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## BOOK REVIEW

# New Perspectives in Music and Gesture

Edited by Anthony Gritten and Elaine King

Reviewed by Marc R. Thompson and Juan Ignacio Mendoza

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New Perspectives on Music and Gesture (2011), edited by Anthony Gritten and Elaine King, is an engaging follow-up to the book *Music and Gesture* (Gritten & King, 2006). Most (but not all) of this volume's 13 contributing chapters are based on lectures given at the Second International Conference on Music and Gesture, held at the Royal Northern College of Music, Manchester, United Kingdom, in July 2006. Like its predecessor, this book features contributions from ethnomusicology, music performance, music theory, music education, music philosophy, music semiotics, and music cognition. There are, however, some new fields represented here—perhaps most notably in a chapter on the psychobiology of musical gestures. The contributors could all be labeled musicologists, but this would be a gross simplification given their unique multidisciplinary research specialties. Indeed, it is difficult to define the music theorist who also does statistical modeling, or the music psychologist who performs computational feature extraction from motion capture

data. Generally speaking, the book presents a rich blend of the theories and practices related to the multimodal phenomenon of the musical gesture. The editors, both musicians-cum-researchers, are themselves a fine mix of theory and practice. Gritten is a professional organist who has written on the music of Igor Stravinsky and John Cage, and a researcher in the philosophy and aesthetics of music. King, an accomplished cellist, performs empirical research on ensemble music performance with an interest on communicative gestures and breathing.

A casual skim through the book gives the immediate impression of diverse research goals, methodological approaches, and experimental data. Each chapter opens with its own definition for gesture, outlining the term's adaptability. The editors appear conscious of the extensiveness to which this word can be used in different streams of research. It is no coincidence that they begin their introduction with an apt and inclusive definition of gesture by music theorist Robert S. Hatten: "...any energetic shaping through time that may be interpreted as significant" (Hatten, 2006; p. 1). An energetic shaping is a convenient term, as it can be applied to any mode of perception or production. This multimodal perspective is quite necessary when considering how gestures exist within musical contexts. As the editors point out, "musical gestures may be conceived, produced, experienced and interpreted by individuals in various ways, whether aurally, visually, physically, conceptually or otherwise" (p. 1). The book's contributions focus on three main categories of gestures: (a) movement gestures, which are bodily articulations produced by musicians or by listeners; (b) auditory gestures, which exist within the auditory stream as segments of expressive timing or dynamic nuances; and (c) pictographic gestures, which exist within the literal score sheet of a musical work.

The first category can be considered analogous to the physical gestures that commonly accompany linguistic communication (hand movements, head nods, etc.). Such gestures are meaningful because they carry nonredundant information, acting as an additional channel that can either emphasize or completely contradict the spoken word. Moreover, gestures are so integrated with speech communication that we use them even when the person we are talking with cannot see us, for example on the telephone. Taken to a musical context, the facial contortions or intricate poses acted out by musicians provide visible cues that audiences use to interpret musical intentions. Like speech, we perform musical gestures even in the absence of an audience. Take as an example Glenn Gould, who continued to display a unique array of gestures in the recording studio, well after having quit concert life (Delalande, 1995).

The second category can be understood as the auditory correlates of bodily gestures. For instance, upon hearing a musical phrase, we run mental simulations of the physical actions required to produce the phrase: the dynamics of a phrase are correlated with the amount of corporeal force the musician uses to perform it. The implicit awareness of the music's physical production allows the listener to identify and understand the musician's expressive intention and even empathize with his or her emotional state. The connection between auditory and physical gestures has led many to regard music cognition as an embodied process (Leman, 2008).

The third category posits that gestures exist within the musical score itself. The shape and contour of melodies and harmonies as they appear on a score sheet can be depicted as having semantic subtext, revealing the intentions of the composers, or clues the performer can use when deciding the affective disposition with which to perform the music.

All three forms of gesture can be considered focal points that have been segmented from a stream of information. Physically speaking, these focal points are unremarkable—they are performed and exist within the natural order. However, when an agent deems these segments significant, the segments acquire meaning, purpose, and intentionality. Gestures are segments that possess semantic ties or metaphoric mappings to objects, memories, and affects. Lakoff and Johnson (1980) argued that metaphors structure the basic understanding of our experience. Therefore, one could argue that gestures shape our understanding of music. How one interprets a musical gesture depends highly on prior knowledge and experience. Some gestures are universal, while others are highly subjective. For instance, a fortissimo figure immediately recalls strength and power, and a pianissimo and legato figure brings to mind tenderness. These associations can be experienced collectively by multiple societies, demonstrating that such mappings between sound and emotions are universal. Meanwhile, all music, from Mozart to Mos Def, contains gestures that only those very familiar with the musical genre and/or culture will understand. And even then, just as we can misinterpret intentionality within language, we may experience a musical gesture that even the producer was unaware of or did not intend.

From the above casual observations, it can already be suggested that gesture research is complex, yet acts as a valuable framework for studying music perception and cognition. Throughout what follows, we present a summary for each chapter within the book, sometimes merging our comments for more than one chapter as we deem pertinent. Due to the time lapse between the book's publication and this review, we have also provided suggestions for further reading of recent work that relates to the book's topics.

## Chapter Summaries

Biomusicology examines musicality from a biological perspective. In Chapter 1, the authors strongly affirm that musicality is not only innate in humans, but plays a fundamental role in a young child's communication and socialization development. Titled "Psychobiology of Musical Gesture: Innate Rhythm, Harmony and Melody in Movements of Narration", by Colwyn Trevarthen, Jonathan Delafield-Butt, and Benjamen Schögler, this chapter is based on many years spent observing the interactions of babies and their caregivers. A primary observation from their research is that mother-infant interactions are a form of musical discourse, complete with narrative and structure. This is thanks to the infant's innate sense of rhythm, which enables interaction and entrainment with the caregiver. The caregiver reacts to the infant's gestures and this action/perception cycle leads to social bonding. Within the babbles and phonemes, mother-infant interactions are sophisticated and nuanced musical interactions—the authors describe them using ornate descriptions throughout: for instance, the dyadic proto-conversations between infant and caregiver contain "the basic properties of intelligent art, which rewards and strengthens friendship in shared experience of beautiful movement" (p. 30) and "the movements of lips, eyes, head, arm, hand and torso [are] not unlike an orchestral piece where the commencement and conclusion of instrumental sections fits into harmony with others in differing patterns to express different qualities" (p. 31). To demonstrate the rhythmic and entrained aspects of infant-adult interaction, the authors present data in which a newborn's arm movement appears to be tightly synchronized with an adult's speech. Though compelling, this singular example's duration is 2.5 s, yet the authors are enthused to describe it as a music composition with the tempo marking *allegro moderato*. The writing style used to discuss their findings (particularly the inference of Western music nomenclature) is slightly problematic, as it is difficult to determine whether the authors are taking an illustrative or literal approach to reporting their findings. It is also unclear whether the entire interaction is a musical piece, or whether just the brief reported excerpts are. For the most part, the chapter is very interesting to read, though somewhat cumbersome, as it spans many areas (including a digression into the gestures of gymnasts). It wraps up not with a concluding paragraph, but a section on music and gesture in education and therapy. Biomusicology is a captivating proposal, and this chapter serves as a good starting point for someone interested in research on infant musicality. However, for a broader outlook on infants' sensorimotor development (of which musicality is but one instance), one could also look at the work of Thelen and Smith (1994) or more recently Delafield-Butt and Gangopadhyay (2013).

From the gestures used by infants interacting with caregivers, the book moves to gestures used by performers and composers. Chapters 2, 3, and 4 make critical claims regarding the perception and production of musical gestures. Claim 1: Musical performances convey meanings via expressive gestures, even when the performance consists of artificial or manipulated sound sources. Claim 2: Musical gestures are actions that convey intentions, and are interpreted within the brain's mirroring system. Claim 3: Musicmaking triggers expressive performance gestures due to its discursive and metaphorical aspects. What is interesting about these three chapters is how each author approaches music and gesture within different frameworks (ecological psychology, motor theory of perception, linguistic communication, respectively) while arguing similar points.

W. Luke Windsor's chapter, "Gestures in Music-Making: Action, Information and Perception", stresses that both music production and perception are embodied processes, in which we rely on past experiences to make sense of what we are hearing. Borrowing ideas from James Gibson (1979), Windsor argues that musical gestures contain affordances, and that they are encoded with traces of information related to how they were produced. The affordances associated with a musical gesture indicate both the musician's physical action and his or her emotional intention while producing the sound. Using the example of a piano performance, Windsor notes that subtle variations of spectral content in the audio signal carry information that allows the listener to infer or imagine the amount of force used by the pianist to produce the musical sounds. Together, these characteristics encoded within the audio signal constitute a unified gestalt that ultimately informs the listener of the musician's expressive intentions during the performance. The affordances inherent in the sound hark back to the manner in which the sound was produced, thus bridging auditory gestures to physical actions. Performances are ripe with a multitude of gestures occurring in parallel. Using modeling techniques based on the work of Todd (1992), Windsor focuses on gestures perceived as a result of expressive timing within a performance of Franz Schubert's Impromptu in G-flat. The sum of expressive timing is built on individual contributions from patterns associated with different levels of the piece's metrical hierarchy. It is not clear if the argument is that a listener should be privy to individual patterns. The main idea of this analysis seems to be that the listener is aware of the aggregate timing structure, and recognizes the performance's continual accelerations and decelerations as cues for information regarding the musician's physical actions. The listener assigns meaning to music because the ebb and flow provides affordances that hark back to human involvement. But can this be applied to music that is constructed through more synthetic means? Windsor argues the same eco-

logical principles can be applied to acousmatic music composition. In this genre, the composer aims to conceal the origins of the sounds used within the composition. Despite this manipulation of the original sound source, our perception of musical sounds is so ecologically grounded, that even those artificially produced sounds come to have affordances of their own. The compositional soundscape is ripe with shapes and colors, and the listener, by nature of an ecologically grounded perception, defaults to ascribing structure and meaning to the ambiguous sounds. These perceived gestures are the hand of the composer, which means that acousmatic presentation still affords human involvement in its production. Windsor's main argument, which to us seems quite feasible, is that our deep and ecological need to create mappings between sounds and physical actions is the main mechanism involved in recognizing structure within any kind piece of music.

In Chapter 3 ("Coarticulated Gestural-Sonic Objects in Music"), Rolf Inge Godøy presents his ideas about music and gesture through the framework of the motor theory of perception (Liberman & Mattingly, 1985). The motor theory "claims that perceiving sound is closely linked with mentally simulating the gestures that we believe have been made in the production of that sound" (p. 70). For Godøy, music perception greatly relies on learnt soundmotor couplings. While some couplings appear to be hard-wired due to neurophysiological connections, most are learned through experience. For instance, when listening to music, we run simulations of the sound-producing gestures that we know, through personal history, are related to the music. Here, Godøy's ecological understanding of how music is processed closely mirrors the notion of affordances explained by Windsor.

Godøy's chapter also parallels Windsor in his definition of gesture. Whereas Windsor uses the term gestural pattern, Godøy uses the term holistically perceived chunk to denote a self-contained and salient musical event. Like Windsor's gestural patterns, chunks can be further deconstructed into simultaneously occurring fragments, which Godøy terms as atoms. Atoms interact with each other through a process the author calls coarticulation (p. 71). Examples of coarticulation are commonly seen in spoken word formation. The sounding of a word does not begin with the first phoneme, but with the placing of the tongue in the correct position. In music, the atoms of a chunk not only comprise expressive parameters (timing, articulations, counterpoint), but also the multitude of physical actions needed to perform the music. Additionally, the chunk can comprise the gestures not directly related in the sound production (commonly known as ancillary gestures). However, because we perceive these parameters as a unified chunk, the individual borders between atom events (spatially and temporally) can appear smeared. As an example, Godøy deconstructs a pianist's performance of a

rapid triplet figure. Using several plots capturing the performance's spectrogram, and movement patterns of the shoulder, wrist and elbow, Godøy shows how a gesture actually consists of many interacting atoms. On viewing the performance, an observer would not be privy to this level of detail, but instead experience the gesture as a unified whole.

Although this analysis did not consist of any statistical modeling, Godøy's approach was somewhat easier to follow than Windsor's method to deconstruct the structure of expressive timing. The notion that a gesture contains coarticulations, in which sound and movement interact with each other, to us seems less abstract than Windsor's modeling of expressive timing as an aggregate of multiple gestural patterns.

In Chapter 4, ("Musical Gesture and Musical Grammar: A Cognitive Approach"), Lawrence Zbikowski expands upon the analogy between linguistic and musical gestures. A gestural analysis is made of a film clip in which Fred Astaire performs Jerome Kern and Dorothy Field's standard "The Way You Look Tonight" (1935). The analysis is made within a framework used for linguistic gestural communication, in which "gestures that accompany our speech reflect a mode of thought that is independent but coordinated with language" (p. 87). Based on the work of McNeill (2005), Zbikowski describes how gestures occurring within a discourse (whether linguistic or musical) are composed of catchments, which is defined as "a distinctive sequence of physical movements that can be combined with similar sequences to create an analogue for a series of events relevant to discourse" (p. 88). The author demonstrates how Astaire's performance contains three distinct catchments that appear according to the melodic and lyrical content of Kern and Field's tune. For instance, the song opens with a descending perfect 5th interval. Astaire sings this interval as he lowers his head (catchment 1). The melody then contains a sequence of notes E-F#-G-F#-E, which has an arch-like shape. For this portion, Astaire performs a slight circular motion (catchment 2). Astaire performs these particular gestures because the musical content contains the metaphors of descent, and that of an arch.

Mirroring the points made by Windsor and Godøy, Zbikowski argues that musical gestures in music performance and perception are based on learned associations and metaphors between sound and physical movements. While the gestures performed by Astaire in this performance are based on the musical content, their characteristics are ultimately restricted by the limitations of his sitting position as he accompanies himself. Unable to move his hands freely, he uses his head to mimic the melody's arch-like contour. It could be noted that Astaire's gestures also reflect his body's sensorimotor capacities. For instance, when he lowers his head during the opening descending 5th interval, this gesture might have been performed as part of a singing technique

used to expand the throat for a better production of that specific note. His gestures are therefore determined both by musical content, and the ecological demands of performing while at the piano.

While we consider these analyses to be a contribution to the area, we must warn that some concepts are not well defined and can be confusing, as the relationships of grammar, speech communication, music, and bodily gestures are explained and wrapped by the following sentence (p. 84): "the notion of a musical gesture is not a metaphorical one but a reflection of the essential materials of musical expression." There is no definition provided for "the essential materials of musical expression," which makes this sentence confusing. One possible interpretation could be that musical gestures do not represent the expression but are identical to the expression. Additionally, a question could be raised concerning the decision to investigate this particular performance. For this study, the author chose not to focus on emblematic gestures such as head nodding or giving a thumb's up, but "more spontaneous, created on the fly in the process of discourse" (p. 84). However, it is not at all clear that the gestures performed on the film clip are in fact spontaneous since the song and scene must have been rehearsed, with Astaire presumably receiving input on how he should move from the director, or that his gestures may have been choreographed. Despite this comment, the idea of a musical catchment remains compelling. It would therefore be interesting to investigate whether musical catchments occur in improvised forms such as jazz, in which the interplay between two musicians is more analogous to a spontaneous dyadic conversation. At least one study has already shown that for individuals with high social aptitude, the quality of interaction within a jazz duet is perceived as easily as the quality of interaction within two speakers (Pesquita, Corlis & Enns, 2014).

Chapter 5 finally makes a break from the perception and production of musical gestures, and takes a turn toward pictographic gestures within a musical score. In "Distraction in Polyphonic Gesture", book editor Anthony Gritten focuses on an appoggiatura figure found in the third movement of Stravinsky's Violin Concerto (1931), Aria II. Gritten examines the multidimensionality of this gesture, not only as it resonates with music composed by Bach, Brahms and Tchaikovsky, but on how the gesture can be perceived according to the listener's focus of attention. This particular gesture, Gritten points out, is an example of Stravinsky's usage of *agon*. That is, it embodies the sense of conflict and contrast with which Stravinsky's music is often associated. The gesture could be seen as polyphonic; not in a traditional musical sense, but in the way polyphony has been appropriated by the Russian literary theorist Mikhail Bakhtin. As a literary device, polyphony implies multiple narrations (often in conflict) emerging from a single voice or charac-

ter. Gritten then explores the notion of distraction within the perception of the polyphonic gesture. In such a context, polyphony needs to be grounded in distraction in order to afford a more phenomenologically adequate sense of the listeners' engagement with the piece in question. The chapter was challenging to fully understand. Unlike the other chapters, it offered the reader fewer points of entry, and assumed a substantial amount of prior information on the part of the reader. Take for instance the issue of agon. This term as it applies to the music of Stravinsky is not defined: The reader is only informed that it is ubiquitous in Stravinsky's music and that most people already know this. Although the reader can carry out some background investigation, a definition within a footnote would have been serviceable. Nevertheless, from reading this chapter a thesis can be extracted: people can and do enjoy music without being able to make what are, in terms of musicological representation, the most elementary and basic perceptual judgments. In other words, listening to gestures is an invigorating experience.

Chapter 6, "The Semiotic Gesture", by Ole Köhl, begins by stressing the fluidity of musical meaning. Köhl explains that musical meaning is not as rigid or straightforward as that of language. The same music can mean different things to different people, and as the context in which music is heard changes, the meaning changes from one listening to the next. However, musical meaning is not entirely arbitrary—the members of a community sharing a musical experience will likely describe it in similar terms and appraise it using similar aesthetic criteria. Köhl shows interest in the stable substance in musical communication, in which gesture plays a role as the chief conveyer of musical meaning: "...the most stable element in musical semantics is the primary signification from musical phrase to gesture and from musical gesture to emotional content and social belonging" (p. 123). Köhl then furthers the ideas of affordance as presented in Chapter 2 by Windsor by describing the musical gesture as a metaphoric mapping between different modes of perception, and in particular between "the sound domain and the body domain" (p. 122). Meaningful events coded within the musical stream afford sensations of touch. That is, upon listening, we gain a sense of how a musical phrase was performed and thus are able to suggest its intended meaning. It is proposed that the ability to do this originates in the development of interpersonal skills occurring early in life, resonating with the ideas espoused in Chapter 1. The interactions between an infant and caregiver are multimodal in that the interactions contain visual, somatic, and aural cues. Following ideas put forth by Trevarthen (1994) and Stern (1998), Köhl notes that in the infant's mind, this perceptual information is "represented as a unified amodal gestalt" (p. 124). As children get older, they are taught to discriminate between different perceptual modalities. How-

ever, the metaphoric mappings between certain types of sounds and physical sensations remain deeply rooted in humans' ways of interpreting perceptual information throughout life. With brevity and sophistication, Kühl both summarizes the developmental origins of musical gestures, and their use in understanding music.

The next two chapters address the study of orchestral conductors' gestures. Chapter 7, titled "Gestural Economies in Conducting", by Phillip Murray Dineen, presents theoretical approaches to the description of orchestral conducting. This study originally focused on leadership roles in sports and music. Specifically, it considered ice hockey coaches and orchestral conductors, although this chapter focuses on the latter. One important and obvious difference in these professions is the magnitude of the outcome. In sports the performance of the coach can be measured with a nominal scale: win or lose. In music, the performance of the conductor has no true objective measurement. Therefore, the author proposes a series of points of view to assess the performance of a music conductor, referring to them as economies, which are the gesture-related costs to produce given outcomes. The gestures considered here are primarily right (baton) hand down and first beat movements. The different economies discussed are all related to gesture but have been labeled as artistic, gestural, mechanical, semiotic, political, stylistic, aesthetic, and psychological. These together seem to build a solid overall description of the role of the orchestral conductor from a subjective stance, leaving ample room for further research questions to be addressed by empirical research. In fact Chapter 8, "Computational Analysis of Conductors' Temporal Gestures", by Geoff Luck, reports a study that involves feature extraction from musical audio and motion capture recordings to analyze the kinematics of conductors' temporal gestures and musicians' ability to synchronize with them. This is the only chapter in the book that focuses on quantitative data and analysis, thus providing objective results that can be generalized. One important conclusion of this study is that the transmitted information by the conductor concerning the beat is chiefly related to acceleration along the trajectory of the movement and not to a change of direction in the gesture as has been previously thought. The importance of the first beat over the other beats of a bar shown in this study is in line with the philosophical approach exposed in the previous chapter. Another important finding is that previous experience of the conductor is the most important factor in achieving musicians' synchronization. Some studies conducted after the publication in this book address similar issues, such as in Wöllner, Deconinck, Parkinson, Hove, and Keller (2012), a quantitative study of conductors' gestures and Manternach (2011), focusing on the communication between conductor and singer.

Chapter 9, "Gestures and Glances: Interactions in Ensemble Rehearsal", by book editor Elaine King and Jane Ginsborg, presents a study based on observations of physical gestures and eye contact between singers and pianists rehearsing songs. The study involved four pianists and four singers at different levels of expertise. Also, some of the duos had experience rehearsing together while others were rehearsing together for the first time, which added the familiarity variable to the analysis. Although it considers some quantitative data, the analysis is chiefly qualitative. Interpretation of gestures observed in video recordings and quantitative data, such as relative duration of certain gestures, are interpreted from a phenomenological standpoint. A remarkable claim made in this chapter is that the consistent gestural patterns exhibited by performers at musical production indicate they develop mental representations of the desired musical output via bodily movement. While this assertion is very broad, it certainly has a place in further research that could benefit from the latest advances in measurement of brain activity.

Chapter 10, "Imagery, Melody and Gesture in Cross-Cultural Perspective," was written by Gina A. Fatone, Martin Clayton, Laura Leante, and Matt Rahaim. Presenting four case studies the authors discuss how musical gestures can be crucial in music teaching and musical skill acquisition. Three of the case studies comprise observations of bodily gestures used by teachers of North Indian vocal music. The fourth study makes observations of the same phenomena by two Scottish Classical Bagpiping teachers. The studies have different methodological approaches and it is common to all of them that the teachers use bodily gestures to make visual and kinaesthetic mental representations that could aid themselves and their students to produce a desired musical outcome. These gestures were found to lead to imagery related to melody and articulation. This chapter stands out for being the only one not focusing on the "Western classical" musical tradition. Further investigation of related cross-cultural issues in music and gestures can be found in a study carried out by Himberg and Thompson (2011), in which they applied motion capture technology to a case study on cross-cultural differences in movement, paying special attention to meter and beat, group entrainment, and accuracy of synchronization. A related study was conducted by Naveda and Leman (2009) on samba dancing, in which patterns are analyzed with signal-processing tools leading to interesting insights that connect the dancing gesture and the metrically ambiguous music. Other related investigations have explored the effects of gesture in teaching children to sing (see Liao, 2008).

Chapter 11, "Whose Gestures? Chamber Music and the Construction of Permanent Agents", by music theorist Roger Graybill, offers a view in which gestures are originated by the composed music rather than by the performers.

An analysis is presented of the Exposition section of Brahms' String Quartet Op. 51, No. 1. This analysis is based on a long tradition of envisioning the string quartet as four soloists in interaction, as the late 18th and early 19th century quartet is regarded by the author as a "conversation among equal partners" (p. 221). Each instrumental part is regarded as an agent and in this specific view the interactions between agents are analyzed and discussed. This view is suggested as a way of listening that could be used in listening to some works of similar characteristics. The author asserts that this "can make one's listening experience more vivid" (p. 240).

In Chapter 12, by Mine Dođantan-Dack, entitled "In the Beginning was Gesture: Piano Touch and the Phenomenology of the Performing Body", the analysis of gesture is carried out within the boundaries of piano interpretation. A critical examination of previous literature on music performance is provided, giving an overview of how the human body has been or has not been taken into account. Then a reflection is made on the links between timbre and gesture. These two aspects are taken into consideration in light of their interaction with the almost forgotten Kantian concept "Phoronomy," as a philosophical account of quantity of motion. An analysis is provided of physical gestures made by pianists and how they can affect either production or perception of sound. Special attention has been put on hand movement, sketching a matrix of the complex cognitive and kinetic articulations that take place before, within and after the strike of a key. The observations come not only from the author's personal experience but from descriptions given by other pianists, and there is an insinuation of an urge to include more performers' phenomenological accounts of the observed phenomena in further studies. It is worth mentioning at least a couple of related studies conducted after the publication of this book. van Zijl and Luck (2013) reported a study in which quantitative analysis of motion capture recordings were driven by musicians' subjective statements, addressing the relationship of musicians' emotions and their movements while performing. On another related aspect, a study conducted by Thompson and Luck (2012) found relations between pianists' body movements, music structure, and expression intentionality.

Chapter 13, the book's final chapter entitled "Motive, Gesture and the Analysis of Performance", argues that musical motives within a score can only be fully understood when performed. Authors John Rink, Neta Spiro, and Nicolas Gold call for a reevaluation of the term motive, claiming that "music's gestural properties are neither captured by nor fully encoded within musical notation, but instead require the agency of performance to achieve their full realization" (p. 267). Therefore, the score, composed of pitches, harmonies, and rhythms, only offers an approximation of the full experience of music. Although the score offers musical structure, the musician

is left with a substantial amount of leeway as how to interpret this structure, perhaps most noticeably for timing and dynamics. Even the most precise scores cannot quite control each of the minute decisions that the performer makes and they are often consciously unaware of those decisions. The authors investigated 29 performances of the Frederic Chopin's Mazurka Op. Twenty-four No.2. Measurement and observation by means of computational self-organizing maps (Kohonen, 2001) allowed objective comparisons while critical assessment yielded subjective conclusions. The analysis using self-organizing maps produced timing and dynamic clusters. Each cluster represented a typical 3-beat timing or dynamic structure used within the 29 performances. For example, the most common timing structure was flat: each beat within a bar was performed regularly. Informative figures show the distribution of each cluster throughout the span of the piece. Through dyadic comparisons, the computational method revealed how little agreement existed between the performers' interpretive choices. Regarding the subjective analysis, it remains unclear how the perspective presented in this chapter can be reconciled with other chapters, in particular those in which the written music is the sole subject of study (ch.5, and others). It is also unclear what the main conclusion is regarding music and gesture. Although an attractive and interesting computational method for extracting data has been used, the analysis is halted when still at the descriptive level. From there, it is critical assessment that takes over as the main analytical tool. Perhaps the obvious conclusion from this chapter is that expressive parameters change according to the pianist's conception of the piece, and it is these differences in conception that give rise to an interpretation. While this idea is not new, we found the use of self-organizing maps to produce quantitative data quite novel, and unique compared with other methods within the book.

## Conclusion

As stated at the beginning of this review, we feel this book is an important and interesting contribution to the study of music and gestures. Although the studies reported in the book are almost a decade old (the meeting that spearheaded the book's production took place in 2006), the chapters are novel and innovative. Very often, they present ideas for research that has yet to be undertaken. Thus, though a few years old, the book is forwardlooking, and very much earns its title, new perspectives.

One of the book's strongest points bears on how the chapters exhibit independence from each other regarding their approach to observing and analyzing musical gestures. While a certain degree of overlap occurs between

some chapters, most authors address the phenomena from autonomous points of view. Such a rich variety of angles allows the scholarly reader to choose the most appropriate ones, rather than taking them all as complements that sum up to a global definition. The reader is aided in choosing the most useful chapter by the book's introduction, in which the editors suggest categories containing two or three chapters each. Because the book does not have a very strong through-line, there is little need to read it in a linear fashion. One exception though is a strong link between chapters 7 and 8 –both on conductors' gestures– it seems convenient to read them in the order they are presented.

A majority of the authors address music and gesture from phenomenological or subjective perspectives, and report qualitative data and analyses. Although Chapter 13 includes empirical data, a subjective interpretation is made, rather than a quantitative analysis. Chapter 8 is the only one presenting quantitative data and an objective analysis. This orientation is undoubtedly due to the specialty of the contributors. A more rounded investigation of the field of music and gesture might have included more contributors from research centers specializing on the computational analysis of musical gestures, for example, Casa Paganini (Genoa, Italy), IPEM (Ghent, Belgium), IDMIL (McGill University), among others. It is worth noting that this issue was largely remedied at the 3rd International Conference on Music and Gesture, which was organized by the Centre of Interdisciplinary Research in Music, Media and Technology (CIRMMT) at McGill University in 2010. Although this meeting featured several contributions focused on computational methods, it did not lead to the publication of a third book in the Music and Gesture series.

Our main critique of the book has to do with the lack of any multimedia accompaniment to the text. In many of the chapters, the authors describe experiments that use observational video analysis. We believe that the reporting of such studies would have benefited from either a supplemental CD or an online repository from which the reader could retrieve video examples. In some cases, we were able to view the video examples online (e.g., Fred Astaire performing "The Way You Look Tonight" was easily found on [www.youtube.com](http://www.youtube.com)). However, direct access to the performances would increase the book's appeal, and serve as an excellent complement to the text and figures found within. Another point regards the inconsistency in style between chapters. The editors appear to have given free range to the authors regarding how to format their articles. This was surely intended to encourage the authors, but there were some adverse effects. For instance, some chapters lacked a clear introductory or concluding paragraph. Other chapters were difficult to read because of nonspecific subsection headings (Chapter 5, for

instance, has subheadings consisting solely of Roman numerals). Still others had a wide set of claims scattered throughout the chapter (rather than concentrated to a main findings section). While this would not be a problem for someone interested in only reading a particular chapter, we feel that a more consistent formatting and structural style throughout the chapters would aid someone interested in skimming the main points (i.e., introduction, methods used, main findings) of each chapter.

In conclusion, this book boasts an impressive list of authors, each of whom brings forth unique outlooks on musical gestures. The wide range of methods and specializations described speaks to the ubiquity of musical gestures and the seemingly endless perspectives from which the topic can be approached. The book is therefore a suitable companion to the first volume in this series, and should appeal to a wide range of scholars. By the same token, the individual reader is unlikely to find all 13 chapters immediately relevant to their research interest. However, we would definitely recommend this book as an essential addition to any music department's library. Like the editors, we proclaim that "the future of Musical Gesture Studies is bright" (p. 8), and believe that collections such as this book help outline the gesture's substantial role within empirical musicology research and scholarship.

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