called insight. Gestalt problem solvers look for structural relations in both how components relate to one another and how components relate to the whole. They tend to think in terms of figure-ground reversals, and other holistic, meaningful perceptions.[42] In this sense, Gestalt problem solving resembles application of metaphors, a topic to which we now turn.

C. Music as a Metaphor for Mediation

Music, to create harmony, must investigate discord.
-Plutarch

1. Metaphors in General

This article uses music as a metaphor for mediation and goes one step farther—it suggests that mediation *is* a type of music. Before we can accept the lat-

41. Jean Paul Van Bendeghem, *Mathematical and Musical Patterns: in* REASON, EMOTION AND MUSIC 168-69 (L. Apostel et al. eds., 1986).

42. *See* RICHARD E. MAYER, THINKING, PROBLEM SOLVING, COGNITION Ch. 3 (1983).

ter statement, we must first allow ourselves to experiment with the theory of metaphors, generally. In fact, we must teach ourselves how to become masters of them. As Aristotle once wrote: "The greatest thing of all is to be master of the metaphor. It is the only thing which cannot be taught by others; and it is also a sign of original genius, because a good metaphor implies the perception of similarity in dissimilar things."[43]

Gestalt psychologist Marc Leman has theorized that apart from having a cognitive meaning (that is, apart from saying something literal about someone or something), metaphors have an evocative meaning.[44] He offers the following example. When a person says, "Sally is a block of ice," the person does not mean that Sally *is* a block of ice (the cognitive meaning), rather the person means that Sally is an extremely unemotional and unresponsive person (the evocative meaning). Leman believes that there are two types of *evocative* functions of metaphors: one to generate emotions and feelings in the hearer (an expressive meaning); and the other to generate insights (a representational meaning). There is a difference between the cognitive meaning and the representational meaning. He writes that associated with the cognitive meaning of metaphorical utterance are the corresponding truth conditions:

> In contrast, the representational meaning does not say anything *about* someone or something. It just consists in *mental representations and mental pictures.* Their representational meaning is analogical to the expressive meaning in the sense that nothing is being said but is merely evoked. This does not mean that we cannot speak about our evoked emotions and our evoked insights, although to say what precisely they are may be very difficult.[45]

Leman's central thesis is that metaphors involve dynamics that are responsible for the evocation of emotions. He writes:

> Metaphors have a dynamic nature in the sense that they involve tensions and their reductions at different levels of their structure. This dynamic structure can be described at a semantic level as well. Both levels are responsible for the evocation of specific emotions in the hearer. This shows an analogy with the structural and semantical aspects in music.[46]

Leman describes the problem solving feature of metaphors as involving two kinds of emotions: a surge of excitement at the moment of discovery, followed by a calmer feeling of satisfaction. The second, calmer feeling can be understood as a release from the tension created by the previous representational conflict.[47] He writes:

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43. ROTHSTEIN, *supra* note 39, at 167-68.

44. *See* Marc Leman, *A Theory of Metaphor, in* REASON, EMOTION AND MUSIC, *supra* note 41, at 237-50. *See also* ROGER SCRUTON, THE AESTHETICS OF MUSIC 80-97 (1997).

45. Leman, *supra* note 44, at 241 (emphasis in original).

46. *Id.* at 244. Goethe designed a profound structural metaphor when he wrote: "Architecture is frozen music." NOTATIONS: QUOTATIONS ON MUSIC, Leventhal, *supra* note 1, at 87.

47. Leman, *supra* note 44, at 246.

> We may distinguish two steps in the interpretation of metaphors: the first step involves the conflict of two visual representations or two mental representations or a combination of both, and this may be seen as the result of the defectiveness of the literal word and sentence-meaning. . . . The second step consists in the resolution of the conflict as a result of the discovery of a third mental or visual representation. This discovery of a third representation is precisely what we call *insight.*[48]

Insight, then, is the goal of metaphor.

2. *The Music Metaphor for Mediation*

Whether or not you ultimately agree with the thesis of this article that mediation *is* music, perhaps you will be able to accept that music serves as a useful metaphor to describe mediation and to acquire insight into the mediation process and the role of the mediator.

To some, music (including both composition and performance) and mediation may be seen as a conflict of two separate mental representations. But on closer scrutiny, this initial conflict of mental representations can be resolved by identifying and examining the essences of each. The nature and shared essence of these two phenomena is not seriously disputable. Each is an art form and the essence of each is art. If we accept this statement as axiomatic, the next step is to compare their essential art to determine similarities or differences. A high degree of correlation will suggest metaphoric utility; a low degree of correlation will indicate the opposite. To engage in this comparison, we must have initial agreement as to what "art" means.

One commentator describes the term "art" in the visual sense as follows:

> Art deals with visual signs to convey ideas, moods, or generalized emotional experiences. It may be called a language of visual signs. Unlike the language of words, however, art is not meant to be informative. Information is the province of symbols, as in the words of literature, or the numbers of mathematics. Sometimes in the interpretation of ideas or moods, however, the artist may employ visual symbols, but the meaning of such symbols is embodied in the forms or images which the artist creates, just as are the ideas, moods, or experiences he conveys.[49]

Art, then, is something more than mere content; more than information. As another commentator put it, "art is the creation of perceptible forms expressive of human feeling."[50] Albert Schweitzer once wrote:

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48. *Id.* at 245. For a discussion of the relationship between the use of metaphors in mediation and melody in music, see *infra* Part V.D.2.b.

49. JOHN W. COOLEY, APPELLATE ADVOCACY MANUAL, Vol. I, § 1:05 n.5 (quoting OTTO. OCVIRK, ART FUNDAMENTALS, THEORY AND PRACTICE (2d ed.)(Wm. C. Brown Co., 1972)(emphasis omitted) [hereinafter COOLEY, ADVOCACY].

50. *Id.* at § 1:05 n.6. (quoting SUSANNE K. LANGER, PROBLEMS OF ART 80 (Charles Scribner's Sons, 1957)).

> Art is the translation of aesthetic associations of ideas. The more complexly and intensely the conscious and unconscious concepts and ideas of the artist communicate themselves to us through his art-work, the deeper is the impression. It is then that he succeeds in stimulating others to that vivacity of imaginative feeling which we call art, in contradistinction to what we hear and see and experience in our ordinary moments.
>
> The part of a work of art that is perceptible by the senses is in reality only the intermediator between two active efforts of the imagination. All art speaks in signs and symbols. No one can explain how it happens that the artist can waken to life in us the existence that he has seen and lived through.[51]

These descriptions of "art" evoke the question of the relationship between different art forms; e.g. literature, poetry, drama, sculpture, painting, music, etc. Is the meaning of the word "art" the same as applied to all art forms? Is there a "hierarchy of arts," depending on the art form, or is there truly a "commonwealth of arts?"

Most art experts would agree that all of the arts are, in essence, one, but that they separately have discrete differences which make them unique. Essentially, all arts create forms to express the life of feeling (not necessarily the feeling the artist happens to have); and they all do it by the same basic principles. But there the simple comparison ends. Each art form creates a different kind of experience altogether; each makes its own peculiar primary creative end product. Sculpture creates a real three-dimensional visual space; painting, a virtual two or three-dimensional space; dance, a realm of interacting powers.[52]

Music is an unusual art form in that it has three discrete types of creative products: a visual space (written symbols—composition); audible tones (performed composition); and virtual time.[53] The art form of mediation also shares these discrete end products. Mediation has a visual aspect that consists of written and nonwritten symbols (i.e. compositional—agreement to mediate, settlement agreement—and nonverbal (body) language), an audible aspect that is in the nature of performance, and a virtual time aspect (which permits the mediator to expand or contract time to meet the needs of the performance). This correlation of creative aspects between music and mediation preliminarily indicates that music may serve as a useful metaphor to describe mediation and to acquire insight into the mediation process and the role of the mediator.

I emphasize that this article is not intended to probe very deeply into music or into mediation. In fact, very little of what I say about music—through a collage of quoted insights of musicians, composers, musicologists, psychologists—will be

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51. ALBERT SCHWEITZER, J.S. BACH, Vol. II, 15-16 (ERNEST NEWMAN et al. trans., ADAM & CHARLES BLACK 1949) (1923). Schweitzer also wrote that "[m]usical sensibility is to some extent a capacity for tone-visions, of whatever kind it may be, whether it deals with lines, ideas, forms, or events. Associations of ideas are always going on where we would not suspect them." *Id.* at 14.

52. *See generally* COOLEY, ADVOCACY, *supra* note 49, at § 1:05.

50. *Id.* Drama is similar to music in its creative end-products, but its communicative content is intended to be verbally objective, unlike music which is nonverbal, subjective, and capable of differing interpretations.

news to musicians and composers, and very little of what I say of mediation will be news to mediators or advocates in mediation. The hope is that much of what I have to say will still be of interest because of the juxtapositions I make and the hypotheses I propose.[54]

IV. THE TECHNIQUES OF A MASTER COMPOSER, PERFORMER, AND PROBLEM SOLVER

A. Johann Sebastian Bach—The Person

Bach is like an astronomer who, with the help of ciphers,
finds the most wonderful stars.
-Frederic Chopin

Johann Sebastian Bach ("J.S.B." or "Bach") one of the most revered names in music of the Western world, was born in Eisenach, Germany on March 21, 1685.[55] His father, Johann Ambrosius Bach, was from a long line of musicians and, at the time of J.S.B.'s birth, he was the official town musician of Eisenach. He taught J.S.B. to play the violin at a very young age. When J.S.B. was nine years old, his mother died. The following year, his father also died. J.S.B.'s older brother, Johann Christoph Bach, was the organist in a nearby town, and he took care of the young J.S.B. In 1700, J.S.B. won a scholarship to attend a choir school operated by Benedictine monks. He developed skills as an organist, and by the age of 18, he had written several keyboard works and church chorales. Knowledge of his musical genius spread, and soon he was summoned to the Weimar where he became a court violinist. In addition, he was appointed organist in Arnstadt and, for two years, he was able to experiment with his choral works with a small choir at his disposal.

In 1707, he married his cousin, Maria Barbara Bach, and settled in Weimar for the next nine years where he served, beginning in 1714, as Konzertmeister to the Duke. In this position, he wrote many of his fine cantatas and became renowned as an organist. In 1716, he took a post as Kapellmeister in Anhalt-Cothen. There, he conducted the court orchestra. It was there that he wrote his famous Brandenburg Concertos, dedicated in 1721 to Duke Christian Ludwig of Brandenburg. There, he also wrote his French and English Suites for the clavier and a large number of oratorios, passions, masses, and cantatas. While in that position, his wife died. Within a year, he married Anna Magdalena Wilcke, the daughter of a court musician. For his new wife, he wrote some light pieces and songs of great charm.

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54. *See* ROTHSTEIN, *supra* note 39, at xvii.

55. It has been said that modern music began with Johann Sebastian Bach and George Frideric Handel. Bach was born in the same year as Handel and, though they never met, he and Handel were composers of world prominence in the earlier half of the 18th century. As one author has noted, Bach and Handel "shine with uncontested brilliance from a sky that holds no other suns." THE WORLD OF GREAT COMPOSERS 34-38 (David Ewen ed., 1962). *See also* KARL GEIRINGER & IRENE GEIRINGER, THE BACH FAMILY, 119-201 (1956); ALBERT SCHWEITZER, J.S. BACH, Vol. I, 97-150 (ERNEST NEWMAN trans., ADAM & CHARLES BLACK 1923).

Desiring better educational opportunities for his children, he applied for and obtained a post as Kantor at St. Thomas in Leipzig. From 1723 to 1750, the Church and the Music School at Leipzig were the center of Bach's life. However, in Leipzig he had to deal with three difficult authorities—the university, the church, and the town council. He also had to engage in non-musical teaching, which he did not enjoy. During his first seven years in Leipzig, he wrote some 200 cantatas, amid complaints from authorities that he was neglecting his teaching. He clashed with a new rector who would not allow him to hire professional singers for the first performance of his St. Matthew Passion. In the face of these troubles, Bach enjoyed a growing reputation as a master musician and composer countrywide. When he visited his son at the court of Frederick the Great, the king received him with great honor and praise. Thereafter, he wrote such masterpieces as the Goldberg Variations, the Musical Offering and the Art of Fugue.

Bach was considered to be amiable and modest in his interactions with people, unless he suspected their desire to encroach upon his freedom, in which case he could be very stubborn.

He was upright of character and incapable of any injustice. He had a reputation for impartiality, and he was friendly toward all artists. He was humble in the sense that he made no effort to win recognition for his greatest works. He wrote music, not for the hope of recognition, but for the glory of God. The music had to come out of him.[56]

Bach understood and applied metaphor. One music critic wrote of Bach, the aesthetician, in March of 1738:

> Bach knows so perfectly . . . the analogies between the working-out of a musical piece and the art of rhetoric, that people not only listen to him with satisfaction and delight when he expounds lucidly the resemblances and correspondences of the two, but admire also the skilful [*sic*] application of them in his works.[57]

Bach was a fine teacher and conductor of the chorale. Every piece of music, Bach told his pupils:

> is a conversation between the separate voices, that represent the characters. If one of them has nothing pertinent to say, it may keep silent for a while, until it can again enter quite naturally into the conversation. But none must break in with an interjection that is meaningless and has no reason to be there.[58]

Of his musical genius and ability to teach, it has been observed:

> But what . . . does it matter to a genius what his direct pupils do? He really becomes an instructor, in the true sense of the word, when his mouth has long been closed and his works begin to speak. . . . Brahms . .

56. SCHWEITZER, *supra* note 55, at 151, 155, 165, 166.
57. *Id.* at 182 (internal quotations omitted).
58. *Id.* at 219.

> . once . . . said, "in old Bach there is always something astonishing, and, what is the main thing, there is always something to be learned from him."[59]

In his last years, his sight grew increasingly inferior, and after eye surgery in 1749, he became completely blind. In 1750, his sight briefly returned, but shortly thereafter, he suffered a stroke and died ten days later. Like Mozart, Bach was buried in an unmarked grave, though, his remains were rediscovered in 1894.

Ironically, only a mere handful of Bach's works were actually published during his lifetime. His greatest works were rediscovered and published seventy-five years after his death.

B. Bach—The Composer and Problem Solver

Study Bach. There you will find everything.
-Johannes Brahms

If one were to characterize the art of Johann Sebastian Bach in a single word, it would have to be the word "unification"—the "most heterogeneous elements [of music] were welded together by him into a new entity, completely coherent in character."[60] It is said that: "the harmonic idiom he employed was of a most progressive nature, opening up new realms of musical expression, to which even 19th-century harmony did not find much to add. No other composer succeeded in bringing polyphony and harmony to so complete a fusion."[61]

Bach recognized no fundamental difference between sacred and secular music, nor even between vocal and instrumental composition. Indeed, "Bach's inexhaustible imagination created an immense variety of architectural forms. No two of his inventions, fugues or cantatas show exactly the same construction."[62] As a composer, Bach exhibited independent innovation, tempered with eclectic observation. For example:

> The self-taught Bach . . . belonged to no school. No preconceived opinions guided him in his studies. His authorities were all acknowledged masters, the old as well as the new. As often as the distances, his means and his leisure permitted, he went to hear contemporary celebrities and to learn what he could by observation of them.[63]

Bach worked as a problem solver. It is said that he:

> worked like the mathematician, who sees the whole of a problem at once, and has only to realize it in definite values. His way of working . . . was . . . quite different from that of Beethoven. . . . With Beethoven the work is

59. *Id.* at 222.
60. GEIRINGER & GEIRINGER, *supra* note 55, at 202.
61. SCHWEITZER, *supra* note 55, at 203.
62. *Id.* at 202
63. *Id.* at 192.

developed by means of "episodes" that are independent of the theme. These do not occur in Bach; with him everything that "happens" is simply an emanation from the theme.

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Perhaps we can . . . better characterize Bach's mind as architectonic. The powerful aesthetic impression given by his works comes from the harmony of the whole structure in which all the copious and animated details fit quite naturally. Bach's music is the perfected Gothic of art. The further he advances in his fugues, the simpler and grander become the lines. . . .

***

In Bach's music, . . . the plastic outline of the whole is the result of the optical effect of the details; it requires, in order to become visible, a synthetic activity of the hearer's aesthetic imagination. Even to the best musician, at a first hearing, a Bach fugue seems chaos; while even to the ordinary musician this chaos becomes clear after repeated hearings, when the great lucid lines come out.[64]

C. Bach—The Performance Artist

The aim and final end of all music should be none other than the glory of God and the refreshment of the soul.
-Johannes Sebastian Bach

In performing chamber music, Bach preferred playing the viola, because with this instrument he could be located in the center of the harmony where he could hear and enjoy what was going on on both sides of him.[65] He was a master of improvisation, and he was known to improvise at the organ for as long as two hours.[66] "It gave him particular pleasure, when improvising, to go into all possible keys, and to move about even in the most distant ones in such a way that his hearers did not observe it, but thought he had only modulated within the inner circle of a single key."[67]

One famous story describes Bach's visit to the palace of King Frederick the Great. The King invited Bach to play, and he went from room to room with musi-

64. *Id.* at 211-13. Another author notes:
[M]elodic lines are contained in another sort of musical space that incorporates the tensions between tones: the space created by tonal harmony. The multiple lines in Bach's pattern [in Prelude No. 1 in C Major, familiar to most beginning piano students], for example, are not only heard as lines. The melodic tones are also heard as parts of vertical units, chords, arpeggiated, spread out, sounding one note at a time. This arpeggiation is what gives the music its small- scale waves and pulse, underlying the melodic shapes; the chords create yet another surface defining the shape of the work. ROTHSTEIN, *supra* note 39, at 107-09.
65. SCHWEITZER, *supra* note 55, at 209.
66. *Id.*
67. *Id.* at 210.

cians, improvising original compositions on many of the palace's fifteen pianofortes. The King wanted him to play a fugue with six Obligato parts, and he immediately accommodated the King, executing an original fugue with the requested parts, much to the amazement of the King and all present. The next day, the King arranged for Bach to be taken to all the organs in Potsdam where he continued his improvisations.[68]

Having acquired a basic understanding of metaphor and of the approaches to composition and performance of a great musical artist, we are now prepared to make a detailed comparative analysis of mediation as music in Sections V through VII, *infra*.

V. THE MUSICAL ELEMENTS OF MEDIATION

A. Introductory Considerations

Of all noises, I think music is the least disagreeable.
-Samuel Johnson

Beethoven (1770-1827) once said that "[m]usic is the mediator between the spiritual and the sensual life,"[69] and the German poet Heinrich Heine (1797-1856) observed:

> There is something marvelous in music. I might almost say it is, in itself, a marvel. Its position is somewhere between the region of thought and that of phenomena; a glimmering medium between mind and matter, related to both and yet differing from either. Spiritual, and yet requiring rhythm; material, and yet independent of space.[70]

Schopenhauer believed that music is different from all other arts. He wrote:

> Therefore music is by no means like the other arts, namely a copy of the Ideas, but a *copy of the will itself*, the objectivity of which are the Ideas. For this reason, the effect of music is so very much more powerful and penetrating than is that of the other arts, for these others speak only of the shadow, but music of the essence.[71]

And for a human being, hearing music is not merely hearing sounds or patterns of sounds. Hearing music is the complex mental act of modeling relational patterns of sound. For example, one expert has described the hearing of music as follows:

> One reason we hear music when animals don't is that our brains are able to manipulate patterns of sound far more complex than those the brain of

68. *See* DOUGLAS R. HOFSTADTER, GODEL, ESCHER, BACH: AN ETERNAL GOLDEN BRAID 4 (1989).
69. THE NEW DICTIONARY OF THOUGHTS 430, 765 (1966) (quoting Ludwig van Beethoven).
70. *Id.* at 430, 765 (1966) (quoting Heinrich Heine).
71. STORR, *supra* note 2, at 140 (quoting SCHOPENHAUER, THE WORLD AS WILL AND REPRESENTATION (E. F. J. PAYNE trans., 1966)).

> any other animal can manage. We model patterns upon patterns upon patterns—right up to the movement of a symphony. Successive tones are linked to form melodic fragments, and then whole melodies, and then phrases, and then long passages. Simultaneous tones are integrated into intervals, intervals into chords, and chords into harmonic progressions. Patterns of accentuation are charted as rhythms. Shifts in intensity meld into crescendos and decrescendos. As our brains encode these relations, the sensations of sound arise. It's not that our brains assemble a web of relations into music and then "hear" it. Rather hearing is the act of modeling such relations.[72]

The five basic elements, then, of sensed music include sound, tone, melody, harmony, and rhythm. High order applications of the human sensory system to these basic elements include: composition, performance, listening, and understanding. Since the effective mediator must perceive and comprehend the basic elements and their sensory applications, it is to these topics we now turn. In the following discussion of the basic elements and their sensory applications in mediation (and also in the remaining sections of this article), I incorporate my anecdotal insight and viewpoints acquired through more than 25 years of mediator experience together with a collage of opinions of practitioner and academic experts in the field of interpersonal communication and problem solving.

B. Sound

I like Wagner's music better than any other music. It is so loud that one can talk the whole time without other people hearing what one says. That is a great advantage.
-Oscar Wilde

1. Sound in Music

The most basic element of music is sound. But sound has different definitions depending on the perspective of the living organism that senses it.[73] To the physicist, sound is nothing more than vibrations—of or in matter, including air molecules. A physicist can precisely measure quantities and qualities of sound.[74] In contrast, to the psychologist, sound—which registers as vibrating air molecules on human ear drums—is a kind of experience, "a sensation" that the brain extracts from its environment. Not all living creatures sense sound as vibrations, identically. To the cricket, the "sound" of certain frequencies of its colleagues' rasping

72. ROBERT JOURDAIN, MUSIC, THE BRAIN, AND ECSTASY 4 (1997). Strangely enough, in relation to music, the thirteenth century alchemists and the Hermetic philosophers, "assigned great importance . . . [to] pattern, and beyond pattern, meta-pattern, higher orders or modes of shape which expressed themselves through the lower order media of music." R.J. STEWART, MUSIC AND THE ELEMENTAL PSYCHE 64, 124-25 (1987).

73. *See generally* JOURDAIN, *supra* note 72, at 2-4.

74. For a comprehensive explanation of the physics and engineering aspects of music, see HARRY F. OLSON, MUSIC, PHYSICS, AND ENGINEERING (2d ed. 1967). *See also* ROBIN MACONIE, THE CONCEPT OF MUSIC 30-38 (1990) [hereinafter MACONIE, CONCEPT].

legs registers as vibrations on thinnings of its front knees. Thus, a cricket's experience of sound is "soundless" by human standards. To a bird, the sounds of its colleagues' noises consist of many frequencies. Birds search for patterns of repetition of frequencies and are able to recognize each other's individual voices—even regional dialects. Whales, similarly, engage in half-hour-long chants of monotonous repetition. But crickets, birds, and whales have no experience of music. Only human beings *experience* music. It is our brains, not theirs, that can relate their sounds to the concept of music.[75]

Sound has been described as a pure event, but some sounds are also processes.[76] And, it is true that we can locate these pure events in space. For example, we can recognize sounds as being nearby or far away.[77] Another characteristic of sounds are that they are arranged on the pitch spectrum, which, similar to the color spectrum, is a continuum. A physical truth about sounds is that between any two discriminable pitches there lies a third, which may not be discriminable. In comparing sounds to colors, one expert has noted:

> Like the colour spectrum, [the sound spectrum] has salient points and thresholds. Orange shades into red: but orange and red are *different colours*. Orange is not a shade of red, nor red a shade of orange. Likewise one pitch shades into the pitch a semitone above: but, having got there, we recognize the new pitch as another pitch. In between the two we are likely to think of an 'out-of-tune' version of either.[78]

Sound is just one aspect of music. Music, as we shall see, is much more than mere sound.

2. *Sound in Mediation*

In mediation, sound is information—both auditory and visual—from any source. Mediation sound includes both relevant and irrelevant information (it can be nearby the topic at hand, or far away), and it has different definitions depending on the perspective of the person who senses it. To the disinterested observer unfamiliar with the subject matter or context of a particular mediated dispute, mediation sound, initially at least, often seems to be nothing more than an oscillation of contentions based on contradictory facts and/or conflicting prescribed norms. This disinterested observer can objectively measure quantities and qualities of this informational sound. If asked, this person could evaluate and categorize it in relation to some prescribed norm. This, in essence, is what a judge or arbitrator does in relation to informational sound. In contrast, to the experienced, generalist mediator, mediation sound—which initially registers as oscillating contentions—is a kind of experience—a sensation triggering recalled similar situations—that the mediator's brain extracts from the environment of memory.

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75. *See* STORR, *supra* note 2, at 4-5.
76. SCRUTON, *supra* note 44, at 9.
77. *Id.* at 10.
78. *Id.* at 15 (emphasis in original).

In mediation and arbitration, the sounds (information provided by both/all parties), like musical sounds and color, lie on a spectrum from totally implausible (or untrue) to highly plausible (or true). In mediation, between any two opposing contentions (comprised of information) lies at least one more contention that may not be discriminable by the disputing parties. However, it may be discriminable by the mediator. It is this contention that may be the sound that is most satisfying, even though it may seem "out-of-tune" with the primary sounds (contentions) of the disputing parties.

Not all mediators sense informational sound identically. To the purely evaluative mediator, the oscillations of the parties' contentions register as a request for an opinion. On the other hand, this purely evaluative mediator's experience of mediation sound is "soundless" by the standards of a purely facilitative or purely transformative mediator. The latter two types of mediators know that the initial mediation "noises" actually consist of many frequencies, most of which are totally obscured by the predominant informational oscillations. These two types of mediators search for patterns of similar frequencies and are able to recognize individual voices—even aligned voices. Mediation, however, is much more than the recognition, by the mediator, of mere informational sound.

C. Tone

Through vibration comes motion;
Through motion comes color;
Through color comes tone.
-Pythagoras

1. Tone in Music

Leonard Bernstein, in a lecture at Harvard, once remarked: "I believe that from that Earth emerges a musical poetry which is by the nature of its sources tonal."[79] Tone, as an element of music, is formed from a particular pattern of sound, "produced only by the vibration of certain simple shapes."[80] Though wind may "whistle" and brooks may "babble," these sounds are generally thought to be noise. The vibrating shapes that produce tone rarely occur naturally.[81] Simple man-made shapes of matter often make beautiful sounds because they vibrate in simple ways.[82] As one expert has noted:

> Consider a guitar string. When it's plucked, the entire string swings back and forth at a particular frequency—say, 100 cycles per second. If you hold down the string at midpoint so that it's divided into two segments half as long, each segment vibrates at a frequency that's twice that of the

79. STORR, *supra* note 2, at 57 (quoting Leonard Bernstein, Charles Eliot Norton Lecture at Harvard (1973).

80. *See* JOURDAIN, *supra* note 72, at 31. *See generally* SCRUTON, *supra* note 44, at 19-79.

81. The human voice is an exception. As one author has noted: "[P]ull a thin sheet of tissue taut and excite it by a steady flow of air. Shape it just right, adding resonating chambers above, and you've got the voice of Pavarotti." SCRUTON, *supra* note 44, at 32.

82. *Id.*

> whole string, or 200 cycles per second. Similarly, dividing the string into thirds gives triple the original frequency, fourths gives quadruple the frequency, and so on.[83]

Thus, shorter string lengths produce higher frequencies. However, even when a guitar string is undivided and plucked, its top and bottom halves vibrate independently at double the *fundamental* frequency—the frequency at which the undivided whole string vibrates. These independent vibrations are called *overtones* (or harmonics, or partials). A perfect or ideal string would produce an infinite number of overtones, but most sounds deemed musical produce twenty or fewer overtones. A tone, as an element of music, results when sounds are arranged in an orderly pattern of overtones. Pleasing tones in music have a mathematical basis. As one expert puts it:

> Consider all notes named "A" on a piano keyboard. The A found two octaves below middle C has a frequency of 110 cycles per second. Frequency doubles from octave to octave, so an octave higher the frequency is 220, then 440, then 880. . . . [A]ll multiples of a base frequency have the same quality, the same "aura." Even to untrained ears, all A's resemble each other, and so do all C's and G's and B-flats.
>
> ***
>
> Because musical tones are constructed from orderly sequences of overtones, every note is actually a *chord*, one that ranges across several octaves above a note's fundamental frequency. Yet our brains register only a single entity. This happens partly because most of a tone's energy usually lies in the fundamental, and partly because the fundamental is buttressed by the most important overtones.[84]

Resonance is defined as "a harmony of likeness, and a harmony of difference."[85] Besides the frequencies of tones and overtones, the resonance of originating frequencies plays a key role in producing music. Every object has resonant frequencies. Some objects are massive and stiff, which causes them to repel sound; other objects are more flexible. Massive objects resist rapid vibration and tend to resonate at low frequencies; smaller objects tend to resonate at high frequency. When sound approaches an object, the sound consists of many frequencies. The object's resonant frequencies tend to be sustained, while other frequencies tend to be damped.[86]

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83. *Id.*

84. *Id.* at 33.

85. ROBIN MACONIE, THE SECOND SENSE: LANGUAGE, MUSIC, AND HEARING 175 (2002)[hereinafter MACONIE, SECOND SENSE].

86. JOURDAIN, *supra* note 72, at 35-36. *See also* DIANA DEUTSCH, THE PSYCHOLOGY OF MUSIC 89-93 (1999). The perceptual attributes of singe tones are pitch, loudness, and timbre. *Id.* at 93-102. The perceptual attributes of simultaneous tones are: (1) beats and roughness; (2) combination tones; and (3) dissonance and consonance. *Id.* at 103-09. *See generally* ROBERT W. LUNDIN, AN OBJECTIVE PSYCHOLOGY OF MUSIC 9-64 (3d. ed. 1985).

2. Tone in Mediation

In mediation, parties and their lawyers are the musical instruments that produce mediation sound. Particular patterns of mediation sound are called tones. Mediation tones are of three types: high frequency—legal positions (and/or high emotions); mid-frequency—bargaining positions (and/or moderate emotions); and low or fundamental frequency—the basic needs of the parties (low emotion). There are seven categories of basic needs or fundamental mediation tones: physiological, safety and security, love and belonging, esteem, self-actualization, to know and understand, and aesthetic.[87] All mediation tones are constructed by orderly, though often indiscernible, sequences of overtones—the parties' underlying interests. These interests can range across the bargaining and legal positions of the parties, but are commonly not separately identifiable in those ranges because they energize and buttress the seven fundamental mediation tones. A perfect dispute situation could produce an infinite number of interests (overtones), but most mediation sounds deemed tonal that recur in dispute contexts number in the range of thirty or fewer. These recurring interests (overtones) are identified in the table below.

TABLE OF INTERESTS

Time	Words	Secrecy
Place	Apology	Release
Quantity	Control	Reinstatement
Quality	Persons	Assurances
Size	Nature	Procedure
Context	Structure	Opportunity
Distance	Types	Guarantee
Responsibility	Volume	Publicity
Rate	Proportion	Security
Space	Exchange	Share

Of course, many of these interests (overtones) shown above can manifest themselves differently, depending on the dispute context and on the nature of the fundamental need (tone) to which they are related. For example, consider the items in the above table metaphorically—that is, in the broadest sense possible. Thus, in the mediation of a business dispute, "volume" could refer to tripling a marketing effort (i.e. turning up the volume of the corporate message), or decreasing the amount of production output, or increasing the amount of storage space in a warehouse. "Rate" could refer to frequency of occurrence, or a commission or discount, or an evaluation of products, services, or performance, and so on.[88]

Resonance of the above-described tones and overtones in mediation plays a key role in producing the music of mediation. Every participant in a mediation has resonant properties. Some participants (e.g., multi-national corporations) are massive and stiff, which may cause them to repel mediation sound of other participants; still other mediation participants may be flexible. When mediation

87. These basic needs were identified by Professor Abraham Maslow of Brandeis University, in his book, MOTIVATION AND PERSONALITY 80-106 (1954).

88. *See generally* COOLEY, HANDBOOK, *supra* note 35, at 221-22.

sound approaches a participant, the sound often consists of many mixed frequencies in terms of substantive and emotional issues. Massive and/or powerful participants tend to resist rapid vibration (others' legal positions) and are more likely to resonate with other participants in lower frequencies, where their and other participants' basic needs (including the need for a bargained result) are at stake. Mediation participants with little power tend to resonate at high frequency when matters of emotion are involved. When mediation participants interact, their dominant, separate resonant frequencies (e.g., process preferences and issue priorities) are identified and tend to be sustained through the help of the mediator, while other less dominant or inconsequential frequencies tend to be damped.

D. Melody

Give me a laundry list and I'll set it to music.
-Gioacchino Antonio Rossini

1. Melody in Conventional Tonal Music

Melody has been simply defined as "a series of tones that make sense."[89] However, this simple definition belies its complexity as an element of music. It actually consists of several principal musical dimensions, including tonal contour, harmony, rhythm, and thematic pattern.[90] Tonal contour and thematic pattern are addressed here. Harmony and rhythm are addressed in section V. E. and F., *infra.*

As to tonal contour, the human brain "understands the world by reducing perceptions to categories, and it recalls past experience by reconstructing it from categorical memory."[91] Both to create a new melody and to recognize one as previously created, a person needs to understand how tones are categorized in scales and to know how to recognize (*re*-cognize) tones, that is how to discern tones experienced previously and to perceive them as a distinct entity.[92] Before we can understand tonal contour, we first must understand the musical scale, which has been described as "the most basic form of melody."

A musical scale is a system of tonal categorization.[93] It provides a unit of measure for pitch (rather than geographical) space.[94] The human brain can readily discriminate the difference between about thirteen hundred pitches within the range of frequencies of musical tones.[95] In Western (e.g. European, American)

89. STORR, *supra* note 2, at 170.

90. JOURDAIN, *supra* note 72, at xiv, 79-83. *See also* LUNDIN, *supra* note 86, at 65-86. *See generally* GEORGE THADDEUS JONES, MUSIC THEORY 101-12 (1974).

91. JOURDAIN, *supra* note 72, at 65. *See also* DEUTSCH, *supra* note 86, at 68-75; MACONIE, SECOND SENSE, *supra* note 85, at 111-13.

92. JOURDAIN, *supra* note 72, at 63-66.

93. *Id.* at 66. *See also* DEUTSCH, *supra* note 86, at 215-55.

94. JOURDAIN, *supra* note 72, at 66. It has been said that "a sense of pitch, of relationship, comes . . . from an inner quality of proportion, beauty and intuition." STEWART, *supra* note 72, at 61. *See also* DEUTSCH, *supra* note 86, at 93-108.

95. JOURDAIN, *supra* note 72, at 64. One does not need to have the skill of absolute (or perfect) pitch (the ability to identify precise frequencies) in order to comprehend music. Thus, it is possible a person to begin on a different pitch every time he or she sings "Happy Birthday to You" yet still sing "in key" relative to the starting point. *Id.* at 66, 112.

music, the basic unit of pitch space is a half-step (or semi-tone), and every key on a piano keyboard represents a half step between adjacent keys.[96] On the piano, from C to C-sharp is a half-step, just as is the interval from E to F.[97]

Thus, tonal or melodic contour is a concept that seeks to explain why some melodies give pleasure and others do not.[98] There are a near-infinite number of melodies that could be created from Western-constructed scales and an 88-key piano keyboard. Principles developed by Gestalt psychologists at the beginning of the 20th-century have provided musicologists rules to determine which of these near-infinite possibilities are pleasing to the ear—at least the Western ear. The principles that the Gestaltists derived to explain how humans make sense of the world visually also explain how we mentally assemble melodic fragments into whole songs or tunes. For example, the Gestaltists' Law of Completeness holds that the human mind prefers complete patterns (in music, smooth contours). Their Law of Good Continuation holds that the human mind will automatically unite two lines lying along the same trajectory (in music, uniting melodic fragments). It has been said that "melodies that consistently contradict these [Gestalt] laws are not found anywhere in the world."[99]

A theme or thematic pattern, while not a melody in itself, consists of melodic fragments that, collectively, are not well defined or easily recognizable. Such thematic patterns, often interwoven in a type of melodic tapestry, occur both in classical music and jazz.[100] Melodic fragments have no intrinsic harmonic life of their own; they must rely on the support of accompanying chords. Thematic patterns can only be discerned by persons having a good ear for harmony and a good memory capable of retaining melodic fragments over several bars to identify melodic relations. Listeners often say that classical music "has no melody;" in part, this is true because the melodic relations of thematic patterns take special skills and experience to discern. Composers, the musicologists contend, become less "melodic" and more "thematic" as they grow older and take on more ambitious and complex projects.[101]

What are the components of a good melody? To a great extent, the answer to this question is guided by individual taste, but here are some criteria that are thought to be important considerations for musical composers:

- select melody tones from the seven-tone scale upon which the melody is based; if the other five (chromatic) tones in the scale are used, deemphasize them;
- minimize large jumps in scale tones; rarely, if ever jump to a chromatic tone;
- do not repeat individual tones too much, particularly at emphasized portions of a melody;
- place harmonic resolutions at points of rhythmic stress in a melody;

96. *Id.* at 66. Scales of twenty-two steps occur in India and twenty-four step scales are prevalent in the Middle East. *Id.* at 74.

97. *Id.* at 66.

98. *Id.* at 80.

99. *Id.*

100. *Id.* at 81-82. *See generally* TERENCE MCLAUGHLIN, MUSIC AND COMMUNICATION 79-100 (1970).

101. JOURDAIN,, *supra* note 72, at 83.

- change melodic direction at rhythmically important junctures;
- normally limit to one instance each, a melody's highest tone and its lowest tone.[102]

No set of music composing rules is universal. While avoiding the above rules may help to identify what many people would agree are "bad melodies", the rules cannot always predict the good ones. Sometimes a pleasing, durable melody results from a direct violation of one or more of the above rules. Unusual, nonstandard approaches can, on occasion, yield a widely pleasing melody. One such melody in popular music that immediately comes to mind is "One Note Samba" penned by the famous Brazilian composer Antonio Carlos Jobim. This melody, played as sequenced tones without supporting rich chord structures and changes, is very monotonous and drab. It is the dimension of harmony-supplied thematic pattern that converts this tune from a bad melody to a good one. Similarly, other of the above melody-composition rules may be violated, yet still produce good melodies, by appropriate applications or manipulations of the four dimensions of melody—tonal contour, harmony, rhythm, and thematic pattern.[103]

2. *Melody in Mediation*

In mediation, melody consists of themes, metaphors, and stories.

a. Themes

A theme in mediation is a verbal distillation of a dispute into one or more key strategic descriptions that will encapsulate the position of the party and the thrust of the negotiations. Just as the development of a good trial plan includes the creation of a theme of the case, designing a good mediation plan similarly requires that the advocates generate a theme or themes which attempts to capture the interest of the mediator. Some examples of themes which advocates might present in the mediation of personal injury cases are:

From the plaintiff's point of view:

Major theme—the defendant made a sudden turn directly in front of the plaintiff who never had a chance to avoid the collision.

Minor theme—plaintiff was thrown sixty feet from her motorcycle, and slammed into some thick bushes.

Minor theme—plaintiff had permanent head injuries, a broken knee, and was not able to graduate with her college class. Her medical expenses were in excess of $300,000.00.

From the defendant's point of view:

Major theme—the plaintiff was driving 20 miles per hour over the speed limit and the defendant had no opportunity to see her.

Minor theme—motorcycles are inherently dangerous and motorcyclists should slow down at busy intersections.

Minor theme—the law required plaintiff to wear a helmet and she was not complying with the law at the time of the accident.

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102. *Id.* at 85-86.

103. *See generally* MCLAUGHLIN, *supra* note 100, at 86-87.

Minor theme—the plaintiff was flunking out of college at the time of the accident and would not have graduated with her class anyway. Her head injuries, though serious, are not permanent.[104]

As is evident from the above example, mediation themes focus on points of disagreement between the parties. They foster the advocates' concentration on presenting evidence and arguments to the mediator—and to each other—that go to the very essence of the dispute. And most importantly, they provide the mediator with information that can be used to facilitate a realistic and reasonable settlement. Good mediation preparation requires that advocates not only develop their own themes (melodies), but also that they anticipate their opponent's counter-themes and prepare replies to those counter-themes. Themes in mediation should be realistic and consistent, and supported by the facts and law pertinent to the case. As with melody in music, themes in mediation are often most appealing and effective when the listener can relate to, or identify with them, as something familiar or predictable.

b. Metaphors

Metaphors are also the melodies of mediation. They are used both by advocates and mediators. As Professor Michelle LeBaron has said:

> Metaphors . . . convey flavor, texture, sensation, and perspective. They reveal ways we make sense of our lives, sometimes heightening our differences, sometimes emphasizing our commonalities.
>
> Metaphors are more than poetic ways of looking at what we do. They are windows into who we think we are, our purpose, and our approach. . . . [They] are powerful tools for third parties who understand and use them artfully. They help make explicit what are otherwise hidden: assumptions, perceptions, judgments, and worldviews.[105]

Professor LeBaron also points out that one of the primary uses of metaphors by mediators and mediation participants is promoting constructive communication. For example, metaphors can set a positive climate or tone, communicate meaning and shades of meaning or emphasis, reveal symbolic issues, and clarify communication. She provides an example of the use of metaphor to reveal symbolic issues in a conflict over forestry by a participant who said: "If we keep going the way we're going, we're going to hit the wall." Among other things, this choice of metaphor communicated strong feelings and also raised questions such as: "What form would the wall take?" "When might we hit it?" "How would hitting it look?" "Could we avoid hitting it, and if so, how?" In explaining his use of this metaphor, the participant explained his worries about development,

104. *See* GEORGE P. HALDEMAN, ALTERNATIVE DISPUTE RESOLUTION IN PERSONAL INJURY CASES § 5.3 (1993). *See also* COOLEY, HANDBOOK, *supra* note 35, at 158-60; ROGER SCHWARZ, THE SKILLED FACILITATOR 69-70 (2002) (discussing "theories of action").

105. MICHELLE LEBARON, BRIDGING TROUBLED WATERS: CONFLICT RESOLUTION FROM THE HEART 183-84 (2002).

road building, and human impact in wilderness areas. The worries concerned the symbolic importance of forests as legacies for future generations. These concerns may have remained hidden had the participant not used or explained his metaphor.[106]

c. Stories

Finally, stories in mediation correlate to melody in music. As Michelle LeBaron points out:

> Stories connect us to other times, helping us to make sense and meaning of our lives. They carry hope, values, choices, and reasons. Stories give our lives place, identity, and context; they communicate this to others. They connect us in relationship through content, feeling, and meaning. Often the feeling and meaning linger long after the content has faded from our memories. They help us build relationships, and they also trace the contours of the ruptures and crevices that divide us from others. Stories are always present, both in conflict and in harmony. They can be barriers to resolution. They can be resources for change. It all depends on how we construct, tell, and receive them.[107]

E. Harmony

The moment of passage from disturbance into harmony
is that of the intensest life.
-John Dewey

1. Harmony in Music

Harmony results from the design of tones around tonal centers of a given key.[108] A tonal center is the first tone of the scale that underlies the prevailing harmony (key).[109] It is an anchor point—a pull of gravity so to speak—by which the mind measures and compares all tones, intervals, and chords.[110] For example, the tone C is the tonal center of the key of C major in the seven-tone C-major scale (C D E F G A B), and in particular the tones of the C-major triad—the first, third, and fifth tone of the scale (i.e., C E G). Chords that are compatible with the key of C major tend to be comprised of the seven tones of the C-major scale. The first, third, fourth and fifth tones of a scale appear more often than the other tones in a seven-tone scale. The tonal center establishes the probabilities that predict which tones are most likely to follow a given tone. For example, the last tone of a seven-tone scale (say E in F major) tends very strongly toward the scale's first

106. *Id.* at 196-98.
107. *Id.* at 220.
108. JOURDAIN, *supra* note 72, at 118. *See generally* MACONIE, CONCEPT, *supra* note 74, at 103-12.; THEODORE M. FINNEY, HEARING MUSIC: THE ART OF ACTIVE LISTENING 63-76 (1941).
109. JOURDAIN, *supra* note 72, at 342.
110. *Id.* at 105.

tone, F. These probabilities, thought to be determined by the Pythagorean mathematical relationships, tend to make certain chord changes seem inevitable to Western ears. In some music, the tonal center is maintained by a drone—an instrument that sounds the tonal center throughout the work. A cello, bassoon, and Scottish bagpipes frequently perform this function.[111]

Keys (seven-tone scales) that are comprised of mostly identical tones are "close" in tonal center and thus "consonant"; keys that have many unlike tones are considered "far" in tonal center and "dissonant". Consonance is harmony "in which simultaneous sounds 'go well' together with minimal tension."[112] The C-major and G-major scales have only one tone that differentiates them. The same is true of the C-major and F-major scales. Little tension is therefore created in moving between C-major and either of the other two scales. In contrast, the C-major scale and the F-sharp major scale have only two tones in common, and therefore, transitions (or modulations) between them seem dissonant.[113] One author defines the effects of modulation as follows:

> Modulations allow the creation of whole musical regions under the governance of different centers of gravity; it becomes possible, with modulation, not just to shift ground but to create large-scale relations between different grounds. Thus, we sense tensions not only within a key—that is, within a universe determined by a particular tonic—but also between that universe and another determined by a different key. . . . [One] chord may become . . . [another]; as it does, new relations are created between all tones.[114]

Dissonance has been defined as harmony "in which simultaneous sounds are 'discordant' and demand resolution to consonance."[115] Tones close in frequency are dissonant.[116] In lower frequency ranges (at the bottom of the piano keyboard), tones need to be farther apart to avoid dissonance. There, tones even as much as a fifth apart (seven half-steps) are dissonant. One kind of dissonance is called beating. This phenomenon occurs when two or more sounds are combined and the moments of their maximum intensity are out of sync. Interactions of overtones or tones whose frequencies are out of sync increase the overall dissonance, especially in lower frequency ranges.[117] Another kind of dissonance is structural, arising from the harmonic relations between tones of the scales. Some combination of chords that almost always sound dissonant may occasionally sound consonant, depending on their context.[118]

Of the many possible combinations of simultaneous tones, the triads are especially consonant. Triads are the heart of harmony in the music of Western culture. As noted above, a triad consists of the first, third, and fifth tones of the prevailing

111. *Id.* at 106.
112. *Id.* at 336. *See generally* DEUTSCH, *supra* note 86, at 67-75.
113. JOURDAIN, *supra* note 72, at 107.
114. ROTHSTEIN, *supra* note 39, at 112-13.
115. JOURDAIN, *supra* note 72, at 337. *See also* ALAN DURANT, CONDITIONS OF MUSIC 72-85 (1984); LUNDIN, *supra* note 86, at 91-102; SCRUTON, *supra* note 44, at 63-68.
116. JOURDAIN, *supra* note 72, at 101.
117. *Id.* at 102.
118. *Id.* at 103.

harmony. Thus, in the key of C, the C-major triad—the first, third, and fifth tone of the scale (i.e., C E G) is especially consonant. Each key (seven-tone scale) has three primary triads that are built on the first, fourth, and fifth tones of the scale. In the key of C, the primary triads are C E G; F A C; and G B D. Their complements in the key of C are built on the sixth, second, and third scale tones. Thus, the complement triads are A C-sharp E; D F-sharp A; and E G-sharp and B. The seventh tone (B) is neither the initial tone of a primary triad nor a complement. The seventh tone's triad (B D-sharp F-sharp) incorporates two tones not in the seven tone scale, is dissonant, and implies a desire to resolve to the scale's tonal center—C. A chord's return to the tonal center is called "cadence". The process is similar to the resolution of a suspenseful segment in fiction-writing.[119] The primary triads provide a grid overlaying the scale, permit fluid movement among the primary triads and their complements, and furnish the structure by which harmonic movement can be accomplished.[120]

Harmony in music is said to be analogous to space in painting.[121] It has also been described as music's third dimension—depth—in reference to painting, pitch being the height dimension, and time the breadth dimension.[122] Debussy experimented with the whole tone scale and Schoenberg probed atonal music—which sought to discard tonal centers entirely, and to equalize the use of every tone in the twelve-tone chromatic scale. While not every listener can appreciate these creative ventures countering the essence of modern harmony, these ventures challenge rigid-pattern thinking and hold promise for propelling harmonic innovation into unexplored realms.[123]

2. *Harmony in Mediation*

In mediation, most disputes involve both compatible interests as well as conflicting ones.[124] The pursuit of harmony in mediation involves identifying the "tonal centers" in the information presented—i.e. identifying the important compatible interests of the parties and minimizing the dissonant effects of the conflicting ones. As Christopher Moore points out, there are both direct and indirect procedures for identifying the true interests of the parties.[125] Once identified, they fall into one of three categories: "mutually exclusive in that satisfaction of one party's needs precludes satisfaction of another party's interest; mixed in that the parties have some compatible and some competing interests, or compatible in that they have similar and nonexclusive needs."[126] The parties stated positions often masquerade as their interests, when in fact a minor move off a position (a small or

119. *Id.* at 105.
120. *Id.* at 108.
121. *Id.* at 92. *See also* MACONIE, CONCEPT, *supra* note 74, at 75-83; MACONIE, SECOND SENSE, *supra* note 85, at 101-17.
122. JOURDAIN, *supra* note 72, at 93.
123. *Id.* at 96-100. Modulation is an important technical devices in creating musical variety. It means the change from one tonal center to another. *See* OTTO KAROLYI, INTRODUCING MUSIC 81-83 (1991).
124. CHRISTOPHER W. MOORE, THE MEDIATION PROCESS: PRACTICAL STRATEGIES FOR RESOLVING CONFLICT (3d ED. 2003) 256.
125. *Id.* at 255.
126. *Id.* at 262.

"chromatic" concession) by a party may result in a compatible accord. Mediators can assist the parties to achieve harmony by framing joint-problem solving statements to test the simultaneous sound of the parties expressed interests. A suggested protocol for accomplishing joint framing by mediators is as follows:

1. Clearly identify in your own mind the interests for all parties.
2. Restate each party's interests and get confirmation that you are correct in your understanding.
3. Publicly restate the interests of both parties in a joint-problem statement ("We are looking for a mutually acceptable solution that does X for party A, and Y for party B").
4. Ask the parties if this description of the problem and the parties' interests is accurate [rings true]; if not, ask them to modify or restate it until it is mutually acceptable [in harmony].[127]

F. Rhythm

Who can deny that the Queensborough Bridge is the work of the creative artist? It never fails to give me a poignant desire to capture the noble cadence of its music.
-Helen Keller

1. Rhythm in Music

In antiquity, Plato wrote that rhythm results from bringing the fast and slow which are first in opposition, into agreement.[128] In the twenty-first century there are two prevalent notions of rhythm. The first, and by far the predominant notion, is that it consists of patterns of accentuated beats. This type of rhythm is also known as meter and is sometimes referred to as instrumental. The second modern notion of rhythm is a type of unmetric, nonevenly spaced beats of organic movement. An example of the second type of rhythm is unmetric beats of human speech. This second type is also referred to as "vocal" because it originates in song, and thus from speech. Music requires both types of rhythm—meter and phrasing. Meter provides order to time in music; phrasing imparts narrative to music. Generally speaking, meter organizes musical time on the small scale, phrasing on the large scale.[129]

a. Meter

A human's discernment of pitch intervals that establish a sense of key is similar to discernment of durations of sound and the sound patterns, and patterns of patterns (rhythm) thus formed. However, there is an important difference. As to

127. *Id.* at 265.

128. Plato also said that "[r]hythm . . . was given us from . . . [a] heavenly source to help us . . .; for most of us lack measure and grace." STORR, *supra* note 2, at 44. *See generally*, PHILIP SEYER, ALLAN NOVICK, & PAUL HARMON, WHAT MAKES MUSIC WORK 27-43 (1982).

129. JOURDAIN *supra* note 72, at 124. *See generally* LUNDIN, *supra* note 86, at 103-05; DEUTSCH, *supra* note 86, at 75-80; SECOND SENSE, *supra* note 85, at 203-19.

rhythm, while it is simple to categorize notes (one whole note equals two half notes; a quarter note equals two eighth notes, etc.), there are no fixed notions of temporal duration as there are for pitch distances. In one composition, an eighth note may last a half second in duration; in another, a tenth of a second. The mind must flexibly accommodate the need to alter meter, depending on the music's tempo (a concept discussed below).

At the heart of meter is pulse, defined as "an unceasing clock-beat that rhythmic patterns overlay."[130] Just as harmony demands a constant repetition of tonal centers, meter requires constant reiteration of the underlying pulse. When every pulse is as loud as every other, music can sound flat and lifeless. To make music interesting, pulses can be accented.

The concept of tempo needs to be distinguished from meter. Tempo is music's rate of flow.[131] The personality of a composition can be significantly altered by changing its tempo by ten percent. Tempo can affect the mechanics of music perception. When the tempo of music is increased, listeners may miss details; when tempo is slowed, listeners may not be able to mentally grasp groupings of melody, harmony, and meter. Tempo is perceived differently, depending on the accents placed upon notes. For example, even though the same number of notes are played, tempo will seem faster to a listener when every second note is accented in comparison to when every fourth note is accented. When a train pulls slowly into a station, an observer can see and study every window; when a train speeds by a station, an observer can only see a blur of rail cars. This occurs similarly in music when its tempo is speeded up or slowed down. The deep relationships prevalent in music can be literally destroyed, if the music is played or performed in an inappropriate tempo.[132]

b. Phrasing

Phrasing is very different from meter. As one expert notes, "[m]eter is brick; phrasing is poured concrete."[133] Phrasing is a kind of rhythm, because like meter, it maps the flow of time in music. Meter is regular and predictable; phrasing is more concerned with meaningful rather than mechanical flow of beats. One expert provides this example to explain the importance of phrasing:

> To understand the importance of meaning in [musical] phrasing, consider what happens when the rhythm of speech is upset. Instead of "Four score . . . and seven years ago . . . our fathers . . . brought forth . . ." the words might come out as "Four . . . score and seven years . . . ago our . . . fathers brought . . . forth . . ." It's immediately obvious what's wrong here. Words that combine to form larger meanings aren't spoken together. "Years ago" means something; "ago our" does not. So when we talk about the rhythm of speech, we're talking (partly) about cutting up the flow of words into meaningful groupings. The same is true of musical

130. JOURDAIN, *supra* note 72, at 126.
131. *Id.* at 141. *See also* SEYER, NOVICK, AND HARMON, *supra* note 128, at 44-68.
132. JOURDAIN, *supra* note 72, at 142-43.
133. *Id.* at 130. *See also* MCLAUGHLIN, *supra* note 100, at 41-43.

> objects. Wrongly phrased music disintegrates just as assuredly as music played in the wrong meter.[134]

Phrasing relies on markers—subtle pauses, accentuated openings, melodic embellishments. These herald the beginning of one phrase or subphrase and the termination of another. Through phrasing, a composer gives his or her meaning to music, much as an artist lays out an abstract scene on canvas.[135] It has been said:

> Music is a temporal art. Its patterns exist in time and require duration for their development and completion. Although painting and architecture and sculpture make statements about relationships between space, objects, and colours, these relationships are static. Music more aptly represents human emotional processes because music, like life, appears to be in constant motion.[136]

Musical form, discussed in more detail in relation to composition, *infra,* is a type of large scale phrasing. Much music—classical and popular alike, uses an AABA form, meaning that it presents itself as a certain number of bars in an A theme, and then the A theme is repeated and followed by a new, but related, theme in a B form (sometimes called a bridge in popular music), and then the themes are resolved in a final A form. As one expert notes, "[i]n music, it is phrasing that reaches farthest across time to encompass the deepest relations. Thus ingenious phrasing and form, rather than metrical complexity, are extolled as the apogee of musical composition."[137] In essence, power resides much more in phrasing than in meter.[138]

2. Rhythm in Mediation

As Christopher Moore observes, "[t]iming is a critical component in final bargaining and settlement" and deadlines "are limits that delineate the period of time in which an agreement must be reached."[139] Deadlines can help to establish the rhythm of a mediation. According to Christopher Moore:

> Mediators can assist parties in enhancing positive use of deadlines in several ways. First they can help parties to design offers that contain fading opportunities. They can also create artificial mileposts by which to measure progress before the ultimate deadline is reached. Each milepost marks a certain number of benefits that an opponent will receive if he or

134. JOURDAIN, *supra* note 72, at 131.
135. *Id.* at 132.
136. STORR, *supra* note 2, at 79.
137. JOURDAIN, *supra* note 72, at 133.
138. *Id.*
139. MOORE, *supra* note 124, at 323. *See also* BARBARA GRAY, COLLABORATING: FINDING COMMON GROUND FOR MULTIPARTY PROBLEMS 265 (1989).

> she settles at that time. The longer the settlement is delayed, the fewer benefits are offered.[140]

The mileposts in mediation may be compared to meter in music, and the ultimate deadline, the phrasing in music.

Culture can also play a significant role in frustrating the rhythm of mediation. It often significantly influences how parties view time, and consequently deadlines. For example,

> [w]hen disputants are out of sync in their sense of time and timeliness, additional conflicts may result. . . . When working in intercultural disputes, mediators need to become aware of the expectations that parties may have for the use of time and deadlines . . . . Mediators may need to act as cultural interpreters of time and timing to coordinate parties' activities in the context of time.[141]

Having now considered the five basic elements of music and having analyzed their relationships to mediation, it is appropriate to consider four high order applications of the human sensory system to these basic elements, including: composition, performance, listening, and understanding. Since the effective mediator must perceive and comprehend these four high order applications, it is to these topics we now turn.

G. Composition

When music fails to agree to the ear to soothe the ear, the heart and the senses, then it has missed the point.
-Maria Calas

1. Composition in Music

Music composers require a number of specialized skills and abilities. Among them are a vast knowledge of musical patterns, a deep understanding of standard musical forms, natural or developed semantic and episodic memory abilities, a skill in communicating emotion through tones and patterns of tones, an openness to receive inspiration, and a talent to confound expectations. They should also have knowledge of the information theory of music.[142] These skills and abilities are discussed separately *infra*.

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140. *Id.* at 330-31.

141. *Id.* at 331-32.

142. This topic could also be discussed under the headings of "Performance," "Listening," and "Understanding," *infra*. It is discussed here under the heading of "Composition" because the speaker in a mediation must mentally "compose" before he or she "performs" (speaks). Also, it has been said that:

> both composer and listener are in a structural conflict with the performer. . . . [S]imilarities between composer and listener do not make them "allies" (to continue the conflict metaphor); the composer is a specialist while the listener more likely than not is a generalist. The more advanced the composer's skills, the greater the difficulty with which understanding comes to the listener.

a. Knowledge of Musical Patterns

The American composer, Henry Cowell, once said, "The most perfect [musical] instrument in the world is the composer's mind."[143] Musical composers think in sound and are usually very skilled in auditory imagery—a sort of sound perception in the absence of sensation. They are able to manipulate tones in their minds as writers are able to manipulate words.[144] The composer's hierarchy of knowledge is an accretion in memory of his or her musical experience. As one expert notes:

> In certain respects a composer's memory resembles a chess master's. Both carry around a vast library of patterns that can be combined in myriad ways to produce one-of-a-kind compositions or chess matches. And both can recall long sequences of these patterns, remembering every chord of a composition or even every move of a match. Both are also famed for their imagery skills, whether it be Mozart composing an opera in his head, or Koltanowski playing thirty games at once while blindfolded.[145]

Research shows that chess masters have about fifty thousand patterns in their mental archives; a musical composer has also tens of thousands of patterns or musical devices in mental storage.[146] Many composers have little or no conscious knowledge of formal rules of composition; rather they are able to employ them instinctively. Musicologists believe that most great musical composers begin writing worthwhile music only after a decade of practice.[147]

For a chess master, studies have revealed that the mental representation of a chess position is not a copy of the physical board, rather it is an abstract structural description of the meaningful *relationships* between groups of pieces. Years of experience allows the chess master to rapidly identify frequently occurring strategic patterns from the input information. The experienced musician or composer becomes familiar with many regularly occurring pattern (e.g., chords, scales, and arpeggios) and the music master can make use of all this patterning when composing or performing a piece of music.[148]

In addition to the ability to remember musical patterns, the composer must be able to form, shape, and balance these patterns. This has been said to be the basic art of music composition.[149] The basic patterns of musical experience can be analyzed into patterns of tensions and resolutions. As observed by one expert:

> The units of the patterns may be as short and simple as the two-chord tension/resolution of a cadence, or they may add up to a structure as

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FABIO DASILVA, ANTHONY BLASI, & DAVID DEES, THE SOCIOLOGY OF MUSIC 36 (1984).

143. JOURDAIN, *supra* note 72, at 161 (quoting Henry Cowell).

144. *Id.* at 161, 163.

145. *Id.* at 166.

146. *Id.* at 167.

147. *Id.* at 168.

148. JOHN A. SLOBODA, THE MUSICAL MIND 4 (1985).

149. MCLAUGHLIN, *supra* note 100, at 79.

> elaborate and highly-developed as the twenty-one minutes of Sibelius's Seventh Symphony, but the general pattern of tension followed by resolution remains the same in essence.[150]

The ability to sense completion and closure is also an important part of the composer's function. As one expert observes:

> Our sense of completeness or incompleteness is also a product of those patterns or sound terms which become established as more or less fixed, given parts of a particular work. . . . [R]epetitions of the beginning of a well-shaped theme already heard several times will arouse expectations that the theme will be completed as it has been in the past.
>
> ***
>
> [I]n the later stages of a work, part of the sound term . . . may come to stand for and represent the whole sound term. In such a case, the repetition of a fragment of a larger part may not be felt to contemplate incompleteness but, on the contrary, may be taken as a sign of closure, may make the whole work seem complete and stable.[151]

b. Deep Understanding of Standard Musical Forms

In classical music there are many standard musical forms, including the sonata, the minuet, the rondo, among others. Conventional forms in both literature and music are based on a simple archetypal pattern thought to be encoded in the brain. Symmetry, stories, and variation are examples of such archetypal patterns.[152] As one author has noted:

> The forms chosen by composers to shape and order their ideas—sonata form, rondo, and many others—originate outside music and equally apply to quite different human activities. Effective oratory conventionally uses an A-B-A form, a simplified exposition, development, and recapitulation [see explanation of the sonata *infra*]. 'Say what you are going to say, then say it, then tell them what you have said.' It is surely no coincidence that when music finally emancipated itself from words composers increasingly employed forms which can be related to human stories as well as continuing to use repetition, elaboration of pattern, contrapuntal techniques, and symmetry as defining structure.[153]

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150. *Id.*
151. LEONARD B. MEYER, EMOTION AND MEANING IN MUSIC 129 (1961).
152. STORR, *supra* note 2, at 83.
153. *Id.* at 84. For a detailed description of numerous musical forms, see WALLACE BERRY, FORM IN MUSIC (2d ed. 1986). *See also* SCRUTON, *supra* note 44, at 309-42.

Some music writers have suggested that it was the emergence of the sonata form—in which music was entirely unrelated to words—that accounted for the introduction of orchestral concerts. One such writer points out:

> For sonata form provided 'an equivalent for dramatic action': a story in sound which had a definable beginning, middle and end comparable with the form of a saga, novel, or short story. The dance forms which preceded the development of sonata form relied chiefly on symmetry; on the satisfaction which we experience when repetition provides a framework, rather akin to the pleasure we gain from contemplating the regularities of classical architecture, or recurrence in poetry.[154]

The sonata consists of:

> [an] *exposition* [that] presents, and often repeats, a *first subject* or group of subjects in the home key or tonic. Next, a transitional or *bridge passage* modulates to the dominant or to some other closely-related key in which the *second subject* or group of subjects is stated. Second subjects are traditionally more lyrical than first subjects, and are often referred to as 'feminine'. The next section is the *development*, in which the two main subjects are combined, fragmented, juxtaposed, or re-stated in different keys. This is followed by the *recapitulation*; a return of the initial first subject as in the exposition, followed again by a bridge passage and the second subject. But this time, the bridge passage is altered in such a way that the second subject is re-stated in the tonic key, thus uniting first and second subjects, and bringing the movement home to a satisfying conclusion.[155]

Drawing further on the concept of musical pattern, another writer discusses the composer's use of pattern in terms of "framing the subject." He observes: "Framing consists of techniques equivalent to figures of rhetoric—for example, climax antithesis, periphrasis, parenthesis, aposiopesis, which [correspond] to the musical figures of augmentation, diminution, inversion, reversion, iteration, division, and imitation."[156]

c. Applying Memory Abilities

In addition to having a memory of countless musical patterns, musical composers need to have two basic types of memory: semantic and episodic.[157] Semantic memory is concerned with the meaning of a phenomenon; episodic memory is concerned with the fact of or the facts surrounding a phenomenon's specific occurrence. For example, knowing that horses trot is an example of semantic mem-

154. STORR, *supra* note 2, at 81.
155. *Id.* at 82.
156. JAMIE C. KASSLER, MUSIC, SCIENCE, PHILOSOPHY 208-09 (2001).
157. JOURDAIN, *supra* note 72, at 168-69. *See also* LUNDIN, *supra* note 86, at 126-47; MACONIE, SECOND SENSE, *supra* note 85, at 303-25.

ory; remembering the time you once fell off a trotting horse is an example of episodic memory. In relation to music, knowing the difference in sound between major and minor chords is a function of semantic memory; remembering the chord by chord changes in a specific composition containing frequent fluctuations between major and minor chords is a function of episodic memory. Humans appear to be able to remember long sequences of music through a combination of semantic and episodic memory—"aggregating large chunks of music hierarchically, then linking the chunks in a chain so that the experience of one chunk leads by association to the next."[158]

d. Use of Emotional Devices

Within the Western tradition of tonal music, composers use musical devices to represent particular emotions. As one expert notes:

> For example, the interval of the major third commonly expresses joy; whilst the minor third is generally associated with grief. The augmented fourth [e.g. C to F#], called by medieval theorists *diabolus in musica* [also called the tritone] because of its 'flawed' sound, is often used by composers to depict demons, hell, or other horrors. . . . [E]xamples of its use include works by Mozart, Wagner, Liszt, Berlioz, Gounod, Busoni, and many others.[159]

e. Openness to Inspiration

Great composers are endowed with inspiration—the phenomenon of musical ideas arriving full blown in the composer's mind. Most often, inspiration just happens. Beethoven said that his inspiration came "unbidden."[160] Mozart said that his musical ideas came to him when he was alone—riding in a carriage, walking after a meal, or during a sleepless night.[161] There is common agreement that inspiration dwindles when musical composing is temporally interrupted or deferred. Stravinsky once commented that "[t]he musical sense cannot be acquired or developed without exercise. In music as in everything else, inactivity leads gradually to the paralysis, to atrophying of faculties."[162] Some musicians know that they can contaminate inspiration by exposure to or immersion in others' creative ideas. Beethoven on at least one occasion admitted that he was abstaining from attending Mozart operas to protect his own originality.[163] Improvisation, a special type of inspiration, is so central to a composer's and mediator's function

158. JOURDAIN, *supra* note 72, at 169.

159. STORR, *supra* note 2, at 73. Paul Hindemith, an eminent writer on music, disagrees that music induces present-experience emotions in the audience. He suggests that composers are confidence tricksters who skillfully manipulate audiences into experiencing false emotions. He contends that music can only recall feelings in the listener of prior experiences in the course of real life. *Id.* at 76. *See also* ROTHSTEIN, *supra* note 39, at 29. *See generally* STEPHEN DAVIES, MUSICAL MEANING AND EXPRESSION 201-77 (1994).

160. JOURDAIN, *supra* note 72, at 170.

161. *Id.*

162. *Id.* at 171.

163. *Id.*

that the author is devoting a separate, entire article to this topic in *Mediation, Improvisation, and All that Jazz*, currently in process.

f. Confounding Expectations

It has been said that the greatest classical musical compositions are highly individual and are usually identifiable as the work of a particular composer.[164] Identifying the early works of a great composer is difficult because they were written before the composer had discovered his own particular style—before he could imprint his stamp of genius. Genius in musical composing "is the capacity for productive reaction against one's training."[165] As one expert has noted: "The greatest composers, even when using conventional form of the age in which they lived, confound our expectations. In doing so, they affirm their individuality."[166] Classical composer Franz Joseph Haydn, known as the "musician's musician," had an inexhaustible power of invention. He had a sense of generosity and modesty, and a capacity for deep feeling, but above all he had an outstanding sense of humor.[167]

Music writer Hans Keller has said that musical meaning depends on the conflict created by a composer between background and foreground—that is between expectations implied or aroused by the background and the unexpected fulfillments in the foreground. He writes:

> It is this tension, varying in intensity according to the junction a composition has reached, between what the composer does and what makes you feel that he was expected to do that constitutes musical logic. The clearer the tension, the more logical the music—and the clearest tension is that which combines a maximum of contradiction with a maximum of unity between the contrasting elements.[168]

g. Integration of Compositional Resources and Processes

Psychology professor John A. Sloboda provides the diagram appearing in Figure 3 below to illustrate the integration of music compositional resources and processes.[169]

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164. STORR, *supra* note 2, at 114.
165. *Id.* at 115.
166. *Id.*
167. *Id.* at 115-17.
168. *Id.* at 86 (quoting Hans Keller).
169. Figure 3 appears in SLOBODA, *supra* note 148, at 118 and is reproduced by permission of Oxford University Press. This diagram is similar to the "General Problem Solver" computer system described in John W. Cooley, *Mediation and Joke Design*, 1992 J. DISP. RESOL. 249, 273.

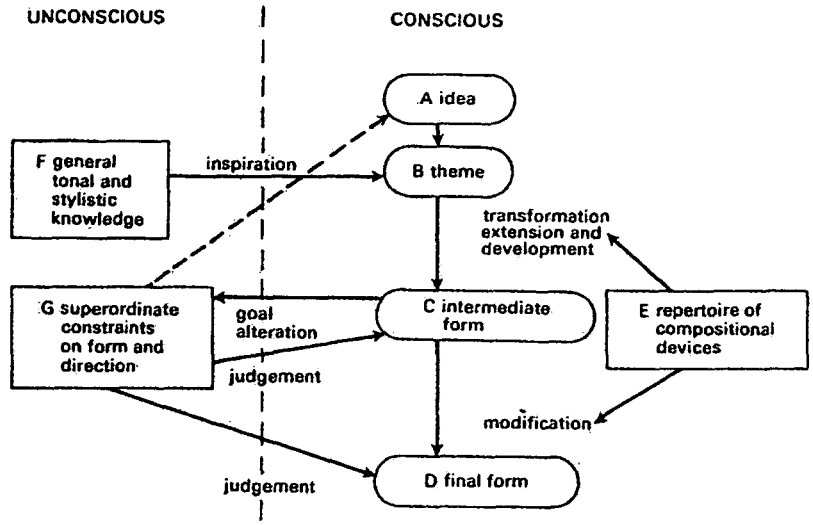

Figure 3

In an explanation of the diagram of a "typical composer's compositional resources and processes," Professor Sloboda writes:

> . . . There appears to be a distinction between those processes on which a composer is able to report fairly easily and those on which he is not. For convenience these have been labeled 'conscious' and 'unconscious.' Square-edged boxes depict knowledge or structures that are stored in long term memory. The curved boxes contain the transitory materials that constitute successive versions of a composition as it grows in a composer's mind. . . .
>
> Box B represents the thematic kernel that springs 'unbidden' to mind out of the storehouse of thematic knowledge (F). Box A is optionally present . . . [in that] sometimes a more or less specific idea of the *kind* of music required precedes an actual theme in awareness.
>
> Box C represents the results of applying compositional techniques of transformation and modification (E) to the original theme. Its contents are then judged against criteria of 'rightness' (G) and, if found wanting, are modified until a satisfactory final form (D) is reached. The pathway 'goal alteration' acknowledges the fact that discovered properties of intermediate themes can actually overwrite originally held goals, so that the composition can appear to the composer to generate its own momentum or 'life,' almost independently of his will.[170]

170. SLOBODA, *supra* note 148, at 118-19.

h. The Information Theory of Music

In her book, *Music, Tendencies, and Inhibitions*[171] Professor Renee Cox Lorraine has clearly and comprehensively explained, in my view more successfully than any modern writer, the relationships, connections, and analogies between tendencies and inhibitions in music patterns and in life patterns. Reflecting on the writings contained in four books of famed musicologist Leonard Meyer,[172] Lorraine advances her principal thesis that music can provide tonal analogues for many of life's tendencies, inhibitions, and resolutions. She writes:

> When a stable or continuous musical pattern is suddenly inhibited or disrupted, we can contemplate or experience the ways the composer or improviser in question will choose to resolve (or not to resolve) the disruption. Different styles of music offer varied means of presenting and dealing with such musical inhibition and thus offer disparate models of dealing with inhibition in more general terms. High Baroque music presents musical inhibitions or conflict while maintaining a sense of overall unity for the listener, in that surface-level conflicts are mitigated by stability on a more remote hierarchic level. The high Classicists have shown us how we may resolve conflict or tension dialectically or synthetically, and often with great clarity and elegance. The developments, recapitulations, and codas in the sonata forms of Beethoven show us that considerable time and energy may be needed to resolve an extreme amount of conflict or tension. The lack of resolution in some of the music of the late romanticists suggest that conflicts or problems can arise that we may not be able to resolve or resolve completely, a condition that can be met variously with struggle or striving, despair, acceptance or serenity.[173]

Showing the relationship between the music compositional process and the life process, Lorraine further amplifies the concept of human tendencies and inhibitions, explaining:

> [The] tendencies of everyday life can be natural or learned. We have natural tendencies to crave sustenance, and some people have conditioned tendencies to crave intoxicants or other means of excitement or comfort. Some inhibitions involve disruptions of the desire for a sense of fulfillment, completion, or closure. In other cases, closure is not so much at issue as is the disruption of a sense of stability, regularity, continuity, or habit.
>
> . . . .

171. RENEE COX LORRAINE, MUSIC, TENDENCIES, AND INHIBITIONS (2001).

172. See MEYER, *supra note 151*. *See also* MEYER, EXPLAINING MUSIC (1973); MEYER, MUSIC, THE ARTS, AND IDEAS (1967); MEYER, STYLE IN MUSIC (1989).

173. LORRAINE, *supra* note 171, at ix, x.

> The responses of individuals to inhibitions of tendencies early in life, and the reaction of caregivers to these responses, are likely to influence the development of character, to influence how the adult individual reacts to or handles stability and change. The way we react to alternate plans, for example, or how well we are able to devise alternate plans at all, are a primary indicator of how well we handle life in general. An individual who had problems resolving early inhibitions or conflicts might develop a pronounced need for regularity and control. Such a person may strongly resent, say, waiting in lines or being caught in traffic. An individual who was able to resolve early conflicts in satisfactory ways, in contrast, might see inhibitions of tendencies as challenges or opportunities, and develop superior problem-solving skills. Still others might, for various reasons, come to enjoy delays or inhibitions for their own sakes, preferring a sense of longing, open-endedness or continuous process to closure or resolution.[174]

2. *Composition in Mediation*

Just as the musical composer must have a knowledge of musical patterns, mediators and mediation advocates must have a knowledge of the potential behavioral patterns of the participants in a mediation. Behavioral patterns consist of overall strategy and style of the individual participant. These patterns include competitive, collaborative, compromising, accommodating, and avoiding, as well as combinations of these five principal behaviors.[175] In addition, patterns include specific tactics employed by mediation participants. For mediators, such specific tactics include conduit, surrogate, reshaping, and clarification.[176] For mediation advocates, specific tactics include limited authority, good cop/bad cop, conditional proposals, and face-saving.[177] Mediators and mediation advocates need to be able to use these patterns and to recognize when they are being used by mediation participants.[178] Thus, memory of numerous behavioral patterns is a necessary attribute of effective mediators and mediation advocates.

Similar to form in music (sonata, minuet, rondo, etc.), mediation has three basic forms (facilitative, evaluative, and transformative) and combinations of these and other problem solving forms (e.g. arbitration) called "hybrids." Subforms in mediation also exist, such as the four-step method of collaborative negotiation—separate the people from the problem, focus on interests not positions, invent options for mutual gain, insist on objective criteria. Typical hybrid forms include: co-mediation, med-arb, binding arbitration, and co-med-arb.[179] [180] Mediators and mediation advocates in designing (composing) the dispute resolution process must understand all the forms in order to know which is most appropriate to apply to

174. *Id.* at viii, ix.
175. COOLEY, HANDBOOK, *supra* note 35, at 168-72
176. *Id.* at 172-74
177. JOHN W. COOLEY, MEDIATION ADVOCACY 85-87 (2d ed. 2002) [hereinafter COOLEY, MEDIATION].
178. JO-ELLAN DIMITRIUS & MARK MAZZARELLA, READING PEOPLE 24-44 (1998).
179. COOLEY, HANDBOOK, *supra* note 35, at 17-21, 25-28.
180. ROGER FISHER AND WILLIAM URY, GETTING TO YES (2d ed. 1991).

the specific dispute situation.[181] Thus, achieving the best result in dispute resolution demands detailed planning and organization.[182]

Michelle LeBaron's discussion of emotional intelligence and emotional fluency in mediation has a direct correlation to using emotional devices in musical composition. The questions she asks in the next passage could similarly be asked of a person engaged in composing music. She writes:

> Our actions can be more constructive when we invite emotions in as assets in our process. Consider the . . . intervention processes you use. When stories are shared, how much space do you make for emotional dimensions? Is there balance between problem solving and exploration? . . . How do you create the space and conditions for . . . participants to experience connection with each other and with you?[183]

Moreover, when she speaks of imaginative and intuitive ways of knowing in conflict resolution, she is actually speaking of an openness to inspiration and to confounding expectations, an important skill of the musical composer. As she explains:

> Putting our imagination into practice, we are guided by intuition. Through imagination we loose the bounds of old memories, seeing new possibilities. Through intuition, we discern ways of enacting these possibilities as we live into the new. In the margins between old ways we release and new ways we adopt, intuitive feelings we may not have understood when they surfaced reveal themselves as enormously helpful.[184]

The mediator's determination of when and how to intervene in a mediation is one counterpart to information theory in musical composition. Roger Schwarz has written:

> Interventions are not magic. Even if you move toward conflict and intervene, your initial intervention may not have the impact you intend. It is natural to have to make a series of interventions to help the group explore a particular issue.
>
> Sometimes you may drop an intervention because you become frustrated as the group members remain silent or respond only indirectly to your questions. Sometimes you may drop an intervention because a group member responds angrily or tearfully. Faced with restating the intervention or dropping it, you choose the latter.[185]

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181. COOLEY, HANDBOOK, *supra* note 35, at 17-25.
182. GRAY, *supra* note 139, at 261-62; MOORE, *supra* note 124, at 145-65.
183. LEBARON, *supra* note 105, at 76; *see also* LEIGH THOMPSON, THE MIND AND HEART OF THE NEGOTIATOR 175-82 (1998).
184. LEBARON, *supra* note 105, at 124.
185. SCHWARZ, *supra* note 104, at 255.

H. Performance

Music is a controlled outcry from the quarry of emotions all humans share.
-Diane Ackerman

1. Performance in Music

It has been said that "no human undertaking is so formidable as playing a musical instrument. . . . [M]usicians . . . must draw together every aspect of mind and body, melding athleticism with intellect, memory, creativity, and emotion, all in gracious concert."[186] Picture a pianist in a chamber music setting.

> Tactile sensations cascade toward the brain, not just from the fingertips but also from receptors embedded in every muscle, tendon, and joint. Meanwhile, the visual system runs helter-skelter, one moment decoding dozens of dots on a printed page, the next aligning hands to keyboard, then darting off to gather timing cues from fellow musicians. In parallel, the auditory system parses the incoming flood of sounds into separate streams for the various instruments, gauges their balance and synchronization, and assesses how the particular piano at hand translates motion into sound.[187]

A sight-read performance, even by a skillful pianist for example, is usually disappointing. The reason for this is that the musician has not yet learned to shape the notes of a particular piece of music into larger structures.[188] Virtuosity is said to depend on how a musician's mind is organized during performance—this means the virtuoso's attention to poise, focus, imagery, and planning.[189] Ordinary musicians have a "typist mentality" in that they are concerned with individual notes. It's as if they focus on each piece of tile in a mosaic and do not grasp the image communicated by the complete mosaic. In contrast, virtuosi seek to nurture deep amorphous relations by directly cultivating their imagery.[190]

A noted psychology professor makes these observations regarding the performance of music:

> [S]killed human performance is seldom a rigid movement sequence where each movement is triggered in an inflexible way by the preceding movement . . . [.] [P]erformance is the result of an interaction between a mental *plan* which specifies features of the intended output and a flexible programming system 'which has learned through experience to compute

186. JOURDAIN, *supra* note 72, at 201. *See generally* SCRUTON, *supra* note 44, at 438-56. For a description of fear of performance, see AARON WILLIAMSON, ELAINE GOODMAN, ELIZABETH VALENTINE ET AL., MUSICAL PERFORMANCE: A GUIDE TO UNDERSTANDING 168-82 (John Rink ed.) (2002).
187. JOURDAIN, *supra* note 72, at 202.
188. *Id.* at 229.
189. *Id.* at 225.
190. *Id.* at 232-33.

> the patterns of muscle contraction that will achieve the goal (of producing the specified output) over a broad range of startling conditions'
>
> ***
>
> The failure comes in getting the hands to do what . . . [the performer] knows they should do. A common cause of this . . . is miscalculation of an unfamiliar leap, or 'running out of fingers' in rapid passagework. At such points the expert sight reader can invent a new plan, consistent with the structural context, which he *is* able to program, so 'covering' his error with a plausible alternative.[191]

The same writer also observes that two basic activities comprise performance: planning and programming. Expert performers have to be able to build up routines for solving programming problems rapidly and accurately in new situations. He suggests that practicing scales and studies have both a sound pedagogical and psychological basis, since they ensure that the performer is exposed, in advance of performance, to a whole range of potential programming problems in a systematic way. The same writer also believes that the master musician is highly skilled in planning and programming. Less skilled performers fall into two common "types" of musicians: the type that can play relatively simple music and have a profound critical appreciation for other people's performances; and the type that is highly skilled technically, but performs them insensitively.[192]

In music, practice makes perfect. One expert notes:

> Researches have found marked differences between the practice styles of amateurs and virtuosi. Amateurs tend to play long passages straight through, stopping to repeat faulty notes several times when they encounter them. Virtuosi concentrate on fragments, seldom playing the entire piece, and they correct wrong notes by playing them in the context of a larger phrase. . . . They understand that the cause of a bad note often lies not in the motions for that note, but in the motions for the notes around it. And so they correct wrong notes by working on the relations between notes, by reorganizing the deeper levels in the motor and conceptual hierarchies from which the notes arise.
>
> ***
>
> To no one's surprise, studies have found a strong correlation between quality of performance and amount of practice. At one noted conservatory, the best violinists had practiced 7,400 hours prior to entry; the average, 5,300 hours; the worst, 3,400 hours.[193]

191. STORR, *supra* note 2, at 88-89. For an interesting piece on memorizing in music performance, see WILLIAMSON, *supra* note 186, at 114-26.

192. STORR, *supra* note 2, at 88-90.

193. JOURDAIN, *supra* note 72, at 233.

Psychologists believe that performance is controlled by hierarchical mental structures and procedures that control detailed finger activity while the performer is free to attend to higher order aspects of the performance. The incredible speed of a virtuoso performance—what the ear might perceive as 20 separate notes, may well be for the performer, a single integrated, automatic physical activity.[194]

It is also clear that when a person performs music, he or she embraces and individual style. For example:

> A style suggests ways to sit, ways to sing, ways to feel rhythm. It also suggests ways to think. A style even defines a musical community—a group with shared notions about music and its purpose. The shared style allows for musical communication without misunderstanding, a common sense of what is being said and why. The same style of music presented to different communities will create different reactions, just as Expressionist music would if played in a horror film, a concert hall, or a Catholic Church.[195]

Finally, ensemble performance entails special challenges for the performer. Four aspects of making music with other performers are: coordination (keeping time), communication, the role of the individual, and social factors.[196] Among other skills, coordination involves anticipation and reaction. As one author observes:

> Ensemble performers interact with one another in various different ways. . . . One kind of interaction can be likened to the process of *hunting*, in the sense that one musician follows another just as the hunter tracks its prey by anticipating and reacting to its movements. . . .
>
> A second kind of interaction involves mutual adjustment, or *cooperation*, between performers. . . . In effect there is a fine line between cooperating and hunting, and such skills might be affected by dominant personalities in the ensemble as well as the nature of the music itself (for instance, an accompanist might follow the performer who has the melody).
>
> Musical interaction can be planned to a certain extent in rehearsal: performers might wish to work out who will follow whom during a particular passage, or who will take the lead in the ensuing passage. . . .[197]

194. SLOBODA, *supra* note 148, at 6.
195. ROTHSTEIN, *supra* note 39, at 89.
196. WILLIAMSON, *supra* note 186, at 153. For a description of how orchestral groups function, see MACONIE, CONCEPT, *supra* note 74, at 57-65.
197. WILLIAMSON, *supra* note 186, at 154-55.

2. *Performance in Mediation*

When Michelle LeBaron discusses somatic ways of knowing in conflict settings, she is describing conduct that is very similar to that demonstrated by a musical performance. She writes:

> [W]e internalize behavioral patterns that become a certain shorthand, that inform our interpretations, expectations, and attributions that are accompanied by patterned physical experiences. An external stimulus starts a habitual response, and we engage in a dance our bodies know well, leading us into familiar situations and, sometimes, cul de sacs. . . . If our chest feels tight, we can send breath to release it. If our voice sounds muffled, we can make a different choice, summoning a voice that is strong and commanding. As internalized patterns are interrupted, we access more ways to shift how we hold ourselves and our ideas. . . .[198]

As noted above, the virtuoso in musical performance, seeks to nurture deep amorphous relations by directly cultivating their imagery. Christopher Moore describes virtuoso mediator performance as including the skill of vision building, which allows the mediator and the parties to escape the "typist mentality" in problem solving. He writes:

> Vision building involves parties in individual and joint construction of an ideal vision of what a workable solution or relationship might look like in the long run. Parties are asked to think separately about the best vision they could develop that would meet each of their respective interests. . . . Once an agreement is reached on a common vision, parties are asked to identify problems that are inhibiting or will inhibit them from attaining it.[199]

This performance exercise can be used in conjunction with ratification of the status quo (which in turn relates to planning and programming by a virtuoso in musical performance and to performing in musical ensemble). Ratification is "commonly used by parties who have a past or current relationship in which they have established patterns of interaction or developed solutions to problems that they would like to formalize and keep in a future relationship."[200]

In contrast, Bush and Folger advocate a note-by-note sight-reading performance by a mediator. In essence, they implore mediators to focus on each piece of tile in a mosaic and so as not to grasp the image communicated by the complete mosaic. They write:

> First of all, throughout this session the mediator avoids making any global assessment of what the dispute as a whole is about and instead keeps a *microfocus on the parties' contributions.* The mediator is always

198. LEBARON, *supra* note 105, at 89.
199. MOORE, *supra* note 124, at 285.
200. *Id.* at 282.

> focused on what the parties have just said, what they are doing in each move as the dispute unfolds. During the entire session, the mediator remains in a *responsive* posture. When he makes a move he does not know what his next move will be. Each "next move" depends on what the parties do in response to his prior move and on what possible opportunities for empowerment and recognition arise at that point.[201]

As noted above, a virtuoso musical performer when confronted with a performance error can invent a new plan, consistent with the structural context, which he is able to execute so that his error is covered with a plausible alternative. Communication consultant Barbara Madonik describes something similar in mediation in describing what she calls "helping parties leave the conflict behind." To achieve closure in a mediation or an aspect of it, she suggests to mediators to start:

> your strategy with a nonverbal cue to all parties. Go to the spot you marked out as a positive location, or anchor point. Other-than-consciously the parties will now anticipate constructive ideas. Once you have established this mind-set, give the parties a positive overview of the mediation. Highlight only the worthwhile points of the mediation.[202]

I. Listening

Wagner's music is much better than it sounds.
-Mark Twain

1. Listening in Music

a. General

Musicologists have identified four types of music listening: melody, harmony, rhythm, and phrasing.[203] For many people, melody listening is really word listening. For example, if you were to ask someone to identify a favorite song, she is likely to recite the song's lyrics instead of humming the melody. For people unskilled in music, words are a memory aid. Harmony listening requires a sophisticated polyphonic listening ability. Harmony listeners prefer "good toned" instruments that produce clear overtones. They shun instruments, like the electric guitar, that produce "noise-laden" tones.[204] Musicians usually have a refined perceptiveness for complex harmonies, whereas non-musician listeners do not. Non-musician listeners often do not fully comprehend harmony-oriented music.[205]

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201. ROBERT A. BARUCH BUSH AND JOSEPH P. FOLGER, THE PROMISE OF MEDIATION 192-93 (1994).
202. BARBARA G. MADONIK, I HEAR WHAT YOU SAY, BUT WHAT ARE YOU TELLING ME? 248-49 (2001).
203. JOURDAIN, *supra* note 72, at 256-59. *See generally* WILLIAMSON, *supra* note 186, at 185-96; DAVIES, *supra* note 159, at 167-99.
204. JOURDAIN, *supra* note 72, at 257.
205. *Id.*

Some people listen to music for its "beat" or rhythm. Rhythm listeners, as they are called, consider music as a pleasurable device to make their bodies pulse.[206]

To a listener, music with little information content is not interesting. "Information" in this context refers to aspects of a musical passage that are not easily anticipated by a listener. Successive notes in a scale can be anticipated by a listener and can be boring, but a sudden shift to a new key can be full of surprises for a listener, capturing his interest and possibly eliciting an emotional response.[207] Normally, people prefer low information content in music to music overloaded with information. Studies show that as people grow older, their tolerance and even preference for more complex, information-laden music increases.[208]

Psychology Professor John Sloboda uses the music listening research of W. J. Dowling to explain the difficulty of a listener to identify the separate melodies when simultaneously played. He writes:

> Dowling found that recognition of the melodies [Frere Jacques and Happy Birthday] was almost impossible when they overlapped in pitch. They merged into a single, unrecognizable sequence. However, when the melodies were moved apart in pitch so that their notes did not overlap, the melodies could easily be recognized.
>
> Dowling found one condition in which overlapping melodies could be recognized. This was when listeners were asked to search for particular named melodies. Melodies perceived in this way were done so with effort, however. . . . A visual analogy may . . . be helpful. . . .[Figure 4 below] will be seen spontaneously as two triangles.

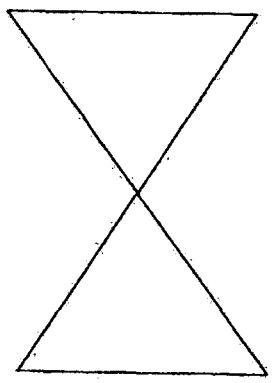

Figure 4

> You do not naturally see the numeral 7; but if I ask you to *find* a 7 in the figure, you can do so. In the former case, your perception was governed

206. *Id.* at 258.
207. *Id.* at 260.
208. *Id.*

> by the spontaneous and largely automatic Gestalt principles of grouping (the 'laws' of proximity, closure, and symmetry being operative here). In the latter case you use prior knowledge about the shape of a figure 7 to overcome your natural grouping tendencies and achieve a more difficult, less spontaneous, way of seeing the figure.
>
> Dowling also found that unfamiliar melodic patterns (learned by the listeners during the experiment) could not be recognized so easily when interleaved with other melodies, even when there was pitch separation of as much as an octave. This shows that the use that can be made of pitch streaming [a single sound source is heard as if it were two independent sources] is not invariant, but can be helped or hindered by acquired knowledge about music.[209]

Research also shows that people make choices as to genres of music because of a need to conform. They usually acquire a taste for a particular type of music, be it classical, popular, rock, country western, or others, during their early adolescence and they carry this preference throughout their entire lives.[210]

Experienced music listeners realize that music inevitably reflects the personality of its composer. Haydn and Wagner represent extremes of this truth. Haydn composed music that "shames self-absorption" and "makes personal preoccupations look petty," and it has the capacity to "dispel irritation, [and] . . . banish a mood of depression".[211] In contrast, Wagner's music:

> either overwhelms or repels because his style faithfully reflects his personality. The immense length of his later operas illustrates his disregard for the listener. He does not wish to communicate, only to convert. It need not prevent one from recognizing, and being intensely moved by, his music; but it is understandable that some listeners resent the feeling of being taken over rather than charmed or persuaded.[212]

b. Music Listening as a Pattern Comparison and Decision-making Process

Harold E. Fiske, in his book *Music and Mind,*[213] describes music listening as a decision-making process. His thesis is based on behavioral research concerned with subjects' tonal and rhythmic pattern detection, discrimination between different patterns, and identification of changes which may occur as a pattern is developed. He concludes that the "recognition of patterns and their variations is the foundation of one's ability to deal with the structure of a musical composition . . . [and a person's] sensitivity to pattern recognition and systematic pattern change is

209. SLOBODA, *supra* note 148, at 160-61.
210. JOURDAIN, *supra* note 72, at 263.
211. *Id.*
212. STORR, *supra* note 2, at 120.
213. HAROLD E. FISKE, MUSIC AND MIND: PHILOSOPHICAL ESSAYS ON THE COGNITION AND MEANING OF MUSIC (1990). This section is an adaptation of pages 23-38 of that work.

required for the comprehension of a composition's style and musical uniqueness."[214]

Fiske views music perception as more than mere pattern detection. It depends additionally, he believes, upon the ability to identify *relationships* between patterns. This ability is a function of a person's innate or developed problem-solving and decision-making expertise in mentally answering, in milliseconds, a series of questions presented by the musical situation. For example, he writes:

> . . . [O]ne can imagine a listener recognizing and solving the following sequence of problems:
>
> - "Are these two melodic phrases identical or are they different?"
> - "If different, what is the cause of the difference (e.g., a tonal discrepancy, rhythmic discrepancy, nuance, discrepancy, etc.)?"
> - "[W]hat is the pitch [rhythmic] interval [duration] relationship between the two patterns?"
> - "Does this discrepancy represent motivic development or is an entirely new pattern intended?"
> - "If motivic development is implied, what is the relationship of the discrepancy to the original pattern?"[215]

Fiske is quick to point out that the above list is not absolute, but it does serve as a starting point in an investigation of the structure of the pattern comparison process. He then proceeds to describe research that investigates the hypothesis of whether a successful solution to a given listening-comparison decision depends upon correct solutions to the previous listening-comparison decision.

In essence, the experiment consisted of three different musical phrase comparison tasks, each considered by the researchers to be progressively more difficult, and it sought to determine whether this hierarchy of processing difficulty actually existed, or whether simultaneous processing of two or more comparison tasks occurs. The three tasks were:

1. [Separate tests concerning the] [d]etection of a tonal discrepancy between pairs of tonal patterns and detection of rhythmic discrepancy between pairs of rhythmic patterns;
2. Detection of a discrepancy, either tonal or rhythmic, between pairs of tonal-rhythmic patterns;
3. Identification of the type of discrepancy; either tonal or rhythmic, between pairs of tonal-rhythmic patterns.[216]

Results of this experiment demonstrated that, with respect to tonal and rhythmic patterns unfamiliar to the subjects, Model A—the task hierarchical model—accurately defined the listening-decision process. The results further showed that "it does not seem likely that it is possible to proceed directly to a higher level task

214. *Id.* at 24.
215. *Id.* at 26-27.
216. *Id.* at 31.

(as suggested by Model B) without first making decision about lower level tasks."[217]

2. *Listening in Mediation*

There are obvious parallels between listening in music and listening in mediation. Eastwood Atwater describes the following elements of listening:

> A good listener . . . hears more than the speaker's words. He also hears the speaker's pitch, tone of voice, and rate of speech. . . . The volume and pitch of the speaker's voice, how high or low, or how loud or soft it sounds, are also helpful in decoding the speaker's message. Some emotions like enthusiasm, joy, and disbelief are usually delivered in a high pitch. Anger and fear are also expressed in a high pitch, as well as in a wider range of tone and pitch of volume. On the other hand, apathy and emotions like sadness and grief are usually expressed softly and in a low pitch, especially toward the end of each sentence. . . . [Non-verbal communication] may be useful or damaging depending on the skill and intent of the communicator and/or the listener. In some cases, it may help persuade by re-enforcing the message being put forth by the communicator, or non-verbal communication may betray the communicator by appearing inconsistent with the spoken word.[218]

Active listening in mediation is similar to the pattern comparison and decision-making process in music listening. Christopher Moore defines active listening as a "communication technique in which a listener decodes a verbal message, identifies the emotion being expressed, selects a word or phrase with the same meaning and emotional intensity as that conveyed by the speaker, and restates the feeling content of the message to the sender for confirmation and clarification."[219] Further, Moore notes that active listening performs several functions for the participant in mediation. For example:

- It assures the speaker that he or she has indeed been heard.
- It allows the speaker and listener to verify that the precise meaning of the message has been heard.
- It demonstrates the acceptability of expressing emotions.
- It allows the speaker to explore his or her emotions about a subject, and to clarify what he or she really feels and why.
- It can facilitate appraisal of the link between the emotion and the substantive or procedural content of the conflict.

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217. *Id.* at 32.

218. Eastwood Atwater, *I Hear You*, *in* E. WENDY TRACHTE-HUBER AND STEPHEN K. HUBER (EDS.), MEDIATION AND NEGOTIATION: REACHING AGREEMENT IN LAW AND BUSINESS 31-33 (1998). *See also* JAMES J. ALFINI, SHARON B. PRESS, JEAN R. STERNLIGHT, JOSEPH B. STULBERG, MEDIATION THEORY AND PRACTICE 121-23 (2001).

219. MOORE, *supra* note 124, at 176. *See also* ROBERT BOLTON, PEOPLE SKILLS: HOW TO ASSERT YOURSELF, LISTEN TO OTHERS, AND RESOLVE CONFLICT 49-61 (1979).

- It may also perform the physiological function of encouraging release of tension through expressing emotion.[220]

J. Understanding

If a composer could say what he had to say in words
he would not bother trying to say it in music.
-Gustav Mahler

1. Understanding in Music

To fully appreciate music, people must do more than merely listen to it; they must understand it—they must be able to grasp its meaning.[221] The meaning of music is a hazy concept that has challenged philosophers for centuries. For most people, the meaning of anything is derived from verbal interpretation based on their experience of the world or of themselves.[222] In addition to the interpretation of words, people derive meaning from intonation or inflection. It is unusual to hear someone speak in a monotone. People accentuate words and syllables to express shades of emotion and intention. Thus, every statement, musical or otherwise has at least two levels of meaning: a verbal meaning that describes the speaker's experience—inferentially and otherwise—and an intonational one that describes how the speaker feels about the experience.[223] In music, people find meaning in quality of performance, in ritual, in sharing an experience, sometimes in singing themselves, in applause, among other examples.[224] Jean-Jacques Rousseau, a revolutionary social theorist and an accomplished musical composer, believed that primitive man sang to communicate to each other before they learned to communicate in words. He theorized that:

> [M]en first spoke to each other in order to express their passions, and that at the early stages of human society there was no distinct speech apart from song. Earliest languages, he suggests, were chanted; they were melodic and poetic rather than prosaic and practical. . . . [I]t was men's passions rather than their needs which prompted their first utterances, for passions would drive men towards others, whereas the necessities of life would impel each to seek his satisfaction alone. 'It is not hunger or thirst, but love, hatred, pity and anger which drew from men their first vocal utterances' [quoting Rousseau]. Primitive men sing to one another in order to express their feelings before they come to speak to one another in order to express their thoughts.[225]

220. MOORE, *supra* note 124, at 176.
221. *See generally* DAVIES, *supra* note 159, at 321-80.
222. JOURDAIN, *supra* note 72, at 271-72.
223. *Id.* at 272-73.
224. *Id* at 273.
225. STORR, *supra* note 2, at 12 (quoting Maurice Cranston).

There are many parallels between music and language. Music and language both consist of extended, highly organized streams of sound.[226] Poetry bears quite a close resemblance to music and phrasing, and as discussed above, may provide music's closest parallel. The human brain treats spoken and musical phrases similarly in that it divides long streams of sound into comprehensible chunks—words into sentences and tones into melodic phrases.[227] It is well known that:

> [l]inguistic analysts distinguish *prosodic* features of speech from *syntactic:* stress, pitch, volume, emphasis, and any other features conveying emotional significance, as opposed to grammatical structure or literal meaning. There are many similarities between prosodic communication and music. Infants respond to the rhythm, pitch, intensity, and timbre of the mother's voice; all of which are part of music.[228]

It is also common knowledge that the prosodic features of speech can operate without the syntactic.

> If two people conduct a 'conversation' by humming, without parting their lips or using words, a good deal of information can be conveyed, such as 'I am weary'; 'I am pleased'; or even 'I love you'. . . . Some composers have been particularly aware of the prosodic aspects of language. Janacek systematically recorded the melodic curves of speech; and what he called 'speech melodies' remained central to his method of composition.[229]

While music and language are similar, there are also important differences. If music has a grammar, it is not as precise as the grammar of language. As one expert notes:

> The grammars of natural languages are designed for exactitude. Particular kinds of words in particular forms and sentence positions generate precise meanings. Changing the form or order of words in a phrase is apt to render the phrase incomprehensible. But musical phrases are highly malleable and tolerant of ambiguity. A melody turned one way rather than another may be less pleasing, but it is still "meaningful." Indeed, unlike ordinary language, music thrives on the violation of rules. Linguistic validity is usually all-or-nothing; musical validity is more a matter of degree.[230]

Translation presents another difference. Words of any language can be translated into another. But meaning does not translate well between styles of music—classical to rock, for example. Meaning is largely distinct from dialect in language; in music, however, meaning appears to be embedded in the idiom or form

226. JOURDAIN, *supra* note 72, at 275. *See generally* DAVIES, *supra* note 159, at 146-49.
227. JOURDAIN, *supra* note 72, at 275.
228. STORR, *supra* note 2, at 9.
229. *Id.* at 71.
230. JOURDAIN, *supra* note 72, at 276.

of its expression.[231] Music also differs from language in its capacity for multiple voices. When tones overlap in music or in singing, we can hear chords; when words overlap in conversation, there is disorientation and confusion.[232]

Because both language and music possess generative hierarchies, research continues into their comparative surface and deep structures.[233] As noted above, on the surface, there are comparisons, though weak, of patterns of words and of notes that yield, respectively, sentences in language and melodies in music. But more serious research has been conducted on comparisons in the deep structure of music and language. In the 1950s, linguist Noam Chomsky developed a theory that a universal linguistic grammar is embedded into the human brain as a result of hundreds of thousands of years of evolution.[234] Chomsky once remarked:

> *[A]ll* music—whether folk, pop, symphonic, modal, tonal, atonal, polytonal, microtonal, well-tempered or ill-tempered, music from the distant past or the imminent future—all of it has a common origin in the universal phenomenon of the harmonic series. And that is our case for musical monogenesis, to say nothing of innateness.[235]

But even 50 years before Chomsky's work, the German musicologist Heinrich Schenker analyzed deep structure of the music of several classical composers and concluded that "good" composition is based on a single underlying chord that comprises its deepest tonal center. He theorized that the hidden transformations and elaborations of this single chord provide music's background, its *Ursatz,* from which all surface notes derive. He believed that *Ursatz* is "always creating, always present and active" a "continual present" in the mind of the composer—the "meeting of past, present, and future."[236] Schenker rewrote famous scores adding an extra staff for *Ursatz.* He believed that music had a deep-structure universal grammar that restricted what it could be. His theory however was based on the study of about twelve Western composers and contained almost entirely a harmonic analysis with only minor consideration of rhythm.[237] Striking parallels exist between Chomsky's views on language and Schenker's views on music. Psychology professor John A. Sloboda writes:

> Perhaps the most fundamental similarity concerns the differentiation between surface and deep structure. Surface structure is, roughly, the form taken by a linguistic (or musical) sequence as it is uttered (or written). The two sentences 'John phoned up Mary' and 'John phoned Mary up' have different surface structures; and so do the two musical sequences. . . . Nevertheless, in both cases . . . there is a particular closeness between the two sequences. . . . Chomsky proposed that we could capture the closeness of such sentences within a grammar, if we assigned them to the

231. *Id.* at 277.
232. *Id.*
233. *Id.* at 277-78.
234. *Id.* at 278.
235. STORR, *supra* note 2, at 60-61 (quoting Noam Chomsky).
236. KASSLER, *supra* note 156, at 229, (quoting Schenker).
237. JOURDAIN, *supra* note 72, at 278.

> same deep structure. This deep structure is an abstract entity, not itself a sentence, from which both surface structures can be derived by the application of *transformation* rules.[238]

Brain lateralization also affects both music performing and music listening, and therefore music understanding. As one expert observes:

> A good deal of nonsense about brain lateralization has appeared in the popular press in recent years, usually along the lines that the left brain is coldly analytical and the right brain mystically intuitive.
>
> Perhaps the most useful generalization about the roles of the two sides of the brain is that the left brain is particularly concerned with modeling relations between events across time, while the right brain favors relations between simultaneously occurring events. In its role as a temporal sequencer, the left hemisphere specializes in not just the grammatical transformations of language, but also trains of analytical thinking, successions of complex physical movements, and perception and generation of rhythmic patterns. All these abilities unfold over time. In contrast the right hemisphere is expert at modeling spatial relations, body position, and the relations among concurrent sounds, including musical chords. These skills focus on assembling pieces into an instantaneous whole. [239]

But in the end, most experts would agree: understanding music is all about thinking. One author observes:

> If music is organic it is because it is something else: a representation of thinking. Music's musculature is constructed out of the sinews of argument—even when the result is as seemingly mindless as the latest ad jingle. The arguments and relations may vary from style to style. But the character of musical thought is unmistakable: it even reflects upon itself, looking back, recalling elements and ideas from the past, transforming them, deriving new ways of hearing from old.[240]

2. *Understanding in Mediation*

The distinguished psychiatrist, Anthony Storr, drawing on his life-long passion for music, has written that:

> Encountering a new piece of music is not unlike making a new acquaintance. In both instances, increased familiarity will bring greater understanding. . . . Getting to know a difficult piece of music is comparable

238. SLOBODA, *supra* note 148, at 13.
239. ROTHSTEIN, *supra* note 39, at 132.
240. *Id.*

> with getting to know a person who does not immediately reveal him-or herself, or who may appear to erect barriers against intimacy.[241]

Music writer Frances Berenson complements Storr's insight when she writes, "[p]ersonal knowledge of a work is an important aspect of one's engagement with it, an engagement which as the character of a relationship which is akin to friendship . . . Music has essentially human characteristics."[242]

Michelle LeBaron devotes nearly an entire chapter of one of her books to meaning and understanding in conflict. In explaining how meaning making leads to understanding, she explains:

> Meaning making relates not only to the procedural and material aspects of a conflict but to its deeper, symbolic genesis. . . . [P]arties to conflicts often have difficulty getting inside the meaning-frame of the other. . . . Yet it is important to remember that we do not inquire to determine who was right; we inquire to understand. The meanings we each make are multitextured and reinforced by life experience and cultural norms. . . .[243]

Robert M. Kraus and Ezequiel Morsella have described four communication paradigms, together with six communication principles, which they believe enhance the understanding of the parties to a conflict.[244] These four paradigms and their related principles have obvious direct parallels to understanding music and are discussed below.

The Encoding-Decoding Paradigm.

Principle 1: Avoid communication channels with low signal-to-noise ratios; if that is impossible, increase redundancy by restating the same idea in various forms.

The authors point out that all communication channels contribute some amount of noise to a message. Noise is defined as any undesired signal. The more signal there is in relation to the noise, the more similar the received information is to the sent information. Also the speaker and the listener may use codes (meanings) that differ subtly, but which can lead to misunderstanding. Restating the information in various forms can enhance understanding by the listener, because there will be a higher probability that one or more forms of information will resonate with codes understood by the listener.

The Intentionalist Paradigm.

Principle 2: When listening, try to understand the intended meaning of what your counterpart is saying.

Understanding results from a recipient's correct interpretation of the sender's communicative intentions.

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241. STORR, *supra* note 2, at 113.
242. *Id.* (quoting Frances Berenson).
243. LEBARON, *supra* note 105, at 172.
244. Robert M. Krauss & Ezequiel Morsella, *Communication and Conflict*, *in* THE HANDBOOK OF CONFLICT RESOLUTION: THEORY AND PRACTICE 131-41 (Morton Deutsch & Peter T. Coleman, eds. 2000).

Principle 3: When formulating a message, consider what the listener will take your words to mean.

The recipient cannot understand an intended meaning of a sender if the meaning of a message resides outside the realm of shared knowledge.

The Perspective-Taking Paradigm.

Principle 4: When speaking, take your listener's perspective into account.

This paradigm and principle proceeds from the proposition that individuals perceive the world from different vantage points and differing experiences. Understanding the sender's perspective may be more important than understanding the understanding the literal meaning of the message.

The Dialogic Paradigm.

Principle 5: Be an active listener.

This paradigm and principle are explained in more detail *supra* in the section regarding listening in mediation.

Principle 6: Focus initially on establishing conditions that allow effective communication to occur; the cooperation that communication requires, once established, may generalize to other contexts.

In conflict situations, in order to enhance understanding, parties must be able to first cooperate and collaborate to create meaning. This is the basic challenge to effective conflict resolution.

VI. THE MEDIATIONAL SYMPHONY

People who make music together cannot be enemies,
at least while the music lasts.
-Paul Hindemith

Observing the mediation of a dispute is much like watching and listening to an orchestra performing a symphony. "The word *symphony* means 'playing together.' Teamwork is the art of playing together,"[245] and it is the conductor (mediator) who facilitates that art. Please read, immediately below, Theodore Finney's description of the four movements of Brahm's First Symphony and allow your imagination to roam freely. Try to see the metaphor of a mediation and of a mediator in Finney's words actually describing an orchestra's performance of Brahm's work. Draw as many analogies and comparisons as you can.

[First Movement: Opening Statements]:

> The introduction to the first movement outlines the drama of the whole work. Against the thunderous reiteration in the bass, against, too, the steady fall of inner voices, the violins, through consonance and dissonance, soar upward. As the movement gathers momentum that upward thrust pervades every theme. It gathers to itself the new motives of other themes. No matter what momentary emphasis or appealing form the con-

245. MACONIE, CONCEPT, *supra* note 74, at 165-66.

tradictions of that upward thrust may take, its strength and vitality are sufficient to bring the movement to a triumphant close . . .

[Second Movement: Shuttle Diplomacy]

The second movement, by moving immediately into a distant key and a quiet, lyrical mood, seems to attempts to take the symphony and the listener as far from the intensity of the first movement as possible. But the attempt is not wholly successful. The strength of the first movement is not long in returning, though reminiscently, and with its return the pulse of the music quickens. Yet the movement continues the attempt to reconcile the loveliness of its own themes with the remembered vitality. At the end the two prove not incompatible.

[Third Movement: Parties' Separate Caucuses]

The third movement is really an intermezzo, a moment of relief between more important matters. The mood of great drama cannot be sustained too long. This rather quiet and gracious movement releases the tension. But Brahms has calculated the amount of the release. This intermezzo has its somber moments, its small tensions, and it ends with a quiet abruptness that asks for renewed attention.

[Fourth Movement: Reconciliation and Agreement]

With the final movement comes a return to the conflict between the upward thrust and the downward pull of the first movement. The themes are new, but again they embody a dualism from which release can come only through the most intense and persuasive analysis and development of the forces involved. The long and unabating process of musical development finally establishes, through passages which are of almost ugly strength, the triumphant message of the symphony.[246]

VII. CONCLUSION

It is the stretched soul that makes music, and souls are stretched by the pull of opposites—opposite bents, tastes, yearnings, loyalties. Where there is no polarity—where energies flow smoothly in one direction—there will be much doing but no music.
-Eric Hoffer

We have come full circle now. We began with the notion that nature itself—indeed every elementary particle of matter, including our physical beings—may well be composed of vibrating strings. This, at least, is what the mathematicians and physicists currently believe, and these conclusions reinforce the teachings of the ancient Greeks concerning the relationship between music and the harmonies

246. FINNEY, *supra* note 108, at 292-93.

in nature and the universe. Mathematics and music have long been considered as dual metaphors. In previous Pracademic articles, mathematics (geometry, algebra, and calculus) and mediation have been shown, similarly, to be dual metaphors.[247] This article has shown the relationship between music and mediation as dual metaphors. Thus, mathematics (as the basis of proof for the superstring theory) seems to provide the common link between music and mediation as problem solving arts in the quest for universal harmony.

In closing, I leave you with some final thoughts about where our current metaphorical journey, with Bach as our guide, has brought us and about where it may take us in the future. In the following quoted passage from *Emblems of Mind*, you may substitute "mediators" for either "mathematicians" or "musicians", without any deterioration of meaning.

> Mathematicians and musicians may spend most of their time in the mathematical world of hypothesis and reason, but the inner life of their arts is in the world of the Forms, in the processes of dialectic and its argument by metaphor. That is where our journey arrives as well. But it has no end; with metaphors we never reach a conclusion; the world is always expanding, always contracting, its extravagant wealth shaped into exquisite order. We are sounding strings whose resonances echo up and down the line, in all our caverns, as we all seek to carry knowledge further, in ever-higher argument, knowing that the end of one journey is just the beginning of another.[248]

I look forward to embarking on our next metaphorical journey into music and mediation through my article: *Mediation, Improvisation, and All That Jazz.* I hope you will join me.

247. *See* Cooley, *Descartes*, *supra* note 17; Cooley, *Geometries*, *supra* note 18.
248. ROTHSTEIN, *supra* note 39, at 238.