

## IMPLICATIONS OF EMBODIED COGNITION AND SCHEMA THEORY FOR DISCERNING POTENTIAL MEANINGS OF IMPROVISED RHYTHM

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Rhythm is an essential and therefore indispensable aspect of all music. Arguably, rhythmic elements are the most accessible of all the musical elements for clients in music therapy to produce and manipulate expressively (Hiller, 2011). Yet, theoretical understanding of rhythm and its use in musical expression is a neglected area of both music therapy (Bunt, 1994; Daveson & Skewes, 2002) and musicological inquiry (Gabrielsson, 1993; Kramer, 1988; Mead, 1999). However, the area of psychological investigation known as “embodied cognition” or “schema theory,” which has been constructively applied to composed tonal music, may prove fruitful in deepening our understanding of potential meanings of rhythm in music therapy, particularly in clinical improvisation.

Aigen (2009) has astutely noted that music therapists must take responsibility for providing theoretical explanations of the therapeutic meanings of all the musical elements used in therapy processes. How do we explain a client’s rhythm? Where do a client’s abilities to use rhythm for self-expression and to relate to others come from? Ansdell (1997) supports the notion that music therapy and musicology can enhance each other’s pursuits of knowledge regarding music. Significantly, Aigen (2005, 2009) has been a leading author in bringing concepts from schema theory to music therapy toward explaining tonal aspects of clinically improvised music. This chapter seeks to shed light on the meaning potentials of rhythm in improvisation from the perspective of schema theory and to briefly highlight implications for improvisational music therapy.

### Embodied Cognition and Schema Theory

Musicologists concerned with studying how meanings may be derived from music experiences have recently embraced concepts from an area of cognitive psychology variously referred to as *embodied cognition*, *schema theory*, or *metaphor theory* (Brower, 2000; Dogantan-Dack, 2006; Iyer, 2002, 2004; Johnson & Larson, 2003; Krueger, 2009; Phillips-Silver & Trainor, 2007; Saslaw, 1996; Seitz, 2005; Zbikowski, 1997). (The terms “embodied cognition” and “schema theory” will be used interchangeably in this chapter to represent these related models.) Much of the development of this highly significant perspective on human cognition and language is based on the cognitive science, cognitive

linguistics, and neuroscience investigations of George Lakoff and Mark Johnson (1980, 1999).

Embodiment theorists posit that humans gain knowledge and comprehension of the world not from purely thought-based cognitions, as per the Cartesian model (wherein the mind is the locus of all knowledge and reasoning), but rather from bodily experiences involved in interacting with the physical world. Cognitive processes used for comprehending physical interactions include the use of metaphors—linguistic tools that help an individual categorize experiences from a variety of domains. A metaphor is commonly used to represent and thus comprehend one *thing* in terms of the attributes of another thing. For example, the pile of paperwork on my desk may be described metaphorically as a mountain—a huge structure that is in my way and that will take a great deal of time and effort to traverse or conquer, with the word “conquer” also being a metaphor for completing the task that I perceive as an enemy with whom I must do battle. Additionally, the metaphors used to comprehend one type of *experience* are often mapped onto other types of experiences that have constitutively similar attributes, which is a process known as “cross-domain mapping” (Lakoff, cited in Saslaw, 1996, p. 20). For example, most adults can recall an experience from childhood of spinning themselves around until dizzy and disoriented, even to the point of falling to the ground for lack of balance control. I may map this bodily experience onto my experience of feeling overwhelmed with having many projects active at one time—each needing my immediate attention—by stating that my head is “spinning” from the “dizzying” amount of work I have yet to do. The metaphoric concept or *conceptual metaphor* takes as the *source domain* the embodied action of spinning that results in dizziness and disorientation (a physical experience) and applies it to a *target domain*: that of feeling overwhelmed with many disparate tasks, each requiring immediate attention (a psychological/mental experience). Humans also use cross-domain mapping to conceptualize experiences of emotions through metaphors related to embodied knowledge when we describe, for instance, “falling” in love, feeling “down in the dumps” when depressed, or “flying high” when feeling great joy or elation.

One powerful aspect of mapping a bodily experience onto another type of experience through metaphor is that it helps us to categorize our experiences and thereby gain the ability to draw on previous experiences to understand and respond to new ones. Another useful aspect of cross-domain mapping is that it enables us to communicate with others regarding various types of experiences. We are able to draw on our own collective human bodily experiences, as conceived through conceptual metaphors, to understand and perhaps empathize with another person’s experience. Recent research has begun to support the notion that the use of metaphors in everyday understanding of human experiences is a common and, in many instances, universal phenomenon across cultures and languages (Narayanan, 1997; Reiger, 1996).

The foundations of our metaphoric concepts are found in what Johnson calls *image schemata* (1987). He describes image schemata as “structures that organize our mental representations at a level more general and abstract than that at which we form particular mental images” (pp. 23–24). Thus, image schemata are not pictorial representations of experiences, but are more fundamental. Image schemata are dynamic constructs formed from bodily experiences in the world of objects and space, and they represent experiences of interacting with and observing the attributes of objects and other

people, and of being and moving in space. Further, schemata possess internal consistency of pattern and form in their construction, aiding in the human proclivity to order and organize perceptions and responses to a wide variety of experiences in the world. While preserving a level of consistency, Johnson stresses that image schemata are also dynamic in nature rather than rigid, inflexible, and literal, and are therefore capable of accommodating the natural variety of human embodied experiences that occur in different, perhaps innumerable, contexts (p. 29).

To briefly illustrate, one key image schemata relevant to understanding music experiences is the CONTAINER schemata. (The convention of using capital letters to designate specific schemata is common in writings about schema theory and will therefore be applied in this paper.) A container has a boundary that delimits what is inside it from what is outside of it. We may understand the concept of a container first through our bodily experiences of having an inside and an outside to our bodies, and second from the act of going in and out of, for instance, a house, a room, a store, or an automobile. The reader may also usefully imagine the CONTAINER schema as represented by a box or a soup can. Things can be either inside the box or soup can or outside of it. Similarly, certain actions or events may occur inside a particular container, whereas others typically occur outside of it. With regard to a musical piece, let us consider a popular song with the common AABA form. Each section of the form may be considered a container for particular musical materials and the ways in which the materials are configured. The musical structures found in the B section are typically organized differently than those in the A sections that surround it, thus differentiating the sections from one another; each *contains* different configurations of the musical materials. The chord progression, melodic materials, rhythmic structures, and even lyric content that distinguish the B section are considered “inside” the B section, whereas those that constitute the A section are “outside” of the B section. However, we may also find a melodic motif from the A section interpolated “into” the B section. Statements during a rehearsal of the song that aid musicians in their orientation, such as “we are *in* the second A section” and “let’s *get through* the B section,” allude first to the experience of being inside the A section and second to the intent of moving through and eventually leaving the B section. Such directives, conceptualized through the embodied orientation of *in-out*, are demonstrative of applications of the CONTAINER schemata that occur quite naturally with regard to performances of music (Johnson, 1987, pp. 30–37).

How have musicologists contemplated the application of embodied cognition concepts to rhythm? Dogantan-Dack (2006) reports that current thinking regarding embodied understandings of musical rhythm has roots in the 19th century within the early psychology of music theorists. As evidence for this contention, she notes that the earliest science-based psychology research of the 1800s was, in fact, performed by experimental physiologists interested in human beings’ psychological experiences of sensations of the moving body, or *kinesthesia*. Dogantan-Dack further notes that the early psychology of music theories regarding rhythm also drew from the experimental physiology research of the time and therefore applied motor theories to explain the nature of musical rhythm. It seems apparent that, since the days of the early music psychologists, those interested in musicology have been seeking answers to questions of rhythm through concepts surrounding the embodied nature of rhythmic movement (pp. 452–453).

## *Conceptualizations of Time in Schema Theory*

Most, if not all, definitions of rhythm refer to some aspect of its relationship to time. So, to understand rhythm, we must first have a clear idea of the nature of time. Lakoff and Johnson (1999) apply concepts from embodiment theories to provide a detailed rendering of human beings' conceptualizations of and ways of reasoning about time, which are steeped in metaphor. The following descriptions are derived from Lakoff and Johnson's *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought* (1999) and Johnson and Larson's (2003) article "Something in the way she moves—Metaphors of musical motion" in the journal *Metaphor and Symbol*.

### *Time and Events*

A human being's life may be construed as a series of events. Events occur in time. Every event has a starting point and an ending point. In order to measure the time properties of an event, humans have devised instruments, such as clocks and stopwatches, which are based on consistent, cyclical iterations of small events (i.e., seconds) that are considered equal in their properties. A clock or stopwatch is used to track and categorize iterations that occur according to the arbitrary system wherein sixty iterations of a second equals one minute, sixty minutes equals one hour, and so on. Occurrences in succession of the events known as *seconds* symbolize an interval of time. Inherent in the notion of seconds occurring in succession is the inference of movement from one second to the next and the next, and onward. In fact, it is the movement of a pendulum or spring-loaded, cycling gears in a clock that produces realizations of time interval events for the purpose of measurement. The use of a clock or stopwatch allows an event to be measured from its beginning to its end. Therefore, it seems that we understand time via our understanding of the properties of *events*; that is, the time of our lives progresses from event to event. We also experience *moving through the duration* of each event. Subsequently, we measure the time properties of events through comparison with other events—the consequences being that our experiences of time are integrally linked to our experiences of events, and our experiences of events are embodied experiences, all of which occur in some form of space (Lakoff & Johnson, 1999, pp. 137–139).

### *Time and Movement in Space*

Interestingly, the language we use to conceptualize and reason about time—which reflects, in essence, our metaphoric thinking about time—takes movement in space as its source domain. In other words, we map conceptualizations of motion in space onto the target domain of time. It turns out that our experiences of time are conceptualized in terms of physical orientation of two sorts: the Moving Times Metaphor and the Moving Observer (or Time's Landscape) Metaphor, both of which incorporate the Time Orientation Metaphor. In the Time Orientation Metaphor, an observer in the present is faced in a fixed direction, with future time conceived of as being *in front of* and past time *behind* the observer. Examples of language used to describe experiences from this orientation are "I'm looking *forward* to the concert," "look *ahead* to next week's schedule," "let's not *go back* and revisit that issue," or "those days are *behind* us now."

The Moving Times Metaphor is a conceptualization in which *times* are an infinite series of events moving past the observer who is located *in* the present. The times are oriented facing the observer, who is oriented facing the future. Therefore, *time passes by us* or we experience the *passage of time*. Linguistic phrases that demonstrate this metaphoric conceptualization include the following: “time is *flying by* us,” “our performance date *will arrive soon*,” “the due date *has passed*,” or “*here come* the staccato sixteenth-note figures.”

In the Moving Observer (or Time’s Landscape) metaphor, on the other hand, the observer is not in a fixed location, but rather moves on a path over the landscape that is conceived of as time, and on which innumerable points of time (i.e., events and/or structures) are found at different locations. Movement along the path is thus the passage of time, and the distance traversed is the amount of time that has passed or is yet to be experienced. Just as in the Moving Times metaphor, the future is conceptualized as being in front and the past is behind. Linguistic phrases relevant to this metaphoric conceptualization include the following: “we are fast *approaching* the scheduled performance,” “we’ll *soon reach* the end of the semester,” we’ve *passed* the cutoff date,” or “we are *coming up on* the swing eighth patterns.” With regard to long or short amounts of time reflected in the metaphoric movement across the time landscape, we might say any of these phrases: “we have *quite a ways to go* before we are ready for the recording session” or “let’s *move on quickly* from this piece so we can *get to the next one* on the list.”

An observation about these two key metaphoric conceptualizations is that they are figure-ground reversals of each other, depending on what is taken as the moving subject in a given scenario—either times (events/structures) or the observer (us) (p. 149). This concept may have relevance for conceptualizations of rhythm in that figure-ground relationships are found among the various rhythmic elements, particularly those of pulse and rhythmic figures.

### *Rhythm Event-Structures*

Lakoff and Johnson (1999) summarize their findings regarding time-oriented metaphors by telling us that human beings use metaphors related to movement in space to conceptualize time because of our day-to-day bodily experiences moving and physically interacting with the world. The authors refer to these experiences as “motion-situations” (p. 151). It seems that we automatically correlate our actions (i.e., motions during motion situations, or observations of the actions of others) with the time-defining events that endow us with our sense of time, such as the movement of clocks and our body rhythms. The authors support their belief in these metaphoric conceptualizations, and the embodied cognition concepts that undergird them, by explaining that humans “do not perceive time independently of events. ... We can only define *time* to be that which is measured by regular iterations of events” (p. 154, italics original). The authors further conclude that, “Motion-situations thus contain the literal correlations that are the experiential bases for the Time Orientation, Moving Times, and Moving Observer metaphors” (p. 151).

A conceptualization that I would like to put forth here, and one that seems important to experiences of rhythm related to time and movement metaphors, is the notion of rhythmic structures (i.e., rhythmic figures) as *rhythm events*. For just as distinct

events such as a party, a business meeting, or a person telling a story have a temporal shape with a beginning, middle, and end, so too do rhythmic structures, as they are experienced by people. Therefore, we might, then, speak of rhythmic figures as *rhythm event-structures*—that is, temporal structures with a particular form occurring in the experiential space of time. Rhythmic figures are, simultaneously, events and structures. (Rhythm event-structure is my own construction and is not related to Lakoff and Johnson's [1999, pp. 170–234] *event-structure concepts* that deal with metaphorical understandings of causation. My conceptualization of rhythm event-structures is meant to highlight the duality of a rhythmic figure metaphorically understood as both an event that occurs over time and a structure akin to a building.)

If we relate the Moving Times and Moving Observer metaphors noted above to perceptions of rhythmic music, we experience a series of rhythm event-structures. For example, in the Moving Times metaphor, we experience rhythm event-structures moving toward us, through or around us (depending on how directly we experience the rhythm), and eventually past us, whereas in the Moving Observer metaphor, we move toward, through, and eventually past various other rhythm event-structures. This notion is demonstrated in the examples of a listener in the Moving Times metaphor who experiences the *approach* of staccato sixteenth-note figures and a listener in the Moving Observer metaphor who *is approaching* a section of music containing swing eighth patterns. The staccato sixteenth-note figures and the swing eighth patterns are structures that we can isolate and describe as distinct, but they are at the same time events that we experience: as time, in the course of time, and through time. The concept of rhythmic figures as discrete event-structures is certainly not foreign to musical processes, as players often isolate particular figures and practice them repeatedly outside of the context of a musical whole, thereby highlighting the structural unity and independence of each pattern. Similarly, when improvising, a player may create a new pattern and subsequently repeat, restructure, embellish, reduce, or expand it in various ways while holding in mind the distinctive character of the initial pattern as a discrete event-structure with its own temporal form.

A discrete rhythm event-structure may be a single beat or a rhythmic figure, or even a rest (e.g., a beat or more of silence) that we as listeners experience as time moves past us or as we move through it. A rhythm event-structure may also be a pattern that we re-produce as performers or that we create through improvisation as we move metaphorically over the landscape of time. From an embodied cognition standpoint, what differences are apparent in the ways that rhythm is conceptualized within the process of listening vs. re-creating vs. improvising?

### *Characteristics of Listeners, Performers, and Solo Rhythm Improvisers*

Whereas the “lion’s share” of musicological interest, including that of embodiment theorists, has historically focused on listeners’ perceptions of music, little evidence exists for interest in the experiences of improvisers (Gabrielsson & Juslin, 1996; Juslin & Persson, 2002; Nettl, 1998; Pressing, 1984). Notably, in recent decades musicologists have begun to focus research on performers’ efforts in expressing aspects of emotion while performing precomposed works. Interestingly, key machinations that performers use toward expressing emotion in music have to do with timing, and therefore

rhythm is clearly implicated in this work (Juslin, 2001; Juslin & Laukka, 2003; Juslin & Timmers, 2010; Laukka & Gabrielsson, 2000). Yet, a performer of a precomposed work remains a significantly different subject of study from an improviser. Subsequently, in seeking to understand improvised rhythm through schema theory, we must consider how embodiment concepts apply from the vantage point of an improviser compared to that of a listener or a performer.

### *Listeners*

Johnson and Larson (2003) report that, for music listeners, there are two perspectives from which to experience music on a landscape: as observer or as participant. In the *observer* perspective, the observer-listener remains in place on the landscape while musical event-structures move past her/him and she/he thus undergoes and thereby experiences them. Contrarily, in the *participant* perspective, the participant-listener moves along a path on the landscape of time, undergoing and experiencing musical event-structures as they are encountered (pp. 72–73). In both perspectives, a listener may either actively engage in the process or act as a passive subject to it. In both the observer and participant perspectives, however, a listener plays no role with regard to creating, sounding, and shaping the nuances of particular musical structures. Also, whereas a performer plays the role of creating movement while playing, she/he does not engage in creating musical event-structures, as does an improviser.

### *Performers*

A performer's perspective is as a participant. A participant does not simply await musical event-structures as does an observer-listener, but exercises intentionality with regard to the music sounded and therefore agency in the process of revealing or sounding the prescribed musical event-structures of the piece. While sounding or giving voice to composed materials, a performer also has opportunities to individualize the way the materials are sounded, usually within a certain stylistic range. With regard to musical agency, Johnson and Larson (2003) distinguish between the metaphorical concepts *I am moved* and *I move* (p. 76). To be moved ("I am moved") by the music is to be subjected to *musical forces* that push or pull us in various ways (p. 75), such as the forces by which an observer-listener is moved. Interestingly, a participant-listener moves toward the musical forces found in various musical event-structures of a piece and therefore experiences moving through them as well. To move musically ("I move"), on the other hand, is to *be* the force that causes musical motion or movement. At the most basic level, a performer, by the act of sounding composed materials from a page, lends human energy to cause music to be sounded and therefore to move *in* the music. Yet, at another level, a performer may exercise agency to shape and consequently aid in moving the music in individualized ways. This is facilitated through varied use of tempo, dynamics, and phrasing, while also reproducing the prescribed or composed event-structures of the composition. At still another level, a performer also hears the sounds and feels her/his own physical efforts while reproducing musical event-structures, and therefore may also be moved *by* the music that is sounded. By possessing energy and a capacity for intentionality to cause musical motion through human agency, a performer determines

whether and how musical event-structures are sounded, but not what the nature of each event-structure is, nor *where* each is to be located on the unfolding path on the landscape of musical time, since these are predetermined by the composition itself.

### *Rhythm Improvisers*

Another perspective that has received little attention in the musicological literature is that of the rhythm improviser. While an improviser's experience may be construed as moving over a landscape (like the experiences of a listener-participant or a performer), the improviser does not encounter structures in particular locations on the landscape, nor is it the improviser's role to bring a composer's musical event-structures into existence through musical agency. Rather, the improviser creates or brings forth rhythm event-structures, shapes them, and experiences their unfolding while moving at a self-generated rate of speed along a self-created path on the landscape of time. The improviser further responds in an individualized way to the improvised rhythm event-structures while continuing to create more, until the improvisation ends. In this perspective, the improviser is the sole agent in a unique cycle of creation, perception, and reaction. The improviser is the source of energy that initiates improvising, the resource for establishing and regulating the cyclical or noncyclical nature of the path over which rhythm event-structures occur (i.e., pulse and tempo), the architect and expresser of all rhythm event-structures that are formed (i.e., rhythmic figures), and the supervisor/manager and experiencer of the unfolding processes. In the moments of creation, along with the role as human agent for bringing sounds into being, an improviser may also be considered a composer, a conductor, an arranger, an orchestrator, and an audience to all that occurs in the improvisation.

### *In-time and Over-time Processes*

The improviser's perspective is one that Iyer (2004) describes as being grounded in *temporality*, meaning that the individual (player) is part of an embodied process that occurs either "over-time" or "in-time" (pp. 160–161). Processes that occur over time are those that "are merely *contained* in time; the fact that they take time is of no fundamental consequence to the result" (p. 161, italics original). Examples of over-time processes may include composing an orchestral work or writing a song, short story, or novel. In-time processes, on the other hand, are processes that are "*embedded* in time; not only does the time taken matter, but, in fact, it contributes to the overall structure" (p. 161, italics original). Rhythm improvisation epitomizes an in-time process. A rhythm improviser is a framer of time—that is, an agent who utilizes the possibilities of time to create time-oriented and time-dependent structures (i.e., rhythmic figures) while moving forward in time, over the landscape of time, perhaps from one rhythm event-structure to where the next will be created.

Returning to the Moving Times and Moving Observer metaphors, we note that an improviser's time orientation is the same in both perspectives (i.e., the future in front, the past behind), but her/his nature as the subject of the metaphor is different than that of a listener or a performer. Again, the Moving Times metaphor places the observer-listener in a static position and receptive role, detached from the processes of creating or shaping

the event-structures encountered and undergone, and therefore subject *to* the music. Musically, the Moving Times perspective makes logical sense for an observer-listener. The participant-listener, in Johnson and Larson's (2003) conceptualization, is also placed in a receptive role, taking in the preordained structures she/he comes upon and living through them on the journey over the landscape. Musically, the Moving Observer perspective makes logical sense for a participant-listener, but also for the experience of a performer of a composed work. The participant-listener receives the music as she/he arrives at its location in musical time, whereas the performer reconstructs a composer's structures at their prescribed locations.

Compared with a participant-listener or a performer, a rhythm improviser is indispensably involved in creating, forming, and locating rhythm event-structures as well as bringing into existence the path on which they occur. A rhythm improviser also determines the nature and character of the forward movement along the path over the landscape of time. Due to the unique nature of an improviser's role, she/he is not simply an observer, but is a *creator* as well as an *experiencer* of the processes. The improviser creates the experience and consequently also lives through it, along with each event within it, by taking in the rhythm event-structures (i.e., receiving the auditory and kinesthetic stimuli of the improvisation) and also by potentially being moved by the musical constructions and forces. The improviser determines when improvisational time begins and ends and also how time is marked and organized based on passed embodied experiences of being and moving in the world or witnessing the movements of objects and others. Therefore, according to embodied cognition concepts, the ways that pulse, subdivision, tempo, rhythmic figures, meter, and accents are manifested in creating rhythm event-structures in improvisations stems from and is constrained by an improviser's experiences of bodily movement in space and time.

### **Schemata Relevant to the Rhythmic Elements in Improvisation**

Given the importance of embodiment in recent conceptualizations of music, it is essential to attempt to describe the various rhythmic elements as they relate to bodily movement schemata and their associated metaphors, all in the context of improvising.

#### *Musical Pulse and Locomotion*

Musical pulse, sometimes referred to as "basic beat," is the division of time into equally segmented and equally significant recurring events. Defined in this way, pulse can be conceptualized by itself, without reference to subdivision, tempo, meter, and rhythmic figure, and therefore warrants a separate discussion in terms of embodied cognition constructs. Musical pulse may be understood through a few key schemata that have to do with locomotion, including those for PATH, VERTICALITY, BALANCE, CYCLE, GROUNDEDNESS, and GRAVITY.

As bipeds, humans, whose development is beyond infancy, ambulate most often by walking—a form of locomotion. The left-right-left-right symmetry of the action of walking is cyclical, like a rhythmic pulse. Simplistically, the machinations of walking include the legs swinging from the hips in a cycle consisting of one leg swinging forward, the forward foot striking the ground that supports the weight of the body as it vaults over

the leg that is now in contact with the earth, while the other leg begins to swing forward and its foot subsequently strikes the ground, and so on (Farley & Ferris, 1998; London, 2006). As each leg “lifts up” and “returns down” to the earth in the cycle of steps, the individual experiences VERTICALITY. This process carries the body in a forward direction on a real or metaphorical PATH, a surface over which movement occurs and that designates where on the landscape the walker is going, where she/he is, and where she/he has been. The nature of a walking posture also invokes the VERTICALITY schemata as the individual experiences the empowerment of being in an upright position, affording the efficiency of ambulating bipedally rather than by crawling on all fours.

An individual’s legs are most often roughly equal in length, so a walking stride creates an even rhythmic CYCLE of left-right, left-right—a completed cycle entailing the execution of a step from each leg. In the process of walking, one foot always remains in contact with the GROUND; in running, both feet may leave the ground simultaneously, but they always return. Therefore, when walking (or running), we are, in a sense, GROUNDED; we are supported, held up, maintained by the ground beneath us. Being grounded in this way is also a function of the “pull” of GRAVITY—that is, the force of nature that causes bodies in motion to return to the earth, to the ground. We experience stability and support in our movement by being regularly connected with the surface over which we travel, yet we must also assert effort toward maintaining our vertical posture in the face of gravitational force. The muscular and skeletal movement scheme of walking (and running) is also cyclical and therefore may be characterized as rhythmic. Therefore, when walking or running evenly, we may say that we are moving in a rhythmically grounded fashion (London, 2006).

Along with comprehension of the cyclical movement involved during the experience of walking, humans also gain understanding of BALANCE. BALANCE, in this case, is a dynamic concern of equal distribution of weight in various forms necessitated by the influence of GRAVITY—the natural force that, in essence, pulls physical objects downward toward the earth. In walking, unconscious adjustments are continually made in the central nervous system for the weight of the torso, each arm and leg, and the head, as these pivot over the axis formed by the foot and leg that is in contact with the ground. BALANCE is, of course, important to the process of remaining upright (VERTICALITY) so that the cycle of steps may continue as evenly as possible and the body may therefore move forward in a controlled fashion (Farley & Ferris, 1998).

Given the above explanations of schemata related to walking, I wish to assert that it is the experience of intentional movement schemes related to locomotion that provide the basis for a human’s ability to reproduce a musical pulse. Briggs’s (1991) report on musical development lends further credence to this claim. Her consolidation of findings from musicologists and music education researchers indicates that a 10- to 14-month-old child’s ability to intentionally play a steady beat develops concurrently with her/his ability to walk, with improvement toward mastery of both continuing through the 36- to 72-months period (pp. 10–15). It should be noted that our ability to walk is, of course, preceded developmentally by the locomotor scheme for crawling, which, once mastered by an infant, is also a cyclical and therefore rhythmic action. The key to both schemes, however, is the individual’s intentionality in the process, for it is through her/his intentional actions in moving in and against the properties of the world that an individual develops understanding of the nature of stable cyclical patterns of action and the

associated benefits for well-coordinated locomotion, and eventually for rhythmically organized music-making.

Walking, it seems, is the most energy-efficient way for a human to ambulate under her/his own power (Farley & Ferris, 1998). Other locomotion options exist, of course, such as skipping, galloping, shuffling, hopping, and so on. But with a moment of thought, we understand that all of these movement patterns require more cognitive and physical energy of the typically developed human body than does the even, reciprocal motion of walking. Numerous other rhythmic cycles occur in a functioning human body—some more even and/or stable than others—such as in sleeping, respiration, digestion, and menstruation. Historically, musicologists have related musical pulse with the heartbeat, even naming this essential and most basic rhythmic element after it (Spitzer, 2004). Yet, rhythmic biological imperatives such as heartbeat and respiration largely occur unconsciously, with our attention brought to them most often only when they are not even or stable, such as when affected by physical exertion or by psychological responses to events (e.g., fright or joyful excitation). If heartbeat were in fact the true basis for understanding and producing musical pulse, then it seems that infants would be born with the ability to do so, which is not the case. I contend, on the other hand, that the *conscious* and *intentional* embodied locomotor movement experiences of walking (and crawling prior to walking) have greater import for the development of embodied awareness and potential skill in playing pulse than the more-often-than-not unconscious and unintentional experience of heartbeat. For just as a musical pulse divides time into equally segmented, equally significant, recurring sound events or cycles often made explicit when an object interacts with another (e.g., a mallet striking a drumhead), the process of walking with an even gait requires equally segmented recurring swings of the legs and feet striking the ground.

The cycles of pulses are balanced, as are steps when walking. Interestingly, the cadence range (rate of speed) of human adult walking may also be roughly matched to the typical tempo range of much Western music. Drawing on the work of Fraisse (1982) and Todd (1994), Iyer (2002) substantiates a similar notion wherein listeners are thought to comprehend rhythm in music by linking its attributes to that of bodily movement schemes such as walking. Iyer posits that the relative cadence range of walking (in the region of 60 to 180 bpm) has a musical correlate in the pulse rates or tempi of a large portion of Western music. (It is quite likely that other musics of the world similarly draw from this tempo range; however, no research was identified to support this notion.) More recently, London (2006) has provided a thorough review of research on measured relationships between walking cadence range and musical tempi, further sustaining Iyer's contentions. Presumably, the correspondence between tempi of Western musics and the average range of adult walking cadences is not accidental but speaks to the embodied nature of this indispensable rhythmic element. It also seems logical to assume that, since listeners are believed to comprehend rhythm through their understanding of bodily movement schemes, performers and improvisers likely gain this knowledge through similar means and therefore draw from embodied knowledge when improvising with rhythm (Mead, 1999).

Musical pulses may function in a figure-ground relationship with rhythmic figures that, by definition (see below), divide time unequally yet often, but not always, in mathematical relation to the cycles of the pulse. Similarly, a key attribute of the

experience of human locomotion, regardless of type, remains being in contact with the earth; human agents are figures always supported by the ground, always in relationship with it. And, whereas walking is the foundational scheme for human bipedal locomotion, rhythmic pulse is the cyclical foundation for the experience of rhythmic movement—that is, the GROUND over which rhythmic *movement* is experienced by both performer and listener. The music theorist Mead (1999) adds support for the notion of a relationship between walking and musical pulse by reminding us that “qualities of locomotion” as well as tempo are reflected in familiar music terminology (i.e., tempo markings) (p. 5). Examples may include *agitato* (“hurried, restless”), *grave* (“slow and solemn”), and *andante* (“at a walking pace”) (Apel, 1969). Mead (1999) further explains his stance thusly:

I suspect that further aspects of rhythm also derive from our physical motion, however. We are extremely sensitive to the differences between even and odd groups of pulses, whether they be at the level of the beat, its subdivision, or numbers of bars in a phrase. It strikes me as not unreasonable to reflect that our sensitivity to this difference is at least in part derived from our sense of the difference between those cyclic actions that involve reciprocal motion, such as walking, and those that do not. (p. 5)

It is important to recognize that a rhythmic pulse is often a covert experience for an improviser rather than explicitly sounded when playing. An improviser may relate rhythmic playing to an underlying pulse that is created and maintained internally but not actually played or sounded explicitly. Thaut (2005) refers to the internalization of rhythmic pulse as a “felt pulse” and notes that other rhythmic actions a player might construct—regular or irregular—are somehow “referenced and synchronized against underlying sensations of pulse patterns” (p. 7). Regardless of whether the pulse is expressly sounded or its perception simply felt, its characteristic grounding aspects, explained through schema theory, nonetheless impinge on an improviser. These grounding aspects play a role in the achievement of *cyclical movement forward on a path* wherein a *gravitational pull* toward the *ground* is experienced, requiring effort to maintain *balance*.

Metaphorical linguistic phrases that evidence a link between notions of musical pulse related to locomotion and the underlying structures of the PATH, VERTICALITY, BALANCE, CYCLE, GROUNDEDNESS, and GRAVITY schemata may include any of the following:

- “Here the music settles *onto the beat*”
- “Louis Armstrong was known for playing just *in front of or behind the beat*”
- “He *laid down* a *steady* beat throughout the entire piece”
- “Her playing was *grounded* in an even pulse”
- “His wildly expressive playing was *ungrounded*”
- “The insistent pulse of the bass *supported* the group’s cohesion”
- “He was able to *stand up on his own* as a new member of the rhythm section”

#### *Subdivisions*

Subdivisions are divisions of the time span of musical pulses into smaller, equally spaced, equally significant events. They may be sounded or manifested as rests. Subdivisions most often divide the pulse into equal cycles of halves, thirds, fourths, sixths, eighths, sixteenths, and so on. The origin of any subdivision is the pulse, and therefore a sense of the underlying or felt pulse is found in subdivisions. This being the case, a subdivision cannot be separated from its direct relationship to the pulse. A series of subdivisions may sometimes function similarly to the pulse—for instance, when used as an ostinato. Notably, subdivisions occur more frequently than pulsations, yet they do not signal a change of tempo. Pulse and subdivisions share the same temporal and therefore metaphorical space. In summary, subdivisions fill the time between pulse beats with more frequent events that are equally significant while also remaining measured within the same metaphorical space as the underlying pulse beats.

Referring back to the discussion of pulse as related to walking, it seems prudent to examine whether the same explanatory metaphor of locomotion may hold true for subdivisions. Key differences between subdivisions and pulse, of course, are the frequency with which the equally subdivided beats occur and the increased use of physical and cognitive energy required to produce and organize them.

#### *Pulse and Subdivisions: Walking and Running?*

In terms of linking locomotor concepts, it may be tempting to state that, since pulse is related to walking, then subdivisions relate directly to the act of running. However, a moment of analysis of walking and running movement schemes suggests that, within a small range, these two locomotor schemes can, in fact, share a similar *rate of occurrence* (also variously referred to as speed, cadence, or, in music, tempo) (London, 2006). Therefore, we might say that walking and running are just two similar metaphorical ways of articulating or representing a pulse. Yet, whereas walking and running may potentially share a small cyclical range of cadences, the complexity of movement involved in each scheme is different, as are the energy requirements of each. In running, it frequently occurs that both feet simultaneously leave the ground as the body works against gravity to propel itself both upward and forward, thereby demanding more coordination and energy than in walking. Hence, the complexity of movement patterning (coordination and organization) and energy required seems to differentiate these two locomotor schemes.

A similar relationship seems to exist between the coordination, organization, and energy requirements of pulse and subdivision playing. Yet, despite these apparent similarities between walking-running and pulse-subdivisions, an issue that seems to weaken the link is the metaphorical temporal space required among them, if in fact we liken metaphorical temporal space to the characteristics of physical space. For unlike the temporal and metaphoric space necessary for the realization of pulse and subdivisions of the pulse (i.e., the same temporal and metaphoric space), running, in actuality, typically moves a person forward over a landscape farther than the scheme for walking over the same time period, thereby requiring more space or distance to accommodate the result of running movements. When an individual needs or wishes to move forward quickly, shifting the movement pattern from walking to running accommodates the energy

associated with the impulse to move faster. Correspondingly, the feet strike the ground more frequently but also with greater expanse between them, and more distance is traversed. It is here with regard to the metaphorical distance covered on the PATH, as found in the equal relationship between pulse and subdivision playing, that the metaphorical connection between walking-running and pulse-subdivision seems to lose explanatory power.

Summarizing the above metaphorical concerns surrounding pulse-subdivisions and walking-running, we can say of subdivisions that they accommodate an improviser's increases of energy from that typically expended by pulse playing. This occurs, however, without changing the underlying time cycle or the underlying movement scheme (pattern) of the felt pulse, but also without changing the amount of space on the metaphorical time landscape that is traversed. Running, on the other hand, while potentially maintaining a mathematical relationship to an earlier walking cadence such as by doubling or, less likely but possibly, tripling or quadrupling the rate of previous walking steps, results in greater distance traveled on a landscape during the same time frame as when walking, and also expends a greater amount of energy. Thus, the potential metaphorical relationship between pulse-subdivision and walking-running appears to be violated.

Returning to the schemas noted above relating pulse and walking, namely the schemas for PATH, VERTICALITY, BALANCE, CYCLE, GROUNDEDNESS, and GRAVITY, it is the PATH schema that is not accommodated in the attempt to metaphorically link subdivisions to running. The PATH unfolds over the GROUND of the felt or actuated pulse. Subdivisions, by definition, relate directly to the grounding pulse, their realization being part of the pulse, and therefore their manifestation being in the same time (and metaphorical space) as the pulse. How, then, do we differentiate subdivision from pulse? What is the embodied nature of subdivisions, and what metaphorical concepts help in our explanatory pursuit of this rhythmic element?

### *Subdivisions and Bilateralism*

Human walking is a bipedal accomplishment. We are able to walk because we possess the bilateral structures (left and right legs and feet) that allow it. We are also bilateral with regard to our upper extremities (i.e., arms and hands) and, as humans, we are incredibly creative when it comes to the seemingly infinite number and sorts of things we can do with our bilateral upper extremities. One of these incredible feats is to subdivide musical pulses into smaller, equally significant units. We typically accomplish this through variously alternating the actions of our left and right arms and hands. We might conjecture that this act has historical roots in pre-verbal human language communication—for instance, when a person sought to communicate with another about the speed of an animal as it moved nearby, of the rate of flow of a river or storm cloud, or perhaps about the flow of energy of an emotion. Demonstrating these important “motion-situations” (Lakoff & Johnson, 1999, p. 151) by striking an object with alternating left-right patterns at different speeds with one's hands could indeed be considered a creative and efficient way of nonverbally communicating information about movement and energy parameters of various phenomena. What I argue here is akin to this idea: Humans' performance of subdivisions of a pulse is realizable because our cognitive and motoric capacities allow us to use subdivisions as a means of expressing or communicating

something about temporal flow parameters of movement and energy. Said another way, as humans, we take advantage of our embodied understanding of motion-situations and bilateral upper extremity structures to create subdivisions and thereby express or communicate about movement and energy.

In summary, I argue above that the comprehension and performance of pulse playing have their bases in the locomotor scheme of walking. While it may seem logical to metaphorically relate running to subdivisions of pulse due to certain inherent relationships—that is, running and playing subdivisions both require increases in complexity of coordination and energy compared with walking and playing pulse, respectively—I have shown that the metaphorical relationship eventually fails, for pulse and subdivision share the same temporal space on a metaphorical PATH, whereas a runner and a walker, over time, will naturally end up in different places altogether. The comprehension and playing of subdivisions of pulse is instead argued to be related to the nature and possibilities of human bilateralism and cognitive abilities (and, perhaps, to a human’s creative/aesthetic penchant) for coordinating and organizing bilateral movements. This advantage may be applied in response to a need or desire to express experiences or observations of motion-situations in the world that occur at various rates of speed and with varying levels of energy.

Metaphorical linguistic phrases that evidence a link between subdivisions and expressions of movement parameters of speed and energy are the following:

- “Her playing seemed to have a *sense of urgency* as her *rapid* sixteenth-note subdivisions *continued unabated* for the duration of the improvisation.”
- “The *unhurried feeling* experienced earlier in the music returned when he switched from playing a steady stream of eighth-note subdivisions to half notes.”
- “While listening to her *relentless subdivisions*, I had the mental image of someone trying to *hurriedly flee* from danger.”

#### *Tempo: Measure of Energy*

For any musical pulse to exist and to be recognized by an improviser or listener, there must always be a measurable rate at which the pulse cycles occur, or a tempo (London, 2006). Regarding tempo in improvisation, Bruscia (1987) expresses the view that “Tempo is a *gauge* of energy, signaling the need to be held up by a ground ...” (p. 451, italics added). To define and expand on this notion relevant to improvisation, consider how when rhythmic playing begins, it evinces an expression of embodied energy requiring some form of structure *on which* to emerge and *to which* other rhythmic elements or events may potentially relate. Cooper and Meyer (1960) believe that tempo “is not an organizing force”; rather, that it allows qualification of the rate of speed of the pulse (p. 3). Tempo is also not something that simply happens when a pulse occurs, but it is consciously or unconsciously established by an improviser and is one clear revelation of energy manifested in a music improvisation. Fraise (1982) reviewed research indicating that individuals appear to possess a stable “spontaneous” or “personal tempo” as observed and measured in various empirical movement tests such as measures of finger-tapping speeds. Related to the above discussion linking pulse and locomotion, Fraise also noted that research subjects’ spontaneous tempi were highly correlated with

the typical range of adult walking cadences (pp. 153–154). Hence, it seems that the rates at which an improviser plays are individualized and yet relative to her/his experiences of human bipedal locomotion.

When improvising begins, a pulse cycle also potentially begins, establishing an overt or covert ground over which other rhythmic events may take place. As noted above, the tempo of pulse cycles is an indication of the energy expressed moment by moment in an improviser's rhythmic playing, and it may change freely according to various dictates of the player. Summarily, some form of energy must always be implied and applied in order for initial and subsequent beats to be sounded by a player, for a pulse cycle to be realized, and for rhythmic expression to be sustained throughout an improvisation.

Returning to the PATH schema, we note that as an improviser moves forward on a PATH, she/he does so always with a particular amount of energy that influences the pulse cycles and that manifests as a particular (measurable) rate of speed or tempo. With regard to rhythmic elements, Bruscia (1987) classified pulse, subdivisions, and tempi of improvisations as “rhythmic grounds,” and stressed that rhythmic grounds signal a state of equilibrium without an indication of a goal or other intention. Such energy flow related to pulse might be characterized as *inertia*: steady forward movement that remains unchanged until acted upon by another force. Therefore, when an improviser responds to an *impulse* (internal drive or compulsion) to play beats that do not correspond with pulse beats, the inertia is disrupted and a change occurs in the equilibrium, consequently signaling a need for resolution (p. 451). It is at this point that a rhythmic figure may be born.

As noted above, Mead (1999) reports that many of the terms used to describe tempi—or in composed music, to suggest appropriate tempi—are based on metaphorical linguistic terms regarding locomotion and/or deportment of locomotion. Above, I highlighted the examples of *agitato* (“hurried, restless”), *grave* (“slow and solemn”), and *andante* (“at a walking pace”). A review of music theory texts will reveal an abundant list of similar terms. Other metaphorical phrases that evidence a link between tempo and qualified energy related to movement or locomotion in improvisations are any of the following:

- “His tempo evolved from *quick and restless to calm and relaxed* before the improvisation was finished.”
- “It became clear that the *lumbering* tempo established early on in the group improvisation would not contain the *high amount of anxious energy* of many of the members.”

### *Meter and Accent: Containers and Boundaries*

Like tempo, meter is not a sound stimulus that an improviser “plays” as in pulse beats, sounded subdivisions, or rhythmic figures. Rather, it is a cognitive organizational tool for sorting rhythmic stimuli into manageable groups or “chunks” to assist in making the world of time-based musical/rhythmic experiences comprehensible (Lerdahl & Jackendoff, 1983; Radocy & Boyle, 2003; Thaut, 2005). The concept of “chunking,” first introduced by Miller (1956), has long been established as a cognitive structuring strategy for making sense of serial or sequenced bits of information (Gobet, Lane, Croker, Cheng, Jones, Oliver, & Pine, 2001). When represented on a written score, metrical structures are

referred to as “measures,” reflecting their function as regular organizational structures. Each measure holds a specific “measure of time,” that is, amount or number of pulse beats. Most often in Western music, measures are organized in sets of two or three pulses and the variety of possible subdivisions of those pulses (Cooper & Meyer, 1960; Radocy & Boyle, 2003).

From a schema theory standpoint, meter may be conceptualized as a continuous series of connected CONTAINERS with permeable walls that most often constrain the amount of rhythmic stimuli permitted inside each container, while at other times allowing an overflow of rhythmic stimuli to cross over into adjacent containers. Unlike when a performer re-creates composed music, an improviser “creates” these organizational containers for her-/himself during the spontaneous act of improvising and reinforces their conceived existence and function through the use of *accents* or emphasized beats (Cooper & Meyer, 1960; Radocy & Boyle, 2003). In this regard, Cooper and Meyer have noted that an accent “is a stimulus (in a series of stimuli) which is *marked for consciousness* in some way” (p. 8, italics original). Consequently, an improviser may play accents as a means of remaining conscious of the metrical containers she/he has established or to create rhythmic tension by accenting across metrical boundaries. Whereas a variety of accent types have been described (see Creston, 1964), Lerdahl and Jackendoff (1983) emphasize accents that reinforce meter, or “metric” accents, and those that function toward grouping other sorts of rhythmic events, such as rhythmic figures. Concordantly, in improvisation, accents often are created through the use of physical strength as an improviser stresses particular beats that *land inside* the metrical containing structures, their sound durations *fitting* inside the container, thereby reinforcing the meter—Lerdahl and Jackendoff’s *metric* accent. Accents may also be improvised that permeate the boundary of a metrical container by prolonging the sound stimulus or creating the perception that the sound stimulus is prolonged, thereby *crossing a metrical container’s boundary into* the next container and potentially disturbing the strength of the metrical boundaries or walls of the containers. Consistently crossing the boundary may subsequently alter the regularity of the metrical structure and potentially establish a new meter with new containers that hold a different measure of time than the previous ones.

Metaphorical linguistic phrases that evidence a link between functions of meter and the CONTAINER schema include any of the following:

- “Her rhythms *landed squarely within* the measure.”
- “He *broke out of* the meter and improvised freely.”
- “She ignored the established meter and played *in her own time structure*.”
- “The amount of syncopation *blurred the boundaries of the meter*.”

### *Rhythmic Figures: Structures and Events*

A key metaphorical concept emerges from the musicological literature regarding the potential embodied nature of rhythmic figures in rhythm improvisation, namely the architectural notion of rhythmic figures as *structures*. Along with sound, silence, and time as materials, the concept of forming or building rhythmic structures includes the embodied factors of movement and energy in time and space, as well as the related concept of *events* in our comprehension of time. We will examine below the defining

features of rhythmic figures before exploring their conceptualization as structures and events.

A rhythmic figure, or that which other authors have variously referred to as rhythm patterns (Bruscia, 1987), rhythmic groupings (Cooper & Meyer, 1960; Lerdahl & Jackendoff, 1983), “objective rhythmization” (Fraisse, 1982), beat patterns (Thaut, 2005), or quite generically as “a rhythm,” may be characterized as a division of time into a mix of equal and unequal beat segments with equal and unequal durations (i.e., long and short notes) and significances, (i.e., accented [strong] vs. unaccented [weak] beats). The concept of rhythmic figures infers an ordering of musical time that differs in structural quality from cyclical pulses or their subdivisions. Cooper and Meyer (1960) define a rhythmic figure as “the way in which one or more unaccented beats are grouped in relation to an accented one” (p. 6), a stance similarly held by Lerdahl and Jackendoff (1983). Cooper and Meyer refer to rhythm as “architectonic” in nature, meaning that the elements of rhythm, as well as various levels of rhythmic groupings, are used to *build* or *construct forms* in the service of organizing composed tonal music. Fraisse (1982) reports that in ancient Greek Ionian philosophy, *rhythmos* commonly meant *form*, “but an improvised, momentary, and modifiable form. *Rhythmos* literally signifies a ‘particular way of flowing’” (p. 150, italics and internal quotation marks original), thereby referencing rhythm’s relationship to motion or movement. Consequently, given the earlier discussion of embodied time conceptualizations, the notions of form and flowing also draw on the concepts of events and space. Fraisse, who himself reports the non-existence of an exact and generally accepted definition of rhythm, goes on to relate that Plato defined rhythm as “the order in the movement,” stressing that the locus of human beings’ perceptions of rhythm is movement of the human body (p. 150). Fraisse conceptualizes the basis of rhythmic figures as “Any differentiation in an isochronous series of identical elements” and notes, as do the other authors mentioned here, that the differentiation may come from beats having different durations or accents, or from pauses or rests in the flow of beats (p. 159). Thaut (2005) explains that rhythmic figures may (a) take the form of either simple subdivisions of a pulse constrained by meter, (b) be quite complex and highly syncopated but still organized within established metrical structures, or (c) be asymmetrical in their relationship with a meter or an underlying sense of pulse, or *free rhythms* (p. 11). Free rhythms “consist of extended or brief groups of rhythmic events that are characterized and distinguished from each other by changes in contour, timing, intervals, durations of sequences, tempo changes, or accent patterns” (p. 11). It should be noted that, with regard to free rhythms, Thaut refers to the Free Jazz experimental improvisation movement of the 1960s and 1970s that sought to set aside or “free” improvisers from melodic, harmonic, and rhythmic structural conventions. (See Bailey, 1988, for a detailed examination of this movement in improvised music.)

### *Rhythmic Figures as Event-Structures*

It is clear from the above definitions that rhythm involves both structure/form and movement. From the embodied cognition concepts of time described above, the playing of rhythmic figures, it seems, also shares characteristics with experiences of human bodily actions entailing energy and movement through time and space, while also drawing from embodied understanding of time via events. Whether constrained by or free

from musical conventions (i.e., some level of pulse and/or metric stability), a rhythm improviser is an agent who creates or forms distinct rhythmic figures that are different from pulse beats or sounded subdivisions, *while* playing. Reflecting on my own experiences of rhythm improvising and those of my clients and students, it seems that an improviser may express different intentions when forming rhythmic figures. These intentions may include manipulating the rhythmic elements and possibilities at one's disposal as guided by personal or cultural notions of aesthetic forms of expression, or communicating in some way with a listener or fellow improviser.

As we seek to describe the process of an improviser manipulating the materials of time (i.e., rhythmic elements) for aesthetic or personal satisfaction, it seems apt to metaphorically relate rhythmic figures to an architectural metaphor in that we often explain that an improviser *constructs, makes, creates, generates, shapes, or forms* rhythms while improvising. Other terms used for the creation of rhythmic figures may include the following: *make up, produce, fashion, craft, build, assemble, develop, compose, or structure*. The concept of *constructing* is an embodied experience that humans have shared at least since our ancestors began fashioning clothing and shelter against the elements by using the bilateral and independent capabilities of upper extremities to manipulate materials into useful forms—indeed, a sort of improvising.

As noted above, rhythmic figures or structures created by an improviser are formed in time, using time and sounds as materials. Correspondingly, and according to schema theory, these discrete rhythmic structures are also formed at certain locations on an unfolding PATH on the metaphorical time landscape and are thus also associated with our conceptualizations of events. An improviser creates and organizes rhythmic figures, or what I have referred to as *rhythm event-structures*, as she/he traverses a metaphorical PATH. The PATH is highlighted or brought into being through the creation of rhythm event-structures, for without the formation of rhythm event-structures to mark it as different from the GROUND, the existence of a PATH on which rhythm event-structures may occur is unwarranted; the path's proposed purpose otherwise goes unfulfilled. Without rhythm event-structures to distinguish a path from the ground, all that exists is the ground. Rhythmically speaking, to play pulse is to play the GROUND. However, with the formation of a rhythm event-structure comes the possibility of movement from one event-structure to another and another, thereby necessitating the existence of a PATH between them, and with it the innumerable ways that an improviser may move between each rhythm event-structure. In this regard, we may also reflect on the experience of an observer or participant-listener who, depending on the tempo of movement via the music, either experiences the music moving toward and past her/him or moves to and through the music's rhythm event-structures at varying rates of speed, thereby having her/his experience of the event-structures influenced in one way or another.

To summarize, rhythmic figures as event-structures have to do with the embodied concepts of constructing structures (i.e., rhythmic objects) using time and sound as materials. Rhythmic figures, being constitutively formed of time and space (via the metaphorical relationship between the two), are distinct with regard to the parameters of movement and energy they possess. Rhythmic figures are also constructed *over* the time of an improvisation, making each also an event (with a beginning, middle, and end) that the improviser subsequently moves through while creating them and moves away from in order to construct more rhythmic figures or event-structures. The architectural metaphor

alludes to the agency of the improviser in the process of building or constructing the event-structures of the improvisation.

Metaphorical linguistic phrases that evidence a link between improvised rhythmic figures, events, and metaphorical concepts of architecture may include any of the following:

- “She *built* her improvisation by *alternating the placement* of a one-measure-long and a two-measure-long rhythmic figure.”
- “He *formed* his rhythmic figures out of staccato sixteenth notes.”
- “Her improvisation was characterized by *carefully placed* rhythmic figures *assembled* in various ways from the common ‘shave and a haircut’ motif.”

### **Summary: Embodied Cognition, Schema Theory, and Meanings of Rhythm in Improvisation**

In this chapter, an attempt has been made to draw on concepts from the cognitive science domain known as “embodied cognition” and the related model of schema theory to explicate a deeper understanding of humans’ proclivities to use rhythm in improvised musical expressions. The key tenet of embodied cognition is that humans gain comprehension of the world, and our experiences in it, through bodily interactions with it and/or through our observations of objects and people moving and interacting in the world. A key tenet of schema or metaphor theory is that humans’ metaphorical conceptualizations of interactions with the world provide a means through which we explain to ourselves our experiences of and in the world—meaning that we aid our comprehension of life experiences by mapping experiences from one domain onto another. For example, we may map the bodily experience of running into a large object (“to crash”) onto the target domain of feeling overwhelmingly tired and needing to lie down and rest.

Due to the nature of rhythm as a fundamentally time-based experience, conceptualizations of humans’ psychological experiences of time were examined through schema theory. Highlighted was the fact that humans’ experiences of time are metaphorically understood through experiences of moving to and through events in space; time is understood only through our knowledge of the properties of events, including our experiences of enduring the ways that events unfold. In this regard, important schemata for experiences of time were explained. These include the Time Orientation, Moving Times, and Moving Observer schemata. From analyses of these schemata, an assertion was made that rhythm shares conceptual aspects with our experiences of structures found in particular locations on a landscape and also with our experiences of moving to and living through events, leading to the concept of rhythm event-structures. With regard to rhythmic improvising, it is theorized that the experience of creating rhythm structures at varied locations on the metaphorical landscape of time and the experience of living through each rhythm’s form as an event in time are not separate.

The experience of a rhythm improviser and thus the ways that rhythm may be conceptualized from this particular music engagement vantage point was found to differ considerably from that of a listener or a performer of composed works. In explicating differences inherent in the role of listener vs. performer vs. improviser, a rendering

emerged of the multilayered nature of an improviser's role and the multifarious demands of the improvisational process. Significantly, a rhythm improviser initiates improvised sounds through capacities to focus physical energy, motor actions, and cognitive agency on interacting with instruments. In so doing, the improviser creates rhythm event-structures as well as the metaphorical path on the landscape of time on which the event-structures occur or are located. The improviser also experiences applying her/his own physical and cognitive energies and efforts to organize the resulting sounds that emerge from the process. An improviser simultaneously appraises the sounds for their value to the improvisational process while continuing to create and to variously construct subsequent rhythm event-structures until the improvisation ends.

Thus, the picture emerges of rhythm improvising as a uniquely complex and sophisticated endeavor that touches upon and draws from numerous aspects of human functioning. Explaining the nature of the rhythmic materials involved in improvisation, therefore, requires an orientation capable of accommodating the unique factors implicated. With this in mind, embodied cognition and schema theory concepts were brought to bear on explanations of the rhythmic elements of pulse, subdivisions, tempo, meter, accent, and rhythmic figures used by rhythm improvisers.

### **Implications of Embodied Cognition Theory for Improvisational Music Therapy**

Foundational thinking on implications of schema theory for music therapy can be found in Aigen's (2005) *Music-Centered Music Therapy* text and *Journal of Music Therapy* article titled "Verticality and containment in improvisation and song: An application of schema theory to Nordoff-Robbins Music Therapy" (2009). Paramount in Aigen's theoretical view of music therapy is that "all aspects of melody, harmony, rhythm and meter, and texture that constitute one's clinical-musical interventions should have an underlying rationale" (2009, p. 242). Toward fulfilling the mandate understood in this proposition, Aigen advocates the importance of embodied cognition theories "as a tool in integrating musical content with the extra-musical clinical concerns that characterize the focus of music therapy" (p. 244). Other significant implications for the use of embodied cognition theories in music therapy are in how clients' functional capacities are revealed through their participation in various forms of musicking, including improvising. Aigen (2005) notes that relevant image schemata can provide an informative link between a client's life experiences inside and outside of music, that the metaphorical language used to describe music and musical experiences is useful toward gaining insight into music and its importance in clinical processes, and "that image schemata are not just of cognitive importance but also represent basic emotional, psychological, and developmental needs and aspirations of human beings" (pp. 178–179). Aigen also concludes that a key benefit of musical engagement revealed through embodied cognition theory is the compensatory nature of metaphorical understandings gained through musicking for clients whose disabilities limit their access to the cognitive, emotional, psychological, and developmental benefits of directly engaging in moving and physically interacting in the world (pp. 201–202).

*Forces*

In the findings described earlier regarding applications of embodied cognition theory to rhythm improvising, I noted that, at a foundational level, a rhythm improviser initiates and then maintains efforts in improvising sounds through embodied capacities to focus physical energy, bodily action, and cognitive agency on the processes of interacting with instruments. We may say, then, that in order for any rhythm improvisation to occur, there must be application of some form of *force* in the process of moving one's body with and against instruments. Johnson (1987) tells us that any action or interaction among objects and/or people implies the presence of forces (p. 42). The embodied experiences of human beings, as we move through the world and interact with objects and each other moment by moment, may thus be viewed as a series of force interactions or relationships (p. 45).

Forces, we are told, evince certain general characteristics that are immediately related to embodied understandings. Among these characteristics are the following: (a) Humans' basic awareness of forces is made evident through our experience of interactions. Johnson emphasizes, "There is no schema for force that does not involve interaction, or potential interaction" (p. 43); (b) Force is most often related to the movement of an object in a particular direction through space; (c) An object in motion usually follows a singular path; (d) Every force is derived from some source or origin (therefore, due to the directionality of forces, agents may manipulate forces toward a particular purpose or goal); (e) The strength, power, or intensity of a force is variable and is in many instances measurable; and (f) Since forces are evidenced through interactions, "there is always a *structure or sequence of causality* involved" (p. 44, italics original)—"Forces are the means by which we achieve causal interactions" (p. 44). Johnson holds that the characteristics just described constitute image schemata or *Gestalt structures* for all forces. Further, our metaphoric understandings of actions, interactions and therefore events, including improvising with rhythm, are conceptualized through the same image schemata. Johnson also asserts that image schemata, such as those for FORCES related to interactions and events, are implicated in the way meanings and inferences are developed (pp. 44–45). What sorts of force Gestalt structures may be identified in rhythm improvising, and how might FORCE schemata be useful to a music therapist toward understanding and working with a client's improvised rhythm? (For detailed expositions on the nature of tonal forces, see Aigen [2005, 2009], Johnson & Larson [2003], and Larson [1997, 1998].)

Johnson (1987) describes the following four general types of FORCE Gestalt structures or relationships that may bear on the processes of rhythm improvising: *Compulsion*, *blockage*, *counterforce*, and *diversion*. These structures may provide conceptual foundations for music therapists toward comprehending a client's improvised rhythm in both solo and co-improvisation situations. In solo improvising, a client generates, coordinates, and responds to improvisational and rhythmic forces of her/his own, whereas in co-improvisation, client and therapist both generate, coordinate, and respond to their own and each other's improvisational and rhythmic forces. Improvisers' playing may also be influenced in response to aesthetic, emotional/psychological, and physical forces rather than to purely musical ones. It therefore becomes possible for a therapist to witness and infer from a client's rhythmic improvising aspects of embodied experiences and understandings in relationship to self, to the world, and to others (Aigen, 2005). The therapist may also actively explore and subsequently work in treatment with a

client's responses to various types of forces through use of clinical-musical techniques. With regard to implications for improvisational music therapy, I will variously highlight related concepts from the IAPs formulated by Bruscia (1987, pp. 403–496), analytical music therapy (Priestley, 1994), and Nordoff and Robbins's (2007) creative music therapy models. I will also draw on notions related to the 64 clinical techniques found in Bruscia (1987, pp. 533–557).

### *Compulsion*

Given the above characteristics of forces, we may note that any force that results in real or potential action must have a point of initiation from which it begins, or a *compulsion* that then moves with a certain intensity in a particular direction along a path (Johnson, 1987). For a rhythm improviser, the compulsion or *urge to play* may have its origin in the impulse to create sound. The impulse may stem from, for example, an emotion, an aesthetic idea, or a need or desire to enact a physical expression of energy or to communicate with another. In such cases, the improviser may say that she/he *is moved* to play. Johnson emphasizes that without compulsion, an assertion of force will not occur. Therefore, at the most basic level, a client must experience an impulse from which a movement or action might be initiated and, whether aware or not of the impulse, must also be capable of responding to it with some form of action upon an instrument.

When a therapist witnesses the force of compulsion in a client's rhythm improvising, a sense of particular aspects of the client's immediate functioning in various domains may be gained. First, the presence of pulse in an improvisation is indicative of the client's experience of time (which is understood via movement in space) and the capability of cognitively and motorically organizing it or organizing self in relation to it. If pulse is present, the therapist may also infer something about the level of energy inherent in the client's ongoing impulses through the tempo and/or use of subdivisions. Further, with the presence of pulse, the therapist may note the occurrence of metrical organization and therefore something of the client's organization or coordination of expressive impulses. The immediate presence of rhythmic figures in an improvisation, while inherently indicating relationships to pulse/subdivisions, tempo, and meter (i.e., the organized flow of energy in time), may further provide for a therapist a more complex view of the client's experience of her-/himself as an agent who, in turn, comprehends the self as an agent who moves in time through various events and participates in creating, structuring, and experiencing events in the world. In other words, a rhythm improvisation that uses the widest range of rhythmic materials available reveals immediately the broadest perspective of the improviser's cognitive, motor, and psychological functioning in that moment. When pulse is not present in a client's initial playing, on the other hand, a therapist may note that the compulsion to create sound has revealed a force in response to an impulse. However, the nature of the impulse will indicate quite different meaning potentials having to do with a lack of organization in the client's motoric, cognitive, or emotional/psychological realms of experience or combinations therein. According to the IAPs (Bruscia, 1987), in response to a client's initial improvised offerings (i.e., her/his compulsion), a therapist may begin to assess through the variability profile the range of stability or instability or change with regard to the client's use of tempo, meter, and rhythmic figures toward later interpreting potential meanings (pp. 427–433). Further, the

therapist may be drawn to listen through the congruence profile as the client's use of tempo, subdivisions, and/or meter may exhibit differential relationships to each other as revealed through tensions among these rhythmic grounding and organizing elements.

For Nordoff and Robbins (2007), witnessing a client's compulsion in improvisation is related to the concept of the *music child* that is described as

...that entity in every child which responds to musical experience, finds it meaningful and engaging, remembers music, and enjoys some form of musical expression, communication, and sharing. The *music child* is therefore the individualized musicality inborn in every child: The term has reference to the universality of human musical sensitivity—the heritage of complex and subtle sensitivity to the ordering and relationship of tonal and rhythmic movement—and to the uniquely personal significance of each child's musical responsiveness. (p. 3)

Hence, to witness the compulsion of an improvisational impulse is to witness the manifestation of the music child's impulse to engage musically with the world. (It should be noted that the concept of the music child is not limited to children with disabilities, but applies equally to all improvisers [Aigen, 2005].) For Nordoff and Robbins, most improvisational experiences are co-created between client and therapist. Therefore, a client's impulse to create sound may stem from a need or desire to respond to the therapist's sounds as well as from her/his own internal expressive or communicative impulses. Toward comprehending a client's rhythmic expressions, a therapist working in this model first assesses the nature of the client's compulsion by attending to the rhythmic character and quality of intentionality in the sounded impulse, with a particular focus on pulse beating stability (p. 298). With the overarching aim of rhythmically (and therefore interpersonally) connecting and relating with the improviser, Nordoff and Robbins highlight the significance of pulse playing as an embodied experience in the following statement: "Two individuals responding to the pulse together are experiencing the most universally natural way of finding mutuality in being physically active to music" (p. 298).

### *Blockage*

Moving and therefore interacting in the world is not always a clear and unrestricted process, for we encounter obstacles or *blockages* along our paths, necessitating a redirection of our forces to circumvent the blockage. According to Johnson (1987), we do this by going around, over, or through the blockage, or else we must simply stop. In this regard, we may hear such metaphoric phrases related to circumventing a blockage if one can only *work around an issue* or *get over a hurdle* or *through a bottleneck*. It seems that there is evidence of intelligence and creativity in a human's process of determining how to get around a given blockage, as many options may be at one's disposal. Such is the case for a rhythm improviser. Let us explore the types of blockages that may occur in rhythm improvising.

The blockages that a rhythm improviser may encounter exist in the form of intra- and interpersonal experiences as well as intra- and intermusical experiences. For instance,

a solo rhythm improviser is always vulnerable to the intrapersonal-intramusical auditory feedback loop while creating and responding to the improvised sounds. As a client improvises and hears the improvised sounds, she/he may become aware of emotional energies and related associations underlying the expressions. Should the client be resistant to emotional awareness and the feeling implications of the emotion, the client may consciously or unconsciously alter the forces that are entailed in the character of the current improvising toward avoiding the emotion. The feedback the client thus receives changes, and she/he may then *move along in the improvisation unhampered* by the emotional blockage. An example of an interpersonal blockage may have to do with the authenticity in a client's improvising. This may be the case when a client recognizes that the improvisation may reveal something about her-/himself that she/he wishes to conceal from the therapist. In reacting to this potential blockage, she/he may consciously alter the forces inherent in her/his rhythmic expressions in an attempt to hide the aspect in question from the therapist while continuing to improvise. Along these lines, Priestley (1994) writes of similar instances of clients attempting to hide or avoid revealing aspects of themselves, but with a focus on implications regarding unconscious processes as viewed psychoanalytically. Priestley refers to these events as types of *resistance* occurring in a client's improvising and/or verbal processing of improvisations and leading to what she terms a *resistance vacuum* wherein a client unconsciously avoids revealing, feeling, and/or addressing certain emotions and any related cognitive materials via music, thoughts, or words (pp. 181–185).

A third example that crosses intra- and interpersonal as well as intramusical perspectives is when an improviser recognizes being somehow limited (i.e., is blocked) by the sensorimotor challenges required in improvising and how she/he or a listener may feel about it. Here the improviser may seek to form a particular expressive structure related to an aesthetic idea or one that suits an emotional expressive intent in the moment but is limited in doing so due to physical constraints (e.g., lack of mastery on an instrument). In attempting to create a particular structure, the client may misplay the figure and hence consider it a failure of sorts. To avoid feeling inadequate, the client may repeat the misplayed figure as if it were intended and thereby circumvent the blockage while continuing to improvise via more physically accessible materials (i.e., simpler rhythmic structures). By altering the forces inherent in playing and thereby moving on to using less challenging materials, the client avoids feeling her/his own or the therapist's judgment of adequacy/inadequacy.

In the above scenarios, types of blockages in a solo rhythm improvisation are metaphorically linked to combinations of a client's intra- and interpersonal emotional/psychological functioning, to sensorimotor capabilities, and/or to intramusical responses based on aesthetic concerns. As noted for the compulsion schemata, a therapist listening through the framework of the IAPs in the above scenarios may find significance in the variability profile, noting the client's tempo, meter, and rhythmic figure playing as musical/rhythmic forces are altered in response to real or perceived blockages (Bruscia, 1987, pp. 427–433). The therapist may also note points of tension in the improvised music as the variations occur over time and as alternate rhythmic materials, played in order to bypass a given blockage, are found incongruous with tension levels in the materials that preceded them (pp. 437–441).

Instances of blockage that occur via intermusical interactions depend on different types of forces than the scenarios just described. In the case of co-improvisation, client and therapist are vulnerable to each other's rhythmic forces as each player forms rhythmic materials in the improvisational situation. Here we refer to forces that are inherent *in* the sounds or tones of a rhythmic utterance. We find support for the concept of musical forces in the work of Zuckerkandl (1956), who held that musical tones, including the sounds that constitute rhythmic expressions, "are conveyors of forces"—and that "Hearing music means hearing an action of forces" (p. 37).

Nordoff and Robbins (2007) have noted that, depending on the level of awareness, emotional status, and factors related to development and pathology, a client might be more or less susceptible to the effects of certain musical forces in the therapist's improvised offerings. In the Tempo-Dynamic Schema (pp. 317–321), various extreme qualities of a client's use of tempo in beating—labeled *Condition-Determined* playing—are described according to the ways in which they inhibit or block musical communication with the therapist relative to a more "normal musical experience" (p. 318). In Scale III: Musicing (pp. 419–430), a client's instrumental rhythmic responses to aspects of the therapist's structured rhythmic materials, including pulse, tempo variations, and rhythmic figures, are assessed. Various condition-determined disorders in a client's rhythmic improvising may be considered blockages of the client's musically free and responsive playing. In particular, Nordoff and Robbins identify categories of potential blockages, including *Perseverative*, *Compulsive*, *Reactive*, and *Undirected/Unaware* beating, each of which a client may exhibit in the presence of the therapist's improvisational sounds, that is, in the presence of the therapist's rhythmic forces. Consequently, the authors have also sought to develop musical techniques through which a client's condition-determined improvising may become more freely directed and relational with the therapist's (p. 316). As the therapist attempts to alter a client's playing through various techniques, the client may be nonresponsive and continue on her/his current beating path. In this case, we might say that the client does not respond by bypassing the blockage at all, but rather drives directly through it without evidence of being at all influenced by the therapist's musical forces. According to the IAPs, a therapist might focus examination of the improvisation through the autonomy profile. Here the therapist may find that, due to the client's resistance (or lack of awareness) to being influenced by a co-improviser's sounds, the client avoids taking a certain type of role in the relationship (Bruscia, 1987, p. 447).

### *Counterforce*

The impact of a counterforce is that it stops the progress of another force, as if a head-on collision of forces occurs (Johnson, 1987). Counterforces in solo rhythm improvising may take a similar form to blockages, depending on the improviser's interpretation of the force relative to her/his own musical/rhythmic forces and according to the client's proclivity to respond to such force relationships. For instance, a solo rhythm improviser, when faced with the same sorts of intra- and interpersonal scenarios as described above related to the *blockage* force schemata, may respond not by seeking a way to get around or through a potential blockage, but rather by interpreting the blockage as a force equal to her/his own improvisational activity and hence responding to its

impact by ceasing to play. This is not an uncommon experience, as humans have many times described the experience of metaphorically being *stopped in one's tracks* or *halted in one's progress* for some reason. Therefore, a rhythm improviser may interpret and respond to intra- and interpersonal sorts of forces as counterforces. The client may similarly respond to intra- and intermusical forces. For example, the client may be confused, frustrated, or overwhelmed by the nature of her/his own improvised sounds or those of another improviser and respond by ceasing to improvise, perhaps not knowing how to continue or feeling incapable of doing so.

A therapist listening through the IAPs may hear the halted improvisation process through the integration profile as an over-differentiation of a client's playing in relationship to her/his previous playing, that is, the client's use of improvised sounds vs. no sounds. Using the autonomy profile (which infers co-improvising), the therapist may also note that the stopped improviser has chosen to resist, avoid, or obliterate the development of any leader-follower relationship within the improvisation (Bruscia, 1987, pp. 444–449). Nordoff and Robbins (2007), on the other hand, note in Scale II: Musical Communicativeness that a client's failure to maintain improvisational efforts has to do with, for example, being noncommunicative with the therapist, lacking intentionality and control in improvising, and/or using instruments in an infantile manner (p. 401).

### *Diversion*

In the case of diversion, two forces converge, not head-on as is the case of a counterforce, but from alternate angles, thus sending at least one of the forces in another direction or trajectory and onto a new path, as in a ricochet effect (Johnson, 1987). Such causal interactions occur frequently through the course of our daily experiences as we approach situations that challenge our extant forces and purposes and cause us to be moved in a different direction, with a new aim or goal and perhaps also with a different attitude or energy. In rhythm improvising, a player may be diverted by her/his own sounds as she/he hears, evaluates, and responds to them in the course of playing. Depending on the impact of factors related to aesthetics, emotions, and/or physical sensations experienced while playing, the improviser may be diverted, or *moved*, to make adjustments. For example, the client may alter the nature of the tempo, meter, and or rhythmic figures as the improvisation unfolds or alter the manner in which the rhythmic elements are articulated. Diversion by aesthetic factors entails responding to musical forces in accordance with the event-structures that the improviser creates and experiences. Alternatively, the impact of emotional factors related to the improvised rhythm may mean diverting one's playing in response to memories and/or associations elicited and/or to symbolic interpretations of the rhythm's character that *cause* the improviser to *change the course* and perhaps the character of the rhythmic materials. And finally, as an improviser experiences the physicality of the forces of movement involved in improvising, she/he may *be moved to change* the nature of the enactments performed against the rhythm instruments. A therapist may again find the variability profile of the IAPs to be of significance while hearing and seeking to understand the nature of the client's diversions of tempo, meter, and rhythmic figures within solo rhythm improvisations (Bruscia, 1987, pp. 427–433). The therapist may also consider the

character of the new material as it relates to the rhythmic sounds that preceded it, in accordance with the congruence profile (pp. 437–441).

In co-improvising—along with potentially being diverted in response to one’s own aesthetic, emotional, and physical factors—an improviser also may experience the impact of the other participant’s improvised rhythmic materials and/or the other participant’s personhood, as between a client and therapist. In some models of improvisational music therapy, therapists often assess the ways that clients respond musically/rhythmically to particular musical offerings, with the assessment information subsequently providing guidance to the therapist’s responses in treatment, such as in creative music therapy (Nordoff & Robbins, 2007). A resource that also provides great clarity regarding the notion of *diversion via musical forces* in clinical co-improvisation is the taxonomy of 64 clinical techniques compiled by Bruscia (1987, pp. 533–557), and in particular the 25 purely *musical* techniques that are implemented through a therapist’s improvisational efforts. Bruscia defines a clinical technique as “an operation or interaction initiated by the therapist to elicit an immediate response from the client, or to shape her/his immediate experience” (p. 533). Not all of the 64 clinical techniques are musical in nature. Some are verbal, some are structural or environmental, and some are procedural. I will describe here a few examples of musical techniques, referred to as “Redirection Techniques,” which are expressly designed to divert a client’s improvising in a particular manner and which have immediate relevance for rhythm improvising (p. 545). For instance, the technique of *Introducing Change* entails the therapist introducing new material such as rhythmic figures into a co-improvisation with the aim of helping the client *take her/his improvisation in a different direction* than its current course (p. 545). The technique titled *Differentiating* may be initiated when a client’s improvisational tendency is to emulate or merge with the therapist’s rhythms and thereby avoid taking an individualized and independent role or expressing from the client’s own impulses. In *Differentiating*, the therapist improvises rhythmic materials that are clearly distinct and contrast with the client’s sounds, with the aim of *causing the client to change* the nature of her/his rhythmic playing and thereby recognize her/his own identity in the music as separate from the therapist’s (pp 545–546). Lastly, the technique of *Intervening* is used by a therapist to disrupt or break into a client’s perseverative or fixated rhythm improvising. The goal of the technique is to provide the client with a stimulus to *change the inflexible or obsessive course* and/or character of the client’s playing. For example, a therapist may use strong syncopations or cross rhythms to destabilize the client’s perseveration in a metered context (p. 547).

### **Summary: Embodied Cognition and Improvisational Music Therapy**

With the long-held philosophical and musicological belief in a direct relationship between rhythm and human experiences of movement, it seems natural to seek understandings of improvised rhythm from embodied cognition theories. Application of schema theory to improvisational music therapy draws on the fundamental idea that, when an improviser plays on or interacts with rhythm instruments, certain FORCES are enacted. Further, interactions with instruments result in other forces to which a player becomes susceptible. These include (a) the forces of improvised sounds and the physical forces of a improviser’s own actions with and upon the instruments played; (b) the

psychological forces of memories, associations, emotions, and aesthetic ideals that the sounds may elicit; (c) the forces inherent in the interpersonal relationship with a listener or co-improviser (i.e., therapist); and (d) the musical forces that a co-improviser may enact. Finally, we can relate these particular forces with a group of Gestalt structures considered universally characteristic of the ways that all forces interact in the world. These include the schemas for compulsion, blockage, counterforce, and diversion.

When improvising rhythms and both product and process point to the client's metaphoric understandings of her-/himself as an agent on the world (i.e., self-perception), an embodied cognition perspective seems most relevant to guide clinical decision-making. As Aigen (2005) emphasizes regarding the application of schema theory to music therapy, part of the benefits for clients may be the opportunities that music provides for having experiences that compensate for the sorts of experiences that fully functioning persons have and that clients, due to certain limitations, cannot provide for themselves—a type of therapeutic helping that Bruscia (1998) refers to as “redress” (p. 68). Hence, in improvisational music therapy within a schema theory orientation, the therapist might address a client's need to experience the variety of forces that are available in music experiences that the client may otherwise not be able to access.

Last, from an embodied cognition perspective, a therapist can begin to comprehend the meaning of a client's rhythm by comparing the client's rhythms and the client's process of improvising to her/his own metaphorical understandings of embodied movement and/or emotional energy movement. In listening to or co-improvising with a client, a therapist might use her/his own experiences of forces related movement schemata as points of comparison to understand the client's rhythm or to challenge the client in various ways toward helping the client gain experiences with and abilities to respond to certain types of forces. For clients whose abilities to move and/or physically interact are limited, experiences of rhythmic movement provided by the therapist in co-improvising might be used to compensate for the client's limited experience and to therefore bring to the client opportunities to deepen understanding of the various forces in the world, among which are the client's own.

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