

MUSIC AND GESTURE

ANTHONY GRITTEN
AND ELAINE KING

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MUSIC AND GESTURE

To Adèle and to Andrew

Music and Gesture

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Introduction

Anthony Gritten and Elaine King

The study of music and gesture – of music as gesture, of Musical Gesture – has come of age. This maturity comes on the back of several movements in musical scholarship: movement away from narrow models of musicological engagement predicated upon the work concept and its textuality towards broader models geared around and within performing and performance (and, recently, recording); movement away from a narrow focus on the musical mind towards a broader focus on the musical body; movement towards the dominance of an empirically grounded scholarship influenced and aided by the powerful computing technology recently on hand to measure gestures; and movement towards the recognition of areas such as performance studies and music psychology as validated scholarly disciplines. Other factors also suggest that the future is gestural: there is now a second, younger generation of scholars hard at work in the wake of seminal studies by David Lidov (1987) and others; there has been an International Conference on the subject; a major single-author monograph has been published on the subject by Robert Hatten (2004); and so on.

The aim of this particular collection of essays is twofold: to construct and explore the relations between music and gesture from a variety of theoretical perspectives; and to examine the nature of certain types of gesture in musical performance. The volume exposes theory and practice within the area of scholarship on musical gesture and showcases some of the key theoretical ideas and practical considerations in a single binding.

This volume has its origins in the First International Conference on Music and Gesture, which was held in August 2003 at the School of Music, University of East Anglia (Norwich, UK). This event drew together over 150 delegates from all around the world and its eighty-six papers, six keynote addresses, three symposia, two concerts and roundtable discussion hosted lively debates over the constitutions and connotations of musical gestures and exemplified a variety of approaches to the theme. This collection of essays draws together a selection of material first presented at the conference alongside new material. Although by no means fully representative of the extraordinary variety of scholarship currently available on the subject (there is no discussion, for example, of conducting), this book offers a range of differing perspectives.

The twelve chapters in this volume are organized into a heuristic progression from more theoretically oriented essays towards more practically oriented case studies. In the first seven chapters, theoretical considerations about the interpretation of musical gestures are identified and phrased in terms of semiotics (chapters 1 and 2), the mimetic hypothesis (chapter 3), concepts of

musical force (chapter 4), immanence (chapter 5), quotation and topic (chapter 6) and the potential work done by discourse on musical gesture (chapter 7). The remaining chapters focus on the significance of physical gestures in performance by engaging with their rhythmic properties (chapter 8), the way in which breathing supports gestures in piano performance (chapter 9) and the nature of the bodily movements exhibited by solo clarinetists (chapter 10) and individual artists, specifically the pianist Keith Jarrett (chapter 11) and the singer Robbie Williams (chapter 12).

Whether journeying through the book sequentially from beginning to end or along any other more circuitous personalized route, the reader is encouraged to listen to the various resonances between and across the chapters. These include the importance given to bodies (performing and listening bodies), to processes (of performing and perception), to motions, to expressions and to interpretations (of performers and listeners). This said, as befits the tremendous variety of perspectives on musical gesture currently available, not all terms are used with precisely the same meanings, and this results in some interesting tensions across the volume, reaching as deep as assumptions about what constitutes the central, most floating term of them all – gesture.

Studying Musical Gesture

The study of human gesture is a vast, complex field of research that raises many issues about performance and perception. Different communities use, understand and explore gestures in different contexts, and so definitions of musical gesture vary across these communities, as do methodologies, both theoretical and practical, for understanding how musical gestures originate, what they mean and how they work.

Across cultural, aesthetic and terminological differences, however, most scholarship on musical gesture makes a grounding assumption, broadly semiotic in nature: a gesture is a movement or change in state that becomes marked as significant by an agent. This is to say that for movement or sound to be (come) gesture, it must be taken intentionally by an interpreter, who may or may not be involved in the actual sound production of a performance, in such a manner as to donate it with the trappings of human significance. This is a movement of ascription whereby *x* is read as *y*: physical movement as musical gesture, the acoustic properties of sound as aesthetically valuable.

Once this basic assumption has been made, distinctions can be articulated and explored: musical gestures can be considered as dynamic opposites of static postures; as body movements that contain and convey information; as excessive, expressive movements that add to the basic sense of an act. ‘Musical gesture’ can be used to refer to movements involving the manipulation of an object (conventionally an acoustic instrument); to empty-handed movements (with or without speech); to observable body movements with micro-physiological correlates; to dynamic contours in music perception; and so on. Further distinctions can also be made between types of gesture: instrumental versus ancillary;

manipulative versus empty-handed; planned versus accidental; structural versus non-structural; expressive versus syntactical; original versus feedback; physiological versus psychological; and so on. Interpretative methodologies can also be constructed and put into practice, often based on these very distinctions. Phenomenological, functional, physiological, psychological, cognitive, style-historical, performance practice, social-critical and other approaches can be found alongside each other throughout contemporary scholarship on musical gesture, and in various dispositions in the twelve chapters in this volume.

Overview of *Music and Gesture*

Robert Hatten (chapter 1) proposes an original theory of gesture in music and demonstrates its interpretative range in examples from Beethoven and Schubert. Musical gesture is biologically grounded, drawing on the close interaction of a range of human perceptual and motor systems that intermodally synthesize the energetic shaping of motion through time into significant events with expressive force. Musical gestures derive meaning from biological and cultural correlations as these are negotiated with both discrete (harmony and voice-leading; rhythm and metre) and analogue (articulation, dynamics, pacing) stylistic elements. Musical gestures, Hatten argues, are thus emergent *gestalts* that convey affective motion, emotion and intentionality by fusing otherwise separate elements into continuities of shape and force. Thematic gestures are marked as significant parts of the discourse of a movement; they may feature articulatory shapes as prominently as pitch shapes (an important point with respect to the presumed abstraction of pitch cells in late Beethoven). Through a species of developing variation, thematic gestures coordinate the expressive trajectory, and thus motivate the unique form of a movement. Rhetorical gestures are marked as significant disruptions of expected continuations or closures, suggesting a higher agency that may comment upon or even redirect the discourse – perhaps sustaining an ongoing dialogue between internal and external agencies.

A different theoretical tack is taken by David Lidov (chapter 2), who begins by noting that interest in musical gesture has often been motivated by the opportunity it affords of an alternative to descriptions of music based on categories of notation. According to Lidov, this context for the idea is too negative and so general that the idea of musical gesture has often been readily inflated and become vague. For the sake of a sharper discourse, we ought to look for distinctions, for constraints on the idea of gesture rather than extensions of it. If we understand gesturing in music as reference to just one type of somatic experience, some of its contraries are gesticulating, speaking, dancing, breathing and posturing as well as symptoms or various acts of locomotion or labour. All of these kinds of stances and actions generate musical images, and none of them, strictly speaking, are gestures. If we differentiate among these, as Lidov argues, then they allow us to pose further questions about images in music of personally, historically or culturally specific characters of bodily manner, perhaps approaching a notion of *habitus*.

Recent metaphor theory offers evidence that musical thought is grounded in embodied experience. Most of this evidence comes from analysis of language, where discourse on music is consistent with image-schematic reasoning: we describe music as if we were thinking via image schemata such as the path, container and gesture; and since there is evidence that these image schemata emerge from embodied experience, musical concepts based on such reasoning are said to be grounded in embodied experience. This type of evidence, however, does not show precisely how, for example, the concept of a melodic gesture is grounded in gestural acts. To bridge this gap, Arnie Cox (chapter 3) offers additional kinds of evidence that specify more closely how musical concepts are tied to embodied experience. Recent work on motor imagery, particularly that involving mirror neurons, indicates that observed movement is perceived and conceptualized in terms of the observer's own experience of making the kinds of movement observed: whether watching sports, dance or musical performance, we covertly (and occasionally overtly) imitate those whom we observe. In the case of music, this means that we understand the gestures of performers in part through imitative participation, whether the performers are live, recorded or recalled. Cox invites the reader to feel how different kinds of music motivate different kinds of imitative participation, and the connection between embodied experience and conceptualization is made more demonstrable.

In exploring the idea of metaphor further, Steve Larson (chapter 4) draws on philosophy, cognitive linguistics and recent work on musical forces to suggest how thinking about musical gestures in terms of musical forces may help us better understand the creation and experience of music. Indeed, central to the rich system of metaphors invoked by musical gestures is the mapping of musical motions onto physical motions. Musicians have long discussed music in terms of motion and forces. That work identifies three musical forces: gravity, magnetism and inertia. Larson argues that these three forces provide the necessary and sufficient conditions for explaining a number of musical behaviours. Furthermore, a growing number of empirical studies provide converging evidence for the predictive power of these forces in accounting for aspects of musical compositions and improvisations, systems of pre-compositional rules, and the responses of participants in varied music-perception experiments.

Related to the concept of force is the basic phenomenon that musical sound seems to move, and this is a crucial factor in the creation of musical meaning. William Echard (chapter 5) asks, what are the implications of going one step further and claiming that the quality of movement is somehow immanent to the music itself? This question opens up a family of issues, from the mostly technical (iconism and indexicality, the status of presentational signs, emergence and supervenience) to the more ideological (how to situate music and the activity of music scholars as social practices). Echard works outward from a central example, 'Funky Worm' as recorded by the Ohio Players, in order to examine both practical and abstract theoretical questions concerning the immanence of musical movement. This discussion proceeds from the perspective of a pragmatist aesthetics that seeks both to describe the unique characteristics and relative autonomy of musical meaning, and to tie this distinctive kind of meaning to its

specific social genesis. Such a programme may be interpreted as an attempted reconciliation between the more radical tendencies of social and aesthetic theory.

Raymond Monelle (chapter 6) turns to the issue of the relation between topic and quotation when considering musical gestures. Topical references may take the form of actual quotations. But more typically, the musical topic is merely a stylistic allusion, suggesting its object by approximation, distortion or admixture. There are three stages of this: the literal quotation, the near-quotation or 'shadowing' and the hidden stylistic allusion. With reference to specific examples, Monelle demonstrates that, paradoxically, the third category shows topical reference at its most true, while the first category contains only proto-topics. This is because the signification of musical topics is primarily cultural, not social/contemporary. Topics are at their most powerful when the reflection of an item of contemporary life is least in evidence, and the musical gesture refers most directly, even unconsciously, to the mythic world of cultural signification. The topical quotation, then, is the weakest form of topical reference.

As the study of musical gestures grows stronger and becomes more widespread, Anthony Gritten (chapter 7) steps back and asks music what it thinks about all the scholarly activity. What is its reaction to the many inroads made by scholarship, to the systematic colonization and territorialization, to the careful excavation and interpretation of so much of its hitherto sovereign territory? Does music feel uneasy at the fact that its gestures are increasingly (if still partially) well understood? Underpinning Gritten's argument is a notion of 'drift': a sense that our engagement with music and its gestures is a movement not of us drawing closer to music but of music's moving away from us.

In exploring gesture from another perspective, Justin London (chapter 8) speculates whether or not musical gestures are really 'musical' at all. As he explains, the limits on our ability to produce and/or hear rhythmic patterns have long been known; studies of our ability to synchronize with a series of taps, discriminate differences in duration, and so forth, go back to the nineteenth century. More recent studies of musical performance – from jazz drumming to Chopin études – have confirmed earlier research: in a rhythmic pattern, component durations cannot be shorter than about a tenth of a second, nor can they be much longer than two seconds. As London shows, the same temporal limits for music are parallel to the limits of other non-musical behaviours, such as walking and running, thus both music and gesture seem to obey a common set of neurobiological limits for the perception and production of patterned movement, grounded in our kinematic awareness and motor control. To explore this relationship, London establishes not only the upper and lower limits for musical rhythm, but also gives us a sense of the temporal topography between those limits. After wider considerations, he suggests that not all musical gestures are 'musical': for sounds to be rhythmic, they must occur within the defined critical range for musical rhythm and be regular enough to afford the listener the ability to synchronize his or her attention and/or motor behaviour(s) with them. When this synchronization is possible, then we have musical gestures; gestures that have a sense of movement and coherence precisely because we ourselves can move that way.

Elaine King (chapter 9) focuses more specifically on gestures produced by performers and considers how breathing functions to support them. She begins by noting that while some musicians are required to use their breath as part of the process of sound production, others are not, such as string and keyboard players, although they cannot avoid breathing altogether of course. In investigating pianists' breathing, she questions whether breathing might be intrinsically, albeit unconsciously, connected to the delivery of musical gestures, perhaps to help with the execution of phrases and climaxes as well as to enhance sound production. King documents the results of preliminary empirical research, detailing both heart rate and the patterns of inhalation and exhalation of professional pianists across repeat performances of selected works. The data are examined in the context of music-analytical observations about each piece and consideration of expressive components, including tempo and body movement. Her research indicates that pianists' breathing is sometimes consistently linked to the pacing and shaping of musical phrases and to the production of physical movements. Indeed, pianists (and other non-wind players) might learn where and how to breathe in preparing a piece of music as an alternative (or additional) way of securing their musical interpretation.

In developing research on physical gestures through empirical enquiry, Marcelo Wanderley and Bradley Vines (chapter 10) analyse the body movements produced by solo clarinettists in performance. They reveal that ancillary gestures vary across different pieces and with different performers: individual clarinettists show different movement patterns, although similarities may be found between them, suggesting the existence of various levels of information in the resulting movement: material/physiological, rhythmic/structural and interpretative. In the light of their data, Wanderley and Vines show that performers' expressive movements are neither random nor just produced as a visual effect, but are an integral part of the communication process established during the performance, and represent another level of information complementary to that present in the sound produced through the instrument.

The final two chapters feature analysis of physical gestures produced by renowned performing artists through study of recorded live performances. Peter Elsdon (chapter 11) begins by highlighting the way in which descriptions of Keith Jarrett's piano playing emphasize his physical mannerisms, drawing attention to the physicality of the improvisatory act and the expressive depth of his playing. Elsdon focuses on the expressive properties of physical gesture using footage from Jarrett's solo concerts. He describes a number of physical attitudes or gestural types that can be loosely aligned to the specific musical styles employed within Jarrett's solo improvisations. These gestural types help both to amplify a series of expressive qualities articulated sonorously and musically and to create a meaning richer and more complex than music alone. But, the relationship between physical and musical gesture is ultimately complex and resistant to quantification. Elsdon points out that the bodily gestures of Jarrett's performances are less about enacting a physical analogue to musical gesture and more about expressing the feeling of that gesture. In this way, gesture signifies to the audience something about the improvisatory process, not least the fact that Jarrett is playing and apparently being

played by the music. Much of the spectacle and drama of these performances turns upon the mythology that surrounds free improvisation, a mythology that Jarrett himself has sought to perpetuate. In this way Jarrett's solo concerts become akin to a theatre of improvisation, in which his physical posturing takes centre stage.

Jane Davidson (chapter 12) notes that personality factors, such as extroversion and high intrinsic motivation, contribute strongly towards the desire and ability to develop as a solo performer. However, she argues that an additional key factor in both the production and the perception of musical performance is body movement. Davidson explores the origins of the body movements used in a stage performance of 'She's the one' by Robbie Williams and asks which elements are salient for the performer and his audience. She draws on data from several empirical studies involving solo pop singers and considers the relations between cultural context and musical style in her analysis of Robbie's act so as to fully understand what factors influence his behaviour. Above all, her study highlights the way in which multiple layers of meaning can be construed from the performer's physical gestures, but also how the interaction between the performer and members of the audience contributes towards the interpretation of that individual act.

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Chapter 1

A Theory of Musical Gesture and its Application to Beethoven and Schubert

Robert S. Hatten

A theory of musical gesture must begin with an understanding of human gesture prior to its manifestation in sophisticated musical works.¹ I define human gesture rather inclusively as *any energetic shaping through time that may be interpreted as significant*. By significant, I mean that for some interpreter, a gesture will convey information with respect to affect, modality and/or communicative meaning. My definition is inclusive in two further senses: a gesture may be created or interpreted in any *medium or channel*, and it may entail any *sensory perception, motor action, or their combination*. Note that this definition embraces not only all varieties of significant human motion (including gesticulation of the hands or facial expressions) and their perception, but also the ‘translation’ of energetic shaping through time into humanly produced or interpreted sounds, ranging from the intonation curves of language, to song, instrumental music and (indirectly) the representation of sonic gesture in notation. Any energetic shaping through time, whether actual or implied, and whether intentional or unwitting, may be considered as a gesture if it may be interpreted as meaningful in some way. Thus, even lacking a direct communicative intent, a gesture may be very revealing of the attitude or emotional state of the gesture.²

Human gestures include characteristics that we can associate with a fundamental musicality shared by all: the capacity to perceive, and roughly reproduce, characteristic shapings of rhythm, timing, pitch contour and intensity. Not only can healthy humans process such shapes in all sensory and motor realms, but their expressive character, as affective gestures, is part of human development prior to language. This development has been observed in the interactive exchanges between infants and their care-givers by researchers such as Colwyn Trevarthen (1986a, 1986b), who captured the character of these exchanges with the evocative term *intersubjectivity*. The timing of exchanges, often documented as rhythmic turn-taking, is a striking indicator that gesturing is interactive from the very beginning. More importantly, these gestures are interpreted and produced as *affectively loaded* communicative events (although we should not think of their communicative content in the same referential sense as words in language).³

Gesture draws on basic *sensorimotor* mappings that foster a natural categorization of dynamic events throughout perception, even prior to conceptualization. Movements – usually involving several parts of the

sensorimotor system – cohere or become integrated into *synthetic* movements that can support gestural interpretation when their elements are coordinated into a singular functional motor action or perception – or typically a combination of both. These synthetic movements generally entail an affective modality, if not a directly communicative intent. Synthetic movements with potential affective or communicative content are marked as significant, and their meaning is *emergent* – more than the sum of their components. Naomi Cumming (2000) also emphasizes this emergent aspect of gesture, and David Lidov (1987) considers what I would consider a synthetic gesture as *molar*, hence indivisible.

The prototypical molar gesture takes place in the perceptual present of working memory (up to two seconds), and its interpretation draws on both *imagistic* and *temporal gestalt perception*. Our perception of a short, prototypical gesture is characterized by an imagistic synthesis of *immediate, qualitative depth*. The imagistic mode is crucial for immediate recognition of faces – both their identification as individuals and the immediate assessment of their emotive state (Sacks 1987). In turn, this perceptual mode enables us to process the qualities of timbres or chords, as well as recognizing them as singular objects. Imagistic synthesis, indeed, is characteristic of all object perception and cognition.

The other perceptual mode with bearing on our interpretation of a prototypical gesture is the gestalt perception of *temporal continuity*, which is associated with the cognition not simply of an object but of an event, as motivated by the *functional coherence*, or purposeful coordination, of its movement. The coherent interpretation of movement as event was critical throughout evolutionary history as a means of detecting camouflaged predators by synthesizing a series of sounds and visual impressions into an individual moving profile. Conveniently, this capacity also enables us to hear a string of frequencies as a single (and singular) melody. As a *basic category*, then, a prototypical gesture becomes an extremely coherent perceptual gestalt, in that it can combine, in the perceptual present, the nuanced syntheses of both imagistic and temporal modes of gestalt perception.⁴ In other words, an interpreter can experience the *immediacy* of a qualitative perception that is being both reinforced and modulated by the *continuity* of a dynamic perception. Interestingly, these two modes of perception correspond to Charles Sanders Peirce's categories of the iconic and the indexical, respectively.

The basic shape of a gesture has the further evolutionary advantage that it can be mapped onto any or all the sensory and motor systems (better understood as the integrative *sensorimotor system*). This interactive mapping facilitates the coordination of motor action and perceptual interpretation. The interchangeability between producing and interpreting a gesture depends on a representational capacity that is shared throughout the sensorimotor system, and that enables individual mappings to be correlated with each other. By drawing on all the relevant senses and muscles, we are able to synthesize a subtly nuanced movement or a richly nuanced perception. This interactivity of representation, via mapping of analogous energetic shaping through time across the visual, aural, tactile and motor realms, is termed *intermodality*.⁵ The perceptual and cognitive syntheses and analogues that are intermodally activated to produce and perceive significant

energetic shaping through time (the foundation for meaningful gesture) are fundamental to an organism's survival.

To summarize the argument thus far: gesture involves the coordination of *intermodal syntheses*, based upon the *functional coherence* of movements as events, and their *emergent* meanings. These gestural events are *affectively loaded*, and they typically appear in response to the demands of *intersubjectivity*, which begins developmentally with the interactive exchanges of infants and care-givers attempting to communicate. Finally, the interpretation of prototypical gestures, those taking place within the two-second boundary of the perceptual present, is enhanced by the close interchange between *imagistic* and *temporal gestalt perceptual modes*. Given the combined strength and flexibility we bring to any interpretation of energetic shaping through time, meaningful gestural interpretations can seem inevitable – if only at a basic or default level.

Gestures, however, translate into music as more than energetic shaping through time, and more than the energy it takes a performer to produce sound. In many styles, oppositionally marked gestural types, such as grief versus elation, may be correlated with structural oppositions among musical elements, along the lines of the model I developed for *Musical Meaning in Beethoven* (Hatten 1994). Such oppositional categorization creates a more systematic, *stylistic*, or (in Peirce's terminology) *symbolic* level of meaning for gestures.

Nevertheless, one typically finds intuitively satisfying motivations for what may have developed as conventional symbolic representations. For example, grief would most naturally be expressed in terms of downwards and heavy gestures, and elation by means of upwards and light gestures. In Western musical styles a kind of virtual gravitational field or vectoral space provides an analogue to the forces working on the human body in physical space, enabling the motivated opposition of downwards grief versus upwards elation. These fields or spaces provide comparable environmental constraints against which freely willing, energetic musical gestures can begin to feel like gestures of the body. As soon as that happens, we can speak of a kind of *agency*, especially when a series of gestures appear to cohere as an intentional or goal-directed sequence, progression, or discourse.

In Western tonal music, these dynamic fields are created by two primary frames. The first is metre – conceived not as a static grid for quantitative measurement, but as an active, qualitative field that provides virtual orientation with respect to up versus down and to a sense of relative weight – not unlike the gravitational field we experience every day.⁶ The second organizing frame is tonality – a complex, stylistic achievement that contributes its own conventionalized forces, as Steve Larson (1993, 1997–98), Candace Brower (2000) and Fred Lerdahl (2002) have variously demonstrated.⁷ Together, metric and tonal forces constitute what I call a *virtual environment* in which we can trace the presence of an animating force (implying an independent agent) by the constraints that weigh in on (deflect, deform, or resolve) otherwise freely motivated energetic movement. Thus, we access the bodily (as gestures of a free agent) in music through the implied effort required to overcome environmental forces (or,

conversely, the acquiescence that yields to those forces), and further, through an analogy with the effort of our own bodies to overcome physical (or other) forces on earth in order to achieve an intention.

The basic or default level of gestural interpretation in music is motivated by both *indexical* (dynamic, association by contiguity or connection) and *iconic* (imagistic, association by similarity of properties or structures) correlations with gestures in other modalities. The more *symbolic* level is kept coherent by a musical style; in Classical music a complex tonal syntax obviously places further demands on listeners' interpretive competencies. Musical gestures may be multiply motivated, however, and it is the interaction of indexical and iconic motivations with syntactic and symbolic ones that makes the study of gesture so rewarding for performing styles such as the Viennese Classical. This style draws upon very sophisticated perceptual and cognitive competencies in proposing analogous energetic shapings through time. Based on the competencies implied by a musical style, we can define stylistic types of gestures; new tokens of types, and indeed, new types, will reflect the growth of that stylistic competency.

Stylistic types of gestures must nevertheless be realized individually in musical works. In the Classical style, a familiar gestural type is the two-note stepwise slur moving from strong to weaker metric location. In fact, this slur is affiliated with two distinct style types – the *empfindsamer* 'sigh' gesture, whose expressive significance ranges from grieving lament to poignant inflection, and the *galant* gesture of 'graciousness', analogous to formalized social bows (as in, *faire une révérence*) and appearing formulaically in the *galant* or appoggiatura cadence. Manifestations of style types may be more or less original, but each is understood as a *strategic token* of its corresponding type. Beyond the features that cue affiliation with a type, however, further distinctive qualities of a token may be interpreted as significant, especially from a gestural perspective. Let us consider two examples.

Overuse of the *galant* gesture in conventionalized cadences, often with suspension of the dominant-seventh chord in the upper voices over tonic resolution on the downbeat in the bass, made it less expressively focal and hence unmarked stylistically. But an example from Schubert illustrates how a figure which is stylistically unmarked may be strategically marked by thematic foregrounding.⁸ In opening the second movement of his Sonata in A Major, D. 664, Schubert echoes the *galant*, appoggiatura cadence of the first movement (Examples 1.1a and 1.1b). When late in the second movement Schubert elects a similar appoggiatura cadence (bar 70), the elision with the head motive of this theme reinforces the motive's original derivation (Example 1.1c).

The two-note stepwise slur may be extended to include increasingly larger motivic units, and the same gestural shape is applied to its more extended instances: light initiatory accent, smooth follow-through and unaccented release. The 'sigh' motive is extended into a more elaborate *galant* gesture in the rondo theme from the finale of Beethoven's Op. 7 (Example 1.2), which features an anacrusic, anticipatory sigh before the initiating sigh on the downbeat, thus doubling the expressive effect.

Allegro moderato

(a)

Andante

(b)

(c)

Example 1.1 Schubert, Piano Sonata in A Major, D. 664 (a) I, final cadence; (b) II, opening theme, bars 1–3; (c) II, final cadence and codetta, bars 69–75

Here, the two-note gesture combines *galant* graciousness with the sigh, troping the two gestural meanings to yield an effect that is neither superficial in its conventional graciousness nor tragic in its emotional context. Expansive, gracious and with a touch of poignant longing, the Romantic effect of this gesture emerges from the strategic treatment of a Classical style type, exploiting its potential for further interpretation.

RONDO
Poco allegretto e grazioso

The image shows a musical score for the opening theme of the finale of Beethoven's Piano Sonata in E-flat Major, Op. 7. The score is in 2/4 time, E-flat major, and begins with a piano (p) dynamic. It features a melody in the right hand and a rhythmic accompaniment in the left hand. The melody starts with a quarter rest, followed by a quarter note G4, a quarter note A4, and a quarter note Bb4. The left hand starts with a quarter rest, followed by a quarter note G3, a quarter note A3, and a quarter note Bb3. The score continues with various rhythmic patterns and melodic lines.

Example 1.2 Beethoven, Piano Sonata in E Flat Major, Op. 7, Finale, opening theme, bars 1–4

Among various strategic adaptations of stylistic gestures we find *spontaneous* expression, motivic or *thematic* foregrounding and development, *dialogical* interplay, *rhetorical* marking of dramatic shifts or swerves in the ongoing discourse, and *troping* (as in the creative juxtaposition and implied figurative interaction of two gestures). The category of the *spontaneous* may seem a bit ephemeral, since even the most original of gestures will quickly be interpreted as strategic for the work, and such spontaneous gestures are often *thematically* marked, both by their salience and their subsequent development. Nevertheless, the spontaneous translation of gesture to music is an avenue by which composers can introduce individual and often personal affective character without falling back on conventionalized formulae. The subsequent negotiation of a spontaneous gesture within the syntax of a style – the attempt to rein in an unruly gesture, for example – is a premise that may foster greater creativity in its working out.

The *dialogical* function of gesture, grounded in the intersubjective development of human gesture, is reflected in Haydn's oft-noted 'conversational' style in the string quartets⁹ and Mozart's dialectical oppositions in his opening themes, which suggest two competing agencies. The dialogical convention is also implicit in the concerto, or more generally, the concertato principle that stems from Baroque practices.¹⁰

Rhetorical gestures include the expressive fermata in a slow movement, or the cadential 6/4 that marks the break for a cadenza in a concerto, but such conventional gestures lack the force of strategic gestures that create rhetorical reversals, undercuttings, or shifts in level of discourse, such as the ones I have explored in an article on Beethoven's Andante from the String Quartet in B Flat major, Op. 130 (Hatten forthcoming). At first I conceived of rhetorical gestures as limited to marking dramatic turns or shifts at the level of form (or expressive genre), but it soon became clear that the rhetorical, at least for the Classical style and beyond, is best defined as that which *marks a disruption in the unmarked flow of events at any level of the musical discourse*.¹¹ What constitutes the unmarked flow is of course subject to varying interpretations, and habit or convention is constantly adding to the fund of expected functional events in a style. Hence, as a result of the pressure of style growth, rhetorical gestures often become more extreme in order to mark fresh emphases, especially if a style has come to embrace oscillations in intensity as part of its normative or unmarked flow.

Gestural *troping*, along the lines of the troping of topics, is another possible strategic function. Example 1.3 illustrates how, in the opening theme of the finale of Op. 101, Beethoven tropes the topics of fanfare and learned style (bars 1–4) with a pastoral musette (bars 5–8), and I have suggested elsewhere (Hatten 1994: 171) that the juxtaposition of these topics yields an emergent meaning along the lines of heroic (fanfare) affirmation (the authoritative learned style) raised to a higher spiritual level (the connotations of the pastoral for Beethoven) – hence, a definitive inner victory of the spirit. The possibilities that emerge from a creative fusion of different gestures would appear to be endless, but a note of caution is in order. Gestures are already such distinctive syntheses that in order to interpret a gestural trope as an amalgam of two separate (and presumably contrasting) gestures, the gestures in question must already possess established (stylistic or culturally immediate) expressive correlations, or else be (strategically) familiarized as thematic, before they are combined. Another criterion might be that each can be heard as making its own contribution to the expressive meaning that emerges from their synthesis or fusion.

Geschwind, doch nicht zu sehr, und mit Entschlossenheit.
Allegro

29

5

Example 1.3 Beethoven, Piano Sonata in A Major, Op. 101, Finale, opening theme, bars 29–32 and 1–8

Perhaps the most important function of gesture, however, comes from its thematization as motivic idea. A gesture becomes *thematic* when it is (a) *foregrounded as significant*, thereby gaining *identity* as a potential thematic entity, and then (b) *used consistently*, typically as the *subject of a musical discourse*. In a coherent musical discourse, the gesture may be varied without losing its affiliation to the original form (its identity, perhaps generalized as a schema), as long as the stages of its evolution are (a) progressive (i.e., no huge differences in shape between developmental forms or variants) and (b) temporally associable (no huge gaps in time between instances of the gesture).¹² A thematic gesture is typically designed so as to encapsulate the expressive tone and character of the work or movement; thus, its expressive properties help the listener understand and interpret musical meaning at higher levels, as well. What might otherwise appear accessory – the articulations, dynamics and temporal character of a motive – are potentially structural in that, by their embodiment in thematic gestures, they contribute to the shaping of an emerging expressive trajectory. As will be seen, unusual features of the resulting forms may be expressively motivated by the progressive evolution of thematic gestures.

Inevitably, *thematic gestures* (the focus of my analyses here) result from the compositional attention musical gestures receive as basic-level carriers of emotional force. Thematic gestures, like motives, are *further* marked as significant parts of the discourse of a movement, and they play a structural as well as expressive role in the unfolding form and expressive genre of a movement or work. Thematic gestures are not necessarily tied to one pitch structure, or even one metric identity, since on the one hand similarity of gestural shape may relate different pitch shapes, and on the other hand, gestures themselves may be subjected to developing variation as part of a coherent musical discourse. Furthermore, the continuity of a gesture does not demand unbroken continuity of sound, as in a legato group of pitches; continuity of gesture binds even separately articulated notes. Consider, as illustration of these first few points, a significant thematic gesture for Schubert's Piano Sonata in A Major, D. 959 (Example 1.4a), which I have written about elsewhere.¹³ It is developmentally varied in the continuation (Example 1.4b), and in the second movement it is metrically shifted and relegated to a haunting ostinato gestural pattern in the left hand (Example 1.4c). In the finale, it is found in both metrical locations in the first two bars (Example 1.4d).

Gesture also implies agency – the gesturer, if you will – and the specific characteristics of an agent, in terms of expressive modality. A gesture may thus evolve from having a character to 'being' a character in a thematic musical discourse. Manfred Clynes's (1977) work reveals the biologically universal modes of motor production and sensory perception that create and categorize basic emotion types as expressed gesturally. His 'gesture hypothesis', as David Lidov (1999) describes it, also speaks to the precision with which we access subtle nuances of expressive gesture.

Allegro

(a)

(b)

(c)

(d)

Example 1.4 Schubert, Piano Sonata in A Major, D. 959, I. Developing variation of a bracketed thematic gesture: (a) contrasting first themes, bars 1–10; (b) integrative counterstatement, bars 16–18; (c) closing theme for the first theme group, bars 22–5; (d) transition, bars 28–30

Because of its characteristic shaping and shading, *gesture may help define a topic*, as for example the funeral march topic in the opening theme of Schubert's Piano Sonata in A minor, D. 784, with its grieving gestural ostinato suggestive of a cortège (bar 9ff.). Such thematic gestures may also be troped, perhaps in conjunction with topical troping.

Gestures are richly informative and perceptually immediate; they can of course be stylistically mediated, as well – within the constraints of biological or cultural correlations, of course. But it is the immediacy of biologically typed gestural meanings – anger, grief, joy, disgust, surprise – that allows us to connect viscerally at a basic level with music that may be culturally or historically quite distant from our own time, even as we struggle to decode symbolic levels of gesture or ritualized movement that may have meanings far different from our own cultural expectations.

Expressive interpretation is enhanced by integrating the analysis of topics and tropes with gesture. For example, how might topics be selected for their *gestural associations* as well as their *tropological potential*? An interesting example is found in Schubert's Piano Sonata in G Major, D. 894 (Hatten 2003). In the trio of the Menuetto (Example 1.5) the mode shifts from B minor to B major for an exquisite troping of *Ländler* and musette. Both topics are already pastoral, so the trope is neither surprising nor problematic for the interpreter. The musette is more static, and the phrase structure of the first eight bars reinforces the stasis – the last four bars simply fade away in a reverberation of tonic harmony. The triple pedals and triple *piano* together provide a dream-like web within which the *Ländler's* gentle lifts and burbling ornaments are given an almost visionary quality – the special remove of idealized and idyllic pastoral space, whether understood as 'wistful recall of lost innocence' or 'dreamy yearning for an idealized future state'.

The image shows a musical score for the Trio of the Menuetto in G Major, D. 894 by Franz Schubert. The score is in 3/4 time and G major. It consists of three systems of music, each with a treble and bass clef staff. The first system starts at bar 55 and ends at bar 62. The second system starts at bar 63 and ends at bar 67. The third system starts at bar 68 and ends at bar 75. The score includes dynamic markings such as *ppp*, *cresc.*, and *decresc.*, and features triplets and other musical notations.

Example 1.5 Schubert, Piano Sonata in G Major, D. 894, III, Trio, bars 55–73

Molto moderato e cantabile

The musical score is written for piano and bass. It begins with a tempo and mood marking of "Molto moderato e cantabile". The key signature is one sharp (F#) and the time signature is 12/8. The score is divided into six systems, each with a measure number in the left margin: 4, 7, 10, 13, and 16. The dynamics are indicated by *pp*, *mf*, *p*, *ppp*, *fp*, *decresc.*, and *pp*. The notation includes various chordal textures, arpeggiated figures, and melodic lines with slurs and accents.

Example 1.6 Schubert, Piano Sonata in G Major, D. 894, I, opening theme, bars 1–17

In the second strain the gentle musette-*Ländler* is displaced by a waltz with a more active gestural character; the waltz bars are more strongly articulated, louder and more forcefully expressive. How might we interpret the shift? The waltz is more sophisticated than the lower-style *Ländler* and gesturally more individualized, which suggests the emergence of a stance, perhaps projected into a more social sphere. Thus, we might contrast the non-dynamic ‘being’ of the musette-*Ländler* phrase with the dynamic ‘doing’ of the waltz phase, to apply Eero Tarasti’s (1994) Greimassian modalities.

Compare now the first movement’s two main themes. The pastorally serene stasis of the opening theme (Example 1.6) features slow harmonic rhythm, an initial move to the subdominant and compound metre. The second theme (Example 1.7) features a waltz topic troped with pastoral features – most notably, pedal point and slow harmonic rhythm. Its additive motivic structure (sounding like 40 bars of 3/8) obscures an underlying *Satz* structure with a 2–bar extension (8+2 bars of 12/8). The troping of waltz and pastoral creates an emergent expressive meaning that I would characterize as ‘timeless ecstatic transport’. An immediate variation of the 10–bar theme further underlines the progressively transcendent character of this topical trope, through such features as continuous semiquavers and use of higher register (bar 37ff.), leading to a sense of spiritual exaltation.

Example 1.7 Schubert, Piano Sonata in G Major, D. 894, I, second theme, bars 27–38

Schubert's Piano Sonata in A Minor, D. 784, offers a compelling example of how gesture, topic and trope can combine forces to create powerful new expressive meanings. A grieving gesture (bars 9 and 10 of Example 1.8) does more than support the funeral cortège topic. It appears to be a thematic gesture, characterized by its expressive shape, and thematised by its prominent role in the discourse, beginning with the initial quaver releases in bars 2 and 4. The two pitch events are encompassed by a single gesture, in which the second event is an abrupt release of the first. The attempt to reject, or shrug off, a grief that is too great to bear, is captured in this evocative gesture.

The major mode second theme (Example 1.8, bar 61ff.) provides, or at least attempts to provide, relief from the obsessively tragic first theme group. This theme presents a trope of topics: hymn-like texture and range is combined with pastoral pedal point, harmonic rhythm and emphasis on the subdominant harmony. Interpreting this trope in its dramatic context is not difficult at this stage – ‘an idyllic realm of spiritual consolation’, for example. But what makes this theme so incredibly poignant is a further trope, involving the lurking echo of the earlier grieving gesture, as implied by the accentual structure of the two minim chords in every other bar. The gesture's strangely cortège-like quality persists in this more serene theme and triggers a chain of interrelated meanings, from the vulnerability of a theme that cannot fully displace grief, to the poignancy that is this vulnerable theme's emotional interpretant. Indeed, the fragile visionary character of this theme is ultimately shattered, and poignancy leads to emotional devastation when, after first breaking up the phrasing registrally and mixturally, the tragic gesture delivers its stunning blows of negation.

Having demonstrated how gesture, topic and trope can be integrated, I turn to their interaction with tonal structure, first by examining expressive motivations for unusual tonal design in the exposition of this sonata. The counterstatement of the main theme (Example 1.8, bar 26ff.) begins to lead transitionally away from the tonic, but in the wrong direction (Example 1.8, bar 30ff.). Harmonically, the funeral march emphasizes plagal harmonic motion; grief appears to motivate analogous tonal motion into the subdominant region: from A minor to the key of D minor and its own minor subdominant.

Although bars 42–46 imply a turn back to A minor, a *subito pianissimo* in bar 47 drops the descending-third motivic version of the gesture down a tone to B flat-G, echoing the subdominant of the subdominant. From this dark impasse of an emotionally failed transition, we are suddenly thrust up a semitone with a *forte* tremolo and *fortissimo* fanfare in E major. The *deus ex machina* reversal is signaled by the use of a fanfare topic, suggesting victory, and strong dynamic gestures, implying a self-willed projection of heroic force. But note the persistence of the grieving gesture in bars 53–4, which is repressed by an even more forceful diminution in bars 57–8.

Stylistically, we might have expected the minor dominant at this point, as substitute for the relative major; Beethoven in his tragic piano sonata movements often uses the minor dominant for his second theme – for example, the first and third movements of the ‘Tempest’, Op. 31, No. 2, and the last movement of the

'Appassionata', Op. 57. The major dominant is not coherent in a classically conceived sonata form; thus, we must consider its use here as associational and dramatically oppositional. As a mutation of the minor dominant, E major is an explicit reversal of the tragic obsessiveness that would have persisted had the minor dominant been selected. Here we have a good example of how expressive and dramatic gestural and topical meaning can motivate style change in the realm of tonal structure.

Allegro giusto.

9

17

25

31

37

Example 1.8 Schubert, Piano Sonata in A Minor, D. 784, I, exposition

continued

The image displays a musical score for piano, consisting of seven systems of staves. Each system begins with a measure number in the upper left corner. The notation includes treble and bass clefs, dynamic markings, and various musical symbols such as accents and slurs.

- System 1 (Measures 45-52):** Starts with measure 45. Dynamics include *p*, *pp*, *f*, and *cr. exc.*
- System 2 (Measures 53-58):** Starts with measure 53. Dynamics include *ff* and *p*.
- System 3 (Measures 59-68):** Starts with measure 59. Dynamics include *p* and *pp*.
- System 4 (Measures 69-77):** Starts with measure 69. Dynamics include *ff* and *p*.
- System 5 (Measures 78-85):** Starts with measure 78. Dynamics include *p* and *ff*.
- System 6 (Measures 86-94):** Starts with measure 86. Dynamics include *ff* and *pp*.
- System 7 (Measures 95-102):** Starts with measure 95. Dynamics include *ff*.

Example 1.8 concluded

Compare the transition and second theme in the recapitulation (Example 1.9). No heroic outburst this time; instead, an enharmonic German augmented sixth chord in bar 215 mystically transforms the depressed state of the falling third motive to a very positive state, as signaled by an A major arrival 6/4 in bar 216. Dynamically, this transformational transition never breaks the soft surface. The truncation of the fanfare section is not motivated by a need to stay in the tonic key; Schubert had already rewritten the earlier part of the transition to keep it down a fifth, and the E flat-C depressed third could thus have been reversed by a heroic E-C sharp outburst, exactly parallel to the exposition. Instead, the expressive role of this compressed return is dramatically to oppose the corresponding move in the exposition. This time, it is not heroic effort of the will, but transcendent grace or, more secularly, sudden illumination that accomplishes the transition, without requiring a blustery show of strength.

[Allegro giusto]

Example 1.9 Schubert, *Piano Sonata in A Minor, D. 784, I*, recapitulation: transition and return of the second theme, bars 209–23

Notice how gesture contributes to this interpretation, since the second theme is not only tonally resolved to A major, but gesturally ameliorated with a softening agent – the triplet reverberation that fractures the disruptive force of the tragic gesture’s subversiveness. Gestural meaning is reinforced by the doubling, as well. A doubled third increases the ‘sweetness’ of the major tonic, which marks this variant of the theme as even more serene than in its first visionary appearance – an important achievement, if the recapitulation is not to sound anticlimactic.

[Allegro giusto]

259 *pp* *cresc.*

266 *ff*

270 *p* *ff*

274 *p*

279

284 *ff* *p* *pp*

Example 1.10 Schubert, Piano Sonata in A Minor, D. 784, I, coda, bars 259–90

The fanfare reversal that was omitted in the recapitulation returns in the coda, and a further, furious diminution of the reversed grief gesture suggests that even more power is required to overcome the relentlessness of a primal grief, expressed this time with a descent to a dark diminished-seventh chord (Example 1.10, bar 259). But the energy of the heroic fanfare is dissipated by the second

theme's condensation to a bell-like benediction (bar 277ff.). This benediction is hauntingly framed in the very articulatory shape of the grief gesture that it had been at pains to disguise – by means of hymn-like and pastoral continuities in the exposition and ameliorative triplets in the recapitulation. Even the stark *subito fortissimo* disruption by the descending-third motive in sustained and augmented form (bar 285) sounds more threatening than resolutive. The implied transcendent close is thus undermined, and the overall expressive genre will move inexorably to a tragic peroration in the finale.

Conclusion

I have throughout alluded to the synthetic character of not only gestures, but topics and tropes. I think the investigation of these categories comprises part of a larger 'Theory of the Synthetic' (not to be confused with the artificial) that is a much needed complement for all that music theory has so successfully accomplished in the realm of the analytic. Such a theory must address the following characteristics of the synthetic, which are not always amenable to traditional analytical approaches: (a) continuity, (b) integration, (c) intermodality, (d) multi-functionality, (e) multiple motivations, (f) multiple levels, with respect to such continua as immediacy versus mediacy, and (g) the relationship of cognition to rich perception.

Seen from this perspective, the interpretation of musical meaning I have pursued here is not something that needs to be circumscribed in dealing with what Peter Kivy calls 'music alone' (1990), in deference to the concept of 'purely musical' meaning that he defends for so-called absolute works. Nor should my approach be dismissed as betraying the uniqueness of expression, as when Roger Scruton (1997), echoing Benedetto Croce and Richard Wollheim, reminds us that expression is intransitive, and thus not amenable to simplistic, code-like semiotic mappings. The immediacy of musical gesture provides direct biological as well as cultural access from the outset; and the practiced mediacy of stylistic conventions such as gestural types, topics and expressive genres reinforce the modalities of gesture with oppositionally secured realms of expressive meaning. With so much redundancy of mutually supporting cultural and stylistic meaning, any reasonably competent listener is well-positioned to embark upon the elusive, further interpretation of those unique features, contexts and potential tropes that constitute the creative wonder of late Schubert. I hope to have demonstrated one way of accounting for those *inevitable* interpretive acts.

Notes

1. The analyses and much of the theoretical content in this separately conceived chapter are drawn from chapters 5–8 of my book *Interpreting Musical Gestures, Topics, and Tropes: Mozart, Beethoven, Schubert* (Bloomington: Indiana University Press, 2004).

2. This fact is crucial in evolutionary history, since the capacity to read body language is what enabled members of a social group to cohere and survive, despite the constant dynamics of power and aggression.
3. Daniel Stern (1985) uses the evocative term ‘vitality affect’ to describe a type of intersubjective communication among infants. See also the important article by Ian Cross (2001).
4. Lawrence Zbikowski (2002: 34) considers motives to be basic-level categories, and I extend that insight to gesture (especially for what I call thematic gestures, which also function motivically). Basic-level categories are those we use most frequently, and they are generally in the middle of a hierarchical taxonomy – thus, a gesture may be composed of several tones, but we synthesize the significant event of the gesture instead of each tone (Hatten 2004). The two principles of this mid-level classification are *efficiency* (minimum demand on memory) and *informativeness* (maximum detail). The optimal compromise between these competing demands is found in basic-level categories. Gestures, like motives, are gestalt wholes that efficiently organize the details of tones into synthetic event-structures that are memorable and easily manipulated. However, I would note that the analogy with basic-level categories in language suffers when it is translated to music. First, motives and gestures are often unique syntheses created by individual works. The basic-level category is perhaps better relegated to style types of gestures, such as the sigh figure, that have greater familiarity. Second, motives and gestures are actually comprised of tones (and other lower-level elements); basic-level category words (e.g., bird) are not actually made up of the components of lower-level category words (parakeet, blue jay), but rather include them as sub-categories. Nevertheless, as a basic level of psychological processing (we capture this level of organization most quickly, and it has a preferred cognitive status), the concept is valuable for such basic shapes as Zbikowski’s motives and my gestures.
5. The loosely interchangeable terms that describe this shared representation of events across the sensorimotor system are *intermodality* and *cross modality*. For example, Thelen and Smith (1994: 192), working from a dynamic systems approach to the human development of purposeful movement, have coined the phrase, ‘perception-action categories’ to describe cases of *intermodal integration* in the human infant. They demonstrate that ‘cross-modal matching is intrinsic to infants in that the primary neural repertoire supports these linkages’. One also finds the term *amodal* used when the emphasis is on the invariance of representation as generalizable across any particular sensory modality, and thus not reducible to any specific sense (Donald 2001). Since the generalization implied by amodality may inadvertently suggest abstract representation as achieved by higher, symbolic levels of cognition, I will retain the terms ‘intermodality’ and ‘cross-modality’ for all instances of analogous representation or interaction among perceptual sources.

6. The metric orientation up versus down, however, does not always map in the most obvious ways onto culturally conventionalized dance steps. Little and Jenne (1991: 21) note that in the noble French style of Baroque dance, the ‘plié’ (sink) – a downwards motion involving bending of the knees – is performed on the upbeat of the music, whereas the ‘élevé’ – an upwards motion to the balls of the feet – is performed on the downbeat.

7. With respect to diatonic tonal space, Steve Larson (1993, 1997–98) has defined three forces that constitute what I would characterize as *virtual environmental forces*: gravity (the tendency of tones to descend towards a pitch considered as a base, such as a tonic), magnetism (the attraction of tones towards more stable tones, which becomes stronger as the interval to the stable tone gets smaller), and inertia (the tendency of a pattern of motion to continue in the same way, even past a point of stability). In considering these musical forces as environmental, I mean to suggest that Larson’s model could be usefully complemented with the addition of a perceived or implied *source* of gestural energy – in many cases, the motivating force of an implied *musical agent*. A spontaneous or ‘willed’ individual gesture may be understood as being subject to various forces as it traverses tonal and metric fields, conceived as environmental forces which act upon it in various ways. The gesture may be deflected from its energetic direction, or it may be fulfilled by reaching a point of stability within the operative fields of tonality and metre.

Candace Brower (2000) and Fred Lerdahl (2002) have also incorporated these attractions into their distinctive models of tonal pitch space. Brower relates these forces to the conceptual image schemas of Mark Johnson (1987). The sense of tonal gravity thus draws on a centre-verticality-balance schema, and the sense of tonal motion on a source-path-goal schema. Interestingly, one of the entailments of the latter schema is the ‘motion is carried out by an agent who wills the motion to take place’ (2000: 331). Brower also provides increasingly comprehensive models of pitch space that incorporate the three levels of tones, triads and regions. Her interpretive approach includes a pattern-matching component that compares paradigmatic phrase structures and their variants, and a larger narrative component that integrates the implied dramatic trajectory of a work’s hierarchical pitch structures.

Lerdahl (2002) explores still further the multi-tiered modelling of tonal spaces, including chromatic as well as diatonic. He quantifies musical attractions based on the (cognitive) distance each tonal progression traces in its respective tonal space, factored with its hierarchical status and stability, as determined through the rule-system of his ‘Generative Theory of Tonal Music’ (see Lerdahl and Jackendoff 1983). Lerdahl (2002: 285–92) also explores the analogy of metric spaces, based on a grid concept of metre; this part of the theory is only lightly sketched, and Lerdahl points out the need to incorporate the influence of grouping structure on metric structure. Otherwise, the primary metric attraction is conceived as the tendency of a weak beat to progress towards a strong one (as Riemann claimed).

8. For more on the concept of markedness, see Hatten (1994: 34–56).

9. A recent book (Parker 2002) analyses four kinds of what I term dialogical relationships in the string quartet from 1750-1797: the 'lecture', the 'polite conversation', the 'debate' and the 'conversation'.

10. For a spectacular example involving troping, consider the 'Echo' that concludes Bach's Overture in B Minor. This binary dance movement tropes on both concerto form and concertato style, as can be inferred from an elegant analysis by Laurence Dreyfus (1996: 224–32).

11. Patrick McCreless is pursuing the study of rhetorical gesture along similar lines in a book in progress. His important article on music and rhetoric focuses on its understanding in the German musical rhetorical tradition of roughly 1550 to 1800, during which time rhetoric encompassed many of the elements of structure that were eventually treated less metaphorically and more analytically: formal functions and their sequence, and musical figures, many of which were merely labels for techniques of motivic development. As McCreless summarizes, upon the development of specifically musical theories of melody and form for instrumental music this application of rhetoric was subsumed under structure (2002: 876). However, the rhetorical takes on a fresh meaning similar to the one I intend in the comments of Schindler and Czerny on Beethoven's rhetorical caesurae and dramatic pauses, and one could perhaps trace this tendency in discussions of performance and performance practice from the time of Koch. Indeed, McCreless notes the applicability even of Scheibe's oratorical figures (interrogation, repetitio, gradation, dubitation, exclamation, etc.) to our understanding of the finale of Beethoven's Piano Sonata in D Major, Op. 10, No. 3. Mark Evan Bonds provides a broader historical overview that also addresses the continuity of rhetoric in the first half of the nineteenth century (1991: 132ff.), during the transition from a metaphor of the musical work as an oration to that of a biological organism. Elaine Sisman has applied traditional rhetorical concepts (along with a sensitivity to gesture and topic) in her insightful interpretations of Mozart's 'Prague' Symphony (1997) and Beethoven's 'Pathétique' Sonata, Op. 13 (1994).

12. Meyer (1973: 49) discusses the constraints on our interpretation of 'conformant relationships' (thematic schemata that may include motives or entire melodies). His helpful formula for perceived conformance, expressed as an equation, pits regularity of pattern, individuality of profile and similarity of patterning against variety of intervening events and temporal distance between events. Schoenberg's important concept of developing variation may be refined for analytical purposes by consideration of these cognitive constraints.

13. For further evidence of the thematic significance of this gesture, which appeared in the compositional draft of the first movement before the left hand's articulated gestures in bars 1-2, see Hatten (1993).

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Chapter 2

Emotive Gesture in Music and its Contraries

David Lidov

My proposal is semiotic: to distinguish between the musical representation of gesture and the bodily gestures that are represented. This distinction invites us in turn to distinguish bodily gestures from other bodily actions. Furthermore, to reach a conclusion of any substance, we need to differentiate among gestures themselves. They instance many types. In my exposition, this second distinction, contrasting emotive, phatic and diagrammatic types of gesture, precedes the first, that between gestures and other bodily motions, which might have claimed logical priority. What I do say about other kinds of musically representable motions in the following section will, I hope, evoke some sense of recognition on the reader's part. We all have many notions of this already – for example, of the role of dance movement in music imagery. My principal intention is less to develop these ideas in themselves than to point out that a regard for the total field of body movement representation in music permits us a narrower and more precise conception of gestural representation as just one part of that field. This section includes an analytical discussion (referring to Schumann) which is meant to illustrate and draw together the ideas presented up until this point.

In the final section, I have permitted myself a primitive sketch which, although speculative, attempts to articulate the possibility of understanding abstract schemata of gestures as specifically musical developments of concepts. My proposal here emerges via a diagonal reading of Mark Johnson's *The Body in the Mind* (1987). I mean to indicate, in sum, three sorts of contrariety, namely emotive as against other gestural expressions, gesture itself against other motions, and gesture as a molecular phenomenon against more complex and more abstract schemata of which they are parts, not so much for the sake of describing the contraries with much elaboration but rather to accord more precision to the notion of emotive gesture as an object of musical representation.

Gestural Types Represented in Music

I am unable to postulate a *general* system of gestural types and functions, but my immediate enterprise is not that ambitious. I simply speculate here about categorizations that would be useful for interpretative musicology. For the

purposes of musicology – and only for those purposes – I analyse gestures as realizing three functions: the *emotive* (like sad or happy), the *phatic* (as in *emphasis*, asserting personal power and relationships) and *diagrammatic*. The diagrammatic function, which is the type most attended to in linguistic pragmatics – gestures which point or which outline shapes and structures – has analogues in music, but I will not give them any attention here. One gesture may express more than one function.

My argument must appeal to the principle that some elements of our total gestural behaviour, especially on the side of expression, are innate. Obviously much of it is not innate. The bridge between the innate and acquired elements in one gesture may be regarded as a further act of representation: the performed bodily gesture represents its innate tendencies via a particular *comportment*. To elaborate, it is now well known that Paul Ekman has documented through photography the universality of some facial expressions associated with particular emotions (Ekman & Friesen 1969). For example, the same set of facial muscle contractions expresses an angry frown all over the world, but you need a fast camera to prove it, because in some cultures the frown is habitually *repressed* after less than half a second of expression. Thus, the same (innate) gesture may be released in one context or constrained or elaborated or modified in other ways in another context. As above, the term ‘comportment’ will stand here for this second, more elaborated representation. The terminology is a bit arbitrary, and I do not employ ‘comportment’ with impeccable formality. My prejudice is to assume that certain gestural models are innate, but that gestural comportment and the arrangement of our gestural palettes is more contingent and shaped by culture and circumstance. In this view, the long, rapturous and infinitely flexible climaxes of Syrian and Egyptian traditional music (such as in Um Kulthum or Shaba Faqri) access the same repertoire of basic emotive gestures that a tightly argued exposition of a Haydn quartet will draw on or that you and I might draw on in normal interactions with each other, but they are realized very differently in very different styles, social contexts and systems of values.

To put one more procedural postulate forward, I am absolutely convinced that musical notation cannot fully specify representations of gesture. My reasons are explained in detail in my *Elements of Semiotics* (1999). Very briefly, I do not think that gestural expression relies on a system of equivalence classes as notation must, and, furthermore, the critical particularities of gesture are very subtle. I draw my examples from notated music, but my remarks pertain to performances, in this case more to imaginary rather than specific performances. The possibility of analysing recordings seems to beckon on the horizon, but we barely know at this point what to measure. At our stage of knowledge, careful speculation still has a point.

My examples are all happenstance, mirroring the circumstance that I do not want to tie my speculations to any particular single repertoire, nor do I pretend to have a comprehensive idea of gesture in every type of music. I begin with an incident in which I was struck by the power of a gestural representation to leap out of the background and grab my attention. The situation imposed a fragmentation that gives me an expository advantage.

Last year, when I was visiting my mother in New York, we watched the first part of *Un Ballo in Maschera* on videotape. One of my battles with students, especially composition students, is to persuade them that music belongs in the foreground. When it is not in the foreground, they should turn it off. Here, I was the guilty party. When we turned to supper, the tape kept on playing. Perhaps given my age and dignity, I need not apologize too much for allowing my mother or my supper to be in the foreground and Verdi in the background. At least, because we were eating, we conversed only sporadically. The music was not entirely ignored, but we did not have a libretto before us nor much context. Neither of us knew the opera well at that time. At one point, catching a beat that seemed familiar, perhaps from other Verdi operas – just four chords – I said, ‘Aha, a revenge aria’. (This, we will see, was partly wrong.) My mother’s silent response was to raise her fist, shaking it with the beat of the music. She shook it in a precise manner: a very rapid motion which recoiled and then reverberated in a quickly damped oscillation, so that the motion occupied about two thirds of the beat, her fist becoming stiff and immobile before the movement repeated. My score calls for a beat of 66 to the minute, which is roughly what I remember. Now, I have never known my mother to be revengeful. If she has any extensive experience in dance or acting it is prior to our acquaintance. At 88 years of age, she was no athlete; indeed, her mobility was compromised. Yet the movements she made, and which I have described in idiotic and inadequate detail, were precise and eloquent, leaving absolutely no doubt as to their character.

I have now had occasion to ask a few different audiences to listen to the same tiny excerpt from the introduction to the trio in *Un ballo in Maschera* (Example 2.1) and to shake their fists in the air appropriately to signal revenge. Everybody seems to know what is required. But let me clarify, there is no guessing game here; the task is not to identify the emotion. I say to my audience that an image of revenge is to be the intention. What I want to get a handle on is the *precision* of the character of the response, the *quick unanimity* it evokes and its *connection with music*.

Meno Mosso ♩ = 66

The musical score consists of three staves. The top staff is the vocal line in bass clef, with the lyrics "Dun - que l'on - ta di tut - ti sol" written below it. The middle staff is for the Arpa (harp) in bass clef, with the instruction "secche e forti" above it and a forte dynamic marking "f" below it. The bottom staff is for the CB (Cello/Bass) in bass clef, with the instruction "div. pizz." above it and a forte dynamic marking "f" below it. The tempo is marked "Meno Mosso" with a quarter note equal to 66 beats per minute. The key signature has two flats (B-flat and E-flat). The vocal line features a triplet of eighth notes in the final measure.

Example 2.1 Verdi, *Un Ballo in Maschera*, Act III, Introduction to Trio (Renate, Samuel, Tom)

This simple little fragment begs considerable analysis. Adopting the somewhat narrow terminology this chapter develops, I would say there is no such a thing as one revenge gesture. If I shake my fist in the air once I can make a *threat* gesture, a category that is, I believe, well known to anthropologists and ethologists. A threat conveys no hint of revengefulness, which is more complicated. When we repeat the motion as we must here with Verdi's march beat, we have a combination of a gesture and a comportment. The nearly identical repetitions *stylize* the expression and *discharge* or transmute the *rage* (perhaps anger and/or hate) associated with threatening. Revenge requires, especially in opera, that we defer immediate action. In fact, as I *now* know, the famous aria of this opera that is usually called the revenge aria, is Ricardo's solo which precedes the present trio excerpt. The gestural palette of Ricardo's solo begins in a blind rage that is diverted when he remembers his earlier love. That solo is much more charged with passionate emotion and richer in *emotive* gesture than our present number.¹ When we get to our trio, his rage has been channelled and controlled. Here Verdi's three musketeers are getting set for the kill, pumping up their egos and pumping up their solidarity. Power and relationships are the issue, not raw emotion. The repetitive beat or our repetitive shaking fists represent what I call a *phatic* gesture.

Verdi's musical cue is minimal, but it has a definite quality that only a time-point theorist could mistake. The specific tempo is characteristic. The beat is announced by pizzicato chords in the divided double basses and harp that produce a very abruptly shaped envelope of sound and silence. The chord voicing is thick in the low register, so that while technically all consonant, the sound approaches somewhat the timbre of a cluster, and the measure, though it may begin with an accent is not deeply hierarchical – its steadiness is salient. It is evident that the beat, like the shaking fist, has *character*. Why they have the *same* character is, however, a very hard question to which I can suggest only a very incomplete answer.

Obviously, Verdi's chords, characteristic as they are, would furnish an insufficient image of the bodily action referenced *if* we needed lots of clues; but we do not. A circle with two dots is a face, because we have an intuitive schema for recognizing faces. I chose my first, fragmentary example to emphasize the aggressive initiative which our interpretative capacities assert, and I point out the parallel cases of perceiving faces to show why it is useful to presume that we are relying on an innate vocabulary. How much practice and exposure did we need to learn this conventional representation of revengeful intent? It is not that we never had models or social influences in learning these moves, but when we do learn refined perceptions or expressions very easily and quickly, we have reason to think we were born with a head start.

It seems to me sensible to propose that we have an intuitive model for recognizing a threat gesture, for there are many animals that are said to rely on such codes, but the gesture of the threatening fist is visible, not audible. Auditory threats are roars and growls. Roars and growls are not invoked by Verdi in these introductory beats.

My second experiment was to ask my audiences to signal revengeful intent while holding their two hands together so that they could not shake a fist in

the air. The requirement is to use a heel, or two arms or a jutting chin or eyebrows or hip or whatever body part presents itself to invent a new revenge signal. This request never seems to be a problem. We find that we can dispense with the conventional fist and still keep the gestural character of the action, for the character appears to depend on a rhythmic shape, or to use the felicitous phrase of Rudolph Laban, an *effort shape*. The hypothesis I adopt is that the energy envelope of the gesture corresponds, not part by part but in its totality, to the sound shape.

How to say what the rhythmic shape of this beat is, is problematic. I think it is suggestive to look at the wave envelope as it appears in an image of a digitally recorded sound wave (Figure 2.1) but, as I remarked earlier, we do not really know what to measure. We do not know how heard nuances of attack, decay and spectral time patterns are interpreted as an energy shape.

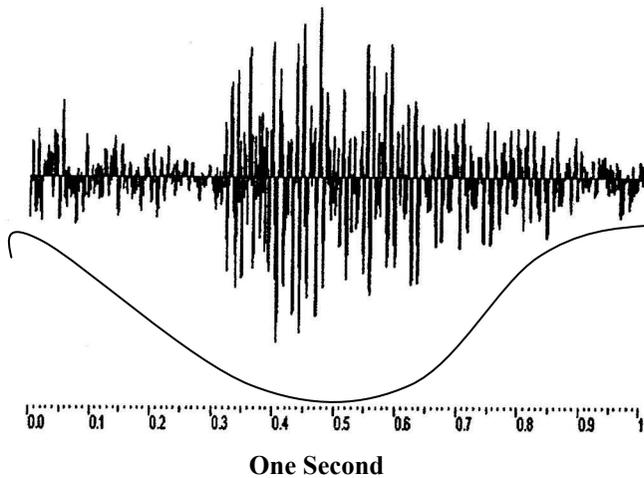


Figure 2.1 Digital wave image of chord and, after Clynes (1977), computed average sentic expression of hate (solid line)

The hypothesis, that we recognize time-energy shapes as specific, defined types of gesture, implies, in turn, that emotive gestures are interpreted as comprising categories (but not necessarily, except in a very limited sense, equivalence classes²) and that there must be a limited number of these. Otherwise we would need endlessly more elaborate cueing to impute a specific expressive impulse to a given, ideal rhythmic profile.

The line of observations I have followed to this point will already have evoked for some readers my usual reference to the *Sentics* theory of Manfred Clynes (1977). After the many years that I have relied on his paradigm, I should acknowledge that Clynes's work on emotional expression and musical pulse shapes remains sketchy and controversial. Neither he nor anyone else has developed with sufficient thoroughness what seemed to me the very promising indications of his research. However, I do not see how musical gesture theorists can afford to let go

of his notions at this point. They remain the only theorizing of substance of a family of characteristic time shapes that might explain how music establishes correspondences with specific categories of emotionally expressive gestures. I still recommend his work as a fount of ideas and logical surmise.

The hub of this present aspect of his multi-faceted theory is the notion that we share an innate vocabulary of dynamic envelopes, that is, brief energy shapes in time, ranging from about two fifths of a second (for anger) to several seconds (for grief and reverence) which constitute part of the neurological apparatus of emotion, and that these are perceivable shapes that can be realized by *muscle activation* or by *sound patterns*.³ I have traced the average sentic expression of hate that Clynes reports underneath the digital wave image in Figure 2.1. It seems to me plausible that there could be discovered some way of drawing out a relationship between these two types of data. The curves shown do not make a good fit, but each asserts its character within the time of one second, and both are, like gestures, shapes, not points.

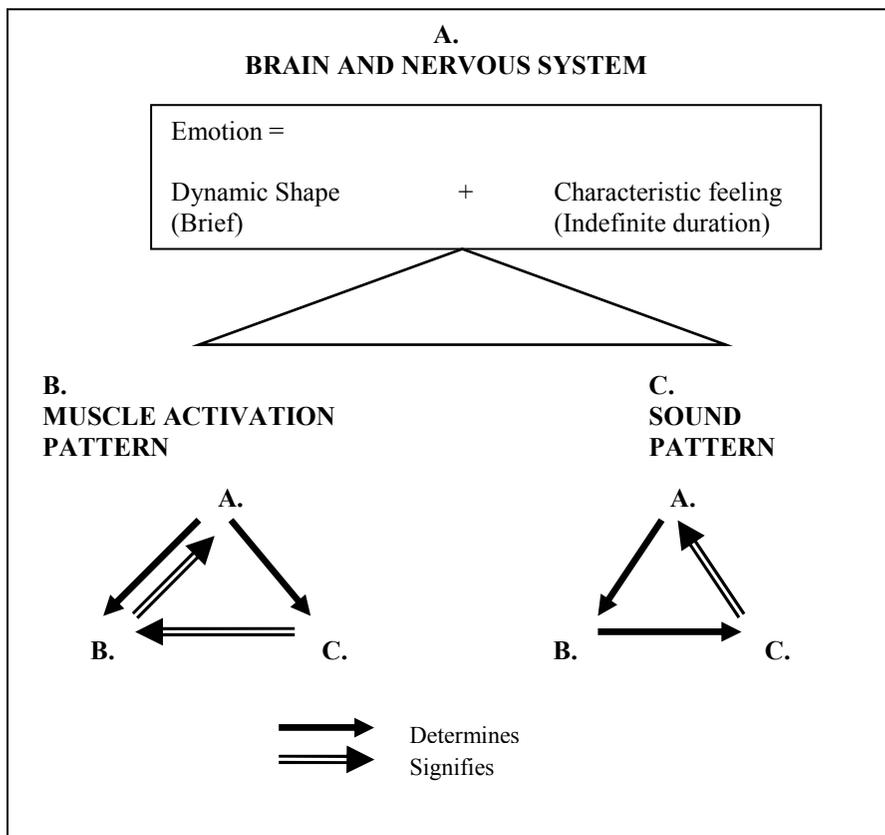


Figure 2.2 Two interpretations of the expressive gesture hypothesis

Clynes's interpretation of these models as neurological paradigms that are accessible to audition without the mediation of muscular movement allows us an alternative view of music's representation of gesture. The two different models are illustrated in my diagram in Figure 2.2. The difference is fundamental for the comparative semiotics of media but without much importance for the questions I am pursuing here. I adapt many of Clynes's ideas in my discussion; however, having made this acknowledgement and recommendation, I do not say more about his writings here.

Musical Representations of Gesture in the Context of Other Musically Representable Movements

Many psychologists postulate that there are a finite number of distinct primary emotions – anger, grief, disgust, love, fear and various others. If some of these emotions include as part of their physiological dynamics an associated time envelope for effort that can be realized and perceived both as a pattern of muscular action as sound shapes, then surely that fact contributes to our picture of musical representations of feeling. Obviously, this cannot be the whole picture. To get a sharper sense of what this proposal of a core vocabulary of emotive gesture means, it is helpful to have in mind something of the contours of the much vaster terrain of bodily states and actions that musical representation can evoke, *other* than emotive gesture: the contraries of gesture itself, both emotive and non-emotive, such as symptoms, gesticulations, utilitarian movements, vocalization *per se* and postures. I do not want to propose my improvised framework of categories as a permanent foundation; I invoke it only to point out how heterogeneous the terrain of musical embodiment is.

Gesticulating, typically chaotic, is not the same as gesturing. A true gesture is a precise, non-verbal articulation. Gesticulation is not intentional. We gesticulate when articulation fails us. My favourite musical example is certainly not typical – Papageno singing with his lips locked, doubled by french horn – inspired orchestration even if the horn does not crack, but better, perhaps, if it does. (Note that Mozart deprives Papageno of melody as well as words – his tune starts with a stereotyped cadential bass line.) But this moment of musical humour is a special case. More typically, we will glimpse gesticulation on the horizon where gestural expression fails. I will suggest an example below.

Some *utilitarian actions* can be represented in music, like fighting, lifting and above all, the movements of *locomotion*. In two cases my categories collapse. For fighting and for sex, the effective actions and expressive gestural forms might have the same rhythmic shape. On the other hand, a gesture that expresses fear is thoroughly different from the practical action of taking flight. Not all locomotion is utilitarian: dancing and some games provide non-utilitarian locomotion or may borrow and elaborate elements of locomotive action without actually producing locomotion. Dancing is a special case as it is nearly inseparable from music, making a tight feedback loop. I do not think I need say anything about the prevalence of the imprint of such motion types in music, but two other points merit

mention. One is the tendency of a walking or dancing gait to take on colours of mood or character or attitude, to become as it were more expressively gestural in that sense; the other is the capacity of all regular metres to share in these feelings. The reason why we need to distinguish between an expressive gait and true gesture is that locomotive motions, like many utilitarian motions, are repetitious, and musical features which represent them may take repetition for granted and as neutral or may even gain intensity with literal repetition. The nuance of the shaped pulse which may be built into performed metre does not pale with repetition; it is like an affective state of affairs, felt as continuing, not repeating. The role of regular repetition is much more constrained for emotive gesture and is different for each gestural function. Repetition tends to blunt the emotive quality of gesture as we already observed with the expression of revenge. The emotional force of threat was toned down and stylized, but the phatic function, expressing a sense of purpose and determination, was heightened. (In diagrammatic gesture, repetition is constructive. I may repeat a motion three times to bullet three parallel points.)

Vocalizing, for song or speech, involves, aside from sound, a distinct somatic experience that you can focus on by sustaining a 'n'. This experience is represented in instrumental music as well as vocal, and the somatic act of breaking into song is often enacted in music where lyricism increases. This, too, is something other than gesture. The second theme group in a sonata form movement sometimes begins by breaking into song. The continuity of accompaniment is a contributing factor to this somatic representation. Musically, the representation often has to do with increasing the contrast between continuity and articulation, longer continuous exhalations of melody separated by breaks that might evoke inhalation.

Breathing is one more kind of musically representable somatic action. Breathing can be calm or excited, smooth or irregular. There are communicative differences of which we often feel the imprint in music, but these are not gestures. The difference on the psychological side may be that breathing seems more imposed, gesture more intentional. On the musical side, recurrence may again be a factor – not necessarily the fairly regular repetition of gait, but regular or recurring images so that we pick up the idea of breaths in the plural. Also, I think there is some antipathy between sharp accent and breath imagery in music, whereas sharp accent contributes handsomely to images of gesture.

Symptoms, which are less susceptible than gesture of deliberate initiation, may or may not gain intensity from repetitious representation, but they are not dampened by it. The kinds of symptoms that lend themselves to musical representation are distortions of gait or breath such as limping, panting, feverish behaviours and weakness. I think it is also technically correct to speak of symptoms of health, such as we have with broad, comfortable breath and a strong, relaxed gait – whose representations are exemplified for me by much of Handel's music. I will let symptoms go with this quick mention, but further interest can be gained from Arthur Groos's work (1995) on tuberculosis in nineteenth-century opera. He deals with librettos and staging as well as sound, but musical signs are there.



Example 2.2 Chopin, *Ballade*, Op. 47, bars 88–90

Posture is another of gesture's contraries, and the relationship between them is problematic. In my article, 'Mind and Body in Music' (1987, reprinted in *Is Language a Music?* (2004)) I worked out a concordance between Chopin's third *Ballade* and its source poem by Mickiewicz. The concordance is based entirely on gesture except for one spot, where I had to improvise (Example 2.2). I interpreted this static moment as postural and as linked to the passage in the poem where we hear a prophecy of doom. William Echard took the matter well beyond my hasty improvisation, surveying a number of interpretations of the concept of posture (Echard 2000). Robert Hatten suggests, in his online lectures on gesture, that posture is gesture under a fermata (Hatten 2001). That formulation strikes me as incorrect because a posture is an equilibrium, or nearly so, whereas no moment of gesture, except the final instant might be said to be so. I will return to the notion of equilibrium, which I think is very basic, towards the end of this chapter. I cite myself, Echard and Hatten to observe the shared problem: we have a thread of a clear idea of how bodily gesture and musical representation might be connected to each other, that is, by sharing a rhythmic shape. Though Echard has given us a start, I cannot find comparably succinct ideas about how the connection between music and posture is achieved. In Peircean terms, I do not see *how* it arises on symbolic, indexical or iconic grounds, although intuitively it appears, as we might say, right before our ears. Posture seems no less important to me than gesture as a source of expressive imagery in music. Our bodies feel weight, lightness, pressure and tensions and the patterns these feelings make are intimately connected with our moods, emotions, social relations and attitudes and are – *I feel* – eloquently exhibited by music. There must surely be deep confluences of neural networks as well as cultural training that establishes the relation between musical features and postural experiences. Furthermore, I have no doubt that these same codes also participate in our perception of gesture in music, for rhythmic shaping incorporates perceptions of weight and tension and so on. But at least with gesture, the rhythmic dimension is there for a first foothold. What inhibits me from saying anything more specific about posture is simply my utter bafflement as to what the mechanics might be. I would suggest, however, that though often brief, facial expressions are closer to postures than gestures, for they seem to be defined by a goal state rather than a curve of motion. A gesture determines its own beginning and end; a facial expression does not.

Gesture is no more important for music than its various contraries. It is entirely appropriate to focus on gesture, but by keeping in mind the heterogeneity of the whole somatic field to which it belongs, a more pointed understanding of gesture should emerge. The most extended example I consider here, and to which I now turn, is the first movement of Robert Schumann's first *Sonata for Violin and Piano* in A minor of 1851. The centrality of gesture to this movement is much more obvious when we realize the difference among the three movements in regard to the kinds of bodily representations they suggest. The second movement, *Allegretto*, is focused on *vocalization* – an interplay of song and speech. The violin's smoothly curved and steadily flowing phrases alternate with a *parlando*-like staccato figure. The third movement, which Elliott Carter might have marked *scorevelli*, is a drama of running and jumping – representations of locomotion. There are representations of gesture in all three movements, but it is in the first movement, marked *Leidenschaftlich*, that gesture furnishes a core argument. Its principle gestures are represented in contrasting compartments – as bottled up in the exposition and then as released in the development.

Once more, the example is a result of happenstance, and it was the particular circumstance of my own encounter with the music that elicited, slowly in this case, the viewpoint I am presenting here. The movement is either one I did not know at all or one I had not heard for many years until recently, and I now think I misjudged it at first, though not entirely, for the work is a site of conflicts that may be unfolded by or inseparable from the rather different reactions it allows. The occasion was a rather shy performance at a student's recital. My initial impression – which I shared with the student – was that his own modesty was compounding a problem Schumann encountered in channelling his impulsive and ardent style to the exigencies of sonata form. I imagined Schumann inhibited by his terror of the ghost of Mendelssohn. This assessment does not seem to me irrelevant, but when I invited the student to read the sonata with me and had to study it myself, I was tempted by a different interpretation.

The opening of the first movement (Example 2.3) is modelled on a fugal exposition. A five-bar theme is presented four times and extended to a cadence. You can hardly miss hearing figures here that are deliciously suggestive of emotive gesture, especially if we take the music a bit under tempo and imbue it with various accents and hesitations. In a polished performance at a good tempo, you may hear that the gestures do not always 'come through', to borrow Alexandra Pierce's phrase (Pierce & Pierce 1991). However, to fault the performance misses a more interesting issue. It is easy to exaggerate the expression, but if we do that, the metrical momentum demanded by the form is compromised. If we play the long line, the individual gestures are repressed. They are too close to each other and cut each other off. None is allowed what Pierce calls its 'reverberation'. (Also, the modern piano compounds the problem with an unsuitably rich tone.) The problem for the *performer* may be to balance Eusebius and Florestan, or to balance Mrs Schumann's elegance with Mr Schumann's emotionality, or to accommodate Robert's radical invention to Felix's neo-classicism, but there is another conflict beyond that one, and this concerns the compartment represented.

Example 2.3 Schumann, Sonata No. 1 for Violin and Piano, Op. 105, I, bars 1–27

To discern that conflict we must take the tune slowly enough to psychoanalyse it.⁴ The theme encompasses incomplete representations of three distinct, emotionally incompatible gesture types, welded together in one melodic phrase. The glassy, unreal fantasy of its arc is already a clue, for it seems to be a parallel to the double face of romantic prose where a slick and gorgeous diction relates abrasive social or psychological realities. The hopeful plea of the rising fourth (marked X in Example 2.3), as if with clasped hands, yields to clutching or grasping (marked Y). Then the melody edges downwards and becomes blocked in syncopated repetition. I am not sure whether I want to call this last atomic moment (marked Z) a gesture or a moment of gesticulation. Either way, it shows an

initiative which then retreats and collapses as it dissolves in an arpeggio (marked W). To our dismay, whatever we are grasping at escapes. (In its first appearance, this gesture of retreat realizes the resolution of a supertonic dominant seventh that Hatten associated with self-abnegation in Beethoven (Hatten 1994). The voice leading is almost the same. As the melody is reharmonized each time it enters, this harmonic pattern is not maintained, but I do not think we should dismiss the coincidence as accidental.)

There is no way that a competent performance can fully unfold these gestures, which Schumann allows us only to glimpse, but if we are allowed to glimpse them and thus to sense their conflict and incompleteness, the result of the fragmentation is pervasive turmoil – *Leidenschaft*. There is more to the music's somatic imagery than just its gestures. This passage is expressive in *not* allowing its gesture to come through. The tempo required subordinates gesture to a continuing state suggestive of bodily tension, breathlessness and pounding arteries. With its head bent down and its arms twisted, the opening theme falls between gesture and gesticulation and captures the agitated comportment of an unexpressed suffering that we are supposed to guess.

The image displays a musical score for Schumann's Sonata No. 1 for Violin and Piano, Op. 105, I, bars 96-101. The score is written in 6/8 time and consists of two systems. The first system shows the violin part with a melodic line and the piano accompaniment with chords and arpeggios. The second system continues the violin part with a long phrase and the piano accompaniment with chords and arpeggios. Dynamics include *sfz* and *f*.

Example 2.4 Schumann, Sonata No. 1 for Violin and Piano, Op. 105, I, bars 96–101

My further evidence for this complicated interpretation is the development section. It does not *liquidate* the themes, as Schoenberg would have it, it *liberates* them. Example 2.4 shows a moment from the approach to the climax of the development. This is a different comportment. This representation, a transformation of the opening motives, gives us a complete gesture, unaborted. It

does not heal *das Leid* of the *Leidenschaftlichkeit*, but the arms are uncrossed, the exasperation is allowed *out*. To be sure, the expression is still somewhat occluded by the stretto imitation that pits the two instruments against each other, but insofar as we follow one or both, the full gesture is there to hear. A marvellous technical feature of this movement is that up to this point, no musical motive had terminated with an accented staccato note. Here it is that punctuation that releases the sweep of the piano's gesture.

In the exposition, the pleading figure of the opening theme is built up to a merely rhetorical climax to conclude its presentation, that is, its gestural force became purely phatic (bars 19–27). But now, at the retransition (Example 2.5), it returns, first with the interiorizing restraint of a longer, chromatic line and then blossoming into a full-fledged, plastic and expressive form.

Example 2.5 Schumann, Sonata No. 1 for Violin and Piano, Op. 105, I, bars 104–14

It may be that some trace remains in this sonata movement of a fundamental incompatibility between Schumann's impulsive expressivity and the academic discipline of his form, but we can also consider that his solution makes a virtue of the obstacle by dramatizing the unfolding of a changing comportment.

(On the other hand, it would strike me as an exaggerated artifice to insist on semantic or narrative construction as the most fundamental structure of this movement. A classical form may play out a consistent plot of allusions without being dominated by it. We may enjoy, as in V. Kofi Agawu's felicitous title, *a play of signs*, that does not supplant the basic thematic and tonal architecture which it colours (Agawu 1991).)

In the interpretation I have presented, a key element is the idea of an incomplete representation of gesture understood as such. The representation of constraint is basic to music. Here is another short example of this principle. This example from Beethoven (Example 2.6) is by no means unique in this respect. The very troubled opening gesture, perhaps easily related either to fear or hatred, is aborted, or pulled back inside. This cutting off, whether *piano* to *pianissimo* as here at the opening or *fortissimo* to *pianissimo* as at the recapitulation, is a constant in the movement. I combined two of Beethoven's motives in the second part of Example 2.6 to suggest what Beethoven is holding back, but the composer never spells out any such link.

Allegro con brio

(a)

(b)

Example 2.6 Beethoven, Trio, Op. 31 No. 1. (a) bars 1–6; (b) bars 1–2 and 19

This trio is the one Haydn advised Beethoven not to publish. The popular anecdote is that Haydn said it was too advanced, that people *would not* understand it. I do not want to buy it. I like to imagine that Haydn was afraid people *would* understand it, and, oriented as he was to the relations of court aristocracy, might have been appalled at the notion of a young musician displaying the interiorization of secret, turbulent feelings. The gesture takes on its meaning in terms of this introverted comportment, which is not the comportment servants are expected to show. The result is a movement of exceptional tension. The point for us, as with the Schumann, but now perhaps with suggestion via Beethoven that we might find examples in any direction we look, is that we respond to suggestions of gesture not only as isolated events but also in relation to the systems of expression in which they participate. In the final section of this chapter, I hope to make this notion more tangible.

Molecular Gesture and Gestural Schemata

The preceding discussions have considered gestures in isolation, as details within a form that is independently determined. The representation of gestures might also realize a fully embodied structure. I consider this possibility via a reflection on the project of George Lakoff and Mark Johnson (Lakoff & Johnson 1999).

Their project is a new structural semantics which finds its paradigm not in the algebra of truth conditional logic but in a system of mappings that is more like a topology. The two key terms of their system are *schema* and *metaphor*. Their concept of schemata builds on work in perceptual and motor psychology, which postulates general patterns like the one we use to see faces. Johnson (1987) and Lakoff and Johnson (1999) extend this idea to encompass patterns of bodily experience that support the relational meanings of language, especially those articulated by verbs and prepositions. ‘Metaphors’ are mappings of these schemata onto situations in the world. They use the word ‘metaphor’, metaphorically at first, as Johnson points out, but as their theory unfolds ‘metaphor’ emerges as a strict and technical term that stands in both for semantic networks and for their corresponding neural networks.

The schemata which Johnson envisions arises in a context of mediation, or a context of what Charles Sanders Peirce or Mikhail Bahktin would identify as interpretation. On one side we have subjectively perceived states and actions of the body, on the other side, states and events in the world around us. Schemata constitute a repertoire that interprets the one for the other – they are *interpretants* in Peircean semiotics. There are good reasons to ascribe schematic logic to unconscious calculations (such as recognizing faces); however, the schemata that Johnson describes in *The Body in the Mind* (1987) are not unconscious or at least not fully unconscious. We readily recognize the forms of our inarticulate intuitions in his descriptions. If nothing else, his book is forceful in pointing out to us a neglected thread of common sense.

A major claim of this theory is that schemata constitute an *intermodal* level of cognitive representations, intermodal in the sense that they interpret kinaesthetic, linguistic, visual and surely (though it is not mentioned) aural actions and experience. Here I want to suggest two cautions, though neither contradicts Johnson in any substantial way. First, the standard cognitive science terminology of a ‘level’ of representation might suggest a misleading picture. We might think of a flat plane of syntagms and paradigms spread across the brain like jam between two layers of a layer cake. Perhaps we should prefer the term ‘layer’ – the thick part of the cake. Not only are some schemata conscious and others unconscious, but some might be available alternatively either in more simple manifestations or in more specific and refined degrees of precision and complexity, depending where we are in the layer. I am not making a theoretical claim here, rather I am merely pointing out that their theory leaves open this sensible possibility that cognitive schema could be available alternately at various degrees of abstraction within one mind.

My second caution takes off from this one. I do not dispute the idea that schemata can be intermodal, but interpretants are shaped both by what is

represented and by what does the representing. Schemata which are developed and refined under the impress of linguistic usage and visual experiences might become quite different from schemata developed and refined by the impress of tonal expression and kinaesthetic rhythm. There is no claim in their work, so far as I know, and no evidence for a claim, that all semantic schemata are absolutely neutral with regard to sensory modalities.

In fact, I find a clearly unintentional suggestion of the contrary in Johnson's chapter on metaphoric constraints. He develops that chapter by analysis of what he describes as schemata for *balance* and, exceptionally, he illustrates these schemata by references to works of visual art. When he gets back to verbal examples, they do not line up with the distinctions his visual examples suggest. Unlike the visual examples, English and other languages seem to develop the idea of balance from metaphoric building blocks that reduce the concept of balance to a static equality of weight. The phrase 'dynamic equilibrium' comes up once in Johnson's discussion and we can see that for normal talking, it is a rather opaque phrase, rather lacking in metaphoric extension. But the idea is not opaque for artists and musicians. Piet Mondrian adopted the term, 'dynamic equilibrium' to stand for his aims in painting. Unlike music and painting, language, or at least the English language, does not cultivate nuanced conceptions of balance within its core idioms.

The world for which Johnson asserts his schemata is by and large the world of visible space and the world of language, although it includes some residues of invisible experience like the concept of 'force'. Notions of invisible continua like force and balance are retained in language at a more rudimentary level than visible relations like containment or boundary. On the other hand, the primary bodily reference of *music* is to an endo-somatic space, a space which has no boundaries but which is rich in colorations and time shapes. It is a life-time education for a dancer to bring visual space and kinaesthetic space into concordance. Fundamentally, they are not the same. Johnson's work does not suggest to me that we should examine music for literal translations of verbal schemata, but rather it invites us to look for schemata which may be neglected by the semantic system of language, and more richly developed in other modalities.

I do not know how to do it, and I do not at this time know how to solve the problems of evidence and analysis, but it seems to me worth some efforts at conjecture. In effect, I have been talking about gesture all along, especially emotive gestures, as conforming to intermodal, but not pan-modal schemata. I would like to offer one very sketchy sketch of a particular palette for gestures and their compartments, which might realize a more complex schemata. I will again start with an anecdote as my thinking about this matter was stimulated by a particular event, and I really have not learned enough about it to detach it from that event. I had been studying Arabic music one summer with George Sawa, a very distinguished scholar and qanun performer who lives in Toronto. When he introduced me to the *Samai-Rast* of Tateos, he said, 'David, this is the piece I always play when I am depressed, and it picks me up, you know – like Bach.' It became evident, as he agreed, that he was speaking of *consolation*. The *Samai* is the third and final number of a Sufi devotional service, functioning as a postlude. The little composition in question, dating from the mid- or late-nineteenth century

seems to me unlikely to have been influenced very much by Bach, though there may be some historical exchanges that I do not know about. The music is not at all like Bach in its particular vocabulary of figures or in its form or in its overall energy, except for one thing: *influenced* as I was by George Sawa's suggestions, I could easily hear it as being consoling the way Bach sometimes sounds consoling. Now I think the very fragility and isolation of this experience will allow me to make a point that would be easy to miss otherwise. The question is not whether a particular piece is consoling. (Being just a beginner, I could be hearing the Sufi postlude in a way that will seem, even one month from now, a great misunderstanding.) We might have entirely different ideas about what if anything in Bach is consoling, even before we get around to the thorny issue of the composer's intentions. We might hear one piece as consoling today and another piece as consoling tomorrow. But the question I want to focus on is this: what is entailed by way of interpretation, especially with regard to gesture, if you or I do at some moment hear a piece as consoling, without regard for whether or not that is the *right* interpretation for an omniscient musicologist in the sky?

Consolation is a basic, embodied experience – think of the little child that runs to his or her mother with a scraped knee. Consolation has a lot to do with gesture and a lot to do with restoring balance. Thus far, I have come up with the following schema for consolation and its representation in music, and what I mean by this is not a list of *intrinsic* musical features but a list of four features that we will *attribute* to the music *if* we hear consolation in it.

1. A gentle level of physical energy, moderate in tempo, moderate in impulses (accentuations).
2. Sensual continuity dominating and distracting us from gestural vividness. Musical continuity distracts us from emotionally vivid gestural behaviour, but there are eloquently suggestive nuances. Gesture is suggested in a musical compartment which keeps gestural reference somewhat ambiguous. Typically both grief and love are evoked, but particular gestural ambiguities are exploited such as the ambiguity of the sigh of sadness and the sigh of love.⁵ Gestures are undercut by losing energy too early, no hair pulling, no leaps of joy, no passionate embrace.
3. The result is to suggest emotional *latencies* rather than fully manifest states. Latency is not a well-developed concept in language, but we know it well in feeling and in music. There is a mobile *balance* of euphoric and disphoric latencies. This is a distinction that language can refer to, but it is not one of the building blocks of verbal language.
4. The evolving balance need not conform to any particular temporal or narrative sequence – there is simply a distinct system of possibilities in play – a palette of gestural compartments.

I did not get out my copy of Liszt's *Consolations* until after I wrote this hypothesis, but now that I have done so, I am sure that Liszt himself must have read this. His

melodic gestures keep disappearing into repeated notes that float weightlessly without direction. The first begins as in Example 2.7. I know that even this example may not quite satisfy a demanding reader's requirements for science. I will be satisfied if I have suggested with some persuasiveness that the possibility of delineating compound, abstract schemata of gesture seems worth thinking about, perhaps as a component of some future semantics of genre.

All of the analysis in this chapter is fragmentary – a bit on Verdi, a bit on Schumann, less than that on Beethoven and Liszt. My immediate reasons for writing this way are personal and circumstantial, but I would like to say a word in defence. Regarding twentieth century musical theory and analysis retrospectively, we must be enormously admiring of its achievements in rendering integrated, systematic and comprehensive accounts of musical works as syntactic unities. Formed as we are by this heritage, it is natural to be hungry for something of the same sort when we explore the analysis of whatever it is that music signifies. I have myself on various occasions bemoaned the fragmentary isolation of topics and gestures, complaining on one occasion of musical analyses which pull the raisins out of the raisin bread but ignore the dough, and I have sometimes tried to redress the injury, as have many musicologists who took up the problem in recent decades.⁶

Andante con moto

The image shows a musical score for Liszt's *Consolations, I*, bars 1-8. The score is written for piano and is in 4/4 time with a key signature of three sharps (F#, C#, G#). The tempo is marked 'Andante con moto' and the mood is 'dolce'. The music features a melodic line in the right hand and a supporting bass line in the left hand. The right hand begins with a series of chords and then moves to a more melodic line. The left hand provides a steady accompaniment with chords and moving lines. The score includes various phrasing slurs and ties, indicating the flow of the music.

Example 2.7 Liszt, *Consolations, I*, bars 1–8

But there is a question here with an important other side. Much music teases with meanings to which it is not systematically and explicitly committed. To deny or ignore this fact perpetuates an unwanted exaggeration of the programme music versus absolute music dichotomy. One of the glories of developed instrumental music and of vocal music which draws on the tradition of developed instrumental music is that it is abstract and resists representations. Gestures (and

topics) can be evoked in music as passing and sometimes arbitrary colorations of syntactic forms which are sufficient in themselves to fulfil our need for system and unity. Therefore, our first requirement in analysing musical gesture need not be a systematic method of dealing with whole works so much as a vocabulary that is sufficiently precise to appreciate magic moments, just as in admiring a painting we can note the skill with which a single face is modelled without pronouncing a theory of the canvass as an organic unity. That is why my emphasis here has been to look at gestural representation in the context of all possible representations of embodiment rather than in the context of the full account of any one work.

I have been attributing values to musical shapes up to this point as if I had a bilingual dictionary in which I could look up a gesture and know exactly what it means. Although I do suspect we have a certain sense of a gestural vocabulary right from birth, I know the matter is still vague and insufficiently studied either for its facts or its consequences. I have indulged in an exaggeration which could be irritating, but my point is to put on the table the musicological advantages of a theory that bodily gesture is a highly delimited and very articulate system of expression, whether or not we can already write a dictionary and a grammar for it. It is only when we define gesture narrowly as a class of schemata for brief effort patterns linked with primary emotions that we see the possibility of an innate vocabulary, whatever the details may be. If we think of bodily gesture in this way and if we regard musical gesture as representing that system or perhaps as corresponding to bodily gesture as a synonym, then we are able to formulate an interpretative language for music otherwise impossible. After all, you could not hear a piece starting out with a truncated gesture unless you already had a notion of that gesture as it could be completed to compare it with. If we do theorize that we have such notions, we can talk about gesture which is repressed, gesture which is aborted, gesture which is ambiguous, gesture which is socialized or ritualized or gesture which is latent or gesture which is absent. Surely we do need such composite conceptions to give an account which is elaborate and subtle enough to complement our experience of hearing gesture.

Conceptual precision here depends, I believe, on making distinctions. Those I have proposed are first, the distinction between the musical representations and the bodily actions represented by music and, second, within those objects of representation, between different functions in bodily gesture, between innate templates for gesture and culturally conditioned gestural compartments, between gesture and other kinds of movement, and between gesture as molecular and compound schemata for gesture. My claim is that all these distinctions are represented in music. I suppose that I have omitted other important and relevant matters, but I do not see how any simpler account could be adequate to what we hear and how we play.

Notes

1. I think it would be enormously difficult to pinpoint Ricardo's gestural references in this aria on the basis of score analysis. My impression is that the acoustic representations of gesture here emerge from intertwined musical and phonetic (that is verbal) features and depend on very flexible performance. For a somewhat more elaborated and integrated description of gesture in opera, see my essay on *La Traviata* in *Is Language a Music?* (2004).
2. *Verbal* classifications like 'angry gesture' or 'sad gesture' induce equivalence classes, but verbal classification is secondary. The model I prefer for gesture (following Clynes 1977) envisions paragons for various expressions (anger, grief, etc.) which influence the production and perception of specific gestures without any guarantee of equivalence. Clynes theorizes that the more precisely an expression realizes its neurological model, the more its evocation feels intense. There is no test of minimal adequacy of the expression, nor is any decisive feature set posited. Equivalence in this respect is thus denied.
3. In 1992 I took some time out to replicate his basic experiment, and for the small amount of work I did – I am an amateur in experimental psychology – I would say that the results were mildly encouraging.
4. I could not avoid noticing that we start with the same diminished third as does the Tristan Prelude, composed later; so far as I can tell, this is irrelevant.
5. See Clynes's analysis (1977), in these same terms, of the F Minor Prelude from Book II of Bach's Well-Tempered Clavier.
6. The complaint will be found in chapter 11 of my *Is Language a Music?* (2004), examples of my attempts to remedy it in chapters 3, 8, 9 and 10, and the argument for the other side, mentioned below, is drawn from the introduction to chapter 15.

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Chapter 3

Hearing, Feeling, Grasping Gestures

Arnie Cox

Musical gestures are musical acts, and our perception and understanding of gestures involves understanding the physicality involved in their production. At one level this is a rather straightforward matter, but when it comes to using the concept of ‘gesture’ to analyse meaning construction, some of our assumptions leave problematic gaps in our explanations. For example, consider the following claims by David Lidov (1987: 82, emphases added):

The variables of pulse are speed and intensity. Speed is exciting. Intensity is involving. The values of simple pulse are fairly obvious: strong, foreground pulse as in folk dances and marches *controls movement directly*. Attenuated pulse is a factor in the *sublimation of somatic force*.

On the surface there may not be a problem here, since pulse is something we often feel when listening to music and it does seem to control movement in certain contexts. But there is a circularity here, for we could just as well say that a feeling of movement generates a feeling of pulse, and that the sublimation of somatic force is a factor in attenuated pulse – or so I would claim. Where does this feeling of pulse originate? If we say that it is a property of the music (of the acoustic stimuli), which we feel when listening to music, then we are led back to where we started: we feel pulse because pulse is there to be felt. The problem here is one shared by other concepts related to embodied meaning, including ‘gesture’: How is it that music makes us feel anything at all? (I am not referring necessarily to emotional feelings but to the more visceral sensations related directly to movement.) In the context of folk music and marches it might not seem that this is a matter in need of explanation: people dance to dance music and march to march music, and the question of how music works in these contexts may not seem to some a crucial area of scholarly inquiry. However, Lidov is using these examples of obvious physical engagement as part of an explanation of how similar types of engagement occur in musical experience generally, including ‘art music’, and since this engagement and its cause are not as obvious as in other repertoires, and because a great deal is at stake, this claim requires a more explicit understanding of how music engages us. What is at stake, to my mind, is the claim that musical meaning is generated by our embodied experience of it – that our embodied experience is not only necessary for experiencing meaning that is somehow inherent in the music

itself, but that meaning arises in our conceptualizations of embodied musical experience and that abstract meaning is the *product* of embodied reasoning. This broad claim requires an examination of the concepts that we tend to take for granted, including the far-reaching question of how we conceptualize relations among musical events in terms of ‘motion’ generally, and in terms of ‘gesture’ specifically. The topic of this chapter is the question of what motivates and structures conceptualization of music in terms of ‘gestures’, and what sense there might be in using ‘gesture’ in addition to, or instead of, the often coextensive ‘motive’ and/or ‘figure’. To answer this, I first offer an account of how music engages us bodily.

Theoretical Background: The Mimetic Hypothesis

Do you ever find yourself tapping your toe to music? If so, why should this be? This very common response to music, along with other subtly overt embodied responses such as head-bobbing or swaying, is not something we normally *choose* to do (although we are of course certainly capable of choosing to engage with music in overtly embodied ways). Informally conducting, playing ‘air guitar’, and ‘beat boxing’ (vocal imitation of the rhythm section in rap) are similar responses, although these are perhaps more often a matter of volition. But we do more than visibly move to music; we also sing along, in real time and in recall, aloud and in our heads. By way of example, let me offer the following anecdote.

I was at a recital by the renowned bass Thomas Quasthof in which he sang the Kerns/Hammerstein tune ‘Old Man River’ for an encore. As he sang I thought that I heard a sort of echo and then realized that an elderly gentleman was actually singing along. His wife shushed him, but when the chorus returned he started singing along once more (much to her quite evident embarrassment). As I read this scenario, this man’s impulse to engage with the music as he did overrode his social inhibition: it was clear that his wife thought he should listen quietly, but it was as if he could not help himself. I believe that his response is of the same sort as toe-tapping and other kinds of involuntary participation, and I believe that these are overt forms of an imitative participation that is a regular part of musical experience and comprehension. Based on observed mimetic participation of these sorts I have proposed the following hypothesis: part of how we understand music involves imagining making the heard sounds for ourselves, and this imagined participation involves covertly and overtly imitating the sounds heard and imitating the physical actions that produce these sounds.¹ Mimetic participation occurs in three forms: (1) covert and overt imitation of the actions of performers (whether the performers are seen and heard, or heard only, or recalled); (2) covert and overt subvocal imitation of the sounds produced, whether the sounds are vocal or instrumental (likely to include an imitation of timbre as well as pitch, rhythm and dynamic level); and (3) an amodal, empathetic, visceral imitation of the exertion patterns that would likely produce such sounds. Each of these forms occurs in real time and in recall, sometimes within the same modality (as in vocal and subvocal imitation of a singer) and often across modalities (vocal and subvocal imitation of an

instrumental melody). The strength of each form of mimetic participation varies from person to person, which establishes a variability in the meanings that we derive from musical experience, including the meaning of ‘gesture’. Understanding the variability in different listeners’ particular habits of mimetic engagement is important for communication about music in terms of ‘gesture’ and other bodily based conceptions.

Before considering the evidence for the hypothesis, I should compare this to similar ideas on the subject. The mimetic hypothesis is similar to ideas put forth by Patricia Carpenter (1967), Manfred Clynes (1977), Thomas Clifton (1983), David Lidov (1987), Kendall Walton (1993, 1997), Naomi Cumming (1997), Andrew Mead (1999) and the nineteenth-century philosopher Herbert Spencer (1857). What each of these writers agree on is that imitation on the part of listeners seems clearly to play a role in musical experience; however, there are three important ways in which their conceptions differ from the mimetic hypothesis: they provide little or no evidence (beyond the anecdotal such as I have offered thus far in a preliminary way); they do not examine the forms, or modalities, of mimetic participation; and they do not consider the breadth of the implications.² In this essay I follow this third restriction, although elsewhere I consider briefly the various aspects of musical meaning in which mimetic participation would seem to play a role (Cox 2001). One implication beyond the topic of ‘gesture’, which I must allude to here in the interest of contextualization, is the construction of the concept of musical verticality, or ‘high’ and ‘low’ notes. Most of us take this as one of our most basic, quasi-literal concepts, but even while acknowledging its metaphoric basis there is not a generally accepted account of the metaphoric reasoning that gives us this concept. I have offered a preliminary account of how this concept can be understood to be motivated by mimetic participation (Cox 1999a), which in turn activates the embodied metaphoric reasoning described by George Lakoff and Mark Johnson (1980, 1999; Johnson 1987). The significance for the present context is that the mimetic hypothesis is something that has implications even for our most basic, quasi-literal concepts – including concepts such as ‘ascent’, ‘descent’ and ‘contour’ which depend on the concept of musical verticality – as well as the concept of ‘gesture’, which is why this aspect of musical experience and conceptualization needs to be detailed with care.

Mimetic Participation in Daily Life and in Musical Experience

Mimetic participation is fundamental to human comprehension, and its role in musical experience is very much simply a special case of how the embodied mind works generally. Since the evidence is detailed elsewhere (Cox 2001) I will review it only briefly here. Clinical evidence for the mimetic hypothesis can be sorted into four kinds: (1) studies of imitation in face-to-face communication; (2) motor imagery studies involving *mirror neurons*; (3) subvocalization studies for speech and for music; and (4) non-vocal motor imagery studies for music. It is important to note that each of these is a kind of motor imagery: hand and limb movements, adjustments of posture, facial gestures and vocal ‘gestures’ (the motor actions that

produce speech and song). To put it another way, in each case the sounds are evidence of the motor actions that produce them, and our comprehension of the sounds involves comprehension of the relevant motor actions. In addition to the clinical evidence, we also have (5) the indirect evidence of our vocal descriptions of non-vocal sounds: we regularly describe instrumental sounds in terms of vocal sounds (such as *cantabile* for an instrumental melody), and the voice is regularly used as a model for melodic playing in instrumental pedagogy. One implication of this is that instrumental sounds are regularly conceptualized in terms of vocal experience, and that this is motivated by subvocal imitation of non-vocal music.

1. Imitation in face-to-face communication includes, among other things, studies of infant-parent interactions.³ Babies imitate those around them and this is part of how we learn to understand others: we see and hear things – facial, vocal, gestural – and we imitate these actions. Our species seems to have evolved in such a way that successful imitation is crucial for successful communication, including learning to reproduce the vocal sounds of speech. Significantly, when infants and parents interact it is not only the infants who do the imitating but the parents as well. Why should it be that parents spend any time imitating their babies? One way to understand this is that mutual imitation fosters mutual understanding. In mutual imitation we become like those we are trying to understand – we understand (in some measure) what it must be like to be them because we are being like them. This sort of empathy is fundamental to being human, which brings up another point. While it might seem that the imitation we practise as infants is something we outgrow, it appears instead that our imitation becomes more covert as we mature – and occasionally becomes overt in certain situations. We can understand this as resulting from the gradual development of motor imagery: the capacity to remember and plan motor actions in imagination, without having to rehearse these actions overtly.

2. Some of the best evidence for mimetic participation generally comes from studies of *mirror neurons*.⁴ These are neurons that fire not only when a goal-orientated action is performed – particularly grasping gestures – but also when similar actions are observed. Care must be taken in applying this evidence to music-producing actions (which have yet to be studied directly), but the findings are suggestive.

3. Perhaps the most specialized motor imagery is that related to speech production and comprehension, and part of how we comprehend speech is through mimetic subvocalization (Gibson & Levin 1975; Gathercole & Baddeley 1993).⁵ We can view subvocalization in adults as a covert form of what infants and children do in acquiring language. We can also see this as a special case of motor imagery: this aspect of speech comprehension is comprehension of the motor actions that produce the sounds of speech. In addition to the speaking voice, not surprisingly, a similar process occurs in comprehending the *singing* voice,⁶ so that part of how we understand song (in real time and in recall) involves subvocal imitation. Since subvocalization is grounded in the physical experience of overt vocalization, comprehension of heard song thus appears to involve comparison with our own experience of singing or otherwise vocalizing. This subvocal empathy is part of what we feel when listening to singing, and different kinds of

singing (e.g. Dusty Springfield, Maria Callas, Janis Joplin, Ella Fitzgerald) can be understood to generate different kinds of feeling in part because they invite different kinds of mimetic participation.

4. There is a similar story to be told about instrumental musical sounds but it is twofold. There is little direct evidence for mimetic motor imagery regarding the motor actions of instrumental musicians – we have, for example, the finger movements of pianists when listening to piano music (Haueisen & Knosche 2001) – but I believe that it is only a matter of time before we have more evidence in this domain. Clynes's (1977) work indicates a degree of isomorphic physical responses across modalities. By itself his work might be interpreted as indicating little more than the fact that music generates a physiological response that somehow matches the intensity of the music heard; however, in combination with these other kinds of evidence his work can be interpreted as part of an impulse to understand through imitation – by matching (unconsciously, or normally so) the physiological intensity that is somehow isomorphic with the music and its means of production.

5. Of particular interest is the evidence for subvocalization for instrumental melodies (Baddeley & Logie 1992; Smith, Reisberg & Wilson 1992). Since most of us have a voice and have used it to make and imitate sounds for most of our lives, it should not be surprising that we would draw on vocal imagery to understand instrumental musical sounds generally. But this means that musical sounds generally are understood partly in terms of our embodied vocal experience, making the exertions of speech and song relevant for understanding music generally. In other words, part of what we feel when listening to music are the imagined, imitative (sub)vocal exertions along with the imagined, imitative intra-modal exertions (the exertions specific to a given instrument). We can see this as being reflected in our vocal descriptions of instrumental sounds: 'cantabile', 'cantilena' and 'mezza voce' in music for strings and for piano; polyphonic 'voices'; 'voicings' of piano hammers and organ pipes; 'choirs' of strings; 'screaming' jazz trumpets and rock guitars; and getting notes to 'speak' on wind instruments. To feel what I mean, try the following: recall a favourite instrumental melody – perhaps the slow movement of a symphony or a chamber work – and while doing so, ask whether your voice is engaged in any way at all: the feeling of singing along, or only the urge to somehow participate subvocally. With few exceptions people report that they do indeed feel some sort of subvocal engagement. (There are several ways in which this could be and should be tested empirically, along with the question of whether people subvocalize without being aware of it.) This is a remarkable phenomenon – that recall of an instrumental melody should engage the voice – because it indicates that part of how we comprehend music (at least in recall), is in terms of vocal experience, regardless of the medium of the source. This would make the exertions of vocal experience relevant for comprehension and conceptualization of music generally and regularly, and this would give us one way of showing explicitly how musical meaning is embodied. For this to be directly relevant to 'gesture', however, it would have to be shown how exertions in the vocal modality are felt in other modalities. I address this in the next section.

Grasping Gestures Within and Across Modalities

If the physicality of gestures were grasped only within the same modality in which they are produced, their meaning would have quite a different character than I believe they do in fact have. When we hear, say, the sound of a violin, the mimetic hypothesis holds that we comprehend it in three ways: (1) via (covert) imitation of the arm and finger movements; (2) via subvocal imitation of the sounds produced; and (3) via an amodal, visceral imitation of the exertion dynamic evident in the sound (a pattern of exertions that would produce the same or similar sounds). The intra-modal imitation will vary according to experience: a violinist, for example, will comprehend the finger and arm movements of a violin performance differently than a musician who has never played a string instrument, who in turn will comprehend these differently than someone who has never played a musical instrument. Yet even having never played the same instrument or any instrument at all, we will automatically have *some* idea of what it must feel like to move one's fingers and arms in a certain way.

I have already discussed the cross-modal example of subvocal imitation, but there is another kind of mimetic comprehension that is akin to subvocalization and this is the comprehension of one instrument (or voice) in terms of another instrument – for example, representing violin sounds in terms of the motor actions that produce essentially the same sounds on the piano. I believe that this is more learned than innate, and it may also be more intentional and less automatic than other kinds of representations, but it is common enough among musicians that it ought to be considered here. The ability to represent one modality in another is possibly (or perhaps likely) dependent upon an *amodal* representation of the exertion dynamic that would produce a sound or a sound pattern in one domain or another, and this is the third kind of imitation listed above. This is a very difficult matter to discuss because the relevant feelings are ineffable and, related to this, their location is invisible. But it is a visceral response to music which is not located in either the limbs or the voice and yet is fundamental to the embodied foundations of musical meaning. To understand the roles of these various kinds of imitation, consider the gesture that opens the final movement of Beethoven's Violin Concerto (Example 3.1).

Violin

sul G

tr

p

Example 3.1 Beethoven, Violin Concerto in D Major, Op. 61, III, bars 1–4

Let us focus on the initial two-note gesture. According to the hypothesis, this event (or event pair) would motivate imitation of the arm and finger movements of the violinist (whether the violinist were seen and heard or heard only, or whether the performance were only recalled or otherwise imagined), as

well as subvocal imitation of the pitch, contour, rhythm, accents (phenomenal and agogic) and dynamic level. But I believe that most of us would also feel something that was not located in either the limbs or the voice – something in the gut that somehow matched the energy pattern of the music. This might well be manifest in the modalities of toe-tapping, head-bobbing and/or conducting, but none of these are specified by the music (the violin playing). The question of where in the body an amodal representation might be located is important, and it may be that this is only a phantasm resulting from the fact that embodied representations can be and are manifest in any of several modalities.⁷ But the more crucial point here is that, according to the mimetic hypothesis, a musical gesture motivates imitative representations that are not confined to the modality in which they are produced (for example, the finger and arm movements of a violinist). This means that a gesture has a meaning which is at once in accord with its mode of production and transcendent of its mode of production. The melodic ‘sigh’, for example, retains its vocality while being comprehensible as a sigh in any instrumental medium. It is not sigh-like only by exterior (acoustic) association with its origins in vocal repertoire, because even in an instrumental realization it is comprehended in part via subvocal imitation: it is sigh-like because it is comprehended by the sigh-producing medium of the voice. At present, however, although the mimetic hypothesis shows that comprehension is cross-modal, it can only suggest that there might be an amodal, visceral representation.

Robert Hatten and the Mimetic Hypothesis

If the mimetic hypothesis has relevance for theories of musical gesture, then there is no better place to demonstrate this than in the context of Robert Hatten’s work. In this section I consider how the mimetic hypothesis bolsters the claims and explanatory power of Hatten’s proto-theory as set forth in a series of online lectures (Hatten 2001).

In Lecture 2, ‘Embodying Sound: The Role of Semiotics’, Hatten offers a set of eight ‘presuppositions for a semiotic theory of gesture’. Number 1 reads: ‘Gesture is movement interpretable as a sign, whether intentional or not, and as such it communicates information about the gesturer (or character, or persona the gesturer is impersonating or embodying).’ If applied to dance or theatre, there is no immediate difficulty here: the gestures referred to are those of the gesturer (including gesturer-as-character/persona). But when we speak of musical gestures, to what extent are we speaking of the gestures of the performers? Without question a performer’s gestures communicate information about the gesturer (the performer), but the role of the musical performer in reproducing signifying gestures is different than that of other performers. The same musical gesture – for example, the ‘melodic sigh’ – can be produced by a great variety of physical means – for example, on the violin, the oboe, or the piano – and yet be classified the same (as a ‘melodic sigh’). These various modes of performance of what we take to be the same thing must then have something in common, and we ought to be able to say precisely what this is. If we focus on music’s acoustic features (pitch, contour,

rhythm) then I see less sense in using terms such as ‘sigh’ and ‘gesture’. In the case of the ‘sigh’, we might say that in each performance medium it *sounds like* a sigh. This is true enough, and an exterior mapping – *this event sounds like that event sounds* – might suffice to account for the metaphoric term ‘melodic sigh’. We could also specify the identity in terms of shared acoustic features in order to explain the reasoning. But I do not find this satisfactory, for when I hear a ‘sigh’ I *feel* a sigh, or something very much like the feeling of a sigh. I believe that this feeling motivates and grounds the meaning of terms like ‘sigh’ and ‘gesture’, and I believe we ought to seek a theory that accounts for the viscerally affective dimension of musical meaning.

We might apply Johnson’s theory of *image schemata* (Johnson 1987) and note that each melodic sigh performed by various instruments manifests, somehow, the same image schema; and we might further note that image schemata are grounded in embodied experience, and that this embodied grounding is thus the basis for using the terms ‘sigh’ and ‘gesture’. Such an application of Johnson’s work gives us a very good conjecture, but we would still need to specify the means by which musical gestures are embodied. This, then, is precisely where the mimetic hypothesis becomes relevant for gesture theory. First, since the term ‘melodic sigh’ makes sense in some measure as a *sigh*, regardless of the performance medium, and since the term ‘musical gesture’ makes sense in some measure as *gesture*, regardless of the performance medium, then we must consider what these have in common *as sighs and other gestures*. Second, since the acoustic features by themselves motivate only a superficial understanding (*this sounds like that*), those of us interested in embodied meaning must explain how events called ‘melodic sighs’ and ‘musical gestures’ *feel* like gestures and sighs. According to the mimetic hypothesis, events that we call ‘gestures’ and ‘sighs’ not only sound alike, but they also feel alike because they are all comprehended in part via mimetic participation. Specifically, comprehension of a melodic sigh involves the following (in various measures, in both real time and recall):

- *on the violin*: (1) imitation of the fingering and the bowing; (2) subvocal imitation of the musical sounds produced (the two-note descent, likely shaped in some measure by timbre and dynamic level); and (3) amodal, visceral imitation of the exertion dynamic of the event.
- *on the oboe*: (1) imitation of the fingering, embouchure and blowing; (2) subvocal imitation of the musical sounds produced (the two-note descent); and (3) amodal, visceral imitation of the exertion dynamic of the event.
- *on the piano*: (1) imitation of the finger and arm movements; (2) subvocal imitation of the musical sounds produced (the two-note descent); and (3) amodal, visceral imitation of the exertion dynamic of the event.

Notice that only the superficial medium differs (the fingerings and so forth), which is not where the essence of ‘sigh’ lies. Regardless of the performance medium,

each is comprehended via subvocal imitation, and in this way each not only sounds like a sigh but *feels like* a sigh.

It is worth noting here that in each case the finger movements are also imitated, and we ought to ask why this does not motivate a competing conceptualization. There are several factors that work against a digitally based conceptualization. One is that there is not necessarily a one-to-one correspondence in each case, since a stepwise descent on the oboe might involve a combination of several fingers. Another reason is that the finger actions here are out of proportion with the most salient features of the event – the duration, contour, timbre, dynamic level and harmonic/tonal context – and are instead responsible for only the vertical dimension of the contour. Nonetheless, in another context the finger actions could easily become much more salient, as in a virtuosic passage work, and in such a case a different sort of conceptualization would be motivated – such as the metaphors of ‘passage’ or ‘run’ (including the *corrente*).

Returning now to Hatten’s presuppositions, the first of these also leads to another important question: how might gestures become abstracted into gestures of a character or a persona? According to the mimetic hypothesis, we experience patterns of exertion by way of mimetic participation, and in this way it is as if we are acting – acting in a way that is more or less isomorphic with the sound-producing actions heard (and seen). In conceptualizing these patterns of exertion, we map these onto our own experience of making similar exertions, and among the most straightforward mappings is that onto gestures: we do not feel only abstract sensations of exertion; we also understand these as the intentional, expressive gestures that we have made and have seen made in other domains of experience. One result of this mimetic participation is that we enact the role of a character or persona – that of an ideal gesturing performer (at once making music and not, since the exertions are not confined to the specific domain of sound production). At the same time, however, the otherness of the music remains, since we are not the principle (original) source of the sounds with which we are engaging. The fact that the music is produced by a source exterior to ourselves may be what motivates a projection of our mimetic musical agency outwards, perhaps towards this exterior source. But since this agency cannot be identified directly with the actions of the performers, it remains an ideal agency that is not-us. We call this agent ‘the music’, and its genesis might follow this pattern: (1) the sound-producing actions of the performers are (2) heard/seen and imitated by a listener, which (3) motivates a participatory agency within the listener, which (4) is then projected outwards towards the original source but which (5) cannot be identified directly with this source and so remains ideal.

The only other of Hatten’s eight presuppositions that I wish to consider here is that regarding posture (presupposition 8), which he says ‘may be considered as gesture “under a fermata.” A “frozen motion” or pose may reveal the energy and affect with which it is invested.’ Such moments can be among the most powerful in music. Part of their affect results simply from the anticipation of what will follow, but part of it results from the feeling of holding an imagined pose. According to the mimetic hypothesis, in the case of a held moment we feel vicariously the energy required to sustain a sound – or to sustain a silence – in some combination of intra-

modal, cross-modal (including particularly the subvocal) and amodal (visceral) imitation. The sensation of holding a pose would result also from the same sense of mimetic agency described above: among the gestures made by our musical persona (our own, or that projected away from us) are poses which may be held for expressive purposes just as in other domains of experience.

Let me apply and extend this to an example from Hatten's analysis of the opening of Schubert's late A major sonata, D. 959. I should note that the topic from which the following excerpt derives is the question of 'resonance' as a gesture; however, for my purposes here I am interested in the personification and locomotive metaphors. The analytical excerpt refers to the beginning of the first movement (Example 3.2).



Example 3.2 Schubert, Piano Sonata in A Major, D. 959, I, bars 1–6

Hatten (2001: Lecture 4: 3, emphases added) writes:

Here, the left hand has the [...] gestural motive one, and its 'stoic heroism' may be seen to 'resonate' the right-hand's sustained chords, which [...] *strive in stepwise ascent* until relaxing into the half cadence on the dominant in bar 6. The *determined will of a persona is clearly implied and gesturally projected*.

I have already described the role of mimetic participation in the personification of music, but it is one thing to talk in general about gestures and another to talk specifically about the strivings of a persona in a stepwise ascent. That is, once we have a musical persona, how do we specify its actions within the metaphorical terrain of musical space? We have to start by rejecting the view that there *is* a bass line that ascends by step, along with the view that a personification of this motion is a metaphoric interpretation of the objective facts. As Marion Guck (1994) has pointed out, even such quasi-objective observations are analytical fictions based on a metaphoric understanding. Our musical *lines*, *ascents* and *steps* are metaphoric conceptualizations of relations among tones in terms of spatial relations. The conception of musical motion and space and the conception of musical personae are both products of the same embodied metaphoric reasoning, so let me sketch an account of this embodied reasoning.

According to the mimetic hypothesis, when we hear the opening of this sonata we participate vicariously with the production of the music – specifically, the bass line and the sustained chords – and our participation takes three forms:

imitation of the arm gestures, subvocal imitation of the sounds produced, and a visceral exertion that matches the exertion dynamic manifest in the music. Again, the degree and combination of participation will vary from person to person, so that more properly I should say that these are the specific kinds of participation that the music *affords* and *motivates*. With respect to the bass-line chords, we feel the two-part arm gestures and their gradual progression ‘up’ the keyboard (that is, their progression to the right). We also feel what it would be like to sing the sounds that are produced by these gestures, including the difference in terms of what we call ‘pitch’, which in this case gives us ‘ascent’. Finally, we also feel an amodal, visceral exertion that is in this case more or less isomorphic with the imagined arm and vocal exertions. As in other domains of experience, the embodied feelings motivate conceptualization in terms of basic, concrete experience (Lakoff & Johnson 1980, 1999; Johnson 1987), and these include ‘gesture’ as well as the quasi-objective spatial conceptions. The pattern of exertion in the Schubert, within and between the successive left-hand gestures, activates the conceptual metaphors *greater is higher* and *states are locations*, along with the related metaphors of *change of state is motion between locations* (*change is motion*) and *difference between states is distance between locations* (*difference is distance*).⁸

The conceptual metaphor *greater is higher* is one of our most common metaphors, underlying concepts such as ‘higher’ prices, ‘higher’ quality, ‘higher’ education and ‘higher’ frequencies, all of which are literally *greater* and metaphorically ‘higher’. In the present case, this metaphor is activated by the greater and lesser exertions felt in imagining producing the piano sounds by way of subvocalization, where the phenomenon that we call ‘ascent’ normally involves greater exertion. The state-locations metaphors are also very common – giving us emotional, financial, musical and other metaphoric locations – and in this context they give each musical event a location, with small, discrete differences conceived as ‘steps’ (on successive downbeats in the bass), and greater, discrete differences conceived as ‘leaps’ (the crotchet octave leaps in each bar). These metaphors combine to give us musical locations, distances and motion within the vertical musical dimension, while the horizontal dimension is the product of these and other conceptual metaphors that similarly become relevant via mimetic participation. Although the details of our conceptions of musical motion and space cannot be explored here, the crucial claim is that all such spatial conceptions begin with the feeling of an exertion dynamic that results from mimetic participation. Once felt, and then conceived in terms of kinds of motion, we can then step back and adopt a third-person analytical perspective, positing an ideal agent in our place. It is this musical agent that then exerts in this way and that way, performing gestures and moving in various ways through and between metaphoric locations. Our conceptual and linguistic habits then perpetuate the analytical perspective – for example, the common formulation, ‘here the music *does this*’ – but language depends on the embodied metaphoric reasoning I have sketched (both originally and as a reinforcement of language’s meanings). It makes sense to describe the opening of this Schubert sonata in terms of ‘striving’ and otherwise ‘gesturing’ not because we empathize with the actions of some already-given musical persona, and not because there is a musical motion already given, but because we feel the

exertions involved in the sound's production, and the exertion dynamic that we feel is more or less isomorphic with the feeling of striving, progressing and gesturing.

Hearing, Feeling, Comprehending, Conceiving and Grasping 'Gestures'

My primary interest generally is in how music engages us and in the relationship between experience and conceptualization. Although all of our metaphoric conceptions of motion and space can be understood to bear the residue of their embodied origins, 'gesture' seems to foreground this embodiment more than most. My final point in this chapter concerns the place of 'gesture' in music epistemology and the differences between this and other conceptualizations in terms of the kinds of knowledge they help establish.

Our embodied engagement with music affords an intimate, visceral and intuitive way of knowing music. A good portion of this type of knowledge is ineffable (Raffman 1993), but our embodied experience also motivates conceptualizations whose meanings remain tied to this embodied experience by way of the patterns of exertion shared between music and other domains of experience. 'Gesture' is one such concept, and while it might be extended to include large-scale relationships, and perhaps to other less immediate events and relations, the more immediate events and relations that are roughly coextensive with 'motives' and 'figures' are in a sense more viscerally engaging and thus more meaningful.⁹ These immediate events and relations, as in the opening of the Schubert A major Piano Sonata, are those which we can most readily 'grasp' (comprehend) and thus know in a way that is different from large-scale relationships. The use of the term 'gesture' highlights this difference, but what advantage is there in the use of this term over 'figure' and 'motive'?

If one examines the concepts in English related to knowing, one quickly finds that these are dominated by visual terms (Johnson 1987; Sweetser 1990). Naturally, this extends to music analytical discourse (Cox 1999b; Johnson 2002), where we 'reveal', 'show', 'clarify' and so forth. Indeed, the very word 'theory' is itself a visual term (meaning 'to show', with the same root as *theatre*). Since human perception is dominated by visual information, this visual bias in our epistemology is not surprising; and since most of the non-visual perceptual information we deal with also has a visible source – invisible smells, tastes and sounds come from otherwise visible objects – in most cases this bias does not present a problem. But for music epistemology this presents a considerable problem, the gist of which is that, that which is most crucial about music is neither visible nor visualizable (without turning it into something other than musical sound), and this leaves music epistemology in an awkward position: if an understanding of something cannot be shown, then it cannot align with our more general epistemology, which would mean that musical knowledge would have to be classified as a special kind of knowledge – a more intuitive kind of knowledge that would not carry the same clout as knowledge in other fields. By focusing on music's 'structure' and on 'figures' we make visualizable representations, which

have the advantage of aligning with our more general epistemology but which also have the disadvantage of objectifying a non-objective, embodied experience.

But we have another way of conceptualizing knowledge in English, and that is in terms of ‘grasping’ (Johnson 1987; Sweetser 1990; Cox 1999b). ‘Comprehend’, ‘conceive’ and ‘perceive’ are each grounded in the experience of grasping. Much like our visual bias, the importance of grasping objects in the history of our species makes it unsurprising that ‘grasping’ should structure our conception of *conceiving* and *comprehending*. But grasping has a different feel than seeing: grasping is more immediate; and while it still objectifies that which is grasped, our knowledge of the thing grasped is more intimate and visceral than it is when we simply regard it. The large-scale ‘structure’ of a musical work is perhaps not easily graspable, but in contrast to this, we know a work more intimately in our moment-to-moment experience of its more easily graspable events and relations (Levinson 1997), and these events and relations are at the level of motives, figures and gestures. But ‘motive’ and ‘figure’ do not reflect that quasi-tangible feature indicated by ‘gesture’, which focuses our attention on a more physically intimate understanding of how the music works.

To see this – to feel this – compare the following conceptualizations of the opening two-note event of the finale of the Beethoven Violin Concerto: (1) a figure, (2) a motive, (3) a leap and (4) a gesture. ‘Figure’ suggests something that is external to us and fixed. ‘Motive’ highlights the dynamic of change, conceived as motion, but still leaves the event(s) as external. ‘Leap’ suggests a more embodied sense of motion, but it is too big for us to feel directly in terms of our own experience of leaping: to leap requires a much greater exertion than the exertion reflected in this opening event; it has an analogous dynamic, or exertion ‘contour’, but it is out of proportion. However, ‘gesture’ suggests not only an analogous exertion dynamic, but one of the same proportion, and this isomorphism affords a closer comparison with our own embodied experience.

‘Gesture’ seems to match best the level at which we grasp (comprehend) music most viscerally and intimately, and in this way it highlights a kind of musical knowing that is distinct from our more visual and quasi-objective conceptualizations. By focusing on musical gestures we draw attention to a crucial area of musical meaning, and by understanding how musical gestures are grasped and conceived we strengthen our understanding of how musical meaning is constructed.

Notes

1. This is a slightly different formulation than that in Cox 2001.
2. One exception is Clynes (1977), who offers a particular kind of empirical evidence which I discuss below. Lidov (1987) bases his arguments on Clynes’s work.

3. A good sample of such research as it bears directly on music can be found in Papousek (1996), Malloch (1999/2000) and Trevarthen (1999/2000).
4. Much work has been done in this area; a representative sample includes Gallese et al. (1996), Rizzolatti et al. (1996), Gallese and Goldman (1998) and Fadiga et al. (1998).
5. I take subvocalization to include both silent vocal imagery and *sotto voce* rehearsal and imitation.
6. Evidence for this can be drawn from Baddeley and Logie (1992); Smith, Reisberg and Wilson (1992); Smith, Wilson and Reisberg (1995); Vaneechoutte and Skoyles (1998).
7. Daniel Stern (1985) has argued for amodal perception in infants. Although he suggests that we eventually outgrow this, it may be that amodal perception becomes disguised by the gradual dominance of modally specific perception.
8. For a fuller explanation of how this and how other conceptual metaphors structure musical thought, see Cox 1999a.
9. Compare Hatten (2001), Lecture 4: 1.

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Chapter 4

Musical Gestures and Musical Forces: Evidence from Music-Theoretical Misunderstandings

Steve Larson

To describe a bit of melody as a ‘gesture’ is to conceptualize music in terms of physical motion.¹ The theory of ‘musical forces’ (Larson 1997, 2002, 2004) takes that conceptualization further by claiming that musical motion is shaped by forces analogous to those that shape physical motion: like its physical counterpart, ‘musical gravity’ pulls down on melodic pitches above a stable melodic ‘platform’; like its physical counterpart, ‘musical magnetism’ draws every unstable note to the closest stable pitch (with an intensity that grows stronger as the goal pitch gets closer); and like its physical counterpart, ‘musical inertia’ leads listeners to expect that the melodic patterns they perceive will continue to shape musical motion. Just as every physical gesture derives its character in part from the ways in which it moves with respect to physical forces, so every musical gesture derives its character in part from the ways in which it moves with respect to musical forces.

Consider the opening of the song ‘Happy Birthday’ (Example 4.1a). If we hear the two Gs as a quaver repetition, then, on first hearing the A, musical inertia will lead us to expect the A to be repeated in quavers too (Example 4.1b). If we hear that repetition as an elaborated version of the simpler crotchet-note melody given in Example 4.1c, then musical inertia will lead us to expect the melody to continue as an elaboration of that crotchet-note melody. And, if we also hear the melody given in Example 4.1c as an ascending gesture, then musical inertia will also lead us to expect the melody to continue ascending through that scale (to B and so on (Example 4.1d)). However, instead of ascending, the melody returns to G (Example 4.1e). The return to G may be heard as giving in to gravity (by going down) and/or as giving in to magnetism (because it resolves to G, which is closer than C). The forces operate over larger spans of music as well. If we hear the music given in Example 4.1a as two gestures (both having the words ‘happy birthday to you’), then we may hear the second of those gestures as giving in to inertia by doing ‘the same thing’ as the first gesture (that is, the same rhythm and/or the same contour). Of course, paying attention to the similarity of these gestures also highlights their difference. The first ends on the leading tone B and the second ends on the tonic C. And in moving globally from B to C, the melody can be heard to give in to magnetism.

a Hap-py Birth - day to you Hap-py Birth - day to you

b

c ?

d etc.

e

Example 4.1 (a-e) ‘Happy Birthday’

‘Happy Birthday’ derives its character in part from the ways in which it moves with respect to these musical forces. The initial alternation between G and A is easily heard as an extroverted and outgoing expression of simple joy. In major, the sixth degree of the scale has the least magnetic pull on it from members of the tonic triad, and can thus be heard as moving in a space that is minimally affected by the magnetic pulls that might otherwise express longing (sing the melody with A flat instead of A, and the magnetic and gravitational pulls make the gesture feel constrained and weighed-down). Because the A is approached from below (and can thus ascend with inertia or descend with gravity and magnetism), there is a freedom in its motion. The rhythmic setting (with the quaver upbeats on ‘happy’ leading to a crotchet downbeat A that leisurely but not dramatically resolves to G) heightens the quality of ease in this gesture. One could say a great deal more about how the musical forces contribute to our experience of the character of this melody.

The theory of musical forces has found varied forms of empirical support. Studies of the distribution of melodic patterns in published accounts of ‘hidden repetitions’ in tonal music (Larson 1997–98), in jazz compositions and transcribed jazz improvisations (Larson 2002) and in Heinrich Schenker’s *Five Graphic Music Analyses* (Larson & VanHandel, in press) suggest that the distribution of those patterns can be explained in terms of the interaction of constantly acting musical forces. Computer models of melodic expectation (Larson 1993, 1994, 2004) rely on an algorithm that quantifies the interaction of musical forces and gives higher ratings to melodic completions that were produced more often by participants in several different experiments. An experiment (Larson & VanHandel, in press) that asked listeners to make judgements about the experienced ‘strength’ of presented melodic pattern completions found that those judgements could be explained in terms of a similar algorithm.

This chapter finds evidence of a different sort. It argues that some theorists misunderstand musical forces in ways that are analogous to the ways in

which people misunderstand physical forces. These misunderstandings become a part of the converging evidence in support of the theory that music is shaped by analogues of physical forces. It extends the analogy between physical forces and musical forces in the following way:

Some people misunderstand the operation of physical forces.	Some musicians misunderstand the operation of musical forces.
Nevertheless, the paths of physical objects are shaped by those forces.	Nevertheless, melodic expectations are shaped by those forces.
Therefore, graceful physical gestures reflect their balancing of physical forces.	Therefore, graceful melodic gestures reflect their balancing of musical forces.

Physicists tell us that some people misunderstand the operation of physical forces. For example, some people mistakenly think that an object in motion will slow down or stop because its inertia gets ‘used up’. And they tend to explain motion in terms of a single force – as if just one force were acting at a time – rather than thinking correctly in terms of the interaction of constantly acting forces. Thus we hear mistaken explanations like ‘the ball continued to rise until its inertia gave out, and then gravity started to pull it down more and more’. Nevertheless, the paths of physical objects are shaped by the interaction of constantly acting forces. The ball just referred to is being pulled down constantly by gravity. And it is the constant interaction of gravity and inertia (as well as wind resistance) that shapes the path of the ball.

Graceful physical gestures are shaped in ways that reflect this interaction. For example, consider the pendulum or park swing. Gravity pulls the pendulum towards its most stable position, but inertia carries it beyond that point. Because these separate forces (and friction) are constantly acting, the pendulum tends towards a state in which those forces are in equilibrium. When our bodies move in ways that respect that interaction of physical forces, the motions are more graceful than they would otherwise be. For example, consider what happens when you jump down from a height. If you were to land suddenly in the posture that you have when you are standing still, it would hurt. In a more graceful landing, you flex your knees as you land so that inertia carries you beyond the ultimately most stable position, cushioning your deceleration by circling around your arrival point the way a pendulum does.

In the same way, when two gestures combine gracefully, one of two things happens. Either the first gesture continues smoothly into the second (so that inertia carries motion through the stable point of elision at which one gesture ends and the other begins), or the first gesture pauses at that stable point before changing direction to begin the second. For example, consider what happens when you catch a ball and then toss it back to someone. If you catch the ball and throw it back in one graceful, smoothly joined motion, you will move continuously, changing

direction at a point of instability, so that inertia carries motions through stable points. If the motions remain separate but still graceful, you will pause in a stable position and then change direction.

If the hypothesis suggested by this analogy is a good one, then we may find theorists making statements that disagree with the theory of musical forces in the same ways that people misunderstand physical forces. We will find that melodic expectations nevertheless obey musical forces, and we will find that graceful melodic gestures contradict those theorists' statements by balancing musical forces in musical analogues of at least these three types of graceful physical gestures: (1) circling around a point of approaching repose, (2) combining two gestures continuously so that inertia carries through the relatively stable point of elision (and thus changing direction at relatively less stable points) and (3) pausing when changing direction at a relatively stable juncture.

This chapter continues by finding just such statements (which disagree with the theory of musical forces in the same ways that people misunderstand physical forces) in the writings of two leading music theorists. It then offers analyses showing how melodies in several different styles of tonal music contradict those misunderstandings by moving in terms of the three types of gestures just listed.

Two Theorists

The two theorists upon whose work I will comment are central figures in the history of music theory. Jérôme-Joseph Momigny was an innovative and influential music theorist who wrote about music two hundred years ago. Leonard Meyer is one of the most respected living music theorists. What follows is not intended as a criticism of either of these writers. I admire them both. Instead, what I hope to show is that even these admired scholars talk about musical forces in the same ways that people misunderstand physical forces.

A Historical Music Theorist

The following passage from Momigny ([1806] quoted in Lerdahl 2001: 166–7) pursues the analogy between physical and musical forces:

there exists a true attraction or affinity between these notes [...] Like the attraction recognised in physics in relation to the inertia of bodies, this attraction acts in inverse relation to distance: a tone that is only half a step away from the one that has to follow it is much more powerfully attracted by it, than were it [separated] by a whole step [...] Since it is sometimes the lower tone that attracts the higher tone, and sometimes the higher that attracts the lower one, it follows that the attraction is not due to gravity but to proximity.

This quote provides further evidence that musicians have long conceived of music in terms of motion and forces. But it also contains some striking mistakes. It confuses physical attraction and physical inertia. It mistakenly attributes to physical inertia an ‘inverse relation to distance’. And it apparently assumes that causation must have only one force at a time (‘not due to gravity but to proximity’).

A Contemporary Theorist

Meyer’s books include *Emotion and Meaning in Music* (1956) and *Explaining Music* (1973). In fact, Meyer’s work provided an inspiration for my work on musical forces (by offering explanations of meaning and expectation in music) as well as a model for its approach (by raising important questions about musical experience and seeking answers both through close examination of individual pieces of music and through interdisciplinary research focused on expectation and meaning). Thus, when Meyer offers an explanation of musical motion that contradicts the theory of musical forces in the same ways that many people misunderstand the laws of physics, it provides good evidence for the argument of this chapter.

In *Emotion and Meaning in Music*, Meyer said that ‘we expect continuation only so long as it appears significant and meaningful in the sense that it can be understood as motion toward a goal’ (1956: 93). In a later book, he repeats the idea that ‘once established, a patterning tends to be continued until a point of relative tonal-rhythmic stability is reached’ (1973: 130) and ‘once begun, a linear, conjunct motion implies continuation to a point of relative stability’ (1973: 131). According to the theory of musical forces, Meyer’s statements mistakenly conflate two musical tendencies (the inertial tendency of a pattern to continue, and the magnetic tendency of a motion towards a goal). They mistakenly suggest that musical inertia evaporates when a goal is attained. And, like Momigny’s statement, they mistakenly imply that musical motion may be explained in terms of a single principle (‘good continuation’).

Plenty of musical passages seem to work in the way Meyer describes. Motion continues in the same direction until a point of repose is reached. But, according to the theory of musical forces, this is an incomplete and misleading explanation of our melodic expectations. The theory of musical forces claims that musical inertia is analogous to physical inertia. As the park-swing and pendulum examples (described above) remind us, the inertial tendency of motion to continue will carry an object beyond a stable point to which it is drawn. Thus, the theory of musical forces claims that while magnetism may draw us *to* a goal, inertia will tend to carry us *beyond* that goal. This contradicts Meyer’s assertion that ‘we expect continuation only so long as [...] it can be understood as motion toward a goal’. A motion to a goal may give in to magnetism as it resolves to that goal, but it works against inertia by stopping on that goal.

Five Analyses

The following analyses show how melodies may embody the constant interaction of musical forces through musical motions that are analogous to the three types of graceful physical gestures mentioned above. The passages analysed (from ‘Twinkle, Twinkle, Little Star’, ‘God Save the Queen/King’, a Chopin Impromptu, a Bach Bourrée and a Haydn Piano Sonata) are preceded by a short discussion of a ‘pattern map’ (Larson 1997–98) that shows how three-note tonic-prolongation patterns are typically combined so that inertia carries through the relatively stable point of elision as described above.

A Pattern Map

Figure 4.1 shows all the three-note patterns that meet the following conditions. The tonic major triad defines the stable pitches as 1, 3 and 5. The unstable pitches create a stepwise connection within that triad’s tonic major scale. All patterns give in to at least one of the musical forces. This ‘pattern map’ also shows how patterns may be combined successively, following two rules: first, the two patterns to be combined are elided (the last pitch of the first pattern is the same as the first pitch of the second pattern); second, inertia continues through the shared pitch (the direction at the end of the first pattern is the same as the direction at the end of the second pattern). In this way, 5–6–5 may be combined with 5–4–3 to create 5–6–5–4–3; the first pattern ends on the same pitch (5) that begins the second pattern (first rule) and the inertia of the last two notes of the first pattern (6–5, that is, down) predicts the direction (down) of the first two notes (5–4) of the second pattern (second rule). One result of these rules is that successive pattern combinations either continue in the same direction or change direction in the middle of one of the patterns (not on a shared pitch).

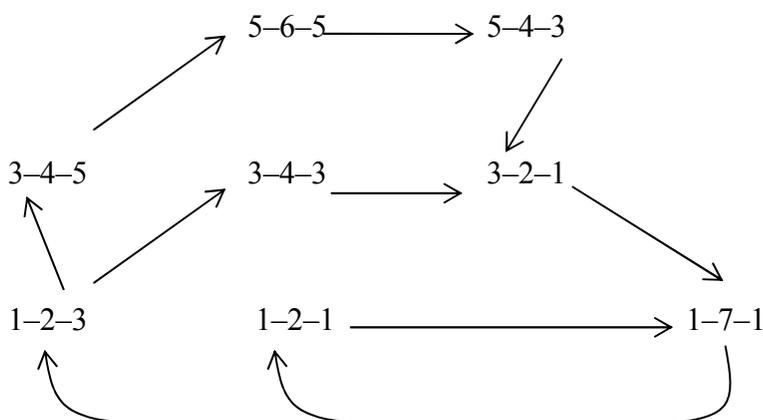
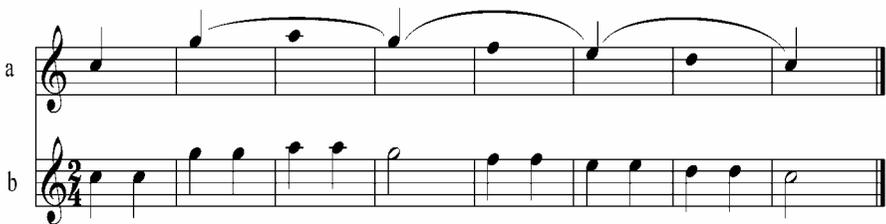


Figure 4.1 A pattern map

'Twinkle, Twinkle, Little Star'

'Twinkle, Twinkle, Little Star' illustrates how inertia continues beyond points of stability in gestures that may be regarded as elided patterns shaped by musical forces. In this folk song, we hear a number of three-note patterns. In Example 4.2, each of these patterns is marked with a slur. Each pattern begins on a stable note (stemmed), moves to an unstable note (unstemmed), and ends on a stable note (here, the stable pitches are the members of the tonic triad). Furthermore, these three-note patterns are elided (the last note of one pattern is the first note of the next). We can think of each of these patterns as giving in to the musical force of gravity (the second note always goes *down* to the third). The first and second patterns give in to magnetism (the second note always resolves to the third – the *closest* stable pitch). The second and third of these patterns may also be seen as giving in to inertia (in both, the pattern continues in the *same* direction to its third note). But notice that, in all of these elisions, inertia continues beyond the stable notes that begin and end each pattern – that is, in each elision, the motion continues in the *same* direction from the end of the first pattern into the beginning of the next pattern. When patterns are combined this way, melodies change direction on unstable notes.

**Example 4.2 (a-b) 'Twinkle, Twinkle, Little Star'***'My Country 'Tis of Thee' or 'God Save the Queen/King'*

Not all elided patterns are joined in this way. But the phenomenon is common in graceful melodies. And it lends a quality of grace to even the most common melodies. Consider 'My Country 'Tis of Thee' (or 'God Save the Queen/King'). The melody and an analysis are given in Example 4.3.

The overall path (the basic skeleton) of the melody (Example 4.3a) consists of two elided patterns, 1–2–3 and 3–2–1. Here, the melody pauses on a stable pitch and changes direction there. (Alternatively, one could view the basic structure as an elision of three patterns (1–2–3 in bars 1–3, 3–4–3 in bars 3–4 and 3–2–1 in bars 4–6) in which case, the patterns are joined as described in the pattern map given in Figure 4.1. According to this alternate view, the melody does not pause, but it changes direction on the unstable pitch. Either way, it corresponds to what we said about graceful physical motions, which either change direction on a

stable pitch where they pause, or change direction on an unstable pitch without pausing.) Notice that the third and fourth bars present two elided three-note patterns. The E–F–E of bars 3–4 gives in to gravity (F goes *down* to E) and magnetism (E is *closer* to F than G is). And the E–D–C of bar 4 gives in to gravity (D goes *down* to C) and inertia (D continues in the *same* direction to C).

The image shows a musical score for three staves labeled a, b, and c. Staff a is a treble clef with a 3/4 time signature. It contains a melodic line with a large slur over the first four bars, indicating a continuous phrase. Staff b is also a treble clef with a 3/4 time signature, showing a more active melodic line with slurs and a dashed line indicating a specific movement. Staff c is a grand staff (treble and bass clefs) with a 3/4 time signature, showing a rhythmic accompaniment with eighth and quarter notes.

Example 4.3 (a-c) Melody and analysis of ‘God Save the Queen/King’

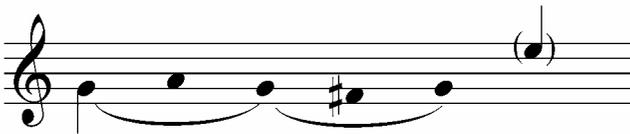
Furthermore, these two patterns are elided (the E of bar 4 is the end of the first pattern and the beginning of the second). And inertia continues through the elision (the E–F–E pattern ends by going down and the E–D–C pattern starts by going down); the E shared by both patterns is approached and left in the same direction.

In both bar 2 and bar 5, the chord of the moment at level b is the dominant. In that context, B and D are stable pitches and C is unstable. The B–C–D pattern in bar 2 uses inertia to overcome gravity and magnetism. As the D of bar 2 moves to the E of bar 3 at level a, the inertia of the B–C–D pattern at level b reinforces that ascent. That is, inertia carries through the locally stable D as the line moves up to E. The D–C–B pattern of bar 5 gives in to all three forces. As the D of bar 5 moves to the C of bar 6 at level a, the figuration at level b circles around the goal, creating the circling approach mentioned above.

Chopin, *Impromptu in A Flat Major*, Op. 29

All of Chopin’s *Impromptus* begin, or begin sections, with a turn figure. In most cases, that turn is on the fifth scale degree. Example 4.4 gives a schematic description of such a turn figure. In this schematic, the fifth scale degree is embellished first with a diatonic upper neighbour and then with a semitone lower neighbour, creating the pattern 5–6–5–#4–5. This five-note pattern may be viewed as two elided three-note patterns. Slurs show the three-note patterns. In the first of these patterns, 5–6–5, gravity pulls the diatonic upper neighbour back *down* to the

note it embellishes. In the second of these patterns, 5-#4-5, the semitone magnetism afforded by the chromatic lower neighbour seems needed to overcome inertia and gravity in order to pull the lower neighbour back up to the note it embellishes. Inertia continues through the point of elision; the descent at the end of the first pattern continues into the beginning of the second. At the end of the second pattern, inertia suggests continued upwards motion. This may be the reason that, as C. P. E. Bach noted ([1753] 1949), turn figures point upwards. In all of the Impromptus, these turns are followed by rising gestures, usually leaps. In other words, the turn figure is a gesture that points upwards in the same way that analogous physical motions do, just as we jump up and then push down into a diving board before a dive, or gather energy and crouch before a leap. Toch's (1948) discussion of what he calls the 'wind up' discusses this figure in similar gestural terms, and in the context of an explanation of melody that repeatedly invokes the metaphors of motion and forces.



Example 4.4 Schematic representation of Chopin's turn figures

The Impromptu in A Flat Major Op. 29 (Example 4.5) begins with a notated triplet, 5-#4-5. But, since the first note of that triplet has a trill, the result is the turn 5-6-5-#4-5. (In the analysis, small noteheads identify the notes that participate in patterns generated by this turn motive.) As Example 4.5 shows, the following three notes, C-B flat-A flat, make another three-note pattern that gives in to gravity and inertia. But, once again, inertia continues the motion beyond the stable pitch – to the following G. (Of course, the A flat is *rhythmically* unstable, so the passage agrees with Meyer's description in the sense that motion continues until we reach a point of relative *rhythmic* stability.) The following F-E-E flat echoes C-B flat-A flat, but it does so in a way that uses rhythmic stability to allow the pattern to close on its last notes. Two initial statements of the opening bar are followed by a descending scale with interpolated embellishing leaps (another feature common to Chopin's Impromptus).

As Example 4.5 shows, the 'tenor' and 'bass' lines contained within the left hand part also combine patterns so that inertia continues through points of relative repose. The bass line combines 1-2-3 with 3-4-5, with the elided pitch (3) approached and left by ascent. The tenor line combines 3-4-5 with 5-6-5, with the elided pitch (5) approached and left by ascent.

The image shows a musical score for Chopin's Impromptu in A Flat Major, Op. 29, bars 1-5. The score is divided into three systems: (a) piano accompaniment, (b) right hand melody, and (c) left hand accompaniment. System (a) shows sustained chords in both hands. System (b) shows a melodic line with slurs and ornaments. System (c) shows a rhythmic accompaniment with triplets and slurs.

**Example 4.5 (a-c) Chopin, Impromptu in A Flat Major, Op. 29, bars 1–5:
Analysis**

Bach, 'Bourée' from the English Suite in A Minor

Example 4.6 gives the opening of the Bourée from Bach's English Suite in A Minor. The basic skeleton of this passage is the pattern 5–4–3 in the minor (the stemmed 'soprano' notes in Example 4.6a) – a pattern that gives in to gravity and inertia. However, each note of this pattern is embellished with an upper neighbour (the unstemmed notes that are contained within the slurs in Example 4.6a). The result is that the pattern 5–6–5 pauses (while the melody leaps down to A) on a stable pitch before repeating, and then moves at a regular pace in such a way that the momentum created by that upper neighbour leads down to the note that begins the next pattern, and so that the last embellishment produces an E–D–C that recalls the basic structure of the whole passage. Similar things may be said of the 'tenor voice' in Example 4.6, which moves in parallel tenths below the soprano.

Now consider how the melody itself (Examples 4.6b and 4.6c) connects each of the basic notes shown in Example 4.6a. Every time that the basic melody steps from a lower to a higher note, the melody first decorates that lower note with its own lower neighbour; the result is that the inertia created by the lower neighbour is heard to carry through to the next (higher) note. Every time that the basic melody steps from a higher to a lower note, the melody first decorates that higher note with a passing motion to a third below; the result is that the melody circles around the next (lower) note. The embellishments added to the tenor in Example 4.6b also introduce inertia that carries through to the next pattern.

**Example 4.6 (a-c) Bach, ‘Bourée’, English Suite in A Minor, bars 1–6:
Analysis**

The use of a consistent set of embellishments gives a certain kind of logic to this passage. And the fact that those embellishments respect the tendency of inertia to continue motion in the same direction – even beyond a point of repose – give a visceral sense of momentum to this passage. Thus its logic appears to be the logic of embodied knowledge about what makes physical gestures graceful.

Haydn, Piano Sonata in D Major, Hob XVI:19

Example 4.7 shows two different passages from Haydn’s Piano Sonata in D Major. Example 4.7b shows the opening bars of the Sonata. Example 4.7c shows the varied repetition of these bars after some intervening material. As Example 4.7a shows, the underlying structure of these passages is the same – a simpler melody that moves essentially in quavers. That simpler melody is composed entirely of the three-note patterns of our pattern map. And (with one exception) they are joined so that inertia carries through the elided pitch.

Haydn’s sense of humour emerges in the way those patterns are repeated. There is nothing odd in the repetition of bar 1 as bar 2 (Example 4.7b). In fact, such a two-fold statement of an opening idea is a common way to begin (and the ascent at the end of bar 1 leading into the ascent at the beginning of bar 2 adds to the smoothness of this repetition). But the fact that the melody does not stop at the beginning of bar 3 does seem odd. While the 3–4–5 pattern that begins bar 3 seems ‘extra’, it also arises as a very natural gesture: because it continues the ascent of the 1–2–3 pattern that leads into bar 3, inertia carries through that downbeat. The silence after that pattern leaves it hanging ‘up in the air’. The repetition of that pattern (with different ornamentation) seems to mock the odd nature of the gesture.

**Example 4.7 (a-c) Haydn, Piano Sonata in D Major, Hob XVI: 19, bars 1–3:
Analysis**

When these three bars are repeated (Example 4.7c), the ornamentation is varied further. This time, ascending semitone appoggiaturas decorate each note of the 1–2–3 and 3–4–5 patterns. However, notice that Haydn begins this new decoration not on the downbeat of the third bar, but with the 1–2–3 pattern that leads into (and through) that downbeat, so that (once again) its inertia can carry across the barline where the ‘extra’ lick appears. Notice also that the decoration chosen (the ascending semitone appoggiaturas) joins those decorations into a longer (almost entirely) chromatic scale whose inertia sweeps through the downbeat with even more momentum. The preservation of the triplet decoration in the repetition of this up-in-the-air gesture adds to the humour of its mocking repetition in a quintessentially Haydnesque way (so that it surprises us by being, at some level, what we had expected).

The wit and grace of this final example rely, at least in part, on our understanding of these patterns as forming ‘gestures’ whose meaning depends on the fact that musical inertia (like physical inertia) may carry those gestures through the points of stability established by other forces.

Conclusion

From the vantage point of the theory of musical forces, these examples suggest that while Meyer’s description of musical inertia (which he calls ‘good continuation’) offers a correct *description* of what happens in many pieces, it is an incomplete (and in fact misleading) *explanation* of the operation of musical forces. Meyer’s assertion that ‘we expect continuation only so long as [...] it can be understood as motion toward a goal’ is contradicted by melodies in which musical inertia carries motion beyond the goals to which magnetism draws them, creating musical gestures that are analogous to the graceful physical gestures that circle about a goal, change direction at unstable points in continuous motions, or change direction at stable points on which they pause. Furthermore, those aspects of musical forces

that are not captured in Meyer's description help explain some important aspects of what makes the music of Bach, Haydn, Chopin and others appealing to listeners.

The point, of course, is not to criticize Meyer and Momigny. Instead, the point is that misconceptions about the operation of musical forces (held by many, including these highly respected music theorists) parallel popular misconceptions about the operation of physical forces – and that this parallel provides further evidence that the theory of musical forces helps to explain the meaning of 'musical gesture'.

Note

1. The content of this chapter is based upon material presented in chapter 8 of my forthcoming book *Musical Forces* (in preparation).

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Chapter 5

‘Plays Guitar Without Any Hands’: Musical Movement and Problems of Immanence

William Echard

Music is often experienced as a form of movement. The term *musical movement* can encompass many referents, but what is of interest to me in this chapter is the phenomenon of musical movement understood as a perceptual or interpretive event whereby music itself is perceived as something which moves, the fact that motion is a quality often attributed to musical sounds themselves. Since the mid-1980s, many theorists have drawn attention to the central importance of this phenomenon, noting variously its relationship to philosophical aesthetics, semiotics, narratology, cognitive science and popular music studies.¹ What such studies share is an interest in how a quality of motion can be attributed to musical sound. Where they often differ is with respect to the ontological, epistemological and methodological entailments of such a phenomenon. Musical movement invites widely divergent explanations, both essentialist and constructivist. To put the question simply: where is musical movement taking place? And if movement implies a subject or actor which moves, what kind of subject is this?²

Although the word *immanence* does not often arise in this literature, I believe it is an important concept to discuss. Concepts of immanence and transcendence, whether broached directly or taken as implicit, are crucial elements in disciplinary disagreements not only because of the specific questions they raise – contentious issues about the autonomy of texts and the possibility of essential meanings – but also because the very notions of immanence and transcendence can be understood as deriving from a desire to separate interpretive and ontological domains from one another, and to favour some over others. To argue that a property is immanent to a particular domain suggests that other domains may be excluded from consideration. And I would suggest that this is not a secondary effect of an immanence claim, but is rather in many cases a primary motive. I raise this as a pressing issue because the study of musical movement holds great potential for broad interdisciplinary treatment, but also touches on certain topics that have been at the heart of long-standing disciplinary arguments. In order to make progress in this area, its divisive potential needs to be addressed and perhaps minimized. I will not tackle this problem directly, but will do so indirectly by

focusing on key issues in the topic of immanence, with a special interest in its relationship to musical movement. Most importantly, I would like to mediate between two insights that may seem at first to be poor companions: first, that music gains meaning in large part through its iconicity with extra-musical experiences (especially spatial and temporal experiences related to embodiment), but second, that it still makes sense to say there is a sort of meaning immanent and specific to music itself. Under antagonistic readings, the first claim would suggest that musical meaning is reducible to non-musical factors, whereas the second would suggest that there is an exceptional, autonomous domain of distinctly musical meanings. Rather than choose between these options, my strategy will be to split the difference by means of models drawn from semiotics (iconicity), cognitive science (conceptual metaphor and conceptual blends) and analytical philosophy (supervenience).

When I use the word *immanence*, I have several themes in mind, loosely connected but not cohering into a definite concept. First, I describe as immanence theories those which take it as given that the music itself moves (i.e., that movement is perceived as an immanent property of musical sound). Second, traditional formalist theories of musical meaning are immanence theories in a different way, seeking as they do to define musical meaning in terms of relationships between various musical structures, immanent to a domain of musical self-reference. These two senses of immanence are related insofar as they both seek to locate as much meaning as possible within formal textual relationships. Third, immanence becomes an issue in theories of movement because movement is linked so closely to experiences and dispositions which must be enacted in real bodies to be fully manifest. This sense of immanence clashes somewhat with the previous two, since it draws attention away from the musical work as an abstract structure, and towards the musical work as a sounded event, inviting us to situate musical movement as a subspecies of more general movement experiences. Despite their tensions, these are the three kinds of claim I have in mind when I speak of immanence in connection with musical sound: (i) movement is often perceived as a property immanent to musical sound; (ii) musical meaning is often said to be immanent to a realm of musical self-reference; (iii) movement is as much an experiential profile immanent to real events as it is an abstract concept.

Objects of Immanence: A General Ontological Position

The question of movement immediately raises further questions about what is moving and where that movement takes place. My interests are in territory similar to that explored by Gérard Genette (1997), who is one of the few contemporary aestheticians to make ontology a central concern.³ As a foundational move, Genette distinguishes between a work and its object(s) of immanence. An object of immanence is for Genette an object of attention, which will often be material but can also be ideal (1997: 30). So it would be an oversimplification to suggest that the problem of objects of immanence is equivalent to the problem of physical embodiment, but the two topics bear strongly upon one another. Most importantly,

Genette maintains that a work is somehow separate from its objects of immanence. This leads him to interesting constructions, such as the statement that some works *have* multiple objects of immanence. Although Genette's discussion of music is regrettably traditional, and therefore does not speak directly to newer questions of musical movement, the ontological questions raised by his general discussion are clearly relevant to the study of musical movement. Specifically, how should we regard the relationship between the idealized movement types which would presumably define a given musical work in general, and the specific movements in which that work may be immanent on any particular occasion? Can we speak of ideal movements or ideal gestures in the same way that more traditional aestheticians speak of ideal tonal structures? Such a solution might seem to be suggested by Genette's general distinction between works and their objects of immanence, but I would like to adopt a different perspective inspired loosely by the work of Gilles Deleuze.

A striking feature of Deleuze's thought is the manner in which he maintains an interest in forms of transcendence and generality while simultaneously endorsing a severe nominalism under which only unique individuals are taken to exist. Deleuze speaks of general properties and structures, but these become fantastically complicated and even mystical in his work given that they must be treated as a transcendent modality of immanence. I do not intend to follow closely Deleuze's approach, but I would like to suggest that we can draw general inspiration from his work in order to model a more pragmatic response to the problem engaged by Genette: how do we treat the relationship between a work and its multiple instances or multiple sites of immanence? My preference is to speak as if the only really existing things are the individual events often called instances of a work, along with tendencies of structuration and interpretation passed on through social actors and institutions. Under this view we would not say that a work has objects of immanence, but rather that many singular and unique events and objects are linked together by having similar motivations and judgements implicated in their creation and interpretation, such that they are understood as being objects of immanence for the same work. If the work itself is anything, it is the continuous history of translations and influences between multiple subjects and objects which continually reinscribe motivations and judgements taken to be similar to one another. The habits and institutions necessary to create these judgements are continually maintained in social practices and institutions. With respect to questions of physical movement, it is worth noting that the *habitus* as described by Pierre Bourdieu is one key player in this process. In discussing musical movement, then, we are running the gamut from the most individuated details of singular compositions, all the way to the general social and biological conditions which allow the general category of *musical work* to be possible in the first instance.

These ontological nuances are not a digression because the phenomenon of musical movement immediately raises questions about what is moving, and what kind of space it moves through. Such questions go far beyond the scope of this chapter, but it is important to highlight my intention to split the difference between materialist and idealist orientations, and also between textualist and

contextualist ones. The general perspective I have described is pragmatist insofar as it seeks to minimize reference to abstract categories and emphasizes the embodied dimensions of musical meaning. However, as a reading of early pragmatists such as Charles Sanders Peirce and John Dewey shows, and as is also shown by the interest taken in continental philosophy by some neo-pragmatists such as Richard Rorty, a pragmatic viewpoint does not require the complete banishment of aesthetic and even idealist concerns. This is crucial, because such factors must be carefully balanced if we are to address the tensions within existing theories of musical movement.

For example, as already noted, one brand of immanence theory is the formalist one. Extreme formalism is no longer as influential as it once was, but a milder formalism is evident in some of the newer work on musical movement. The work of Peter Kivy, especially, provides an interesting foil to my approach. Although Kivy defends Platonism and the idea of autonomous musical meaning, he was also an early participant in the trend to interpret musical meanings with respect to the resemblance that can exist between music and various real-world physical configurations. Since he is a formalist, Kivy wants to argue that these properties are immanent properties of the musical work, yet he has nonetheless done much to situate musical meaning within a broad social and biological frame. Although his central interest is what he has called ‘music alone’, Kivy has been integral in showing that musical meanings cannot be formed without the substantial involvement of other, extra-musical categories.⁴ The same is true of at least one other conservatively oriented contributor to the literature on musical movement, Roger Scruton. And it is for this reason that a general ontological position is helpful in addressing questions of musical movement, since a key issue in this debate is whether we can (or should) simultaneously maintain that trans-musical gestural and spatial experiences are central to the formation of musical meanings while at the same time arguing that there is something exceptional and relatively autonomous about those musical meanings. I will not follow thinkers like Kivy and Scruton in their idealist response to this question, but neither would I fully discard the idea that musical meaning is, in some respects, different from any other kind of meaning. This is the theoretical tension which will be carried forward into the specific analysis that follows.

Case Study: ‘Funky Worm’

The Ohio Players were one of the most commercially successful US funk groups of the early- to mid-1970s, and along with artists such as Sly and the Family Stone, the Tower of Power and Parliament/Funkdelic, helped to usher in the more pop-oriented style of 1970s funk. The group was also notorious for their album covers, which after 1971 frequently featured nearly naked women in suggestive poses. Their second single to reach the Billboard pop charts was ‘Funky Worm’, in 1973 reaching number one for rhythm and blues and number fifteen for pop. Historically, the recording is significant for several reasons. It was a novelty song and played a part in moving funk towards a lighter thematic base after the heavily

political and blaxploitation associations of the genre in the late 1960s and early 1970s. It also featured one of the most spectacular early uses of synthesizer as a lead instrument on a funk record. And in the 1980s and 1990s, ‘Funky Worm’ went on to be one of the recordings most frequently sampled by hip hop artists, not only making its sonic presence widely felt but also helping to define the G-Funk sound of artists like Dr Dre.⁵

Formally, ‘Funky Worm’ alternates between two regions, each centering on a different single chord (ii and I in F sharp Mixolydian, respectively) and a different bass line (Examples 5.1 and 5.2). The overall form is as follows:

Intro / Verse 1 / Synth Solo 1 / Verse 2 / Synth Solo 2 / (continued) / Synth Solo 3

Each section is eight bars long and the tempo is 82 beats per minute. The introduction uses bass line A, sketching out the ii chord (Example 5.1). The first verse uses bass line B, sketching out I (Example 5.2), and these regions subsequently alternate by eight-bar section.



Example 5.1 ‘Funky Worm’, Bass Line A



Example 5.2 ‘Funky Worm’, Bass Line B

As with many funk recordings of the period, several vocalists are featured, but the two most prominent voices are spoken parts portraying a talent booking agent, and an old woman (granny) who wants him to sign the guitar-playing worm she represents. In addition to the dialogue between these characters, there are sung interjections which describe the worm, although much of this description is also handled by the granny voice. Taken all together, the vocal parts present a humorous spoken-word skit embedded in the loose call-and-response texture that was becoming typical of 1970s funk.

Perhaps the most striking sonic features of ‘Funky Worm’ are the three synthesizer solos. The timbre of the first and last is an extremely penetrating sound intermediate between a sawtooth and square wave, with deep portamento throughout. It plays arabesque lines evoking clichés of the orientalist ‘snakecharmer’ topic (Example 5.3). These solos are used to represent the worm coming out of his hole, then going back in. The middle solo by contrast is diegetic,

representing the sound of the worm playing guitar for the booking agent. The timbre for this solo is a dull pluck, somewhat resembling guitar playing but also funny because the sound is so clearly synthetic. Besides the humour implicit in the situation and in the synthesizer timbres, the commentary of the vocalists adds another layer with comments like ‘he plays guitar without any hands, pretty good I might add’, and ‘when he grabs his guitar and starts to pluck, everybody wants to get up and dance’.



Example 5.3 ‘Funky Worm’, Opening of Solo 1

Whether or not we ultimately want to argue for immanent, music-specific meanings present in this recording, there are some important ways in which the meanings afforded by ‘Funky Worm’ depend on a range of contextual factors and established conventions. For example, the horn arrangement of the introduction, combined with the diegetic sound effects of arriving at an office, create a cinematic atmosphere. This is underscored by the prior involvement of the funk style in movies of the period, and also by the Vaudevillian and Hollywood associations of the basic audition scenario. This theatrical element is made stronger by the use of conventional stereotypical characters like the shrewd granny and the slick promoter. In addition, there are important generic factors which situate the meaning of the recording. It has many characteristics of typical early-1970s funk, which at the time would have lent the record a contemporary and party oriented appeal and which later, in the 1980s and 1990s when the track was recycled by hip hop producers, would mobilize a complex blend of impulses: nostalgia for early 1970s black culture, a new style of gangster chic (G-funk) and a somewhat curatorial interest in the discovery and preservation of older styles and models of cultural blackness. Finally, there is the surreal presence of the worm itself. The image of a worm affords many layers of meaning. The most immediate feature may be its novelty, which helped make the single distinctive and also helped to underscore the general movement of funk away from the literalism of the 1960s and towards a more surreal, psychedelic tone. It is also not difficult to imagine this worm as an outgrowth of underground comics, or as a dark twin to Disney. In addition to being funny, the worm is slightly threatening, which may be one reason the record has appealed so strongly to later gangster-style hip hop artists. This sense of threat comes about partly because funkiness itself is a complex category that includes a degree of abjection, and may also have something to do with the widespread association of worms with death and decay.

In terms of the gestural properties displayed by these musical sounds, I will confine my comments to two features: the worm-movement synthesizer solos (solo 1 and solo 3) and the bass lines. In terms of conventional correlations, I have

already noted the orientalist aspect of these solos. In gestural and timbral terms, what is most striking is the excessive energy the solos bring to their embodiment of these topics. The extreme portamento seems almost mannerist. The timbre is penetrating to the point of pain if you listen at a high enough volume, and this potential discomfort underscores the balance of humour and threat already noted. Taken together, these features not only give the synthesizer solos a strongly motile quality, but also a powerful physical presence. By comparison, the bass lines are more subtle, but are still crucial to the effect of the music. Bass line A has a march-like quality. There is just enough syncopation to prevent the line from seeming entirely out of place in the funk/dance genre. A funky humour emerges in this bass line from the clash or blend between its near-march-like quality and the underlying image of the worm. Bass line B is shorter and busier, and so the effect is denser both because of the nature of the line and because the repetitions come more frequently. It is clearly a variation of the first bass line, since it opens with a similar flurry and ends with a similar upwards third. But it is jumpier, especially in its central upwards leap. It is possible to feel in these bass lines movements related to the image of the worm. For example, in bass line A the alternation of on-beat notes with pauses can feel like a repeated contraction/expansion, resembling the body of a worm as it moves. Since this movement alternates with a faster flurry and a leap upwards with a pause, we could imagine a worm moving a few inches (slightly accelerating as it does so), then looking up, then moving again, over and over. Bass line B has a similar profile, but with more rapid transitions, so the suggested movement is more circular or wavering than simply linear. The details of this kind of hearing are always going to be personal, but what can be suggested in general is that the combination of these particular bass gestures with a worm topic within the context of early 1970s funk affords a rich spectrum of vivid metaphorical interpretations.

Immanence and Supervenience

‘Funky Worm’ is a good test case for considering the issues raised at the outset of this chapter because it has pronounced programmatic elements, but also powerful features of seemingly immanent movement. It would be difficult, regarding the overall effect of the recording, to isolate just the music or just the lyrics or even just the record itself as the primary engine of meaning. Cases like ‘Funky Worm’ lead me to suggest that immanent meaning is one possibility in listening, so long as we take the term as shorthand for a complex of more specific concepts, particularly: (i) necessary localization of a property, such that the full meaning or quality of movement in question can only exist as instantiated in the particular work, or in a quotation of it; (ii) untranslatableability, such that nothing else, specifically no description, can adequately substitute for the property, and; (iii) apparently unmediated presence, such that the necessary backgrounds of competence and context, although operative, recede from awareness and it is as if we hear a property directly in the music. I will discard at the outset the idea that this kind of meaning is somehow purer than or prior to other kinds of meaning. But

an interesting technical question remains. How do we specify the location and nature of such an immanent motile quality?

Before discussing semiotic and cognitive mechanisms that allow for these kinds of properties to emerge, it is necessary to specify the nature of the relationship between seemingly immanent properties of musical meaning, such as movement, and the various factors on which they depend. In recent philosophical aesthetics, following Jerrold Levinson, it has been common to see this problem treated with respect to ‘supervenience’ theory.⁶ Supervenience is a relation between two sets of properties in which the supervenient set (the B-properties) is said to be dependent on the other (the A-properties), yet not reducible to them. Any change in A-properties will produce a change in B-properties, yet the B-properties still represent a relatively autonomous category of experience, appearing qualitatively different from the A-properties and requiring different interpretive and explanatory strategies.⁷ So, for example, one would say that a given quality of movement can only emerge in conjunction with a particular combination of musical sounds, and is therefore dependent upon those sounds, but one would not say that the quality of movement simply is those sounds, nor that a formal analysis of the sounds could count as a description or explanation of that quality of movement. Saying that properties such as movement supervene on musical sounds is a way of maintaining the link between particular qualities and particular works without explaining those properties away or making them secondary.

There is a subtle relationship between the concepts of supervenience, immanence and emergence. In one sense, supervenience theory *is* a form of immanence theory. If particular B-properties supervene on particular A-properties, then any object or situation which embodies those A-properties will necessarily display the relevant B-properties. It would therefore seem reasonable to say that the B-properties are immanent to those objects or situations. However, two nuances need to be considered here. First, some varieties of supervenience theory cannot support a view that makes aesthetic properties such as movement immanent to works in a narrow sense, because these theories argue that the relevant supervenience base is much wider than the work itself. For example, Gregory Currie points out that the supervenience base for aesthetic properties includes not only structural features of a work, but also ‘a very broad class of historical properties that includes relations to individuals, the community and to other works’ (1990: 248). Second, while supervenience theory argues that B-properties are dependent upon A-properties, and therefore in some sense immanent to them, it also argues that B-properties are not reducible to A-properties. Since B-properties are not perceived as identical with the A-properties, they transcend those properties insofar as they can be separately conceptualized, and can be imagined to exist separate from their supervenience base whether or not such existence is actually possible. According to such a view, aesthetic properties do not transcend their objects of immanence in an ontological sense, but display an aura of separateness and relative autonomy nonetheless.

The relationship between supervenience theory and emergence is simpler, because in some senses they can be regarded as directly equivalent to one another. A supervenient property is one which emerges from a supervenience base. I raise

this connection because while my later argument will rely partly on concepts from cognitive science, the theory of supervenience is not widely used in that discipline. But the theory of emergence is more common there, and by arguing that the two are closely related, I want to sketch out a bridge between philosophical aesthetics and cognitive science that will help us to move between them as necessary. Also, although the theory of emergence may appear on the surface to invite fuzzy or mystical interpretations, Levinson notes that emergence is ‘not mysticism’ since ‘the idea of emergence seems to *require* a supporting and correlatable substructure’, and this substructure is often treated in a materialist fashion (1990: 146). In all of these ways, I am suggesting that theories of supervenience and emergence allow us to split the difference between traditional views of immanence and transcendence with respect to aesthetic properties such as musical movement. The property of movement arises from many factors – the sounds, the listeners, the context, the specific historical moment – and as such cannot be strictly located in any one of these. And yet what emerges here is a strong impression of immanence, in which the property seems localized within the sounds themselves.

Semiotics as a Descriptive Framework

If we wish to say more about the mechanisms which allow for this mildly paradoxical experience – the emergent impression of immanence – we can turn to the concept of motional objects as developed in recent musical semiotics, and also to theories of conceptual metaphor and conceptual blending from cognitive science. Elsewhere, I have presented a detailed discussion of the history and literature of such an approach (Echard 2005), and aspects of the models are also described by other authors in this volume, so I will just summarize here a few points of special relevance to the issue of immanence.

Most musical semioticians who have addressed questions of movement, following the lead of David Lidov, work from a Peircian paradigm.⁸ In order to follow my argument, only two aspects of Peirce’s system must be understood: the semiotic *object* and *iconicity*. For Peirce, a sign consists of an irreducibly triadic relationship between three related things: object, representamen and interpretant. The *representamen*, without too much distortion, can be understood as analogous to the Saussurian signifier. The *object* is analogous to the signified, but here the differences require immediate attention. The object is something with which the sign user is already familiar: for example a physical thing, a state of affairs, a text, a theoretical model. The activity of semiosis transforms or extends the sign user’s experience of the object. Unlike the Saussurian view, in which a signified is simply correlated to a signifier, in the Peircian model the object of the sign is actively changed by the activity of semiosis, and indeed the purpose of semiosis is to bring about such change. The third element in Peirce’s triadic sign, the *interpretant*, is the most distinctive. The interpretant is a bridge phenomenon – for example, a further sign, a physical reaction, a habit – which instantiates a particular kind of connection between representamen and object. According to Lidov, where art is concerned, ‘principally, the interpretant is our awareness and understanding of the

object in the light of its representation' (1999: 105–8). In other words, due to the activity of the interpretant, 'the sign is biased. Representation is of something *as* something. Turkey and pumpkin pie signify Thanksgiving as festive' (: 85).

For Peirce, *iconicity* is a relationship of resemblance, understood not in a narrowly visual sense but in the sense of a homology of structure. For example, a line drawing of a face and the actual face on which it is based bear an iconic relationship to one another, but this sort of visual iconism is not the sort most relevant in music. As another example, consider the experience of walking slowly, then accelerating your walking, then breaking into a slow run, and finally into a fast run. Now imagine a piece of music in which the spacing of notes follows the same temporal profile as your footfalls, moving from notes spaced far apart through a gradual acceleration to notes very close together. This music bears an iconic resemblance to the experience of speeding up to a run. But even this kind of iconism is not the most abstract, and workers such as those cited above explore much more subtle sorts of iconism between music and the physical world. The argument in short is that because music is composed in a physical sense of energetic fluctuations in a medium, it can bear many iconic relationships to other kinds of energetic configuration, and the energetic configurations associated with different sorts of bodily experience are among the most important of these.

One way to bring the concepts of iconicity and the semiotic object together is to speak, following Lidov, of music's *motional object*. A perceived quality of movement needs to be attributed to some kind of moving entity. By calling this entity an *object* in the semiotic sense, we highlight the fact that we do not just perceive the movement and imagine the entity in a passive sense, but rather enter into a relationship with them (recalling that the activity of semiosis is to alter our already existing relationship with some familiar object). The chain of semiosis amounts to an ongoing engagement, during which we continually elaborate and transform our experience of the motional objects. Motional objects are one reason that 'music confronts us as an acting subject, a persona with whom we identify' (Lidov 1999: 219), not only because their properties of movement remind us iconically of real people, but also because of the dynamism implicit in the semiotic relationship. However, notice that I have left vague the question of exactly what this object *is*. As with the earlier question of immanence, we are somewhat free to chose various possible entities as the object-which-moves. For example Lidov, Cumming and many other semioticians of Western art music often suggest that the object of musical signs is the musical work itself, heard *as* possessing particular properties. Interpretations of the semiotic model which follow this line do not need to deny the crucial role of various contextual frameworks, but while allowing these a central place in the operation of the sign they simultaneously protect the experience of immanent musical meaning by casting it as the object of the semiosis.

To the extent that such a model provides space for immanence as a percept without failing to allow a decisive role for social context, it can perform a mediating function similar to the one I have sought in the theory of supervenience. However, the particular kind of semiotic activity described here is just one of

several that typically occurs in music. Consider the synthesizer break in 'Funky Worm'. The formalist interpretation described above would argue that the semiotic object is the sound itself heard as worm-like. However, there are other semiotic objects which may be modified by this passage, including our ideas about the Ohio Players, the history of funk, a particular instrument, one of those notorious album covers, our relationship to our own bodies and so forth. Indeed, the whole notion of object may become shaky in a rich environment like this. We can hear this music as something which moves like a worm, but we can also now think of worms as things whose movement resembles this music (a possibility opened up to worms by the existence of this recording). How can we pick out just one of these as the object in any final sense? What has happened is that the general concept of wormness and the particular features of this music have come together, and modify each other in a fairly symmetrical manner.

Cognitive Science as an Explanatory Framework

While the semiotic perspective described above offers a vocabulary for describing certain mechanisms of musical gesture, more work needs to be done on *explaining* these mechanisms. In this connection, several of the workers already cited have drawn attention to the potential complementarity between semiotic theory and models being developed in cognitive science. Rather than repeat arguments laid out in that literature, I would like to draw attention to one particular aspect of the theories of conceptual metaphor and conceptual blending which can help illuminate the motional properties of 'Funky Worm', and can also advance our discussion of semiotic objects and immanent meaning.⁹ A very basic idea shared by both the theories of conceptual metaphor and conceptual blending is that more elaborate concepts and experiences are founded on a finite number of basic concepts and schemata. For example, the blended entity 'guitar-playing worm' combines the more basic entities 'guitar player' and 'worm'. These in turn are founded on even more basic categories such as 'human' and 'animal'. This much is familiar from older theories of structural semantics. What cognitive models add is the insight that the very most basic concepts and schemata, those which afford all of the more complex entities as possible experiences, are largely temporal and spatial in nature, and are rooted in bodily experience.

Although basic body-related cognitive schemata and concepts are rooted in real-world experience, the subsequent conceptualizations based on these can become abstracted from that experience, but will not abandon it altogether. As a result, many kinds of surreality and slippage are afforded, in which media such as music create new entities and experiences that are clearly based on literal experience and on logic, but are not fully bound by them. The guitar-playing worm is an example. Similarly, a spatial or temporal metaphor employed to conceptualize a musical experience will retain some elements from the logic of its source domains, but may well go beyond these. For example, consider Philip Tagg's use of a centripetal/centrifugal metaphor to describe musical forms (1979: 217–18).

Tagg argues that the traditional way of employing this metaphor in a form such as ABA would be to describe the A sections as the centre, and the general movement as first centrifugal (away from A), and then centripetal (back home to A). However, in a case like this the perceived 'centre' is not in the middle of the piece in a temporal sense. It comes rather at the beginning and the end. In a case like this, there are aspects of physical centre/periphery experience being exploited, but there is no requirement for a complete or literally correct mapping of these from one domain (physical space) into the other (conceptualized musical sound).

Another possibility afforded by the cognitive model may be called *slippage*. Consider the qualities of movement suggested by the bass lines and synthesizer solos of 'Funky Worm'. These create very general temporal-spatial forms which could correlate with the movement of many different kinds of object. The most obviously exploited here is the movement of a worm, but others include anything else which moves in that way (dancing listeners for example, whether real or imagined), or a spider's web moving in a gentle breeze, or most generally an affective state. Because these objects share in their schematic foundations features mobilized in these qualities of movement, at least two effects arise. First, there is the possibility for a slippage of meaning, in which a listener can move freely between these objects, elaborating just one of them, or a mixture, or all of them, and doing so differently at different times. Second, there is a kind of slippage possible between hearing the music simply as a tapestry of qualities, and allowing those qualities to synthesize into particular semiotic objects. When we combine these sorts of slippage we can visualize a complex, dream-like mode of listening in which certain rules of real-world experience are maintained and yet also transgressed. He plays guitar without any hands. Musical personas do not follow the same rules as do actors in the mundane world. They are dream-like, and just as with dreams, their distinctiveness comes into focus when we notice that they include figures which are the same as those in waking awareness, yet not the same. A topic of extensive discussion in the literature of musical meaning has been the possibility and nature of musical truth and literalism, but I would suggest that the real interest of literal meaning as mobilized in music has to do with the way music can transgress such meaning while still relying on it. If we were to characterize the experience of musical meaning in a general way, it would be much more like a dream than like a rational proposition, and so theories of conceptual blending and iconicity, combined with a semiotic overlay drawing attention to the central role of iconicity, afford a powerful model of musical interpretation.

Conclusion

If the perspective described above is adopted, the rhetorical work usually done by concepts of immanence would be pursued instead through those of distinctiveness or individuation. Various signifying systems and semiotic objects are inherently mixed together in practice, to the point that it becomes impossible to say what is immanent to what, or to argue that certain semiotic objects are exclusive to certain signifying modalities. Distinctively musical experiences are a moment or aspect of

a much more heterogeneous totality. I would suggest that much of the impetus to speak of immanent meaning comes from the feeling that music has a unique place and voice in this totality. However, these immanent meanings must be understood as supervenience upon, rather than autonomous from, more general processes. And it is in the nature of those more general processes that they tend to both maintain *and* to blur the boundaries between existing concepts, domains and objects. Rather than defending the distinctiveness of musical movement by relegating it to a separate or logically prior area, I am suggesting that its distinctiveness only comes into view when we recognize the heterogeneous semiotic world in which music fully participates, and the way in which music makes special use of the same objects and processes as are active in other signifying systems. As Deleuze has remarked, ‘difference in general is distinguished from diversity or otherness. For two terms differ when they are other, not in themselves, but in something else; thus when they also agree in something else’ (1994: 30). A traditional aesthetic theory might argue that ‘Funky Worm’ will always, as music, be undermined by its programmatic elements, as if the linguistic category of wormness overshadows all else. But what is striking here is that this is a *musical* worm, something which can be found nowhere other than in music. The objects shared in common with language, or with the temporal and spatial physicality of real live worms, do not undermine some presumably pure musical gesture, because these objects are musical when elaborated through musical means.

Notes

1. For representative work see: Kivy (1980) and Scruton (1999) in philosophical aesthetics; Lidov (1987, 1999), Cumming (2001) and Hatten (2004) in semiotics (the concerns of which overlap considerably with philosophical aesthetics and cognitive science); Tarasti (1994) and Abbate in narratology (1991) (where the theory of gesture is not as explicit, but is implicit in the idea of musical actorality, which requires the phenomenon of musical movement as an underpinning); Larson (2002), Cox (2001), Brower (2000) and Zbikowski (2002) in cognitive science; and Middleton (1993), Fast (2001) and Shepherd and Wicke (1997) in popular music studies. Much of my own work (1999a; 2000; 2003; 2005) synthesizes these many streams of inquiry, using theories of musical movement as a point of focus.
2. Elsewhere I offer an extended discussion of the claim which is only given in passing here: that the perception of movement in any form very often leads to interpretations in which the movement is attributed to some conscious agent (Echard 2005).
3. While other recent aestheticians have also addressed ontological questions (most notably for our purposes Levinson 1990), Genette’s thought is striking in the degree to which it directly engages with concepts of immanence and transcendence not presented so starkly by other workers.

4. For Kivy's extended defense of the idea of 'music alone', see Kivy 1990. For work in which he shows the crucial role of extramusical factors in affording musical meaning, see Kivy (1980, 1989).
5. A short list of just the better known artists who have sampled the recording would include the Beastie Boys, De La Soul, DJ Krush, Dr Dre, Ice Cube, Jazzy Jeff and the Fresh Prince, the Jungle Brothers, MC Breed, Naughty By Nature, NWA, Public Enemy and Xzibit.
6. See Levinson (1990: chapter 7).
7. In the analytic philosophy of mind, the theory of supervenience is controversial and has generated a highly technical literature. Readers interested in more detailed overviews should consult Kim (1993) and Savellos and Yalçin (1995).
8. Lidov (1987, 1999). For detailed introductions to Peircian thought, see Brent (1993), Hookway (1985), Savan (1988) and the two volumes of *The Essential Peirce* from the Peirce Edition Project, Houser and Kloesel (1992) and Pierce Edition Project (1998). For overviews and commentary on applications of the Peircian perspective to music, see Cumming (2001), Dougherty (1994), Echard (1999b, 2005), Hatten (1994) and Lidov (1999).
9. The theory of conceptual metaphor derives from the work of Lakoff and Johnson (Johnson & Lakoff 1980, 1999; Johnson 1987; Lakoff 1987). A conceptual metaphor is any instance where concepts or schemata from one domain are mapped into another as a means to structure or understand that domain. For example, spatial schemata such as rising and falling are often used to understand changes of value in the stock market, and also as a way to describe changes in the frequency of musical sounds. The theory of conceptual blending has been most thoroughly developed by Fauconnier and Turner (2002). Blends are similar to metaphors in that they create links between conceptual domains. However, in the case of blends the emphasis is not on how concepts from one domain can structure another, but rather on how new conceptual entities can emerge as blends from existing domains. So, for example, a talking horse is an entity resulting from a blend between the spaces of HORSE and HUMAN. For our immediate purposes, the central point is that concepts such as *musical movement*, which create links and blends between musical sounds and broader domains of gestural experience, are not an oddity but rather evidence of the fundamental role of such metaphorical and blending processes in all cognition and experience. And the seemingly immediate nature of the experience of musical movement arises in part from the fact that it is rooted not in conscious interpretation, but in some of the more basic cognitive processes.

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Chapter 6

Mahler's Military Gesture: Musical Quotation as Proto-Topic

Raymond Monelle

'The singular', said Sherlock Holmes, 'is always important.' Nothing could be more singular than the episode for posthorn in the third movement of Mahler's Third Symphony. Not only does the composer choose an unusual instrument for this languorous, nostalgic passage, but he marks it 'wie die Weise eines Posthorns', apparently making his choice quite clear (Example 6.1). Yet posthorn tunes were brilliant, rhetorical affairs; we have a whole page of them in Heinitz's *Instrumentenkunde* (1928: 69). The plangent tune played by Mahler's posthorn, accompanied by a high chord for violins, is surely a *ranz des vaches*, an imitation of the kind of traditional alphorn tune heard in Beethoven's Pastoral Symphony, Rossini's *William Tell* Overture and Berlioz's *Harold in Italy*. These tunes may be compared with an alphorn melody transcribed in Rigi, Switzerland (Example 6.2).

Posthorn (sounding)

Langsam

ppp

Example 6.1 Mahler, Symphony No. 3, III, episode for posthorn, bars 341–4

Ranz des Vaches

Slow

Quicker

Slow

Slower

Example 6.2 Alphorn melody

Literature and the Latin Middle Ages ([1948] 1990). This monumental work revealed that many references in our literature are related, not to the outside world or to observation, but to forms and habits from older texts, especially those in Latin, both ancient and medieval. Musicians hurried to reveal similar references; the literary world of the pastoral, for example, is reflected in a musical universe that possesses its own signifiers (Jung 1980), and the musical *question*, which began as a recitative formula, developed into an independent pattern signifying uncertainty, mystery and threat (Jessulat 2000).

Research in English on the musical topic began with the famous short passage in Leonard Ratner's *Classic music* (Ratner 1980: 9–29), and has been taken up by W. J. Allanbrook (1983), Kofi Agawu (1991, 1998) and Elaine Sisman (1993, 1997). It has become a standard point of reference for analysts nowadays; for example, Michael Spitzer, in his fine book on musical metaphor (2004) renews the theme, and younger scholars like Susanna Välimäki (2004) find it necessary to their own approaches. For Ratner and his followers, the musical topic is less a matter of cultural intertextuality or relation to literature, than of merely a 'thesaurus of characteristic figures [...] associated with various feelings and affections' (Ratner 1980: 9). These figures might be melodic or rhythmic gestures, harmonic effects, dance measures, musical styles or pictorial references, and they might relate to their objects iconically (the *pianto*, for example, is a melodic gesture resembling the sound of a person who weeps) or indexically, as when a fragment of music is imported from another repertoire, like a French hunting-horn call suggested by an orchestral instrument.

Mahler's singular movement, then, seems to illustrate two topics, the pastoral and the military. None of the pastoral signifiers in this score are quotations; indeed, there is apparently an effort to de-nature the pastoral topic by allotting it to the 'wrong' instrument. The military reference, however, is a literal quotation. Yet the military topic, with its trumpet signals and its marches, plays absolutely no part in this movement, except for this one gesture (as we shall see, it appears elsewhere in the symphony). It is often commented that Mahler's early life was spent near an army barracks in Jihlava. Like most people in the central Europe of that time, he would have known this very common signal; it was sounded at every parade. But can this truly be acknowledged as an example of the musical topic? If the theme of the military is indicated in this nuance, with all its associations of heroism, virility, danger, adventure, then it is an intrusion, for the movement, and especially the episode just heard, is predominantly pastoral. One has to assume that the *Abblasen* is a bit of picturesque colour, evoking a country scene with cows in pasture and a distant parade of troops. It is simply a quotation; it is no more a topical allusion than the *Marseillaise* near the end of Debussy's *Feux d'artifice*.

Which brings us to the importance of this figure. It is, and it is not, a topical gesture. Like so much in Mahler, it locates us ironically between several significations, several modes of expression, several subjectivities. Although the military reference is absolutely literal, it is the pastoral reference that dominates. Yet the pastoral tune is not a quotation, and is furthermore played on an instrument

warlike destiny that was supposed to be the mark of their rank, settled down peaceably on their estates. Those young men who chose to take up arms were sent to the new military academies, where they learned, not logistics and strategy, but French, geography, law and history, mathematics and geometry, drawing and civil architecture, fencing and dancing (Duffy 1987: 48–9).

It has been well said that the ‘warrior mentality’ gave way in the Age of Reason to the ‘army mentality’. Concerted discipline was needed on the battlefield, because the thick smoke generated by black gunpowder blinded the troops and there was a danger of firing on your own side. This power of concerted action was cultivated in the constant drilling of the parade ground. Armies were quite small; Frederick the Great won his victory of Rossbach with an army of 23,000.

The image of the soldier was far from heroic. In stage plays like Louis-Sébastien Mercier’s *Le déserteur* of 1770 and J. M. R. Lenz’s *Die Soldaten* of 1775, officers were portrayed as arrogant libertines, ordinary soldiers as stinking beggars. The third age of military history began in the closing decades of the eighteenth century, and especially after the French Revolution. With the introduction of conscription, armies enlarged exponentially. By September 1794 France had 1,169,000 men under arms (Howard 1976: 99). The new leaders believed in the wholesale destruction of the enemy; Lazare Carnot, the Revolutionary general, proclaimed that ‘war is a violent condition; one should make it *à l’outrance* or go home’. Bonaparte was, of course, the genius of this new kind of war, and his mission of total destruction was eventually enshrined in the greatest of all war manuals, Carl von Clausewitz’s *On war*, which established that ‘the natural aim of military operations is the enemy’s overthrow, and [...] strict adherence to the logic of the concept can, in the last analysis, admit of no other’ ([1831] 1976: 579). This doctrine he called ‘absolute war’, and it dominated military philosophy throughout the romantic period. However, its potential for annihilation was so terrible that there were very few major wars during this period; the First World War at last tested Clausewitz’s teachings. But it was a great age for sabre-rattling; in place of courage and patriotism, the nineteenth century cultivated dark shadows like militarism and nationalism.

When the military topic speaks to us in the music of Handel, Haydn, Beethoven, Liszt and Verdi, it presumably does not signify these worlds of brutality and arrogance. The signification comes from a much more distant time: from the heroic epics of antiquity, and from the *chansons de geste* and narrative poems of the Middle Ages and Renaissance, the *Chanson de Roland* and the works of Ariosto and Tasso. The military nobility of the Age of Reason was ‘brought up on fireside tales of heroic deeds’ (Duffy 1987: 35). Aristocrats and gentlemen still believed in the code of *chivalry*, a combination of fearless aggression with acts of mercy and good manners. As its name betrays, chivalry was a product of the days when battle was dominated by men on horseback, who could act independently, striking the enemy at close quarters without thought for concerted action. This kind of fighting was no longer possible, but it was still alive in the imaginations of some men. Indeed, no less a man than John Ruskin bemoaned the modern decline in this noble style, blaming Cervantes for beginning the rot: ‘He, of all men, most helped

forward the terrible change in the soldiers of Europe, from the spirit of Bayard to the spirit of Bonaparte, helped to change loyalty into licence, protection into plunder, truth into treachery, chivalry into selfishness' (quoted in Rutherford 1978: 5).

But for an extended period of our musical past, soldiering, in the imagination of cultivated men, was chivalrous and glorious. This is the signified which we hear in Beethoven and Tchaikovsky. We come now to a paradox. If the *signified* came from the imagination, and the imagination was fed from much earlier times, the *signifier*, on the other hand, had to be contemporary. No one would have recognized the military signals of the time of Achilles or Roland, even if they were remembered, so modern signals had to do. The military signifier, as I have suggested, had two components: first, the march, and second, the trumpet signal. Firstly, then, the march: if we understand it as we hear it in Tchaikovsky's Symphony, or in the Overture to Rossini's *La gazza ladra*, then we may think of a squadron of troops marching briskly in step to the sound of a rousing military band. Every aspect of this image is modern. Marching in step, little practised in 1700, gradually became standard during the eighteenth century. The quick march at 100 to 120 steps to the minute became more prominent in the last two decades of that century, and was not universal until Romantic times; previously the standard pace was the *pas ordinaire*, 60 to 80 steps to the minute, which we would call a 'slow march', and which we hear, for example, in Haydn's 'Oxford' Symphony No. 92. The powerful marching band, with heavy brass and cymbals, owes its origin to the Turkish *mehter*; older bands had typically been sextets of oboes and bassoons. After the failure of the second siege of Vienna in 1683 Turkey entered a period of relative peace with the European nations, and the Sultan presented Turkish bands to several rulers; the noisy, 'barbaric' sound of heavy brass and percussion soon influenced military music (Head 2000).

Similarly, the kind of cavalry trumpet signal that we hear in Haydn, Mozart, Beethoven, Berlioz and Mahler was standardized by a series of official drill manuals, beginning with one for the Prussian army in 1787. The military topic, it would seem, depends on a slightly delicate theoretical structure; somehow, an entirely modern musical event had to signify a warlike spirit that was really imaginary, based on a rosy vision of ancient times.

It becomes clear that a literal quotation, like Mahler's *Abblasen*, functions ill as a topical reference. Everyone recognized the *Abblasen* and associated it with contemporary soldiers. Contemporary soldiers were not very highly respected. Yet the signification of the military *topic* was heroic and idealistic. A topical reference that says, in effect, 'Here a cavalry trumpeter blows a signal', is not really functioning as a topic.

Most important of all, an exact quotation cannot be adapted to convey expressive truths, because it is inseparable from social truths. The true topical gesture is somehow distorted, exaggerated or stylized. Let us imagine the military fanfare preceding the rapid march tune at the end of Rossini's Overture to *William Tell*; the fanfares in Act 2 of *Tannhäuser*; and the battlefield scene in Strauss's *Ein Heldenleben* (Example 6.5). Each of these has the unequivocal brilliance of the euphoric aspect of the military topic, and none of them is an exact quotation. The

most remarkable example is the leitmotiv of the Sword in the *Ring* operas (Example 6.6). So alike is it to a cavalry signal that I have searched for it in vain in the drill manuals, as Leopold Nowak searched, mainly without success, for the offstage trumpet call in *Fidelio* (Nowak 1955). Yet the Sword motive is just a little too stirring, too rhythmically *achieved*, to be a quotation.

Trumpets in E (sounding)
Allegro vivace

ff Horns in E

(a)

Trumpets in B (sounding) on stage
Allegro

(b)

Trumpets in B♭ (written)
Lebhaft

(c)

Example 6.5 Fanfares from (a) Rossini, *William Tell* Overture; (b) Wagner, *Tannhäuser* (Act II); (c) Strauss, *Ein Heldenleben* (battlefield scene)

Example 6.6 Wagner, *Ring*, *Leitmotiv* of the Sword

Even more interesting are the subtle references to this topic in the woodwind answering phrase to the first theme of Mozart's Piano Concerto in B Flat major, K.595, though this faintly recalls the *Abblasen*, and the military openings to the minuet of the 'Haffner' Symphony, the Piano Concerto in E Flat major, K.271 and (softly and delicately) the Quartet in D major, K.499 (Example 6.7). The Romantics, too, adapted the melos of the trumpet signal to indicate manly glory, as in the sunny confidence of Schumann's song, 'Er, der herrlichste von allen' (from *Frauenliebe und Leben*) and the rapturous poetry of Mendelssohn's Octet. In none of these cases does one sense the contempt in which the contemporary soldiery was held, though one senses it, perhaps, in the rousing military aria 'Non più andrai' in *Figaro*, since Cherubino would surely be one of those young coxcombs who filled the ranks of junior officers at the time.



(a)



(b)



(c)



(d)

Example 6.7 (a) Mozart, Piano Concerto in B Flat Major, K. 595, answering phrase of the opening theme; (b) Mozart, 'Haffner' Symphony, III, opening theme; (c) Mozart, Piano Concerto in E Flat Major, K. 271, opening theme; (d) Mozart, Quartet in D Major, K. 499, opening theme

3 Trumpets in F (sounding)



(a)

Habe Acht!

Im Marschtempo.



(b)

Example 6.9 (a) Mahler, Symphony No. 3, I, trumpet call; (b) *Habe Acht!* military call

Mahler's march tunes are almost always dysphoric. Some of his songs illustrate this, like 'Revelge, Wo die schönen Trompeten blasen' and 'Der Tamboursg'sell'. Even when the march seems vigorous and stirring, as in the *Allegro energico* in the finale of the Sixth Symphony, there is an air of parody; this tune is somehow stilted, blind, spectral, its face set against mere effectiveness. The composer, then, is using the military topic for different purposes.

In the last century, the march and the trumpet signal came at last to portray the grimness of absolute war, the signifiers maximally distorted. Holst's march in *Mars, the Bringer of War* has five beats to the measure, and Britten's bugle calls in the *War Requiem* (not quotations, but on the contrary wild cascades of sour heroics) turn into the trump of doom of the *Dies Irae*. Yet the dysphoric form of the topic, too, illustrates the machinery of topical reference; the gesture is expressive because it does not reproduce anything that could be heard in the everyday world, but on the contrary changes, distorts, adapts.

Literal quotations, it would seem, are only proto-topics. They are *chosen* because of their topical reference, though they remain intrusions. In this respect, they differ from other quotations, like the fragment of *Tristan und Isolde* in Act 3 of *Die Meistersinger*. They are selected because of their topical reference, though this reference is not integrated in the semantic of the work. They prove, paradoxically, the reference of the topic, without truly functioning as topics.

Since the topical reference in music must evoke something other than the natural suggestion of the signifier itself, the least effective topical gesture is the exact quotation. The *Abblasen*, the *Generalmarsch*, the *Habt Acht!*, if left in their natural state, must tend to suggest the contemporary army, one of whose parade grounds adjoined the Mahler household in Jihlava. Throughout most of the period between 1700 and 1900, real soldiers were not much respected. The signified of the

military signifier is, typically, the heroism of olden time, which people found in the classical epics and the poems of chivalry. The signified and signifier, in a word, were non-contemporary with each other, and the signifier had to be slightly denatured or adapted to detach it from its somewhat drab contemporaneity. On the other hand, the signifier could be used for more consciously ideological purposes; instead of merely glorifying military heroism, composers might choose to condemn war and lament its destructiveness. Yet the same signifiers, the marches and cavalry signals, still served the purpose, suitably distorted.

The non-contemporaneity of signifier and signified in the musical topic is, perhaps, the most important point to emerge from this discussion. Ratner justifies the hunt topic (with its signifier, the style of the brass hunting horn) by referring to the 'horn signals' which 'echoed and re-echoed throughout the countryside' in the eighteenth century (Ratner 1980: 18), implying that the hunt topic refers directly to the contemporary world. But the hunt topic probably does not evoke the hunting of the eighteenth century at all; like the military topic, it refers to a cultural world of past time. The trouble with an exact quotation is that its signification feels uncomfortably modern. There may, indeed, be topics whose signifieds are contemporary, like the dance measures eloquently described by W. J. Allanbrook. But those topics that refer to great literary and cultural themes, like the military, the pastoral, the hunt, usually evoke imaginary worlds with connections in the distant past. The hero of chivalry, the noble huntsman, the happy shepherd, existed only in the imaginations of people after 1700, and thus the world of social reality was related very distantly to the topics of concert music.

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Chapter 7

Drift

Anthony Gritten

‘That voice comes certainly from a person; a voice, however, is not a person,
it is something suspended in the air, detached from the solidity of things.’
– Calvino

This essay is about the type of work required if we intend to relate to musical gestures in all their subtlety and fragility. It is more about a scholarly attitude than a particular methodology or theory, hence the largely philosophical tone of what follows. How might we work in order that gestures do not suffocate under the weight of scholarly discourse? In Sections I and II, I attempt to outline one possible context for the trajectory of my thought in this essay and to phrase my intentions in drifting as I seem to do. In Sections III and IV, I turn towards the mechanisms of what I shall phrase as ‘drift’. Section V alights briefly on the wider contexts of drift and Section VI brings the work to a tentative conclusion.

I

In this section I describe two extremes in the way we usually relate to musical gestures and hint at their shared underlying problem. This beginning, probably a straw man, provides me with drive for the movements that follow.

Concepts of musical gesture are often used to tighten up our relations to music. They bring apparently opposing elements closer together into ordered configurations: music and sound, sound and noise, mind and brain, brain and body, musical work and musical text, text and act, performing and performance, model and imitation, representation and embodiment, and so on. Like the duck-rabbit picture, you name it (literally), it becomes part of a musical dualism in need of close, regular monitoring for its accountability and transparency: ‘In the realm of art the spirit of classicism is not interested in the negation of multiplicity, but in shaping it, in controlling and restricting it’ (Cassirer 1968: 289).

The desire to tighten up our relation to music is interchangeable with the desire to possess it. Quality assurance regulations describing how we relate to music allow us to feel that we possess it, that musical gestures are ours for the keeping and ours to manipulate and interpret as we see fit. Submitting to our monitoring procedures freely and willingly, musical gestures benefit from so doing insofar as they and we are enabled to engage in informed and informing dialogues on mutually owned and governed terms. These terms regulate the interaction,

ensuring that there is a tight fit between music's gestures and our gestures. On the face of things all this makes good sense and seems to acknowledge one of the so-called realities of music making: that it is we who do things with music.

The ways in which we regulate our relations to music can be followed, naturally enough, in the terms we use. Gestures are usually conceived anthropomorphically in organicist terms (Solie 1980; Montgomery 1992; Levy 1987; Grimley 2002); they are music's life-blood. This reflects the extent of our desire to possess music: 'any attempt to read music as a speaking sequence amounts to nothing more than an act of ventriloquism: a manipulation of the figure of prosopopoeia for the sake of jumping the abysmal gap between word and work' (Street 1994: 183). Invoking the concept of gesture allows analogies between syntactic and semantic musical changes identifiable in 'the text' and the bodily movements of those involved. It allows us to bring internal representations and external embodiments closer together. Indeed, the notion of the performer (and, further down the chain of command, the listener) 'as' composer is a cipher for the notion of musical possession. At its extreme this becomes the ideology of the possession of the composer by divine forces (Kivy 2001), and for the listener whether and how music ravishes him or her in 'the grip of an unseen hand that keeps its hold over player and listeners alike for the duration of a few timeless moments' (Brendel 1990: 217). In this theatrical set-up, the performer is a postman and the terms of his or her contract of employment specify two things: first, that there is something to deliver and communicate, either of the music or of the performer him- or herself (or both); and, secondly, that there is little or no resistance to the communicative process (from anybody or anywhere, least of all from the music) that cannot in principle be overcome.

One immediate reaction to this possessive appropriation of music might be a pendulum swing in the other direction, towards alienation and anonymity. After all, 'the perceiver is only the subject side of a momentary experience, an aspect of the perception or thought itself' (Rosch 1997: 193). There is sense in this swing. Since our musical practices are social practices like all other forms of life, our understanding of musical gesture should, bourgeois apathy aside, respond proactively to the state of 'our' faceless global post-industrial capitalism. While alienation was once said to arise when the worker was not responsible for the totality of the labour involved in the production process, now that we willingly acknowledge that musical processes are (and have always been) alienating (differently at different times), we might argue that we need an alienating understanding of music, one predicated presumably on its relations to sound and noise (Attali 1985; Kahn 1999) and in terms of the rule of performative efficiency (Lyotard 1984: 41–53). One catalyst to this swing has long been noted: "There is thinking; consequently there is that which thinks" – that is what Descartes' argument comes to [...] When there is thinking, something must be there which thinks – that is merely a formulation of our grammatical habit, which posits a doer for what is done' (Nietzsche 1954: 455). Anticipating language games (Wittgenstein 2002), what the 'dream-work' does not do (Lyotard 1988b), the 'neuter' (Hill 1997: 103–57), texts that slip away from their communities of

readers (Fish 1980) and a host of other thoughts, this remark describes what sounds like the anonymity of thought, its drift alongside the subject or subjectivity that thinks it. Think of remarks about the ultimate musical capitalism – ‘Let no one imagine that in owning a recording he has the music. The very practice of music, and Feldman’s eminently, is a celebration that we own nothing’ (Cage 1968: 128) – or the notion that the performer needs just enough education to perform, since ‘When we practice we are educating our reflexes’ (Kooiman 2004). In their different ways, throwaway remarks like these – hardly even ideas – suggest that relating to music involves some sort of paradoxical process of training the mind to empty itself. However, having swung a little in this general direction, it is probably clear that this is not really an ideal way to relate to music. For many, the ideology of insider knowledge, like that of private language, maintains a residual folk-psychological value.

Another reaction might be to rethink the subject who possesses music (rather than his or her intentions). This has been a common reaction. For instance: ‘The normative characteristics of the modern subject include identity, boundedness, autonomy, interiority, depth, and centrality. Even acting only as ideals, these supply the subject with much of the “infinite assurance” proper to it. Probably the most familiar of postmodernist claims is that, like it or not, this vaunted subject is an exploded fiction. The true human subject is fragmentary, incoherent, overdetermined, forever under construction in the process of signification’ (Kramer 1995: 9–10). However well-meaning this reaction (it at least embodies a degree of humility), though, it remains part of the problem. After all, since experience requires a subject (Strawson 2003), studying the musical experience – a much-vaunted panacea for performance studies – is no better a focus for attention than the musical work (the one is a prosthesis for the other). This is a problem for approaches to musical gesture that place the subject prior to performing: while the subject certainly experiences performing, the subject is also performed, and it is not always obvious which side of this dualism – if either – should be given priority. I am not sure that talk of subjectivity solves the problem either, though it is at least couched more explicitly in terms of process and emergence (Cumming 1997, 2000; Kramer 2001; Butterfield 2002). The point is that ‘We must recognise that content and experience can come apart to some extent: the content of an experience is such that it can be grasped via an experience of another type’ (DeBellis 2002: 130; Lyotard 1988e).

The difficulties of talking about music in terms of possession and anonymity (indeed, in terms of a symbiosis of the two) arise because they are no more than flip sides of the same swiftly spinning coin. Perhaps we should balance on the edge – infinitely thin – of the coin, drifting somewhere between possession and anonymity. Perhaps we should drift. Doing so might help us to answer the following questions about *music’s* role in our relation with it: ‘How does music feel when it entwines with its listener like two bodies sliding over and around each other? Exactly what is involved in this sensuous act, and what does time have to do with it? Does music think while it feels?’ (Rahn 1993: 65).

II

This section attempts, not to distance itself from the weight of the context articulated above, but to move along with the concept of musical ‘relation’.

In seeking to monitor music, in desiring to possess it, we make a classic structuralist assumption. We assume the centrality of dualisms to thought: music is constituted of, but is not merely, sound; the musical mind deals with the musical body; imagination and desire structure sound; form shapes content; the performer acts upon the text; music is sound heard in a particular way; music rejects noise; gestures supervene upon (metaphors for) physical movement; and so on. Fair enough: it seems impossible to avoid such dualisms when relating to music, whether seeking to possess it or whether seeking to distance oneself from it. Such is the dynamic of intentionality and the basis of the project of elucidating a phenomenology of music: I relate ‘to’ the music, which is thereby posited over and against me, as object to my subject.

However, there is a large body of thought that suggests other ways of relating (Gasché 1999). This body of thought does not attempt to dispense with dualisms *tout court*, but it does aspire to rethink the relations between the nominal poles of the dualism. Here is one reason for the need to rethink relations: ‘Two opposites, because they are only opposites, are still too close to one another’ (Blanchot, cited in Clark 1992: 79). One might agree that the relation between terms that supplement-undermine each other is not an Aristotelian ‘A-not A’ dualism but a ‘duplicity’: ‘between the two, so absolutely foreign to one another, the closest unity: dissimulation’ (Lyotard 1988a: 10, 1993: 31). Indeed, ‘What would a mark be that could not be cited? Or one whose origins would not get lost along the way?’ (Derrida 1988: 12); and equally, ‘to divide the world into a “real” and “apparent” world is only a symptom of decadence – a symptom of declining life’ (Nietzsche 1998: 19). Theologians for their part write of God that ‘To have a thought *of* something is to contain it in thought, but to have a thought *for* something is to acknowledge that it can overflow thought and exceed all that a thought is capable of’ (Nuyen 2001: 25), while one far-sighted musicologist, borrowing ideas from theatre studies, has similarly attempted to articulate the gap between performance of a text and performance from a script (Cook 2003).

In the wake of this line of thought there is a need to open up and loosen the relation (with its temporal and spatial dimensions) between ‘us’ and ‘(the) music’. There is a need to acknowledge that seeking to quantify the relation may lead to delusions by virtue of our involvement in – temporal engagement with – the space itself; a need to face the possibility that the space between us and (the) music may in fact turn out to be larger and stranger than we can grasp – unscripted. This need continues in the wake of writers whose ‘critique of immediacy’ (Cook 2001: 171, 177) has emphasized the drift of music and its meanings alongside those who (claim to) understand music and alongside itself. It is congruent with the suggestion that the case for psychologism, namely the tendency to describe motivations and practical reasons for acting in terms of the agent’s beliefs, is not as strong as it seems (Wiland 2003) (think of debates between folk psychology and cognitive science). It is also broadly parallel to the need to rethink the concept of

the musical object beyond half-baked notions that the subject-object dualism merely requires breakdown of boundaries and fusion (Butterfield 2002: 344; Bakhtin 1986: 136–7). There must be more, surely, than the ‘mere form’ by means of which objecthood is conferred upon a cognitively underdetermined musical thing (Gasché 2003: 60–88). Why should we assume that music and its gestures are ‘there “all along,” waiting to be articulated and acknowledged’ (DeBellis 2002: 129)? Don’t they have anything better to do?

Before moving along, I should note that while I am interested in our political, cultural and epistemological relations to (discourse about) music (Section IV), I am more interested here in our phenomenological encounter with it (Section III), even though the notion of a phenomenology of music, predicated as it is upon the concept of musical experience, is itself problematic (Section I). Although drift is a phenomenon of musical time – it uses the time-space between an event and its experience, between a presentation and its situation, between an event and a moment (Lyotard 1988e: 59–85; Williams 1998: 74–9; Readings 1991: 104) – I am concerned less with the temporality of drift (insofar as we can ignore it and still be said to be dealing with drift) and more with our experience of drift (insofar as we can ‘experience’ it) and our response to it (insofar as a ‘response’ is possible).

Central to my endeavour is a sense, perhaps nothing more, that, once my hectoring has died down and been forgotten, our relations to musical gestures might benefit from being left looser rather than under still tighter control. Essentially, I am trying to drift towards an understanding of what John Cage called the ‘psychological turn’. Given ‘the different things *for which* a listener can listen in relation to the sound of music’ (Stockfelt 1997: 132), this is the moment when (note the tense) ‘What has happened is that I have become a listener and the music has become something to hear’ (Cage 1968: 7) – an event (Lyotard 1993: 21, 1988c: 165). Some of what will happen below will probably rephrase familiar themes (Section V). However, insofar as it offers anything, drift offers itself less as another theory of musical gesture and more as an attitude concerning musical time and work, as a more or less fanciful notion that might be worth entertaining when we attempt to deal with musical gestures.

III

This section turns to what can be only problematically called the phenomenology of drift. However, the question is less ‘How do we confront music?’ and more ‘How does it confront us?’. I begin with three examples, drifting into issues of embodiment, cognitive congestion and learning.

The notion of drift (it seems too loose to be a concept) is phrased as well as it can be (and unintentionally) by one of Marcel Duchamp’s memorable phrases: ‘A guest plus a host equals a ghost’ (cited in Perloff 1994: 118). What this phrase can be said to phrase (marginalizing its playful humour) is an indirect sense – probably no more than that – of the musical relation that is troubled and loosened by drift. Without going into unnecessary detail, the significance of the remark is

tied up in the way different orders of work are blocked together within a single utterance yet distinguishable, differentiated and distinct. This is the general notion that ‘culture will always work through its textualities – and at the same time [...] textuality is never enough’ (Hall 1992: 284). The playful use of letters targets our visual perception, alongside which the correct syntax and perplexing semantics provide material for nominally higher-order cognitive mechanisms. There is a looseness to the utterance that remains after it has been assimilated, phrased and apprehended by the eyes and the mind (Lyotard 1988b: 44–5; Readings 1991: 48–52; Styles 1997: 71). A similar looseness remains after reading about Claude Debussy’s *Canope* (and this is not a criticism of the writer), after gathering that the work gathers together an enigmatic title, analytical strategies, an ambiguous tonal language, various narrative possibilities, the geometry of the golden section, Egyptian ancient history (Canope jars came in fours) and Parisian cultural history (Debussy had a couple above his desk), all possessively blocked together alongside each other (Hoffman 2002: 103, 111–12). As another scholar says of *Canope*, ‘we are fascinated by these things in spite of – and because of – the cognitive dissonance arising from our relations to them’ (Lewin 1990: 65). Indeed, though ‘dissonance’ is loaded, of course; I prefer to speak of our ‘investments’ in the work. This is clear from even a loose engagement with Stéphane Mallarmé’s prose poem ‘The Demon of Analogy’, in which the protagonist experiences the ultimate aesthetic despair: a dawning awareness of the simultaneous proximity-distance of ‘his’ words as they pass him by in an ever-expanding multiplicity of sounds, referents, notations, psychological-biographical associations, symbolisms and meanings, ‘trailing uselessly off into the void of signification’ alongside each other (Mallarmé 1994: 93).

The point emerging from Duchamp, Debussy and Mallarmé might be the humdrum, familiar point that no one route around an utterance can fully appraise it, nor one combination of cognitive processes dominate over another. The point might also be that the utterances or gestures – insofar as they have a ‘self’ (consciousness and intentionality are not really observable without resorting tautologically to the intentional fallacy, to the metaphor of possession) – offer a certain element of resistance, not just to these improvised interpretations, but to interpretation (possession) *tout court*. And they resist despite themselves (again falsely, if usefully, assuming that ‘they’ and ‘themselves’ mean something in this context). They resist both unity and multiplicity, their resistance (force rather than substance, intensity rather than property) seeming to suggest itself as what we should think of as ‘the musical’ when we talk about ‘musical gestures’. It might ultimately be hidden in plain view: what you hear is what you (do not) get and there is little need for critique (Lyotard 1993: 3, 24). It might be better to leave the Duchamp, the Debussy and the Mallarmé to play out their energies – ‘resonate’ (Rink 2002: 56) (Section IV) – in their own times.

Drift, then, insofar as it is ‘caused’, seems to be caused by the blocking together of different orders of ‘work’ (rather than ‘perception’ (newer musicology) or ‘significance’ (older musicology)). When more than one mode of work is needed in order to do justice to the incoming sensations, it has already begun. A

clear example – can drift be reified so conveniently? – of the blocking together of modes of work is *Reunion*, where decisions in a chess game between Cage and Duchamp stimulated the emergence of musical events (Cross, L. 1999). Another example is the appearance of a gesture from Brahms's violin concerto in Stravinsky's, where the music drifts alongside its 'own' sonorous, visual, notational, syntactic, semantic, and physical gestures (Example 7.1).

(a)

(b)

Example 7.1 (a) Stravinsky, *Violin Concerto, III*, bars 7–9;
 (b) Brahms, *Violin Concerto, II*, bars 56–8

If drift is movement and resistance yet not a property of an object, and if it is caused by blocking together different orders of work, if it is supervenient and emergent, then does it make sense to ask what embodies it? At all cognitive levels and over all durational spans, the movement of acquiring, assimilating, embodying and presenting musical judgements is essentially spiral: a turnaround movement from the incoming givens of, for instance, temporal constraints as determined by the score and by physiology or one's historical knowledge and aural skills to the outgoing preparation of movement sequences for sound production or emotional-physiological changes in the body or sentences with propositional content. Drift is encouraged by this spiralling physiological interference between incoming and outgoing processes, between and within each and every musical gesture.

Consider the discrete elements, stages and spans of musical cognition, articulated for scholarly communities variously in terms of perceptual modalities, image schemata (Johnson 1987), modularity (Fodor 1983; Temperley 1995), dynamic systems (van Gelder 1998) and an epidemiology of representations (Sperber 1996). What is important are the 'characteristic response times and lags of physiological systems' and the 'difficulty of identifying emotion-specific changes in these psychophysiological measures' (Krumhansl 2002: 46; Levinas 1978: 68). Our senses suffer sensory overload, cognitive congestion and over-writing: we are but palimpsests. Phrasing it like this may be laying it on thick, but there is no getting away from (the) matter (Gumbrecht 1996); philosophers have explored the difficulties of separating the senses (Merleau-Ponty 1964; Lyotard 1993; Cazeaux 2005: 160–166), cognitive psychologists have noted that 'neural substrates for music overlap those for emotion, memory, and language' (Krumhansl 2002: 49), and others have explored the different ways in which music presents itself to us (Finnäs 2001) and the fact that 'Music is in some way undecidable, situated in the gap between the beautiful [form] and the agreeable [sensation], and confounding the distinction between form and content' (Reed 1980: 569). Music's physicality affects all our senses simultaneously and confuses (named) distinctions between space and time, subject and object, perception and conception, and so on, leaving behind a series of 'morphological transformations' (Ayrey 2002: 286) not just of the values within domains and modalities but between them. Confusion, of course, is not fusion; confounding is not founding.

This has a particular consequence: as soon as we (think that we) start thinking musically or thinking about music, perhaps attempting futilely to restrict attention to a single sense ('What is the music saying here?', 'Why is the pianist swaying like that?', 'Is this as loud as the previous climax?'), or perhaps shifting attention to gestures occurring over longer or shorter time spans and higher or lower hierarchical levels (Drake et al. 2000) ('Is this the recapitulation?'), or perhaps shifting attention between real and virtual gestures or between sonic and musical properties (graphically confronted in the cadenza in Alfred Schnittke's Fourth Violin Concerto), between instrumental and aesthetic values, music begins to disperse and drift into the distance (Rahn 1993: 58, 61; Lyotard 1993: 20, 42). We unbalance and slip off the edge of the coin (recall the metaphor in Section I). Taken together, without thought (the most difficult task to ask somebody – try it!),

our senses keep us both close to musical gestures (we literally sense them) and distant from them (the temporal physiology of each sense refuses to give us time to reflect leisurely upon the input of any one sense). This is the dissimulation of time and space; they begin without identifiable beginning and continue beginning over and over 'again' (Lyotard 1993: 24). Our anxiety at being possessed by different sensory-cognitive capacities and abilities, frequently phrased in terms of a hearing-doing dualism, is an old theme, of course, if not always phrased in terms of drift, as is the notion of the division of sound into proto-musical and proto-linguistic moments (Reed 1980: 569, 574; Kant 1987: 201–2). The spiralling movement of this paradoxical proximity-distance is the musical moment *par excellence*, the non-essential essence of musical gesture. Musical gestures drift and hypostasize (Levinas 1978: 65–96) alongside the onset of any categorizing logocentric desires. Hence, given the 'Janus-faced' constitution of consciousness (it faces outwards and inwards (McGinn 1997: 300; Bakhtin 1993: 2)), the importance of understanding the psychology-ecology of attention and the dynamics of attending: whether it is serial (bottleneck) or parallel; whether it is digital or analogue; whether, like visual attention, it is to be phrased in terms of a spotlight or a magnifying lens; what constitutes noise, distractions and interruptions to one's attention (Styles 1997: 33–59; Matthews et al. 2000: 87–106, 177–92; Campbell 2005); how 'divergent events' work on the body and mind (Cumming 1991: 184–86); and so on.

One way of getting to grips with the issue of blocking together is to attend to (the issue of) the musical body and the necessity of parentheses in this sentence. Musical gestures are often used as a way of bringing the musical body and the musical mind closer. This is understandable, given that body and mind have often been kept apart, music being assumed to exist in some kind of platonic realm free of messy physicality. Now that we have less transcendental pretensions, though, we might ask what is served by separating or (the same thing) blocking together music 'and' the body. What kinds of aesthetic-ideological work does it do? Is talk of separating them ('teasing apart') and-or blocking them together essentialist (Cook 1999a: 11; Lyotard 1971: 381; Lyotard 1988b: 32)? The issue is, not how to live and perform in the absence-presence of a separation between body and mind (the ideologies of total possession and/or total alienation), but what to do and how to live given the omnipresent possibility of an easy aesthetic-ideological separation between music and the body, given the essential fuzziness of imagery in prospective judgements about action (Johnson 2000), given the possibility of error and creativity and given the openendedness of musical time. The performer, of course, does this all the time: he or she has the music on one hand and puts his or her body to work in performing it on the other. But it is precisely the difficulty of defining 'on the one hand' without reference to 'the other hand' that drift troubles, indeed, that marks the prior activity of drift (if 'activity' is the appropriate word to describe what drift 'does'). And drift is not restricted to the relation between body and mind: studies of improvisation sometimes offer process diagrams with a space for those 'other factors' which we do not or cannot know about (Pressing 1988). As it has been noted (using 'difference' in much the way I have been phrasing drift), 'If we were to ask Difference what its essence was, it would be embarrassed.

In fact, Difference could not bear it. If Difference thought it had a nature, it would get carried away in all directions' (Rahn 1993: 59). In the face of this difficulty (drift drifts alongside 'itself' – what is that?), we must do nothing more than live and perform – we must; it is an obligation. On the one hand, then, drift is an affect caused by the nominal separation-blocking together of such orders of work as the musical body and the musical mind; and on the other hand, it is an attitude (Lyotard 1993: 16, 19).

As part of the learning process, musical gestures drift across time as well as in time (whether this distinction can be maintained is part of the point). Teachers, concerned with specific achievable targets, try to minimize drift and close the gap between conception and perception, or at least to come to terms with it (Sudnow 1978; Booth 1999; Drake & Palmer 2000), as 'mental plans for behaviours such as music performance become increasingly abstract and decreasingly motoric as skill increases' (Palmer & Meyer 2000: 68). Consider how we tend to phrase the relations between musical actions and the physiological, psychological and cognitive representations that make them possible. Many claim that there is a 'huge transition between the isolation of individual practice and the social interactions experienced on the concert platform' (Davidson 2002: 144). This is undoubtedly true of the culture of Western Classical performance, with its host of activities half-way between practice and performance (masterclasses, open and dress rehearsals, recording sessions, private invitation concerts), and it is probably the case from a folk-psychological perspective that for the performer the distance between the last rehearsal and the first performance of a work is greater than that between first and second performances. Whether it is a 'transition', though, with all that this implies of a relatively smooth, relatively gradual, relatively prepared shift, is another matter.

The performer develops a vast surplus of timing, coordination, reading and memorization skills (Williamon 2004), and the types of practice advocated by teachers are, in contrast to the 'sticking-plaster approach' that 'encourages one to seek the solution that works' here and now only, those that '[stretch] the level of skill beyond what was called for' (Hill 2002: 139–42) so that the performer can play without needing to think about what is in fact necessary in order to produce the necessary motor movements. (The full extent of these skills might never be 'fully' tested, though encores are the next best thing for the listener.) Skills and actions drift as different kinds of practice strategies (physiological, psychological, analytical), physical and cognitive regimes designed to reduce stress and anxiety, and the myriad of social performance rituals with 'only' folk-psychological value are blocked together. Since the musical gestures that 'result' from rehearsal therefore lack a one-to-one reversible relation with the theatre of representation within which their multiple descriptions are necessarily couched (there is more than one way of playing the Stravinsky in Example 7.1 and there is more than one way of notating what is played), we should guard against essentializing the distinctions between musical actions and their representations, repressing or idealizing (the same thing) the former rather than allowing for a subtle connivance between the two – a drift.

IV

We are now drifting towards considering the drift of words about music. This is broadly speaking, the issue of interpretation: what we do, try to do, and think we do, when we (think we) do things with music.

Interpretation, whether that of the performer or that of the listener, brings with it the spectre of compliance, the demand of compliance being the demand that the interpretation belong to the text's defining compliance class. For comparison, consider the legal phrasing of vicarious liability: 'Anything done by a person in the course of his employment shall be treated [...] as done by his employer as well as him, whether or not it was done with the employer's knowledge or approval' (*Race Relations Act 1976: 74.4.32.1*). This is the ideology of the interpreter 'as' composer (Section I): the interpreter's acts 'shall be treated as done by the composer as well as him'. However, we know better than to conflate the composer, the performer and the listener, so this element of law cannot be said to describe how interpretation works. It is true, though, that the composer's use of music notation plays an important preventative role: as the law states, 'It shall be a defence for that person [the employer] to prove that he took such steps as were reasonably practicable to prevent the employee from doing that act, or from doing in the course of his employment acts of that description' (: 74.4.32.3). Given what we know about the role of cognitive representations, compliance should probably be phrased as an intention: while it is true that 'musicians vary such attributes as tempo, dynamics, and attack to express different emotions' (Krumhansl 2002: 49), this is not to comply and express but to 'release' emotions. The interpreter thinks less in terms of compliance (with its attendant aesthetic connotations of formal logic and perfection) and more in terms of justice (Ayrey 2002: 263, 274, 287, 296–7). Compliance may involve the appliance of science and beat the musician with the stick of performative efficiency, but justice to the text is what we are after, because it allows for a broader – more musical – margin of error (read: interpretation). After all, although compliance demands conformity (it is normative), conformity is surely the mark of, if not a wrong interpretation (whether performance or listening), then at least a dull one (which is often worse). Rather than compliance and conformity, then, drift and justice.

The looseness of performative interpretation is an interesting way of approaching the issue of how the performer does justice to the music. It opens a space for the performer to drift between performance and interpretation, for every performance at least corresponds to a possible interpretation, 'is compatible with a number of them, or with no conception at all' (Levinson 1996: 83; Thom 2003). This type of drift is encouraged by the 'multiple interpretability' of musical works (Davies 2003), the fact that they are open to different orders of work, whether or not they are all directed by and towards the same ideal (Bar-Elli 2002). The notion that we might loosen the relations between work, performance and interpretation, moreover, seems to resemble part of an emergent argument in Performance Studies about the status and function of (the) performance itself as an aesthetic object in its own right above and beyond its instantiation, representation and type-tokening of

the work (Kivy 1995: 108–42, 260–86; Johnson 2005). What does the interpreter do between ‘performance cues’ (Chaffin et al. 2002) and between the decisions that lead to the attribution of a performative interpretation? Why, he or she drifts.

Interpretation has often been assumed to be the central element in debates within musicology about how words about music relate to music: ‘Is there a communicative medium that should be privileged above all others that help constitute the lived world?’ (Levinson 2003: 62). Thankfully, there is no essential way to privilege ‘music’, ‘words’, ‘music about words’ or ‘words about music’, not even by such subtle means as their ordering in this sentence, and we now recognize that ‘any theoretical system must itself be considered critically, *alongside* the music with which it is associated’ (Clayton 2003: 60). It may be that ‘To understand music seems in significant part to be able to describe it’ (Kivy 1990: 97), but this formulation still sounds too focused upon the product of such an activity (the validity of the ‘description’). Even if this is part of the answer, the question remains: ‘what does a listener actually *do*?’ (Frith 1996: 259).

John Rink’s work is illustrative in this respect. Rink is interested in musical gestures, phrasing gesture in a conventional sense as that which provides the object of a subject’s musical experience. Much of his work has focused upon the notion of ‘intensity’ and upon how the performer might seek it through a process of reflecting upon, developing and informing his or her capacity for ‘intuition’ (Rink 1990: 324, 1992: 214–17, 2004). Rink seeks ways of defining intuition and tends to let intensity just arise in some form of expressive synthesis or ‘resonance’ (Rink 2002: 56): after the end of each essay he hopes it will happen. (This needs detailed grounding in pedagogical method, of course.) Intensity, though, true to (its lack of) form, cannot be guaranteed, calculated, or possessed: one person’s intensity is another person’s irritation. While in this sense Rink’s attitude to intensity may be frustrating for more empirically focused scholars, it is nevertheless true to the drift of music in not attempting to block together music and words too tightly. Almost *malgré lui* (precisely the point of drift), Rink’s work has the benefit of working through the need to ‘mind the gap’ (read: drift (Section V)) in a second, quieter sense than the one most often used by psychologists (‘be wary of the gap’), namely a sense of ‘caring for the gap’.

As resistance, drift is fundamentally a movement. However, it is less a movement ‘of’ music – it is neither a thing nor a property (Section III) – than a movement ‘through’ and ‘across’ its gestures that adds another dimension. This movement is an important part of (discourse about) music, but often gets silenced in the rush to present music with what it means or to present musical gestures with a map of what they do. For instance, tools such as ‘conceptual integration networks’ (Zbikowski 1999) are useful for summarizing the way different orders of work are blocked together, having acknowledged that the constitutive mental spaces begin by drifting into the necessarily compartmentalized diagrams stating what they ‘are’. The interrelationships between mental spaces arise through this movement, and in its wake what can then be called a ‘common topography’ (: 341) is born – and analyses and ‘cross-domain mappings’ (Zbikowski 1997) of all sorts are free to begin. Such structural homologies may even be ‘necessarily the results

of different kinds of analysis' (Williams 1977: 104–5), but drift should be thought of in terms of the movements involved (rather than their 'results') – the movements of the relations (of base/superstructure, for example) rather than the relations 'themselves'. Resistance to the reification of musical relations is of course hardly new (think of modernist musicology, resting on its dialogic laurels); but less common has been an acknowledgement of a resistance to the movement itself. And I mean 'a resistance' neither by musicologists nor by musicology, but by music. Many of our interpretative activities are more concerned with articulating 'the intentional content of one's musical experience' (DeBellis 2002: 121) and with showing how 'musical works, on the one hand, can be resolved into lesser, constitutive elements, and, on the other hand, can be viewed as constructions of such elements' (Meeùs 2002: 161) than with the actual movement of interpretation and articulation – with movement. The question of what music thinks about it all (if anything) is hardly ever asked. This might seem strange, given that hearing 'ascription' is no more than a movement of consciousness by which one thing is heard 'under a different description'. Nevertheless, if what analysis provides is 'not unbridled access to new contents, but a new mode of access to content already in place' (DeBellis 2002: 131), a blocking together of at least two orders of work, then we should acknowledge that the movement of interpretation-articulation drifts.

V

Before drawing to a conclusion, we might make a nominal gesture towards completeness (since possession is the name of the game) and note some relations of drift to its wider contexts.

Drift distinguishes itself from the 'gaps' and 'differences' frequently identified by psychologists, sociologists and cultural critics in (discourses about) music (Clarke 1989; Kramer 2001: 169, 2003: 130). 'Celebrating difference', to name one slogan, fulfils political agendas but often presumes to understand (the) difference (who says what difference is?), thus retaining a problematic authority both epistemological and ethical. In this respect, difference is (advertised as) communitarian and inclusive, whereas drift tends quietly to disperse agency (often as a result of the enactment of differences), and in this sense might be taken as a cure for the reckless critical pluralism of much work in the humanities (Cooke 2002). Ideologies of difference tend to assume that the simultaneity of different events, agents and values is unproblematic ('because I'm worth it'), whereas drift, not human enough (let alone partisan enough) to bother having or being an ideology, results from the separation-blocking together of different orders of work. Differences are quantifiable in theory (even if in practice they are fluid and dynamic), while drift is the response by music to such possessive desires, its weak, half-hearted resistance (why should it make an effort?). Musical gestures are (structures of) feelings, and 'Feeling, or rather sentiment, is not a matter for the

ego; it is matter taking on a form, and its hold is neither active nor passive, as it exists before the act and before subjectification' (Lyotard 1988d: 226).

It should be clear that drift is pervasive within and without music, and regardless of the words we use to (attempt to) phrase it. To my knowledge, *Music, Imagination and Culture* (Cook 1990) was the first study to explicitly theorize drift within musical discourse (without using the word), exploring the difference between what its author named 'the musical' and 'the musicological'. Coeval with the explosion of music psychology, it was part of a general rupture from previous scholarly ideologies. In the wider world, too, a great deal of work, scholarly and creative, has set out to explore the drift between objects and their descriptions. In scholarly communities one might think of those who have noted that critiques are properly critical when they recognize the 'radical incommensurability' of interpretations (MacIntyre 1982; Lyotard 1988e; Cook 1999b: 250–51). One might think of debates about the relations between tradition and originality and the merits of music models (Straus 1990; Taruskin 1993; Goehr 2002). Or one might be reminded of the physical sciences, acknowledging as they do the importance of entropy in the universe (the dispersal, rather than containment, of energy). One might think of interactive musical practices, which refuse to assimilate the musical invention to the musical work (Impett 2000: 33). Or one might acknowledge drift at work in the politically correct point about flat rather than vertical hierarchies of musical interpretations and the impossibility of meta-languages (Cook 1999a: 40, 1999b: 245, 2003a: 209–10). Common to all these phrases is a point concerning music's adaptive value in human evolution, its function as a source of cross-modality and cross-domain 'representational redescription' (Karmiloff-Smith 1992; Cross 1998). What seems to be implied is that we might acknowledge the 'floating intentionalities' (Cross, I. 1999) of our relations with musical gestures.

One might take this to mean that we must embrace drift proactively in our musical practices and take advantage of its looseness. This is one way of phrasing the term improvisation (Benson 2003), and it is certainly true that there are various ways of claiming to possess music; contemplative listening is only one position among many. But these are still positions, still 'modes of listening' (Stockfelt 1997). Better, perhaps, to acknowledge that 'The life in music belongs in the musical process, abstract, indeterminate, unowned except through the act whereby we listeners possess it' (Scruton 1997: 355). I would prefer to phrase it 'even in the act', but, nit-picking aside (music does not drift that low), it should be clear that it is not formalism that drift leaves behind: 'abstract' refers less to the manner in which we possess music and more to the opacity of musical gestures, their drift regardless of how we relate to them – regardless. 'The Neuter, if it may be called neuter, could be said to be that which withdraws while withdrawing and withdrawing even the act of withdrawing, without anything appearing of what thereby disappears, an effect reduced to an absence of effect' (Blanchot 1992: 77). Indeed, in terms of the psychological turn (Section II), drift, insofar as it can be phrased in such an active manner, disempowers us from musical gestures and events, both here-now and on the larger scale of musical style evolution. Despite our delusions of grandeur about the extent of musical ownership, in the grand order

of our species' cognitive evolution and cosmic end, with a detour mid-journey through the land of prosthetics, we are temporary 'hosts' for musical thought (Jan 1999: 41, 51; Lyotard 1991: 8–23). Hosts, yes, and very actively so; but only temporarily.

The difficulty of understanding music's drift is, not just its elusiveness (here it resembles performativity (Stefanou 2005)), but the fact that it has no concern for us, however much we care for it and desire to possess it. One might be tempted to call it selfish were it not for its lack of consciousness and intentionality (Jan 1999: 49). 'Like a "magnetic" or "electrifying" force of personality, music can animate one subject after another, but it does so without any personality, without itself being or having a subject' (Kramer 2001: 164), for it is no more than 'an emergent feature of performance' (Butterfield: 2002: 370). Ultimately, as Cage might phrase the matter, music is 'Something that doesn't speak or talk like a human being' (Cage 1999; Lyotard 1991: 142); it has nothing to say and it says it (Cage 1968: 109). Weak and powerless, that is its power. It is a thing.

VI

Over the course of this essay I have been trying to answer at least one question, namely, 'What does *music* do?', and I have taken this question as being substantially different to the egological question 'What do *we* do (musically)?'. This question usurped the question, 'What does music mean?' ('What do we mean by music?'), and occupied centre stage in musicology for a while, though was itself subsequently usurped by the question of recording.

In seeking an answer, it may be that I have been drifting against the very grain of my argument. Nevertheless, my answer is this: it drifts. This answer seems to be slightly different to most answers to the question, which (crudely simplified) have gone something like this: music does or performs social meanings. It is in tune, though, with the general notion that we should be 'looking for ways of understanding music that are fully attuned to its emergent properties, of which meaning is just one' (Cook 2001: 192).

If music drifts in the way I have been phrasing it, then one might counter that, scholarly politics apart, 'There is a sense, then, in which discourse about music, of whatever kind, is a thing of sand', or, 'To put it another way, discourse about music is inherently shallow' (Cook 2003b: 253–4). One might also assert that this advocates a small question-small answer practice: don't ask anything complicated (Dunsby 1995: 63). It is and it does. Although scholarly modesty is desirable, this seems to me to restrict musicology to the prison house of language within the theatre of representation and to imply that our motivation is collective guilt at the paucity of what we do. Maybe it does and maybe it should be. The point about drift is that, regardless of whether or not it is 'our' music and whether or not we desire it to be ours, music doesn't care less. It doesn't have time.

I have phrased some of the ways in which music and its gestures drift, though by no means all of them. Most are known not even to themselves; indeed, if

there are different types of drift then I have not categorized them. In response to the question ‘Does *music* think while it feels?’ (Section I), I suggest that we are unable to phrase a just answer unless we drift as music does – languid and light. Drift leaves musical gestures loose and on the move, and this drift should be acknowledged in our theories of musical gesture. And I write ‘acknowledged’ rather than ‘represented’ quite deliberately.

Acknowledgements

Example 7.1a (Stravinsky, Violin Concerto, III, bars 7–9) is reproduced by permission. © 1931 B. Schott’s Söhne. © renewed 1959.

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Chapter 8

Musical Rhythm: Motion, Pace and Gesture

Justin London

While musicians can play very fast (as in the individual notes of a piano glissando or trill) and of course very slowly (often with impressive displays of breath support or bow technique), we can only hear a series of notes as a *rhythm* if their durations fall within a fairly narrow range. The shortest durations cannot be less than a tenth of a second, while the longest interval between successive note onsets cannot be more than about two seconds. The range for musical rhythm overlaps in significant ways with the ranges for other human motor activities, most notably walking and running. This is not surprising, as our sense of musical rhythm and motion is bound up with the sensorimotor system that controls our own bodily movements. Thus the way we move informs the way we hear and understand musical gestures (and, perhaps, vice-versa).

In this chapter I will argue that this is precisely what is involved in our perception of a categorical shift of tempo from a moderate to a fast speed, that is, from *andante* to *allegro*. Its kinematic analogue is the transition from a walk to a run. Crucially, what is involved in this shift is not only an increase in the number of events per second, but also the emergence of a more complex coordination of rhythmic activity. I start with a more detailed overview of the perceptual and cognitive constraints for musical rhythm, and how those constraints stake out the speed limits noted above. I then present kinematic data on walking and running, as well as models for each characteristic gait. Next, I go over the data on the walk-run transition in some detail, and suggest their musical analogues. I conclude with some remarks on its implications for our perception of tempo, with support from kinematic models for rhythm perception. As a coda, I also discuss the implications of kinematic models of rhythm perception and production with respect to our sense of musical gesture.

The Long and Short of Musical Rhythm

We cannot grasp the shape of a melody or rhythm if it is too fast or too slow, even though we can make some sense of it (noting its contour, aspects of its speed and motion, its timbre, and so forth). Before going further, a few brief remarks about how to measure rhythm and tempo are in order. Musicians are accustomed to

thinking about tempo and duration in terms of beats per minute, so the tenth of a second to two second range is, in musically familiar terms, between 600 and 30 beats per minute (bpm). Psychologists who study music perception typically measure the duration of the inter-onset interval (IOI) between events, either the onsets of tones, or between very short clicks, and so forth. These IOIs are reported in milliseconds (ms) and thus the range is from 100 ms to 2000 ms. These IOIs have durations, but they are not the same thing as the durations of the notes themselves (as the tones may be legato or staccato, for example), and durational measures are not the same thing as the number of events per unit of time. Nonetheless, both isolated durations and periodic patterns of beats seem to be subject to these same perceptual speed limits, though they are manifest in different ways in different temporal contexts.

These speed limits have long been known by musicians. For example, Westergaard (1975) notes that a tempo of 30 bpm is ‘too slow to be useful’ and, similarly, a tempo of 240 bpm is ‘too fast to be useful’ (the reason he says 240, and not 600 bpm, is made clear below). This should not surprise us, for if there are innate limits for human rhythm, then they should be evident in a wide variety of musical practices and cultures.¹ The range from 100 ms to 2 seconds is very wide, encompassing several orders of temporal magnitude; one way of thinking about it is there are approximately four ‘octaves’ of musical time (Stockhausen 1959). However, not all durations and periodicities within this range are alike. Table 8.1 summarizes the temporal ‘landscape’ for musical rhythm and metre, showing various perceptual phenomena and their specifically musical analogues.

First, there seems to be a clear subjective difference between durations and periodicities in the 100–200/250 ms range versus those longer or slower than 250 ms, and this difference crops up in many studies of temporal and music perception. For example, the *just noticeable difference* (JND) is one of the basic psychophysical measures of perceptual acuity, and the nature of JND changes around 250 ms. Friberg & Sundberg (1995) found that the absolute JND was roughly constant for IOIs shorter than 240 ms, but then, following Weber’s law, became a function of the stimulus duration for IOIs greater than 240 ms (for a summary of earlier JND research see Dowling and Harwood (1986)). Likewise, Warren (1993) investigated our ability to recognize familiar melodies, and found that we are able to do so within a range of 200 to 2000 ms for successive note onsets. Similar results were found when asking subjects to tap along to metronomic ticks (Duke 1989) or to musical excerpts (Drake et al. 2000). Lastly, Parncutt (1994), drawing on earlier research and his own experimental studies, found a range of ‘maximal pulse salience’ which extends from 200–1800 ms.

Recall Westergaard’s claim that 240 bpm (250 ms periodicity) was ‘too fast to be useful’. This is true if we consider this as a limit for *tempo* (which is what Westergaard had claimed), that is, the fastest rate at which we can discern a beat or pulse. For while we can hear durations in the 100–200 ms range as rhythmic elements, they are too short or too rapid to serve as beats, but they can serve (and do serve) as subdivisions of the beat. Thus I have proposed (London 2002, 2004) that to hear a beat requires at least the possibility of hearing a subdivision. Hence,

Table 8.1 Musical and perceptual periodicities

Interval and Periodicity	Musical Phenomena	Perceptual Phenomena
50 ms/ 1200 bpm	Trills, glissandi, drumrolls	Event separation threshold (Steudel 1933)
100 ms/ 600 bpm	Shortest durations in rhythmic figures (Friberg & Sundström 2002)	Limit on subjective rhythmization (Bolton 1894)
	Shortest possible metric subdivisions (London 2002, 2004)	Streaming threshold for pitch patterns (Miller & Heise 1950; van Noorden 1975; Bregman 1990)
		Threshold for reliable durational discrimination (Hirsh et al. 1990)
		Cortical processing of sound patterns (Roederer 1995)
		Synchronization threshold (Repp et al. 2002)
200–250 ms/ 300–240 bpm	Fastest beats (Westergaard 1975)	Holistic versus analytic processing (Michon 1964)
	Limit of subdivision benefit (Repp et al. 2002)	Cut-off for backward masking (Massaro 1970)
	Upper limit for melody recognition (Warren 1993)	Limit for short-term memory (Crowder 1993)
	Upper end of range of pulse salience (Parncutt 1994)	Shift in nature of JND for duration (Friberg & Sundberg 1995)
600–700 ms/ 100–86 bpm	Tempo giusto	Indifference interval (Wundt 1911)
	Centre of range of maximal pulse salience (Parncutt 1994)	Spontaneous tempo (Fraisse 1982)
		Minimal degree of tempo drift (Madison 2000)
1500–2000 ms/ 40–30 bpm	Slowest beats – lower limit of the ‘range of useful tempos’ (Westergaard 1975; Warren 1993)	Shift from anticipatory attending to reaction time (Woodrow 1932)
		Upper limit on subjective rhythmization (Bolton 1894; Fraisse 1982)
5–6 seconds	Longest measures/hyper- measures (London 2002)	Limit of psychological present (James [1890] 1950; Michon 1978; Fraisse 1984)

while subdivisions can be as fast as 600 bpm (in the most extreme cases), beats will involve two or three such subdivisions, and so will fall in the 300–200 bpm range (depending on whether one has simple or compound time). Westergaard's benchmark of 240 bpm essentially splits the difference for simple versus compound time, and thus serves as a good rule of thumb.

While we can feel a beat at any tempo within a fairly wide range (200–1800 ms, or 300–330 bpm), beats are most strongly felt at a moderate tempo, around 90–100 bpm (i.e. with IOIs of 700–600 ms (Parncutt 1994)). Much earlier, Wundt (1911) found 600–700 ms to be the 'indifference interval': when asked to produce an interval neither too long nor too short (or when asked to judge whether an interval is long or short), on average his subjects produced intervals in this range. Similarly, Fraisse (1982) also found this to be the range of 'spontaneous tempo', a tempo that resulted when he asked subjects to tap a comfortable rate. Finally Madison (2000) found a minimal degree of tempo drift in this narrow range. If we are asked to tap very slowly, we tend to speed up. Conversely, when asked to tap or beat time quickly, we tend to slow down. This is tempo drift. If, however, subjects start around 100 bpm, there is very little slowing down or speeding up, and we can maintain this tempo very well.

There really is, then, a 'tempo giusto', an innate tempo that we prefer and gravitate towards. But it is not based on breathing rate, or heartbeats, or other metabolic periodicities (as musicians have proposed in the past). Rather, it seems to be related to timing preferences that have a neurobiological origin, rooted in aspects of our perception and motor control. What makes the notion of a tempo giusto interesting (as well as messy and harder to study) is the fact that most musical passages involve several concurrent levels of rhythmic structure. While the 600 ms periodicity may be most salient, there are almost always longer and slower rhythms present in the music. Hence differing impressions of speed derive from the composite effect of the coordinated pattern of subdivisions, beats and downbeats (Epstein 1995).

Walking, Running and Music

There are many ways in which our bodily motions involve periodic movements – we wave our arms, we nod our heads, we move our torsos back and forth. Here I will focus on walking and running, but other bodily gestures also have musical correlates (Davidson 1993, 1994). While there are a number of variables in the study of walking and running gaits (the length of the stride, the size of the foot, the force of the heel strike, the angle of the foot, the angle of the knee, the angle and velocity of arm swinging etc.), I will, for obvious reasons, focus on the stride rate or *cadence* – the number of steps per minute.

When walking, one foot is on the ground at all times, and at some points in the walking cycle, both feet are on the ground. In a run, however, at some points in the gait cycle, both feet are in the air (the 'flight phase' of the gait cycle in a run). This is the primary distinction between a walk versus a run. It follows from this that walking and running are biomechanically and energetically quite different:

Recent models of bipedal gaits demonstrate that the basic features of walking and running could be produced by the passive dynamics of the limb system. In walking, the body behaves like an inverted pendulum [as the legs swing back and forth while the planted foot serves as a pivot], yielding highly conservative exchanges of kinetic and potential energy. In running, the body behaves like a bouncing ball, in which kinetic energy is converted to elastic energy stored in the tendons and the muscles of the stance leg. (Diedrich & Warren Jr. 1995: 183)

Given these differences between walking and running, to shift from a fast walk to a slow run (or vice versa) involves a transition in many aspects of the gait motions, including arm swings, relative position (phase) of the leg segments, and so on. In both walking and running, however, we speak of the *stance* (on the ground) versus *swing* (in the air) phases for each foot. A comparative diagram is shown in Figure 8.1.

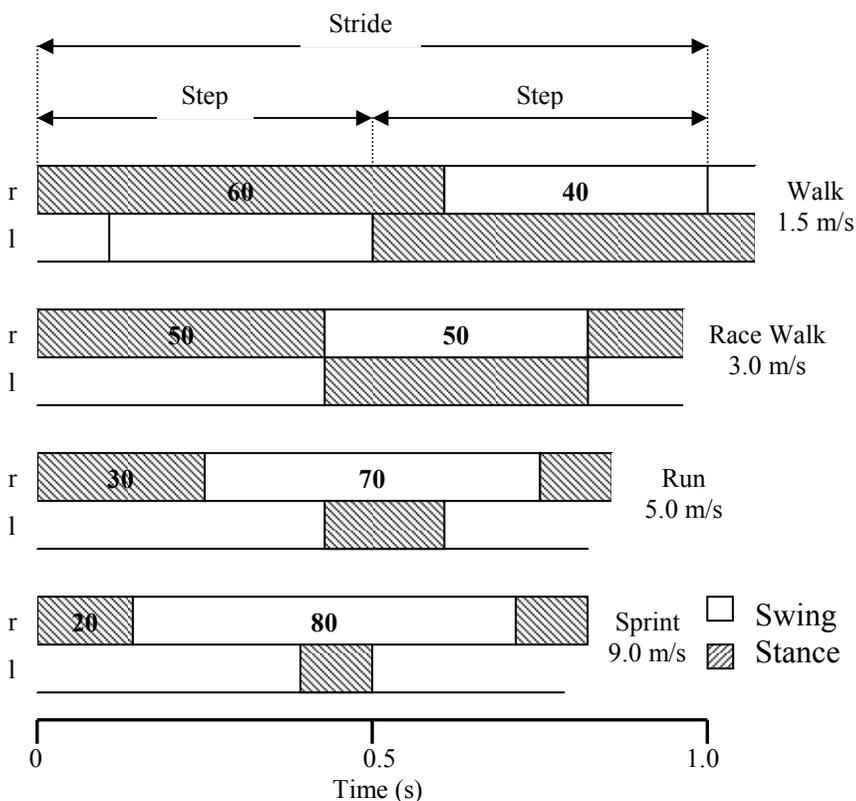


Figure 8.1 Swing and stance phases of walking, running and sprinting (Vaughn 1984: 6)

This diagram also makes clear the distinction between *steps* (which occur between the initial contact of one foot to the initial contact of the opposite foot) versus *strides* (which involve successive points of initial contact of the same foot). A stride is two steps, a complete cycle of all of the movements involved in walking or running. As you can see, in an all-out sprint, most of the time you are in the air: the stance phase occupies 20 per cent of the total stride cycle, while the swing phase takes up the remaining 80 per cent.

How fast do we walk? For both men and women, the range is between 60 and 132 steps per minute, and for both men and women the median rate is 117 steps per minute (this is 512 ms, or close to a classic march tempo). Now men are generally larger than women, especially in terms of height, inseam and foot size. And as a result, the stride length for men is indeed longer. But the stride rate is the same. Men walk faster than women not because their stride is faster, but because their strides are longer. These rates are given in Table 8.2.

Table 8.2 Mean stride analysis variables (Murray et al. 1964, 1970)

	Males	Females
Step Length	79	66
Stride Length	158	132
Steps per minute	117 (60–132)	117 (60–132)
Speed	1.54 m/s	1.31 m/s

Table 8.2 shows that the mean step rate is not far from the maximum step rate (though this maximum is not a hard and fast number, as will be seen below). The mean step rate in a walk is far away from the minimum of 60 steps (that is 30 strides) per minute. A somewhat slower mean preferred walking speed is evident in data presented by Diedrich and Warren Jr. (1995), who found a speed of 1.3 metres per second (averaged across sexes and anthropometric differences). This speed corresponds both to a minimum of energy expenditure for the walker as well as to a step rate around 108 steps per minute (a 550 ms inter-step interval).²

The transition from a walk to a run is of special interest, and it is tricky to pin down for several reasons. First, the timing of this transition depends on both the stride length and the stride rate, and these two parameters are interdependent. Indeed, for this reason, in dynamic systems models of the walk-run transition, a single velocity parameter is used, rather than separate stride length and stride rate parameters (Hanna et al. 2000). Steindler (1955) reported that the walk-run transition occurs around 180 steps per minute (an inter-step interval of 320 ms). More recent research has shown that, as is characteristic of dynamic systems, the walk-run transition exhibits *hysteresis*. That is, the speed of locomotion at the walk-run transition depends on whether you are speeding up from a walk or slowing down from a run. As you might expect, you can hold onto the walking gait as you speed it up, and likewise, you can hold on to a running gait as you slow it down. Thus rather than a specific transition rate, it is better to speak of a range or zone in which the walk-run transition takes place. Diedrich and Warren Jr. (1995)

found the mean transition threshold to be around 2.05–2.17 metres per second, which involved a stride rate of 147–150 steps per minute (that is, inter-step intervals of 410–400 ms), with differences in specific cases depending on direction of transition and individual differences in running speed amongst their subjects.³

Beyond the transition, the fastest runners get their maximum speed by optimizing an increased stride rate with an increased stride length. As can be seen in Figure 8.1, the maximum stride rate for trained runners is about 2 strides (4 steps) per second, or 250 ms per step (240 steps per minute). Untrained runners may employ a slightly higher stride rate (2.3 strides per second, or 220 ms per step), but do not lengthen their stride (and as a result, they do not run as fast). The maximum speed in a sprint is around 9.0 metres per second, more than quadruple the transition speed. Yet our maximum step rate does not even double the transition rates (from 147–150 steps per minute to a maximum of 240–270 steps per minute). While increased speed in a run comes with an increase in stride frequency, it depends principally on covering more ground with each stride.

Table 8.3 summarizes the range of gaits and gait-component timings. Included in this table are the timings for a typical ‘race walk’ (which is a very untypical gait, as the reader may well know) as well as running at a stable or typical rate over and beyond the walk-run transition. Included in Table 8.3 are both step and stride rates. As can be seen, a stable run involves a rough doubling of the step/stride rate for the energetically optimal walk. This suggests that, at least in part, what a run requires is the emergence of a coupled set of stable rhythmic levels – that is, rather than ‘thinking in steps’, the body ‘thinks in strides’. Moreover, it strikes me as highly significant that the running gait stabilizes at an inter-stride interval of around 600 ms, the very same rate which anchors the range of maximum pulse salience.

Table 8.3 Stride and step rates for walking, running and sprinting

Gait	Steps/Minute	Strides/Minute	Speed (metres/sec)
Walk	108	54	1.3
	550 ms interval	1.1 sec. interval	
Walk-Run Transition	147–150	76	2.1
	410–400 ms interval	810 ms interval	
Race Walk	160	80	3.0
	375 ms interval	750 ms interval	
Stable Run	200	100	5.0
	300 ms interval	600 ms interval	
Sprint	240	120	9.0
	250 ms interval	500 ms interval	

Table 8.4 compares significant periodicities for music and gait. In addition to the common significance of the 600 ms periodicity, both music and gait seem to fall within the same speed limits. The fastest step rate in a sprint corresponds to the fastest rate for beat perception. Likewise, the slowest beats seem to correspond to

the slowest possible walking rates. Beyond these admittedly approximate measures of timing similarity, what is perhaps most suggestive is the way both music and running create a rapid sense of motion. As noted above, the fastest running speeds are achieved not by monotonically increasing one's stride rate, but by coupling an increased stride rate with an increased stride length, covering more ground per stride.

Table 8.4 Where is Andante? Comparisons between gait and musical rhythm

Interval Periodicity	Musical Significance	Gait Significance
100 ms 600 events/minute	Minimum duration for an element in a rhythmic pattern	Minimum duration for stance phase in a rapid sprint (?)
200–250 ms 300–240 events/minute	Fastest possible beats; durational threshold for various judgement tasks	Fastest step rate in a sprint
600–700 ms 100–90 events/minute	Indifference interval; attractor tempo in the range of maximal pulse salience	Step rate in stable walk; Stride rate in stable run
1.5–2 seconds 40–30 events/minute	Slowest possible beats	Slowest walking rate (?)

At the same time, as can be seen from Tables 8.3 and 8.4, in a moderate to rapid run, the periodicity that had been characteristic of steps becomes characteristic of strides. In musical terms, while *andante* or *moderato* involves a periodicity near the 600 ms preferred tempo rate, an *allegro* involves this periodicity coupled with not just one, but several underlying levels of more rapid motion. So instead of ‘thinking in beats’, we think in ‘downbeats’ (as the beat and downbeat rates become roughly commensurate). Example 8.1, the opening bars of the final movement of Tchaikovsky’s Violin Concerto, are a good example of this. This melody (marked *Allegro vivacissimo*) is played with semiquavers at or even beyond the 100 ms ‘speed limit’ for rhythm (Heifetz, for example, plays some of the figures with semiquavers as short as 70–75 ms!). At these intervals, the nominal (crotchet) beat IOI is around 350–400 ms and the downbeat IOI is 700–800 ms. The overwhelming sense of speed comes not merely from the rapid rate of the crotchet layer of pulses, but from (a) the presence of two additional layers of subdivision below the crotchet level, and (b) at very rapid tempi, a blurring of the semiquaver durations and articulations as they get below 100 ms. In both a run and an *allegro*, there is a stable high-level periodicity (of the stride in a run, of the measure or half-measure in music) with several layers below (steps and smaller components of the gait cycle, subdivisions of the beat). As Epstein observed, our sense of tempo is projected ‘as a consequence of the sum of all factors within a piece – the overall sense of a work’s themes, rhythms, articulations, “breathing”, motion, harmonic progressions, tonal movement, contrapuntal activity. Yet tempo [...] is a reduction of this complex Gestalt into the element of speed per se’ (1995: 99).



Example 8.1 Tchaikovsky, Violin Concerto in D Major, Op. 35, III, bars 1–5

How fast, then, is *andante*? I can offer a tentative answer, one that may be confirmed (or not) through empirical research. If the kinematic data is relevant, as it seems to be, and thus a good guide, then the *andante-allegro* transition should occur around 140–150 bpm, that is, at about the same rate as the walk-run transition. Inter-subject variation in perceived tempo transition may be related to their personal walk-run transition characteristics (based on physiognomy, physical training and so forth). More precisely, the *andante-allegro* transition should occur when a slower (but not too slow) level of metre emerges (around 75–80 beats per minute) as a more rapid level increases in tempo. This emergence would also require the presence of a level of even more rapid subdivision (in the 200–250 ms range). If the parallels between gait and musical tempo are really strong, then our sense of tempo change should follow the behaviour of other dynamic systems, such that (a) we should experience an abrupt sense of tempo transition even though the underlying IOIs may be changing incrementally and continuously, and (b) the location of the tempo change should depend on whether one is going fast-to-slow versus slow-to-fast (a hysteresis effect (Vos et al. 1997)).

Coda: Not all ‘Musical Gestures’ are ‘Musical’ Gestures

The intimate connections between kinematics and musical rhythm may have further implications than just our sense of motion and tempo change. If the limits on our temporal, perceptual and sensorimotor coordination serve to circumscribe the limits of musical metre and rhythm, then they also stake out the limits of musical gesture. If this is so, then not all musical gestures are really ‘musical’.

Consider the complaint one often hears (though perhaps not as often as in years past) that a certain piece of modern music ‘simply is not music’. This disparagement does not merely apply to works of sonic collage made from various non-musical sounds (pitched or unpitched); these criticisms are heard in connection with newly composed string quartets, piano sonatas and symphonies. The sounds one hears are musical enough – sounds produced by highly trained musicians on the traditional instruments of Western art music. The problem, for these listeners, lies with the arrangement and order of those sounds. Here is an example, the opening bars of Milton Babbitt’s *Composition for Twelve Instruments* (1948) (Example 8.2).

Composition for Twelve Instruments
I

Milton Babbitt

The musical score is for a twelve-instrument ensemble. It features overlapping instrumental entries. The instruments and their parts are: Harp (top staff), Oboe (mf), Violin (3/4 time signature, f to mf), Horn (pp), Trumpet (mp to ff), Bass (pizz., mp), Celesta (mf), and Cello (mf to mp). The tempo is marked as quarter note = 84. The score shows a complex, aperiodic rhythmic structure with various dynamics and articulations.

Example 8.2 Milton Babbitt, *Composition for Twelve Instruments, I*, bars 1–5

While some of the instrumental entries overlap, creating clusters of notes and instruments, there is no discernible pulse nor any sustained line. Rather, there is an aperiodic flitting from note to note, from instrument to instrument, from cluster to cluster. A negative reaction to this music, and other works like it is not simply musical philistinism. Such reactions are borne out of a deep sense of how musical gestures are (and are not) supposed to go. As Susanne Langer has noted (1953: 116–17):

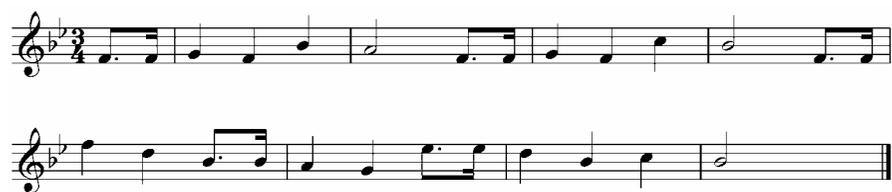
The essence of all composition – tonal or atonal, vocal or instrumental, even purely percussive, if you will – is the semblance of *organic* movement, the illusion of an indivisible whole. [...] The essence of rhythm is the preparation of a new event by the ending of a previous one. A person who moves rhythmically need not repeat a single motion exactly. His movements, however, must be complete gestures, so that one can sense a beginning, intent, and consummation, and see in the last stage of one the condition and indeed the rise of another.

Likewise Roger Scruton has described our engagement with and understanding of musical tones this way (1997: 76):

The phenomenal space and phenomenal time of music are matched by the phenomenal causality that orders the musical work. [...] But it should be added that the causality that binds tone to tone in music is not the dead causality of a machine, but the causality of life, whose principal manifestation, for us, is in the world of human action. The notes in music follow one another like bodily movements – with a causality that makes immediate sense to us, even though the *how* of it lies deep in the nature of things and hidden from view. [...] A tone is heard as the *response* to its predecessor, as tending towards its successor, as continuing an action which makes sense as a whole.

Scruton amplifies Langer's characterization of musical rhythm as akin to organic movement, and he makes its relation clearer: the notes in a musical gesture are analogous to the elements in a motor sequence ('in the world of human action'). The problem with passages like the one that opens Babbitt's *Composition for Twelve Instruments* is that they fail to create this impression of movement; instead, the effect is that of stasis, with each cluster of tones merely succeeding each other, without any sense of 'beginning, intent, and consummation'. We just do not move like that, nor can we hear ourselves (or others) doing so.

Notation also plays a role in the projection and our construal of coherent rhythms. Consider the following example, which is 'Happy Birthday' (a) notated in a straightforward manner, versus (b) the same pattern of tones, but notated in a metrically complex context and with staccato articulation (Example 8.3).



(a)



(b)

**Example 8.3 'Happy Birthday' in (a) metrically simple notation;
(b) metrically complex notation**

In the latter case, it is almost impossible to 'hear' the simple tune from this score in either silent listening or performance (indeed, notice that at least for the performers, the rhythmic figures are, if anything, more coherent in Babbitt's piece). Thus it is possible to engage arhythmically with an otherwise regular pattern of tones.

It should come as no surprise, then, that the limits on the perception and production of musical rhythm are strongly tied to the limits of our sensorimotor system(s), and to ways in which we can generate as well as characterize (i.e., a walk versus a run) coherent movement sequences. Indeed, as Todd (1995, 1999) has argued, it is this sensorimotor engagement which gives rise to our sense of

rhythm-as-motion. This perceived motion, importantly, is precisely one which affords our sympathetic movement, as we can imagine ourselves moving in a similar manner. When we have sympathetic movement, whether it is actual, when we tap our feet or dance, or merely imagined, we have musical gesture. But the range of musical rhythm is not just a range of possible bodily motions – we can, to be sure, twitch faster, or forcibly walk slower. Though we might well call herky-jerky motions ‘gestures’, we would not call them *rhythmic* gestures, for we would not perceive in them musical qualities. While we can observe such movements, we cannot sympathetically move with them.

One may thus frame an argument about ‘musical gestures’ that goes something like this. First, if something is ‘musical’ it is ‘rhythmic’, as ‘being rhythmic’ is one of the fundamental tenets of musicality. To say that someone plays ‘arhythmically’ is, for all practical purposes, to say that they are unmusical. What, then, does ‘rhythmic’ mean? Whether continuous (as in an ongoing phrase or ostinato), or just a short, isolated figure, rhythmic means ‘having a discernable temporal pattern’. That is, first of all, as a pattern, something that is rhythmic involves more than a single sound – at least two sounds, and typically more. In order for a pattern to be *discernable*, it has to be comprised of durations that we are capable of grasping and relating to each other, which means that its component durations must fall within the range of our perceptual and cognitive faculties for rhythm (in other words, within the range of 100 ms to 2 seconds). These durations must be organized so that they form a coherent group. In addition, a sense of pattern is enhanced if the series of durations affords (or at least has the potential to afford) the listener a sense of pulse or metre.

And so the problem is this: not all musical passages present a discernable rhythmic pattern that affords sympathetic movement. In addition to Babbitt’s *Composition for Twelve Instruments*, there are melodies composed of very long, sustained tones, passages filled with very rapid glissandi, trills, tremolandi and so forth (though while trills are indeed characteristically musical sounds, I would argue that they create a sort of timbral rather than a rhythmic effect: rhythmically, they are a blur, while timbrally they are akin to vibrato, ornamenting longer or slower moving tones). While we can hear these melodies and passages as comprised of musical sounds, we cannot move with them. If we cannot move with them, they are not rhythmic, and if they are not rhythmic (in the sense laid out above), then they are unmusical. Thus, while they may be, by definition, ‘musical gestures’, they are not, in some very deep sense, ‘musical’ gestures.

Acknowledgements

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Notes

1. For a more extensive discussion of these limits, as well as their cross-cultural manifestations, see London (2002, 2004). It should also be noted that these limits vary from person to person and from context to context. Nonetheless, they are 'robust averages' that give us a good idea of the typical range of human rhythmic behaviour.

2. How fast do we march? If a march is at 120 beats per minute (one step per beat), then the step rate is only a bit faster than the mean rate for walking – 120 (which is one half-second/500 ms per step). The standard pace is 8 steps for every five yards (5 yards = 4.55 metres). If each step covers 0.569 metres, then marching speed is about 1.14 metres per second – in other words, a march is slower than the median walking pace. Now when we speak of marching, there is that sense of inevitability about it – perhaps due to associations with armies marching into battle – motionwise, a sense of great inertia. But this may be more due to our sense of mass (literally, a mass gathering of people moving together) rather than velocity at which the mass is moving.

3. This is somewhat slower than Steindler's work, but it also not clear whether Steindler measured the walk-run threshold per se, or a slightly higher rate at which his subjects were unequivocally running.

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Chapter 9

Supporting Gestures: Breathing in Piano Performance

Elaine King

Breathing is fundamentally an involuntary action. Yet wind players and singers are likely to attend to their breathing in rehearsal, not least to work out when to breathe in accordance with the pacing and shaping of musical lines. Pianists, however, present a particularly interesting case study because, unlike singers or wind players, they do not depend directly on their breath to produce their sound and, therefore, do not necessarily need to consider when to breathe in order to play a piece of music. Nevertheless, like all human beings, pianists do need to breathe and they could be made aware of breathing in pedagogical situations and in the act of interpretation. For example, a pianist might consciously inhale before placing a chord at the start of a piece, or exhale as the final note of a phrase is delivered. A pilot study was carried out so as to gain preliminary insight into pianists' breathing patterns in Western music performance. In particular, the study examined the correspondence between pianists' breathing rates and musical tempo as well as the consistency of inhalation and exhalation patterns across repeat performances in relation to music-structural gestures (as informed by a broadly analytical reading of the score) and physical movements. The findings will be reported below after discussion of relevant issues and related research.

Existing research provides valuable insight into the importance of breathing for music performers and its function in supporting instrumentalists (including singers). A substantial body of literature concentrates on the teaching of breathing techniques for wind players and singers, while a sizeable collection of pedagogical studies highlight the role of breathing in interpretation.¹ The idea of 'breathing between phrases' is often suggested by teachers as a way of helping non-wind players to pace their realization of a musical line which might otherwise sound too hurried, or suffocated (this does not necessarily mean that breathing actually occurs between phrases). To this end, Kendall Taylor reminds pianists that rests are important as 'music must have air and must breathe' (1981: 157). In drawing a parallel with speech, William Pleeth points out that 'there will always be a logic to the way we breathe and articulate which is related to, and enhances, the meaning of the words we are speaking' (1992: 56). He urges instrumentalists to consider this 'logic' in music performance and suggests that breathing should be intimately related to the delivery of musical gestures. Similarly, Stefan Reid encourages performers to listen to good singers in order to develop 'effective

melodic performance', and hence to absorb information about breathing and phrasing music (2002: 107). For pianists, therefore, breathing might be considered as a part of the interpretative process, such as when speech or singing is used as a metaphor for playing the piano, and in certain instances, it might arise voluntarily.²

There is also a growing number of studies which draw attention to the effects of performance anxiety on breathing and the potential benefits of undertaking practices such as Yoga, Pilates and Alexander Technique. Most of these practices promote awareness of breathing, relaxation and posture, and recent research confirms that training in Alexander technique can 'improve respiratory function' (among other things) in performance (Valentine 2002: 191). Attention to breathing is often seen by pedagogues as a way of relieving anxiety; for example, Taylor advises pianists who produce grunting noises when playing 'to decide on specific breathing-places for passages which cause the undesirable throat-tension' (1981: 150), which also indicates how breathing might sometimes occur as a voluntary (conscious) action. Other scientific studies have focused on the measurement of physiological aspects of respiratory behaviour, primarily using singers and wind players, in order to gain insight into how musicians breathe in performance.³

Of immediate interest, however, is research on breathing in non-wind contexts, yet there is little empirical evidence in this domain, especially about keyboard players.⁴ Indeed, the study of pianists' breathing is perhaps a less obvious choice of subject than breathing by singers or wind players, although it is arguably none the less intriguing. There are complex issues to address, including the influence of musical training, performance experience (in solo and accompaniment/ensemble work), performance anxiety, personal fitness and physical stamina on breathing, as well as specific considerations, such as the regularity and consistency of pianists' breathing, and how it functions in relation to or in support of physical movements, phrasing, tempo and musical gestures. In the pilot study documented below, which only focuses on some of these issues, additional concerns and questions will be raised in the light of the findings which further expose the complexity of the subject matter. Prior to discussion of this work, however, three areas of enquiry will be examined which provide a useful backdrop to the ensuing study and help contextualize the approach.

Respiratory Rhythm in Violin Performance

Ottó Szende and Mihály Nemessuri's seminal text on *The Physiology of Violin Playing* (1971) provides one of the first detailed accounts of 'respiratory rhythm' in non-wind performance.⁵ They investigate a three-way relationship between respiration, 'musical message' (i.e. interpretation) and motor activity (specifically violinists' bow strokes). They found that in performances of Bach's Minuet for Solo Violin from Suite No. 6, 80.6 per cent of the violinists' upbows coincided with inspiration, while musically accentuated notes and cadences were accompanied by expiration (: 103). This led to the conclusion that the musical interpretation itself does not demand a conscious expiration at these points, rather

that violinists typically perform the ends of strong cadences with downbows as they are gravitationally heavier, so ‘it is the motor activity, and the respiratory pattern associated with it, in which the musical conception is expressed during the performance’ (: 102). They believe that there is a close relationship between musical interpretation and motor activity, yet they claim that it is impossible for a performer to ‘exert a deliberate, direct influence on respiratory rhythm while playing’ (: 102). This begs the question as to whether or not pianists might associate (consciously or unconsciously) certain physical movements with respiratory patterns in accordance with the musical conception, such as inspirations with forward body sway at the start of a phrase.

Szende and Nemessuri argue that inspirations could be ‘ingrained’ during practice as ‘dynamic stereotypes’. Through comparison of violinists’ respiratory patterns in performances of contrasting pieces of music, they report that ‘in being engaged in a trained process of motion, the subjects developed a respiratory pattern that matched this process, the tendency of which was perhaps modified but not altered by the compositions’ (: 110). Although the authors do not comment on how breathing affected the duration of up- or downbows, or the placing of downbeats, the sense of developing a respiratory pattern and ‘ingraining’ the way in which we breathe when realizing a piece of music does help to explain how breathing might support performers. Indeed, if breathing patterns are ingrained and reproduced across performances of the same (or different) pieces, then the development of respiratory rhythm is an important (albeit sometimes unconscious) part of the preparation of a musical work for wind and non-wind players alike.

Physical Movements in Piano Performance

Jane Davidson’s empirical research on musicians’ body movements provides valuable information about the role of physical gestures in performance, especially the type of movements produced by pianists. In her study of a solo pianist’s body movements (1991), she observed how physical gestures, including global body sway emanating from the hips (the ‘centre of moment’) and localized head and hand movements, helped listeners to perceive the pianist’s performance manner (deadpan, projected or exaggerated). She also noted that these physical gestures were flexible in that they could vary from performance to performance, yet there was consistency in the timing of gestures at specific points in a piece (such as at a phrase boundary or climax (Davidson 2002: 146–7)).

In a later study with Eric Clarke (Clarke & Davidson 1998), the body movements of a pianist were monitored in two performances of Chopin’s Prelude Op. 28, No. 4 and evaluated in the context of a structural analysis of the work and the pianist’s expressive realization of the music. Although the pianist’s respiratory behaviour was not considered in their study, the results highlighted the relationship between physical, expressive and music-structural parameters of performance: it was noted, for example, that the pianist produced a ‘more continuous and regular pattern of body sway’ (: 85) in the first performance than the second, and this

seemed to be consistent with a 'more surface reading of the music' (: 86). In observing the occurrence of discrete 'expressive [physical] gestures' in these performances, such as head nods, Clarke and Davidson claim that such gestures seemed to define local features of the music, although their relationship with the pianist's body sway was not straightforward (: 88). Clarke and Davidson conclude that musical structure and body movement are 'co-determining features' (: 88) of a performance insofar as the latter can determine the former, and vice versa. This point resonates with Szende and Nemessuri's earlier claim that there is a close relationship between motor activity (i.e. violinists' bowing movements) and musical conception, although they do not go as far as to say that these features are co-determining. Either way, what role does breathing play in the equation – does it influence these features, and if so, to what extent?

Clarke and Davidson also point out that 'gesture and physicality' (: 89) are integral to specifying the character of a performance. The terms 'gesture' and 'physicality' usefully help to distinguish between bodily movements in performance that are gestures (i.e. actions that express something) and ones that are not. Interestingly, they separate 'body sway' from 'expressive gestures' in their analyses, thus implying that body sway represents physicality, less gesture. Nevertheless, they note that body sway performed an 'intuitive time-keeping role' and a 'linking function' across phrase boundaries in these performances, which suggests that the sway itself was meaningful – it was a kind of gesture. In the study detailed below, pianists' physical actions will be referred to more broadly as movements, rather than as gestures, so the former is seen to encompass the latter.⁶

Physical and Musical Gestures in Piano Performance

In her pedagogical work on movement and performance, especially for pianists, Alexandra Pierce (2003) carefully describes how the body should move in order to express 'inwardly imagined music'. She defines four movement principles which effectively help the performer to produce 'good' tone qualities and appropriate musical gestures: 'balancing' posture, 'grounding' body weight, 'releasing' shoulder and arm tension and using 'weight throw' to support playing action. Here, a causal relationship between physical and musical gestures is implied, although I would contend that these gestures are interdependent. Pierce also uses the metaphor of 'reverberation' to encourage performers to become aware of the 'juncture' between phrases in musical works. Juncture is reflected in three stages – ending the first phrase, stillness, and beginning the next phrase – and reverberation arises when physical motion continues through the juncture and the stillness of playing action. She notes that similar junctures are embodied in the breath cycle (inhalation-climax-exhalation) as an equivalent point of stillness arises after exhalation. If a person becomes aware of the junctures between cycles, fuller breaths can emerge involuntarily, thereby reflecting how reverberation creates space.

This idea translates into performance as awareness of junctures between musical phrases can give rise to a less stifled interpretation: Pierce argues that

‘performers *desire* this [fuller] breathing quality, yet often cannot hear when they lack it, nor do they know how to find it’. If junctures in breathing and phrasing are similar, this helps to explain why the idea of ‘breathing between phrases’ can serve as a useful aid for performers in developing interpretation.

Pilot Study: Breathing in Piano Performance

Thus far, it has been suggested that breathing could be ‘ingrained’ by musicians in performance and associated with certain physical movements (Szendé & Nemessuri 1971). Furthermore, physical movements and musical gestures are intimately linked, perhaps causally related (Pierce 2003) or co-determined by the musical structure (Clarke & Davidson 1998). The purpose of this pilot study was to monitor pianists’ breathing in relation to musical tempo, music-structural gestures and physical movements so as to further investigate these lines of thought. It was hypothesized that there would be a consistent relationship between a pianist’s breathing rate and the tempo of a work, and that patterns of inhalation and exhalation would consistently correspond at phrase junctures and in supporting the production of recurrent physical movements across repeat performances.

The study focused on two professional pianists (Ann and Peter), both of whom were aged over 60 and had more than forty years of experience in solo and ensemble performance. At the same time, one advanced student pianist (Stephanie) participated so as to enable comparison with a younger, less experienced player: Stephanie was aged 22 and had four years of intensive training as a performer whilst studying music at university. The decision to use a small pool of subjects was made because of the preliminary nature of the enquiry, yet also to enable in-depth analysis of individual pianists from similar and different backgrounds. It is acknowledged that a larger-scale study is required in order to develop these initial findings and to obtain a more representative set of data.

The pianists were asked to learn and subsequently perform three contrasting pieces of music: Bach’s two-part Invention No. 8 in F Major BWV 779; the second movement of Beethoven’s Sonata in C Minor, Op. 13 ‘Pathétique’ (*Adagio cantabile*); and the second movement of Poulenc’s *Mouvements Perpétuels (Très modéré)*. They were asked to perform each piece twice (in succession) during one session, and no instructions were given about whether or not the second performance should be consistent with or different to the first. The experimental design enabled comparison between performances of the same piece by each pianist as well as across different pieces selected for their varying speeds and styles.

After the performances, informal discussion took place with each pianist to ascertain if they had any formal training in Yoga, Alexander Technique or related practices, and if they were aware of their breathing during these performances (or in preparation of these pieces). All of the pianists declared that they were unaware of their breathing and they did not consider it at any stage of their practice. Moreover, they emphatically remarked that they were never conscious of their breathing in performance, not least because ‘there are so many

other things to think about' (Ann). In effect, breathing was perceived to be an entirely unconscious, involuntary activity for each pianist. With regard to their training, Ann received two years of tuition in Yoga around the age of 30 and attended a course in Alexander Technique, although she mentioned that this focused primarily on the mind, less physical practice. She felt that her training in Yoga made her aware of how to breathe 'deeply' and this influenced her generally as well as in her piano playing. Stephanie received some lessons in Alexander Technique, although she felt that more training was needed for the ideas to be incorporated into her musical practice, and Peter had not been exposed to any tuition of this nature.

During the study, the pianists performed on a Yamaha Disklavier grand piano and a video camera was positioned in the place of an audience to capture their right-side profile. Their breathing patterns were monitored using a portable ergospirometer, which was capable of reporting a range of respiratory functions.⁷ For the purpose of this study, the primary measures were the timing of inspirations and expirations during a performance, and these were matched with the MIDI timing of musical note onsets. The pianists' breath patterns were plotted onto the musical score for ease of analysis along with physical movements, which were recorded by two independent researchers through repeated observation of the videotaped performances. Music-structural gestures were determined through analysis of the score and performance tempi were calculated using the MIDI data and a metronome. The findings of this study will be discussed below in three sections as breathing is considered in relation to tempo, music-structural gestures and physical movements respectively. In the first instance, however, a brief description of each piece will be provided.

The Three Pieces

Bach's Invention is 34 bars long and through-composed (bars 1–4 are shown in Example 9.1). There is one main phrase juncture in the piece which occurs at bar 12 when the music cadences in the dominant key. Thereafter, it progresses through various keys with different sequential patterns until finally returning to the tonic key at the end.

Beethoven's *Adagio cantabile* is in simple rondo form and, according to Denis Matthews, the lyrical opening theme offers 'direct emotional appeal' (1967: 21). The theme is a regular four-bar antecedent and consequent phrase and it is repeated with textural and rhythmic developments (bars 1–4 are shown in Example 9.2). The first episode is twelve bars long and features a soaring and decorative melody, while the central episode, in the tonic minor, is fourteen bars long and introduces a seemingly agitated triplet accompaniment. The movement ends with an eight-bar coda. There are ten main phrases in the piece and the analysis below focuses on the pianists' breathing patterns at each of these junctures.



Example 9.1 Bach, Two-part Invention in F Major, BWV 779, bars 1–4 [Bach-Gesellschaft, New York: Dover 1970]

Adagio cantabile

Example 9.2 Beethoven, Piano Sonata in C Minor, Op. 13 ‘Pathétique’, II (*Adagio cantabile*), bars 1–4 [G. Henle Verlag, München 1952/1980]

The second of Poulenc’s *Mouvements Perpétuels* is fourteen bars in length and comprises seven two-bar phrases, each of which provides a varied repetition of the first (Example 9.3). The music has a modal quality and contains a distinct chromatic motive. The upper and lower voice parts work in contrary motion throughout and there is a sense of perpetual expansion as the lines open out in range. There is a turning point at bar 11 as the momentum changes: the voice parts shift into similar motion and the phrase length is extended. The opening statement returns in the final phrase, but it peters out into a pseudo cadence which brings the movement to a quirky close.

Très modéré (♩ = 92)

Example 9.3 Poulenc, *Mouvements Perpétuels*, II (*Très modéré*), bars 1–2 [Chester Music, London 1919/1990]

Breathing and Tempo

A breath-beat ratio was worked out for each pianist across each performance in order to show whether or not there was a correspondence between breathing and main tempo:⁸ the average length of the pianist's breath cycle (inhalation plus exhalation) was calculated along with the average length of each beat, then a ratio expressed accordingly (Table 9.1).

Table 9.1 Ratio between main tempo and breathing for each pianist across both performances (1 and 2) of each piece. The ratio is expressed as '1 breath cycle to x beats'. The tempo is shown in beats per minute (BPM) and with a metronome mark (MM)

Pianist	Piece & Perf.	Ratio (BPM/ MM)	Piece & Perf.	Ratio (BPM/ MM)	Piece & Perf.	Ratio (BPM/ MM)
Ann	Bach 1	1 : 1.8 (38, $\theta = 114$)	Beethoven 1	1 : 1.5 (32, $\epsilon = 64$)	Poulenc 1	1 : 2.7 (54, $\theta = 54$)
	Bach 2	1 : 1.8 (38, $\theta = 114$)	Beethoven 2	1 : 1.6 (34, $\epsilon = 68$)	Poulenc 2	1 : 2.5 (52, $\theta = 54$)
Peter	Bach 1	1 : 3.3 (41, $\theta = 122$)	Beethoven 1	1 : 1.6 (31, $\epsilon = 62$)	Poulenc 1	1 : 2.9 (71, $\theta = 71$)
	Bach 2	1 : 3.5 (42, $\theta = 126$)	Beethoven 2	1 : 1.6 (31, $\epsilon = 62$)	Poulenc 2	1 : 3.6 (72, $\theta = 72$)
Steph	Bach 1	1 : 0.9 (29, $\theta = 88$)	Beethoven 1	1 : 1.2 (32, $\epsilon = 64$)	Poulenc 1	1 : 1.8 (54, $\theta = 54$)
	Bach 2	1 : 0.9 (30, $\theta = 90$)	Beethoven 2	1 : 1.2 (33, $\epsilon = 66$)	Poulenc 2	1 : 1.9 (55, $\theta = 55$)

The data show that the breath-beat ratios were highly consistent across repeat performances of the same piece for each individual (with the exception of Peter's performances of the Poulenc). For example, in her two performances of Bach's Invention, Ann took (on average) one breath (inhalation plus exhalation) every 1.8 beats, while Stephanie took (on average) one breath for every 0.9 beats. Peter also produced a consistent temporal ratio of one breath to approximately every three beats. The differences between the pianists' breath-beat ratios arose because of the varying average lengths of their individual breath cycles during performance (Table 9.2) and their chosen tempi. For the Bach, there were notable differences between the pianists' choices of main tempi: Peter adopted a faster

speed than Ann, while Stephanie chose a comparatively slow pulse. The informal discussion with each pianist revealed that technical and musical decisions influenced their different choices of tempi. Peter indicated that he wished to convey a *cantabile* effect in his performance of the Invention, and so he aimed to produce a lyrical line with a distinctive one-in-a-bar feel. Ann's performance was 'stately' in character, while Stephanie admitted that technical limitations influenced her chosen (slower) tempo.

Table 9.2 Mean length (in seconds) of breath cycle (inhalation plus exhalation) for each pianist across both performances (1 and 2) of each piece

Pianist	Piece/ Perf.	Mean b-cycle (secs)	Piece/ Perf.	Mean b-cycle (secs)	Piece/ Perf.	Mean b-cycle (secs)
Ann	Bach 1	2.85	Beethoven 1	2.89	Poulenc 1	2.91
	Bach 2	2.73	Beethoven 2	2.9	Poulenc 2	2.86
Peter	Bach 1	4.85	Beethoven 1	3.05	Poulenc 1	2.43
	Bach 2	4.98	Beethoven 2	3.08	Poulenc 2	2.97
Steph	Bach 1	1.77	Beethoven 1	2.18	Poulenc 1	2.07
	Bach 2	1.74	Beethoven 2	2.2	Poulenc 2	2.07

Interestingly, all of the pianists produced very similar tempi in their performances of Beethoven's *Adagio cantabile* (ranging from 31 to 34 beats per minute), and the breath-beat ratios for Peter and Ann were nearly identical (Table 9.1). Stephanie's breathing rate, however, was relatively quick, albeit consistent across her performances. In fact, her breath cycles were quicker than Peter's and Ann's across all of her performances as she tended to breathe faster than they did (Table 9.2). This begs the question as to the influence of experience, age and anxiety levels on performance (and the quality of performance), although consideration of these measures was beyond the scope of this study. Also, it raises the question of the relative length of the pianists' 'normal' breath rates: their breath cycles were measured at rest (before and after playing) and they were similar, reflecting the average human base rate of 15 breath cycles per minute (or 4 seconds per cycle). In the majority of the performances, therefore, the pianists' breathing rates were comparatively higher or faster than the base rate, some more so than others. Of further interest is the fact that Ann's breath cycles were relatively consistent in length across all of her performances, ranging from 2.73 seconds (Bach) to 2.91 seconds (Poulenc). By contrast, the average length of Peter's breath cycles varied across his performances from 2.43 seconds (Poulenc) to 4.85 seconds (Bach), and Stephanie's from 1.74 seconds (Bach) to 2.2 seconds (Beethoven (Table 9.2)).

In general, the data indicate that for each pianist there was a consistent relationship between breathing rate and main tempo in successive performances of the same piece. However, there was neither a common breath rate for a particular tempo, nor a common breath-beat ratio for a specific piece of music. It is plausible to suggest, therefore, that respiratory rhythm is developed at different levels for each pianist, such as at a 'performance-session' level (when breathing is consistent across performances of the same and different pieces given on one occasion, as exemplified by Ann) and a 'piece-specific' level (when breathing is consistent across performances of the same piece on one occasion, as shown by Peter and Stephanie), although these levels could be conceived more broadly if data were collated on different days, in varying performance conditions and with alternative genres. In addition, the affect of anxiety (psychological and physiological) on breathing and its relationship to these suggested levels of respiratory rhythm could be factored into future research (for example, these data suggest that Stephanie was the most anxious of the three pianists because her breath cycles were the fastest, but it is not possible to determine the extent to which her nervousness affected the speed and regularity of her breath cycles, if at all).

Breathing and Music-Structural Gestures

The data were carefully analysed so as to determine the relationship between the pianists' breathing patterns and music-structural gestures, specifically the phrases articulated across repeat performances of the three pieces. A summary of the main findings is shown in Table 9.3 and key points are highlighted below. Particular attention is given here to the type of breaths (inhalation or exhalation) and timing of breaths executed in relation to the opening and closing notes of the piece, the beginning and ending of phrases, and in phrase junctures. Reference will be made to breathing patterns mid-phrase where relevant to this discussion.

Ann consistently breathed *before* the first downbeat or start of play, although the type of breath varied across different pieces and different performances (for the Bach and Beethoven, she produced the same kind of breath at the start and close of each performance (Table 9.3)). Her breath cycles were steady and, for the Bach and Beethoven, there were similarities in her breathing at the start and end of phrases: in the Bach, her breathing around the main phrase juncture corresponded closely in the two performances as she inspired at the phrase end (bar 12) and through the anacrusis before exhaling around the downbeat of the new phrase at bar 13 (Example 9.4); in the Beethoven, she tended to inhale at the start of phrases and exhale at the end of them (breaths occurred through each phrase too). Here, the juncture between breath cycles normally occurred *before* the juncture between phrases. Curiously, Ann's breathing patterns were less consistent in the Poulenc: the timing of some breaths was similar during phrases, but the type of breath differed. There was, however, one striking consistency in the timing of breaths at the turning point in the movement (bars 10–11): the phrase juncture was elongated in both performances as the last beat of bar 10 was lengthened and Ann took a breath in the juncture prior to the downbeat of bar 11 (Example 9.5).

Table 9.3 Summary of breathing data in relation to phrasing. Column 1 indicates the pianist, piece and performance (1 or 2). Columns 2 and 3 show the timing (*: before downbeat; +: on downbeat, **: during note) and type of breath (I: inhalation; E: exhalation) at the start and end of performances. Columns 4 and 5 show the breathing at the beginning and ending of phrases across the piece (per cent type of breaths is given where no specific bar is indicated). The average number of breaths per bar is given in Column 6

1. Pianist/ Performance	2. Start	3. End	4. Breath type: Phrase begin	5. Breath type: Phrase end	6. Breaths Per bar
ANN					
Bach 1	E*	I+	Bar 13: E*	Bar 12: I*	1–2
Bach 2	E*	I+	Bar 13: E+	Bar 12: I+	1–2
Beethoven 1	I*	E+	I (70%)	E (90%)	2–3
Beethoven 2	I*	E+	I (70%)	E (90%)	2–3
Poulenc 1	I*	E*	I (57%)	I (71%)	3–4
Poulenc 2	E*	I*	I (57%)	E (71%)	3–4
PETER					
Bach 1	I*	E*	Bar 13: I+	Bar 12: E*	0–1
Bach 2	I*	E*	Bar 13: E*	Bar 12: I*	0–2
Beethoven 1	I*	I+	E (70%)	I (60%)	3
Beethoven 2	E*	E*	E (70%)	I/E (50%)	3
Poulenc 1	I*	I+	E (86%)	I (71%)	2–3
Poulenc 2	E*	E+	I (57%)	E (100%)	1–3
STEPHANIE					
Bach 1	I*	I*	Bar 13: E**	Bar 12: I+	2–3
Bach 2	I*	E*	Bar 13: E**	Bar 12: I*	2–3
Beethoven 1	I*	E*	E (60%)	I/E (50%)	3–5
Beethoven 2	I*	E*	I (60%)	I/E (50%)	3–5
Poulenc 1	I*	I**	I (86%)	E (86%)	4–5
Poulenc 2	I*	I*	I (71%)	E (86%)	4–5

The image shows a musical score for three measures of Bach's Invention. The score is written for two staves: the top staff is labeled '1st:' and the bottom staff is labeled '2nd:'. Between the two staves, there are two rows of breathing markers: 'E' for exhalation and 'I' for inhalation. The first measure shows 'E' on the 1st staff and 'E' on the 2nd staff. The second measure shows 'I' on the 1st staff and 'I' on the 2nd staff. The third measure shows 'I' on the 1st staff and 'I' on the 2nd staff. The music consists of eighth and sixteenth notes in a treble clef with a key signature of one flat.

Example 9.4 Bach, *Invention*, bars 11–13. The sequence of Ann’s breathing (I: inhalation; E: exhalation) is shown between the staves for both performances (1 and 2)

The image shows a musical score for two measures of Poulenc's Mouvements Perpetués, II. The score is written for two staves: the top staff is labeled '1st:' and the bottom staff is labeled '2nd:'. Between the two staves, there are two rows of breathing markers: 'E' for exhalation and 'I' for inhalation. The first measure shows 'E' on the 1st staff and 'E' on the 2nd staff. The second measure shows 'I' on the 1st staff and 'I' on the 2nd staff. The music consists of eighth and sixteenth notes in a treble clef with a key signature of one flat. The second measure is marked 'pp' and '2 Pédales (légèrement timbré)'. The time signature is 6/4.

Example 9.5 Poulenc, *Mouvements Perpetués, II*, bars 10–11. The sequence of Ann’s breathing (I: inhalation; E: exhalation) is shown between the staves for both performances (1 and 2)

Like Ann, Peter always breathed before the first downbeat or start of play, but the type of breath differed across performances (Table 9.3). In general, he began exhaling at the starts of phrases. Peter adopted a relatively fast tempo in both performances of Bach’s *Invention*, which reflected his desire to achieve a *cantabile* effect (hence one-in-a-bar pulse). In these performances, his breath cycles were long and quite irregular. Of particular interest was his breathing in the second half of the piece: he indicated that he found the passage at bars 14–20 ‘tricky’ and, on both occasions, he exhaled slowly across it (from bars 14–21 in the first performance and bars 15–25 in the second). These expirations lasted 10.8 and 13.6 seconds respectively (this clearly influenced the calculation of his average breath cycle). Similarly, in the central ‘agitated’ episode of the Beethoven, Peter took longer and less regular breaths (a quicker beat was also established), so his breathing altered with the character of the music. In effect, lengthy exhalations (caused by holding the breath) seemed to support material that was musically tense or technically demanding (this was not necessarily detrimental to the quality of the performance and perhaps helped him to convey the character of the music). The only occasion in which Peter produced regular long exhalations was in the second performance of the Poulenc (and here, all of the phrases ended with exhalations). This possibly indicated that he was more relaxed than previously and, once again, it raises the issue of the connection between breathing and anxiety as well as performance intention (Poulenc’s movement, marked ‘very moderate’, is relatively

calm and simple in character). Further research could usefully examine whether or not breathing affects (or is linked to) the intended general character of a performance as communicated by a pianist and observed by an audience.

In contrast to Peter's tendency to hold his breath, Stephanie exhibited fast breath cycles (around two seconds in length), which reflected a degree of hyperventilation throughout her performances. She admitted to some technical concerns before the session, especially about the Bach, and this perhaps explains her shortness of breath. There is a difference, therefore, between Stephanie's and Peter's 'coping mechanisms': Peter's greater experience led him to think and breathe in longer phrases than Stephanie when performing the Bach. Nevertheless, Stephanie consistently produced an inhalation before the first downbeat or start of play, thereby initiating each performance with a preparatory 'upbeat' breath. In her performances of the Bach and Beethoven, her breathing patterns were dissimilar across the beginnings and endings of phrases, yet for the Poulenc, which she described as 'the easiest of the three pieces', she maintained a more regular pattern. In these performances, she tended to produce inhalations at the start of phrases (either before or on the downbeat) and exhalations at the end (either before or on the last beat of the phrase). This indicates that inconsistencies in her breathing were probably related to anxiety.

From these selected observations, individual and general trends emerge about the pianists' breathing in relation to music-structural gestures. A common trend was the production of a preparatory 'upbeat' breath *before* the start of play: 72 per cent of these breaths were inhalations. In addition, there were consistencies in the timing of breaths at key phrase boundaries, such as the turning point in the Poulenc (bars 10–11) and the rest before the first episode in the Beethoven (end bar 16) when the pianists breathed in the juncture (note: it was the *timing* of the breath, rather than the *type* of breath, that was consistent). Each pianist exhibited individual tendencies: Ann produced very regular breath cycles, Peter often held his breath, while Stephanie sometimes hyperventilated. These breathing traits did appear to affect the overall character of performances: for example, in the Bach, Ann's performances were lively but controlled (with regular breathing), Peter's intensely exciting and forward driven (when holding the breath) and Stephanie's extremely careful (through over-breathing). There was no obvious pattern to the type of breaths exhibited at the beginnings and endings of phrases, although in Ann's Beethoven performances and Stephanie's Poulenc performances, they tended to inhale at the start and exhale at the end of phrases. This mirrors the pattern exhibited by wind players or singers as they inhale before executing a phrase and exhale throughout it, but it should be remembered that the pianists did breathe during these phrases too. Peter's tendency to produce long exhalations across certain passages of his performances also resembles the way in which wind players or singers might slowly release air through a phrase in supporting their sound production (it is also possible that Peter's approach to performance has been influenced by his extensive experience as a vocal accompanist). These patterns, however, were not ubiquitous and reflect the fact that the relationship between breathing and phrasing in piano performance is extremely variable. Moreover, this

raises the question as to whether or not these selected consistencies and so-called patterns are in fact ‘patterns’ at all, or merely coincidental points.

Breathing and Physical Movements

The pianists showed a range of physical movements in these performances, including body sway, hand lifts and head tilts. Notable actions are recorded in Table 9.4 and discussed below in relation to the breathing data for each pianist.

Table 9.4 Summary of physical movements and breathing for each pianist according to body sway (Column 1), hand lifts (Column 2), head tilts (Column 3) and other gestures (Column 4). Breath type is shown when it coincided with the movement (I: inhalation; E: exhalation; X: no correspondence) and in which performance (1: 1st; 2: 2nd)

1. Pianist/ Piece	2. Body Sway	3. Hand Lifts	4. Head Tilts	5. Other
ANN				
Bach	Upright Still	At cadences: Bar 11 LH: I ₁ Bar 12 RH: I ₂ Bar 34: I _{1&2}	Main beats: Bar 6: X Bars 21–22 (1): X Bars 24–25 (2): X	Lift of torso on downbeats: Bars 18–20: X
Beethoven	Upright Small sway	Off chords bar 23: E _{1&2} ; 25: I _{1&2} ; 70/72: E ₁ /I ₂ ; 71: I ₁ /E ₂ ; 73: E ₁ /E ₂		Lift of torso on downbeat: Bar 26: I ₁ / E ₂
Poulenc	Upright Still		Main beats: Bars 1–2, 5: X	
PETER				
Bach	Slouched Still		Downbeats bars 4–7, 26–28: X	Forward-right bend: Bar 20: E _{1&2}
Beethoven	Notable sway	Off chords bar 16: E ₁ / I ₂ ; 23, 25: X; 70–73: I _{1&2} ; 71: E _{1&2}		Back sway: Bar 18: E _{1&2} Wrist pulses: Pre-start: I ₁ / E ₂
Poulenc	Notable sway			Foot tuck: Bar 7: E _{1&2}

continued

Table 9.4 concluded

STEPHANIE			
Bach	Still		Quaver beats: Bar 19: I–E–I _{1&2} Bar 20: E–I _{1&2} Bar 12: I _{1&2}
Beethoven	Notable sway	Off chords: Bar 23, 25 RH: I ₁ / E ₂	On semiquavers: Bar 7 (1): E–I Downbeat: Bar 56 (2): I Slouch–eyes up: Bar 29: E ₁ / I ₂ Elbow circles: Bars 51–58: X
Poulenc	Still		Gentle nod on beat: Bars 1–2: I– E–I–E per bar Elbow circles: Bars 1–2: I– E–I per bar Slouch–eyes up: bar 4 (1): I

Ann primarily maintained a stable and upright posture in her performances (Table 9.4), although small amounts of body sway were evident during Beethoven's *Adagio cantabile* (it was a little more obvious and widespread in the second performance than the first). For example, at the start of the first episode she swayed forward at the end of each bar (returning to her 'resting position' at the start of the next bar) and to the right in bar 22. These movements were accompanied by inspirations that occurred between the first and second beats of the bar. In the last presentation of the main theme (bars 59–66), her body sway was consistent as she moved forwards and backwards on the first and second beats of each bar respectively, effectively expressing the pulse and flow of the music. 61 per cent of inspirations and expirations occurred in the same places in both performances of this passage, with 57 per cent falling on main beats in line with the swaying movement. It should be noted that the hand lifts which marked the end of each cadential statement at the close of the coda (bars 70–73) 'reverberated' through the quaver rest during which a breath was also taken (Table 9.4). With regard to her performances of Poulenc's movement, the only distinctive physical movements were small head tilts from left to right on crotchet beats. In bars 1–2, the pattern of tilts differed (in the first performance, the sequence was right-left-centre-right, and in the second left-right-left-right), while they were the same in bar 5, but there was no obvious relationship between the tilts and her breathing. This begs the question as to whether or not physical movements and breathing are more likely to coincide when they are related to hierarchical structures in the music or associated with the processing of particular musical ideas.

As detailed in Table 9.4, Peter produced one striking physical action in both of his performances of Bach's Invention. At the start of bar 20, he suddenly bent forward and to the right as if to grab something (his posture returned to the central 'normal' position by the end of the bar, which was quite upright (Example 9.6)). This movement took place in the middle of the lengthy expiration that

accompanied this ‘tricky’ passage of music. He produced more obvious physical movements, particularly body sway, in his performances of Beethoven’s *Adagio cantabile*. He tended to sway in time with the main crotchet beats, although he sometimes held his posture or sustained the direction of sway over one or more bars. His swaying movements closely resembled one another across the two performances, but in fact, there were only several points where the direction and character of the sway was the same in relation to the music. For example, at the start of the first episode (bars 17–18), he moved forward and right with his body as if to mirror the sustained growth of the melodic line. He then made a pronounced backward sway on the second beat of bar 18: this movement seemed to initiate the descent of the semiquaver line from its highest point (Example 9.7). In both performances, this striking action was accompanied by an exhalation. The direction of Peter’s body sway was not always consistent across his two performances of the Poulenc, although he generally tended to change direction every two beats, leaning forwards in the first half of the bar, then back to his ‘resting’ position in the second half. There was no obvious relationship between the timing of breaths and sways, not least because the average length of his breath cycle did not correspond precisely with the duration of every half bar.

Example 9.6 Bach, *Invention*, bars 19–20. Peter’s physical movement is indicated above the staff: F/RB: forward/right bend; C: centre (‘normal’ position)

Example 9.7 Beethoven, *Adagio cantabile*, bars 17–18. Peter’s physical movement is indicated above the staff: F/R: forward/right sway; B: backwards motion. Breath sequences (I: inhalation; E: exhalation) are shown between the staves for each performance (1 and 2)

Stephanie produced a distinctive physical movement across all of her performances: she slouched forwards and, as her head moved down, she looked up with her eyes at the score. This ‘slouch–eyes up’ movement occurred at the main phrase juncture in the Bach, at the first return of the theme in the Beethoven, and marked the middle of a phrase in the Poulenc. On each occasion, a breath supported it (note that this slouching action was distinct from her ‘normal’ posture during performance, which was more upright). Aside from this, her body sway was most pronounced in the Beethoven, especially during the third bar of the main theme when she moved forwards and backwards on each beat as if to reflect the heightened motion of the melodic line (Example 9.8). Given the recurrence of the main theme, this movement appeared ten times across the two performances. There was some degree of consistency in her breathing patterns beneath it: 70 per cent of the time she exhaled or inhaled just before the downbeat as if to prepare the movement. In general, there were numerous correspondences between Stephanie’s physical movements and her respiratory behaviour in these repeat performances: she normally prepared a physical movement with a breath, and, at phrase junctures, her breathing coincided with physical action.

Example 9.8 Beethoven, *Adagio cantabile*, bars 3–4. Stephanie’s body movement is indicated above the staff: F: forwards sway; B: backwards sway; C: centre (‘normal’ position). Her breath sequences (I: inhalation; E: exhalation) are shown between the staves for each performance (1 and 2)

Conclusion

This pilot study examined the way in which breathing supports pianists, specifically in relation to tempo, music-structural gestures and physical movements. Each of the pianists in this study generally maintained a consistent breathing rate and musical tempo across successive performances of the same piece, and certain breathing patterns appeared to be ingrained, such as Peter’s lengthy exhalation across the ‘tricky’ passage in the Bach, Stephanie’s preparatory inhalation before the start of play, and Ann’s quite regular breath cycles. It was not possible to determine from the data whether tempo influenced breathing rate, or vice versa (i.e. a faster musical tempo did not necessarily equate with faster

breathing), but there was a consistent ratio between these two parameters for each pianist.

Consistent and inconsistent tendencies arose with regard to the timing and type of breaths at the start and end of phrases. Pianists do not breathe regularly in the way that a wind player or singer inspires at the start of a phrase and expires throughout it: the pianists' phrases began with inspirations or expirations that occurred before or with the onset of notes, and numerous breaths took place throughout each phrase. In places, however, breaths did appear to signal the start and end of a phrase by consistently providing an 'upbeat' to the first note or a 'preparation' for the resolution of a cadence. Indeed, all of these performances were initiated by a 'preparatory' breath that occurred *before* the downbeat or first note of a piece, rather than *on* the downbeat, and 72 per cent of these breaths were inhalations. In effect, breathing had an important role at the start of a performance as the breath cycle seemed to preempt action (hence initiating 'reverberation', to use Pierce's term). Breathing points were also consistently made during rests that separated sections, phrases or statements. Szende and Nemessuri (1971) observed that their violinists utilized points of repose to equalize oxygen debt, and this was clear for these pianists too; for instance, they breathed during the rest between the opening section and first episode of Beethoven's *Adagio cantabile* as well as at the end of the coda in the rests that separated the closing statements.

Physical movements regularly appeared to convey information about the tempo and phrasing of the music. For instance, body sway, elbow circles, wrist pulsations and head tilts were observed in accordance with the main beats in a bar, while hand lifts often highlighted the ends of phrases (such as the last note of a section or phrase). Other physical movements reflected dynamic changes, such as Stephanie's 'slouch-eyes up' action, and even appeared to facilitate the technical execution of notes, such as Peter's 'forwards-right bend' during the 'tricky' passage of the Bach (as if to help the hand move into a new position). The relationship between breathing and physical movement was, however, variable: sometimes the timing and sequence of breaths appeared to be intrinsically linked to the production of physical movements, while at other times, quite unrelated to it. For instance, Peter's wrist pulsations occurred in accordance with a preparatory breath before the start of the Beethoven, and Stephanie's 'slouch-eyes up' action coincided with breathing points, but there was no correspondence between Ann's breathing and head tilts in the Bach and Poulenc. It might be the case that physical movements are supported by consistent breath patterns when the performers (unconsciously) delineate specific actions (i.e. they are distinct in character or size from the majority of other movements). Analysis of further performances by these pianists would be required in order to examine this point more closely.

In the light of these preliminary findings, I would argue that breathing is somehow linked to musical tempo, music-structural gestures and physical movements produced by pianists, although the connection is primarily unconscious and extremely flexible. Indeed, pianists' breathing is fundamentally unique in each performance, although similarities in the *timing* and *type* of breath in relation to these parameters across repeat performances indicates that pianists develop some kind of 'ingrained' respiratory rhythm (albeit unconscious). I would maintain that

the consistencies observed in the above data point towards the fact that pianists' breathing patterns are 'patterns' – rather than ad hoc actions – and that they are integral to the delivery of musical and physical features in a performance.

Even though this study demonstrates that respiratory behaviour can be measured so as to determine consistencies in pianists' breathing (here, through comparison of two performances of the same piece), two points must be emphasized. First, consistency does not necessarily mean 'regular', 'steady' or even 'relaxed' breathing: pianists can produce irregular, but constant breathing traits (such as Peter's one-off lengthy exhalations in the Bach), and, similarly, consistent but rapid breaths (i.e. hyperventilation) or long breaths (such as through holding the breath). Second, given the fact that the consistencies observed here in the pianists' patterns of inspiration and expiration were outweighed by inconsistencies, the notion of an 'ingrained' respiratory rhythm must be understood very loosely: no two (human) performances are alike and it would be extremely difficult for a pianist to reproduce exactly the same sequence of inhalations and exhalations in a repeat performance, even if intentional. What is important, however, is the fact that similarities do exist (such as in the average length of breath cycles) and some consistencies do emerge (albeit unconscious).

In the light of Clarke and Davidson's point that physical movements and musical features (derived from the musical structure) are 'co-determined', it is possible to conceive pianists' physical and musical aspects of a performance as existing along one and the same continuum: physical movements influence the expression of musical ideas and vice versa. In theory, breathing could be seen to support this continuum, or rather lie beneath it, so it is somehow linked to it. For instance, if a performer is anxious, his or her breath cycles might speed up and this could affect the execution of physical movements and musical ideas (i.e. they might be delivered more quickly than originally conceived or with less ease). Similarly, physical and musical features produced in a performance might influence the supporting respiratory activity. For example, if a pianist makes a mistake, or perhaps delivers a particular phrase more slowly than anticipated, then a steady breath pattern might change as the pianist unconsciously holds his or her breath.

Breathing, like other motor rhythms, could be seen to support this physical-musical continuum at different (hierarchical) levels in performances of the same piece: at one level, the correspondence between breathing and physical/musical features is similar or consistent across performances, hence seemingly 'ingrained'; at another level, the correspondence is inconsistent or different. Either way, breathing is somehow always linked to the continuum (even if at one or more levels), so when physical and musical features change from one performance to another, this affects the performers' breathing, and vice versa.

Future studies might consider the inconsistent and hierarchical relationships between breathing and aspects of performance more closely. As mentioned previously, this complex subject demands consideration of many other factors, including the affect of anxiety, age and experience on respiratory behaviour, as well as cognitive and other physiological symptoms. Measurements of performance quality would also enable further evaluation of breathing and

alternative questions to be addressed: for instance, are better performances produced when pianists maintain steady patterns of respiration, and do consistent or regular breath cycles indicate control and ease of playing (i.e. less anxiety)? The development of research in these directions will lead towards greater understanding of how breathing supports musicians in piano performance.

Acknowledgements

Examples 9.3 and 9.5 (from Poulenc, *Mouvements Perpétuels*, II) are reprinted by permission. © 1918, revised 1962, Chester Music Limited; International copyright secured. I should like to thank the three pianists who participated in this pilot study as well as Michael Wilkinson from the Department of Sports Science, University of Hull, for technical support. This project was funded by an award from The Arnold Bentley New Initiatives Fund of the Society for Education, Music and Psychology Research (SEMPRE).

Notes

1. For example, Miller 1996; Cleveland 1998; Kelly 1998; and Sehmman 2000 on breathing techniques; Thorpe 1923 and Blum 1977 on breathing and interpretation. There is also related work on breathing and musical tempo: some musicians suggest that there is a relationship between heart rate and musical tempo (Epstein 1995), although evidence also suggests that the origins of tempo are neurobiological and not related to metabolic processes (London, this volume).
2. If breathing sometimes arises consciously or voluntarily, especially in the act of interpretation, this raises the question as to whether or not it might be regarded as a gesture (i.e. an action that expresses something meaningful). Lidov (this volume) claims that breathing is a 'musically representable somatic action that is not, in itself, a gesture'. Kendon (1996) insists that gestures are voluntary actions, so it cannot include breathing, digestion or emotional reactions (i.e. involuntary actions). I would contend, however, that breathing can be regarded as a gesture in certain instances and regardless of whether or not a breath is made consciously (hence as a voluntary action) or unconsciously; for example, a performer's breath might convey information about the intensity of a chord or musical climax as it is either seen (through physical movement) or heard (through the intake of air) by a listener.
3. For example, Sundberg & Thomasson 1999, 2001; Irwasson 2001; Cala et al. 2001; Fuks & Sundberg 1999; Schölmicher-Thier & Weikert 1999.
4. For example, Oloff (1990), Eckmann (1990) and Balser (1990) on breathing and string playing.

5. ‘Respiratory rhythm’ refers generally to the rate of respiration exhibited by a performer, and this includes measurement of the time sequence and pattern of inhalations and exhalations (1971: 98).

6. According to Robert Hatten, ‘whenever characterisation is involved, we can speak of meaningful gestures’ (2001). However, there are conflicting views on whether or not gestures can be conscious or unconscious. For example, Hatten (this volume), argues that gestures can be unconscious because an interpretant might read an action as significant when the gesturer did not intend it to be. On the other hand, Kendon (1996) claims that all gestures must be conscious because they ‘say something’; there is intent (note 2). Here, the observation of pianists’ physical movements encompasses the observation of actions that might be regarded by some viewers and listeners as gestures because, in line with Hatten’s thinking, they express something meaningful, albeit consciously or unconsciously.

7. The equipment was manufactured by Cortex Biophysik and associated software (Metasoft v1) was used to analyse the data. Breathing monitors were attached to the pianists by a smart shoulder vest and they wore a ventilation mask over their mouth and nose, which was secured with head straps. The performers did not complain of any discomfort or extraordinary feelings when wearing the equipment: each pianist wore the mask for at least five minutes before performing in order to get used to it. Other data can be gathered from using this equipment, including heart rate, tidal volume (volume of air per breath), ventilation (volume of expired air), Respiratory Exchange Ratio (ratio of oxygen and carbon dioxide levels to indicate fuel utilization) and flow rate (speed of air flow on expiration). This study focuses on one aspect of respiratory behaviour, although future research could usefully examine these other parameters.

8. Main tempo is ‘the prevailing (and intended) tempo when initial and final retardations as well as amorphous caesurae are deleted’ (Gabrielsson 1988: 33).

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Chapter 10

Origins and Functions of Clarinetists' Ancillary Gestures

Marcelo M. Wanderley and Bradley W. Vines

Musical performance is a revealing human behaviour for the analysis of expressive communication. Not only are traditional musical parameters conveyed – melody, rhythm, articulation – but also information about emotions experienced by the performer and intended by the composer. In combination, these variables contribute to an observer's overall experience. The analysis of musical performance is therefore a broad research subject based upon knowledge and methods from several domains (Gabrielsson 1999, 2003), which complement research on speech and gesture (McNeill 1992, 2000).

Concerning the study of performer gestures (Cadoz & Wanderley, 2000), as compared to the investigation of other aspects of musical performance, until recently researchers have paid little attention to the gestural behaviour of instrumentalists (Gabrielsson 1999). Delalande (1988, 1990) performed one early (and insightful) investigation of expressive movements of musicians. In a detailed study of several videos filmed by Bruno Montsaingeon of Glenn Gould playing various pieces of Bach, Delalande (1988) made several observations concerning the musical implications of Gould's accompanist gestures. For instance, in the beginning of the first fugue from Bach's *The Art of the Fugue* where only the right hand performs, Gould's left hand seemed to 'conduct an imaginary orchestra' (: 86). According to Delalande (: 92):

It should then be concluded that at least in this example, Gould's behaviour is divided between two orientations. One, incarnated by the left hand, is a reading of the score while the other, directed towards the production of the sound object, is performed by the right hand.¹

From the study of roughly one hour of Gould's performances, Delalande proposed a typology of gestures with three levels, from the purely functional to the purely symbolic: (1) *Effective gestures*, those that actually produce the sound; (2) *Accompanist gestures*, expressive body movements; and (3) *Figurative gestures*, gestures perceived by a listener, but without a direct correspondence to a movement of the performer. Examples include changes in note articulation and melodic variations.

Accompanist gestures include postures and movements of the head, chest, (left) hand (when only the right hand performs), shoulders, elbows and eyebrows. These gestures, which are of five types, involve specific configurations of positions, movements and imitations:

1. *Recueilli (meditative, contemplative)*: chest immobile and leaning forwards, lowered head, chin almost touching the chest; occasional eyebrow movements; vertical movement of left hand if free;
2. *Vibrant (vibrant)*: chest curves and straightens up alternately, lower back immobile; occasional head, eyebrow and various left hand movements;
3. *Fluant (fluid)*: chest oscillates forwards and backwards or turns; occasional eyebrow movements;
4. *Délicat (delicate)*: chest is immobile, leaning markedly forwards, nose almost touching the keyboard;
5. *Vigoureux (vigorous)*: chest is immobile, vertical and a bit forwards, head close to the shoulders, shoulders forwards.

In addition, Delalande analysed the eyebrows more extensively. He identified four types: *short eyebrow raises* (with meditative and fluid gestures); *eyebrow raises accompanying melodic motives* (with vibrant gestures); *long eyebrow raises* (with delicate gesture) and *knitted eyebrows* (with vigorous gestures). Delalande observed that the above cases occur as 'pure' cases (frequently, with clear transitions between the types) and 'impure' cases (more rarely, when they are not clearly defined).

The above gesture types (or *styles*) are related to a *temporal segmentation* of the score into units of different sizes. For instance, the *delicate style* is related to autonomous notes; the *vibrant style* to short, well-defined melodic motifs; the *fluid style* to long, continuous phrases; the *vigorous style* being less associated with timing, but more often with marked chords or rhythms. Among the various other findings in this work, the most interesting is perhaps that Gould's movements, although related to the score, did not correspond one-to-one with the notes on the score or to orchestral imaging, but were clearly linked to an *emotional content* in his performance.

In 1993, Jane Davidson published an important study on the perception of visual cues from expressive movements of four violin players as well as of a pianist. Using point-light displays, she showed that visual information about the musicians' body movements conveyed the intended expressive performance manner (standard, exaggerated or deadpan) more clearly than the combined video/sound or sound alone presentation conditions. Davidson's results showed that performance gestures are rich with information about expressive intention. We return to Davidson's research in our discussion of the psychological impact of musicians' expressive movements.

Both Delalande's and Davidson's studies have shown that musicians not only perform skilled movements that are directly related to sound production, but also movements that do not seem to have an obvious link to the generation of sound. Furthermore, Davidson showed that these movements convey meaning to the musician and to the audience. These works have focused on piano (Delalande 1988) and piano and violin (Davidson 1993). This chapter contains an overview of some of our experimental work on accompanist – or *ancillary* – gestures of clarinetists. We explore these gestures from two perspectives: first, by analysing the role of expressive movements in music performance; and second, by investigating the influence of such gestures on audience members' perception of music.

Quantitative Analysis of Ancillary Gestures

This research focuses on ancillary gestures of clarinet players as they perform selections from the advanced clarinet repertoire. The terms *ancillary* or *accompanist gestures* have been used to designate those gestures that are part of a performance, but not produced in order to generate sound. These terms have a similar meaning to what Davidson (1993) called *expressive movements*, although they are to be differentiated from *expressive gestures* in the sense presented by Nicola Orio (1999). To elaborate, one way to classify gestures is by analysing subtle variations of a basic gesture (whether 'manipulative' – in contact with an object – or 'empty-handed') that communicate *expressive content* (Camurri et al. 2004). The main objective is to separate *basic* gestures that are part of a vocabulary of pre-established actions from *variations* on these basic gestures. Authors have used this approach to distinguish between *symbolic* and *parametric* gestures (Modler & Zannos 1997) or *gestures* and *gesture nuances* (Orio 1999).

Orio used an approach based on the expressive content of a movement to study the gestures of an acoustic guitarist. He considered the position of left-hand fingers on the strings (defining pitch) and right-hand string-picking pressure (defining loudness) as gestures belonging to defined *classes* – pitch and loudness – that comprise the basic level of information transmitted to the audience. The way instrumentalists perform these two actions produces a second level of information, that of *expressive content*, or *gesture nuance*. Orio related this second level to the information contained in the instrument's timbre.

In the context of clarinet performance, ancillary gestures are a class of wind instrument performer gestures that are produced by moving the instrument and body during performance – *lifting up/lowering down, to one side or the other, fast tilt-like gestures, head, waist, knee movements and associated body postures* (Wanderley 1999). Although ancillary gestures may be produced consciously – in accordance with a composer's explicit requirements (as in some pieces by Karlheinz Stockhausen and Anton Webern), as a visual effect for the audience (Cook 2003; Davidson 2001), or as part of a communication language between players in an ensemble (Williamon & Davidson 2002) – our goal is to analyse musicians' performance gestures *that do not seem to have a well-defined purpose*

related to sound production, inter-performer, or symbolic performer-audience communication.

We have collected quantitative measurements of several clarinetists playing pieces from the clarinet repertoire (Wanderley 2002; Wanderley, Vines, Middleton, McKay, & Hatch, 2005). Excerpts of the following recorded pieces have been analysed as part of this research: *Domaines* by Pierre Boulez; Sonata in F minor Op. 120 No. 1 for Clarinet and Piano by Johannes Brahms (first movement); Sonata for Clarinet and Piano by Francis Poulenc (first and second movements); Three Pieces for Solo Clarinet by Stravinsky (first and second pieces); and other works by Stockhausen, Mefano and Gaussain.

Movement data were acquired with digital video cameras and a high-accuracy movement tracker (Optotrak 3020 infrared system²). Acquisition sessions took place at the NICI, Nijmegen, at the Free University, Amsterdam and at the Motor Control Laboratory, McGill University. Eight to ten active infrared markers were placed on the performer and clarinet. Performers stood about 3.5 metres away from the cameras. The Optotrak recorded a three-dimensional coordinate for each marker's position in space (horizontal, vertical and sagittal coordinates) at 100 Hz (Figure 10.1).



Figure 10.1 Bradley Vines (saxophone) at the Motor Control Laboratory, McGill University. Note the placement of the markers on the performer and on the instrument. An equivalent set up was used with the clarinetists

We will limit ourselves to the observation of the vertical movement of a marker placed on the clarinet bell.³ In this chapter we have focused on three primary question areas:

1. The *production* of ancillary gestures: whether it is common to move the instrument while playing, identifying basic movement patterns (e.g. ‘rocking’ movements), and the influence of musical and external factors on movement production (for instance, whether similar movements will be repeated if the performer is seated or standing up).

2. The *repeatability* of ancillary gestures: whether a clarinetist repeats the same sequence of movements while playing a piece multiple times, and whether that sequence remains preserved over long time periods (e.g., six months between observed performances).

3. The *production of similar movement patterns by different performers*: whether there exist any movement patterns common to different performers and whether there exists a consistent relation between movements of different performers and the musical score.

Production and Repeatability

It seems clear that most musicians produce ancillary gestures of various types while performing a piece. Figure 10.2 shows the vertical height of the clarinet bell as a musician performed part of the first movement of Poulenc's Clarinet Sonata. It should be noted that ancillary gestures were produced continually throughout the performance, with a maximum vertical movement of the bell in a range of approximately 22 centimetres.

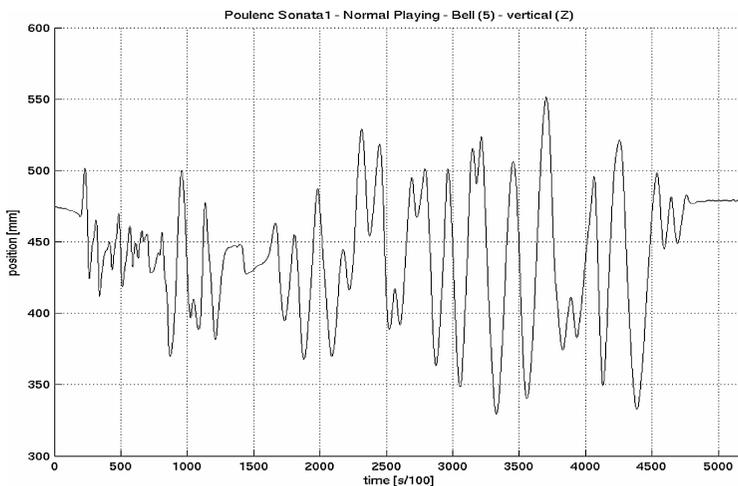


Figure 10.2 Poulenc, Sonata for Clarinet and Piano, I, excerpt. Vertical movement of the clarinet bell during performance (Performer 3)

Rocking Movements

Several performances involved 'rocking' movements (Davidson & Correia 2002), although not all of them (for instance, see the top graph in figure 10.12). Rocking movements involved a wave-like oscillation of the height of the instrument, upper

body and/or the knees. These movements were often strongly correlated with structural characteristics of the piece being performed (Wanderley 2002; Figure 10.3).

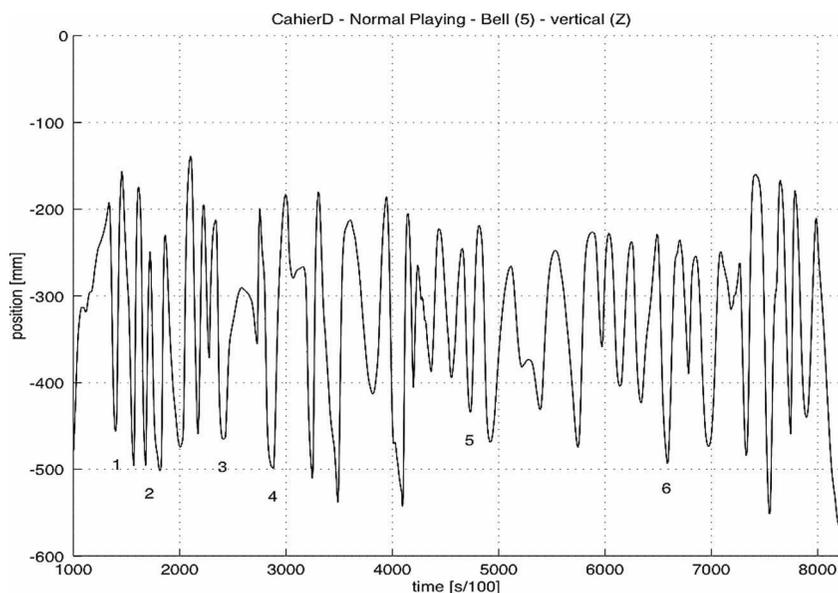


Figure 10.3 Boulez, *Domaines*, Cahier D (original). Vertical movements of the clarinet bell during performance (Performer 1). The numbers indicate the sections of the piece

All four performers who played the first movement of the Brahms Sonata made rocking movements, although these differed across performers. In this case, the presence of rocking movements can be linked to the clear rhythmic nature of the music. This was not the case for other pieces such as *Domaines* or Stravinsky's Three Pieces for Solo Clarinet that have no underlying pulse or metre to which the clarinetists might entrain their movements (Wanderley et al. 2005).

Vertical movement range of the clarinet bell varied across performers, and the different heights of the performers may account for this variation. The temporal segmentation of the movements was revealing as well: Performer 1 made longer movements (in duration) than the other three performers. Performer 1 moved up and down with roughly half the frequency of Performer 2 or Performer 3. Performer 4 used a mixed movement strategy, sometimes more similar to that of Performer 1, sometimes to that of the other two. Is Performer 1's unique movement pattern indicative of a different interpretation of the piece? This would be expected in light of evidence that body postures and movements reveal mental states, intentions and attitudes (Dittrich et al. 1996; McNeill 1992, 2000; Runeson & Frykholm 1983).

There were other consistencies for all four performers, such as the relative height of their bells during breathing, although this may not hold true for other pieces in which breathing is not as well defined as in this movement. It is nevertheless an indication of the obvious influence of respiration on the final shape of the movement contour, which is largely constant across performers.

Movement Standing and Seated

Although it may seem unnatural to play some pieces seated – usually solo and sonata pieces are played in a standing position – during rehearsals, it is not unusual for clarinetists to play these pieces seated.

In the seated performance, the bell tip marker of interest was often obscured by the player's leg. However, it is clear that the bell movements for the seated position are similar to the movements for the standing position (Figure 10.4). Thus, the gesture sequence ingrained in a musician's memory for a piece is robust across position of performance.

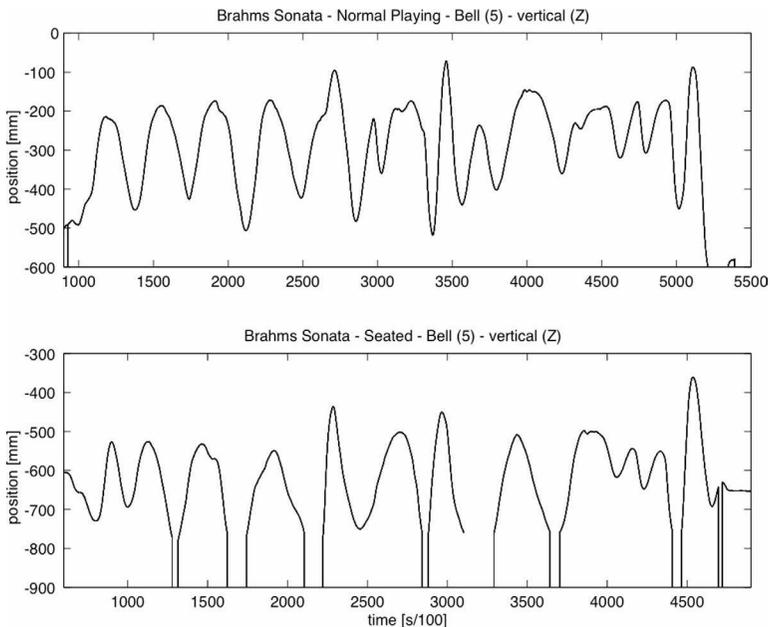


Figure 10.4 Brahms, Sonata for Clarinet and Piano in F Minor, Op. 120 No. 1, I. Vertical movement of the clarinet bell during performance (Performer 1). Top: standing up; Bottom: seated

Standard, Expressive and Immobilized

It is also useful to analyse the influence of intended performance manner on the movements performed. We have asked performers to play in a *standard* manner (i.e. as in a recital), *expressively* (i.e. trying to exaggerate the *emotion* in the performance, but without making reference to a particular form of movement) and *immobilized* (i.e., trying *not to move* while playing). Note that the immobilized manner is different from Davidson's *deadpan* manner (Davidson 1993), which specified an inexpressive performance with no explicit instruction to restrict movement. (Note, however, that Davidson did find a reduction of movement magnitude associated with the immobile performance manner (Davidson 1994)). We chose to use the immobile manner to determine whether it would be possible to play a piece accurately without expressive movements.

By analysing the data obtained with the Optotrak, one can carefully compare the movements associated with each of the three performance manners. Figure 10.5 displays data from three performances of Stravinsky's Second Piece plotted using a consistent vertical scale. The movement amplitudes are comparable for the first two performances, but are very different for the immobilized manner. This fact indicates that the performer was indeed able to consciously suppress most ancillary gestures during performance, or, as shown in Figure 10.6, to reduce the amplitude of the movements.

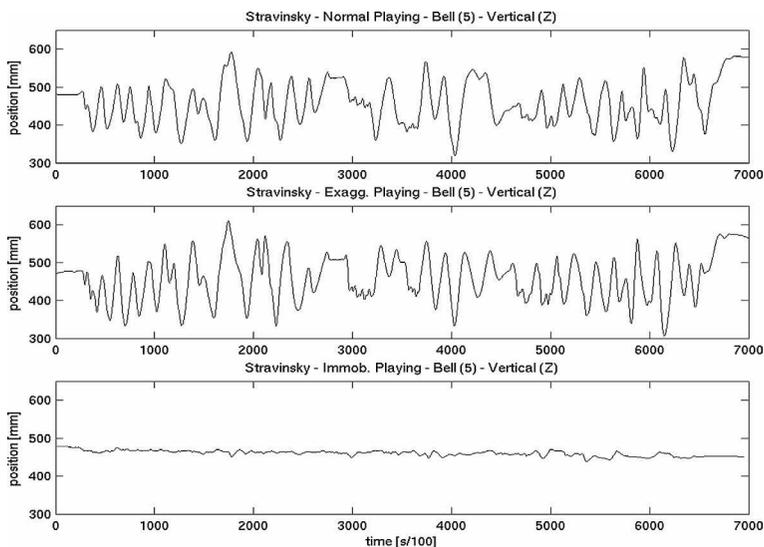


Figure 10.5 Stravinsky, Three Pieces for Solo Clarinet, II. Vertical movement of the clarinet bell during performance (Performer 3). Top: standard; Middle: expressive; Bottom: immobilized (same vertical scale for all three performances)

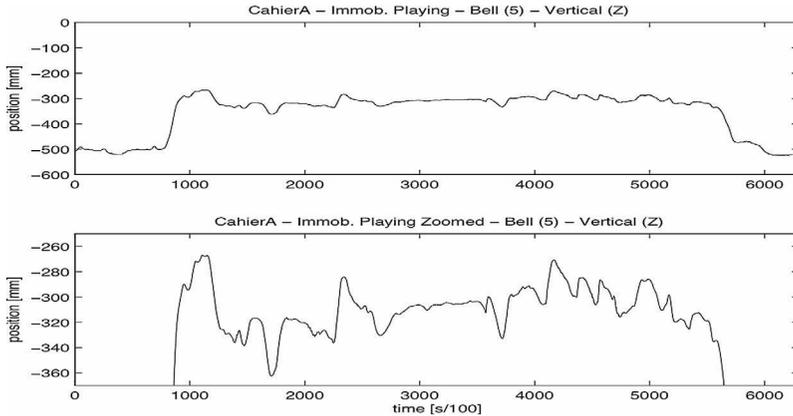


Figure 10.6 Boulez, *Domaines*, Cahier A (original). Vertical movement of the clarinet bell during performance (Performer 1). Top: immobilized; Bottom: immobilized, zoomed in (12 cm range instead of the 60 cm range in the top graph). Note that some movements were not actually suppressed, but instead had their amplitudes reduced

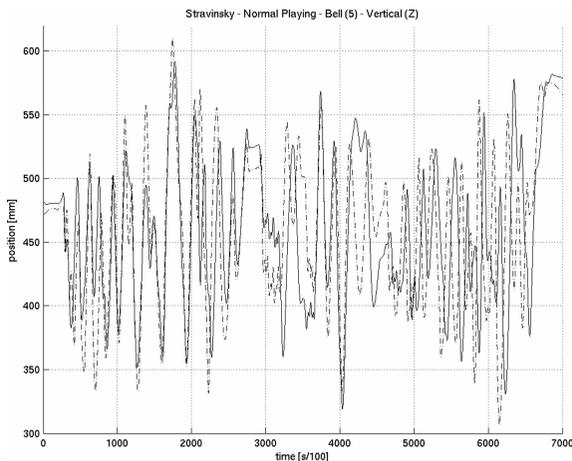


Figure 10.7 Stravinsky, *Three Pieces for Solo Clarinet, II*. Vertical movement of the clarinet bell during performance (Performer 3, same data as in the two upper graphs in figure 10.5). Standard: continuous line; Expressive: dashed line. Note that no substantial difference of movement amplitude can be seen from the graph

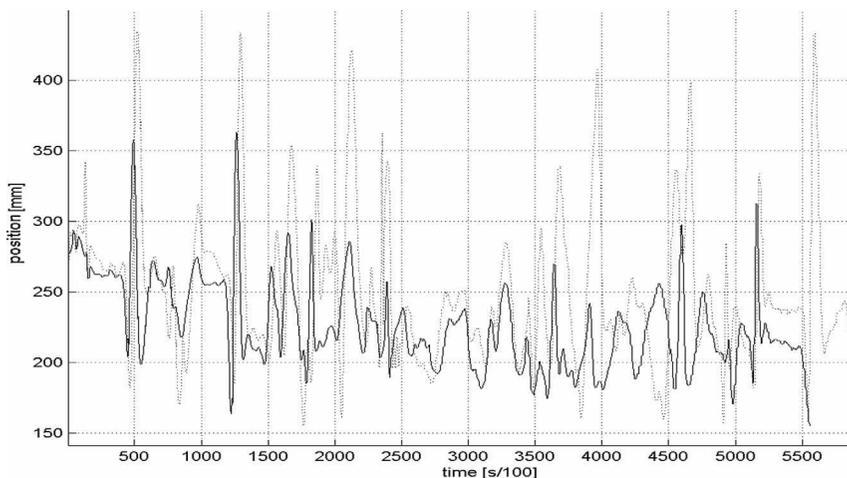


Figure 10.8 Stravinsky, Three Pieces for Solo Clarinet, II. Vertical movement of the clarinet bell during performance (Performer 5). Standard: dashed line; Expressive: continuous line. Note that a substantial difference of movement amplitude can be seen from the graph

Other performers were also able to suppress movements⁴ across performances of a variety of pieces. Note that this does *not* indicate that performers were *comfortable* playing the pieces while trying not to move. For instance, one performer stressed that in the immobilized manner breathing felt unnatural. All that this data shows is that it is possible to play most pieces while trying to suppress ancillary movements. In other words, ancillary movements are *not strictly necessary* for sound production.

In our experiments thus far, not all performers made markedly larger movements in their expressive performance as compared to their standard performance (Figure 10.7), although this did occur in some cases (Figure 10.8).

Accurate Performance Comparisons

Although timing was very consistent for individual performances across repetitions of the same segment of music (considering that they lasted from 30 to around 80 seconds each), in order to accurately compare multiple performances from one or several performers, it was necessary to account for fluctuations in tempo throughout the performances and to correct for differences in overall duration. *Dynamic Time Warping* (or *data registering*) of performances facilitates an accurate comparison of the spatial movement characteristics for various performances by warping the movement data to a reference score (in this case, a

midi file), thus eliminating timing fluctuations. The process involves first finding events (notes) in the audio signals available from the videos recorded in the data acquisition sessions. These event lists are then compared to the reference score – a perfectly quantized score – and the performances are adjusted to the reference timing. Using this method, the movements can be plotted with reference to a common timing (Figures 10.9 and 10.10).

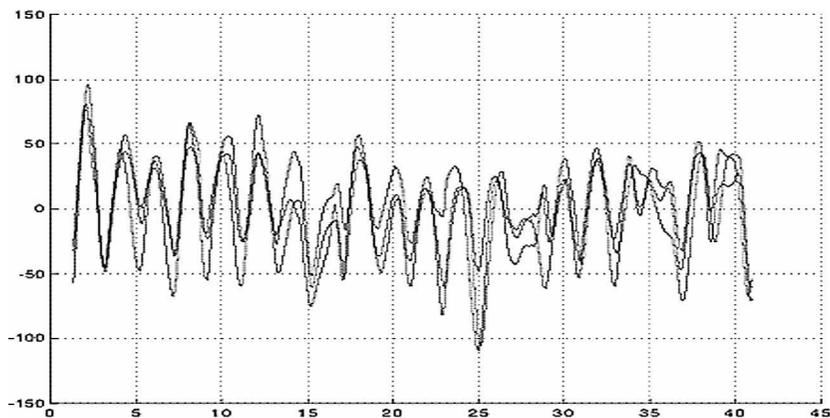


Figure 10.9 Brahms, Sonata for Clarinet and Piano in F Minor, Op. 120 No. 1, I. Vertical movement of the clarinet bell during three standard performances (Performer 2)

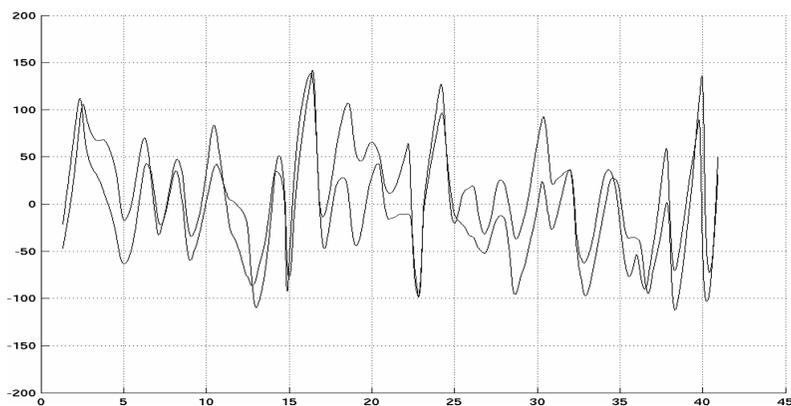


Figure 10.10 Brahms, Sonata for Clarinet and Piano in F Minor, Op. 120 No. 1, I. Vertical movement of the clarinet bell during two standard performances (Performer 4)

Comparing two performers, one can see a general trend in their rocking movements, but several differences exist (Figure 10.11). More research is needed to fully understand the similarities and differences across performers.

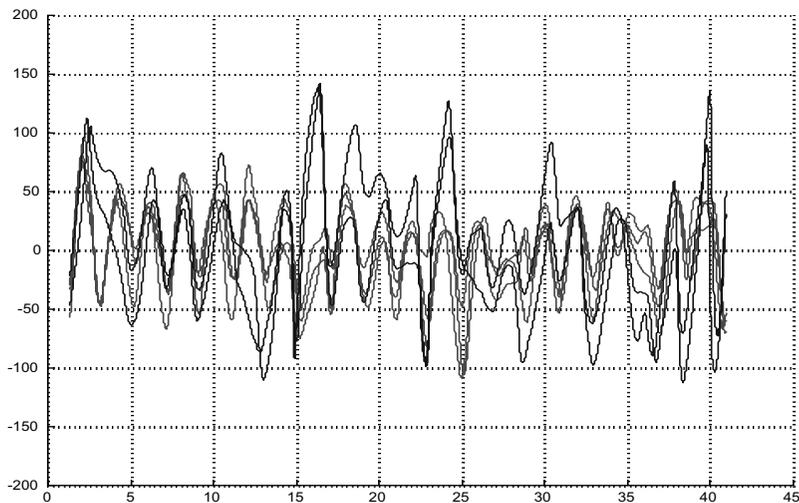


Figure 10.11 Brahms, Sonata for Clarinet and Piano in F Minor, Op. 120 No. 1, I. Vertical movement of the clarinet bell during standard performances (Performers 2 and 4)

Some Musical Considerations

We reported in the section on rocking movement that some performers tended to segment their movements according to different musical considerations (Wanderley et al. 2005). One can visualize this in the following figure that shows the bell movement of two performers playing the same excerpt of the Second Piece by Stravinsky. Note the different segmentation scheme used by the two performers (Figure 10.12).

In the first case, Performer 5 was mostly still during the phrase, with a large movement at the end of it, as can also be seen in the first few seconds of figure 10.8. On the other hand, Performer 6 made continuous rocking movements throughout the first phrases.

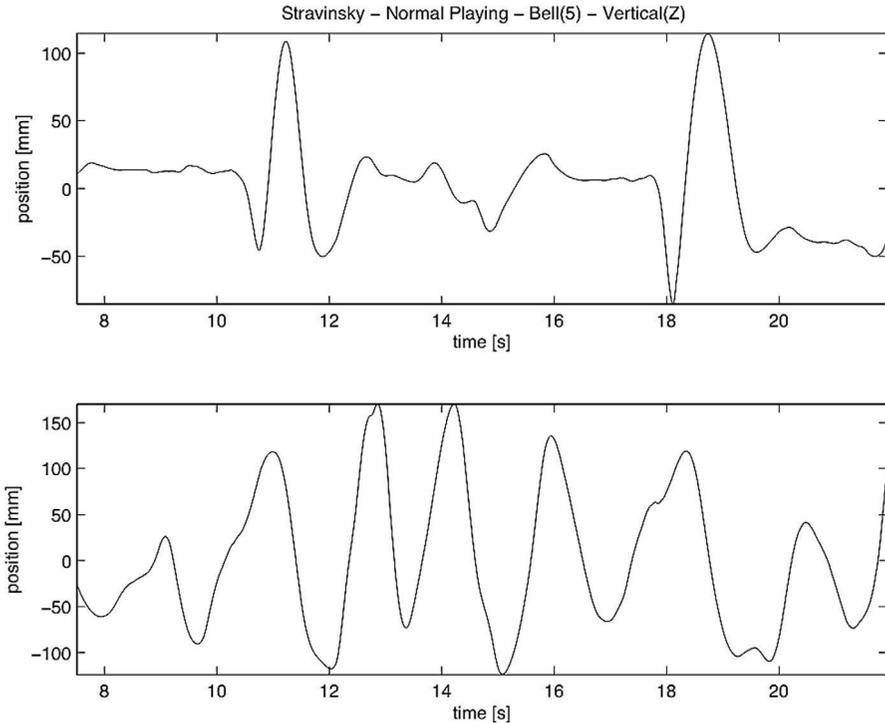


Figure 10.12 Stravinsky, *Three Pieces for Solo Clarinet, II* (first few seconds). Different movement groupings according to bell height by Performer 5 (top) and Performer 6 (bottom). Performer 5's bell movements were related to phrasing (large peaks at phrase boundaries), whilst Performer 6's bell movements were continuously changing in time

Summary: Ancillary Gestures at Different Movement Levels

Based upon the findings presented in this chapter and in our previous work on ancillary gestures, we propose that these movements are related to musical features at different structural levels. From the various analyses presented in this chapter, we conclude that at least three levels influence clarinetists' expressive movements:

1. *Material/Physiological*: the influence of respiration, fingering, ergonomics of the instrument, etc.
2. *Rhythmic/Structural*: dependence on the characteristics of the piece being performed. We have seen that some performers have a tendency to mark the

rhythm with their instrument in various ways (rocking movements) when playing Brahms. Although differences exist, there are observed similarities that cannot be explained by randomness alone.

3. *Interpretative*: relations to the moment of interpretation of the piece as developed by the performer. These will likely be different for different performers.

But what do ancillary gestures communicate to an audience? What effect do they have on the perception of music performance? We will analyse these questions in the following section.

The Perceptual Significance of Clarinetists' Ancillary Gestures

Research by Wanderley and colleagues has focused upon the physical movements of clarinetists, with particular attention given to the performers' knowledge about their own movements and to the relationship between movement trajectories and musical interpretation. In addition, the sonic effects of movement gestures have been studied in detail, with respect to real-time sound synthesis and realness of sound (Wanderley & Depalle, 2004; Wanderley, Depalle & Warusfel 1999). In this section of the chapter, we focus on the psychological dimension of clarinetists' movements, including their effect on the audience's perception of a musical piece.

Davidson (1993), as mentioned above, empirically established the importance of musicians' movements in her study of expressive perception. That research showed that the visual aspect of a musical performance not only carries important information about the music and the musician's musical intentions, but may also convey information that augments the experience of sound alone.

Krumhansl and Schenck (1997) conducted seminal work by investigating emotional and structural responses to a ballet performance. They used a similar multi-modal approach to Davidson (some participants only heard the music, some only saw the dance and the remainder both heard the music and saw the dance), though they collected real-time judgements to gauge the experience of their participants while the performance was presented. They found that the dance conveyed much of the same emotional and structural information as did the music. This finding shows that the perception of movement and the perception of sound can create like experiences. It is possible that the movements of the dancers and the music of the orchestra accessed the same internal schemata, what Daniel Stern (1999) has referred to as 'vital contours'. Ballet is an art form in which the visual aspect is carefully predetermined, whereas a musician's movements are generally not choreographed (though some musicians may use movements to purposefully elicit a response in the audience, as mentioned above (Cook 2003; Davidson, 2001)). Do the movements of musicians convey emotional and structural meaning that is similar to the experience of sound alone? The investigation discussed below addressed this very question.

We have pursued research to determine how musicians' movements influence an observer's perception of emotion and structure in musical

performances (Vines, Wanderley, Krumhansl, Nuzzo, & Levitin 2004; Vines et al. 2005; Vines et al. in press). The research has utilized a multi-modal approach, as did Davidson (1993) and Krumhansl and Schenck (1997), along with continuous measurements to determine the real-time emotional impact and perceptual significance of 'seeing' a musician perform. The experiments were designed to complement the work of Wanderley and colleagues, discussed above. Video recordings that were previously analysed for their movement content (Wanderley 2002) were used as stimuli to explore the perceptual significance of that visual information for observers.

The following methodology was employed. Thirty musically trained participants saw, heard, or both saw and heard audio-video recordings of professional clarinetists performing Stravinsky's second piece for solo clarinet. This pattern of stimulus presentation is known as 'masking' in the analysis of auditory-visual interaction in cinema (Chion 1994). The participants made continuous judgements while observing the performances. They moved a slider up and down along a track seven centimetres in length to register their experience as time passed. A computer program recorded the slider location at 10 Hz and presented the stimuli simultaneously. The tasks were a continuous judgement of tension and a continuous judgement of phrasing. (The ordering of the two judgements was counterbalanced across participants so that half of them completed the phrasing judgement first.) For the tension judgement, participants were asked to express the tension they experienced in the performance by moving the slider upwards as the tension increased and downwards as the tension decreased. For the phrasing judgement, participants were instructed to move the slider upwards as a phrase was entered and downwards as a phrase was exited, so that the slider was near the top in the middle of a phrase and near the bottom between phrases.

The tension judgement has been found in past research to be a consistent measure that is responsive to many aspects of a musical stimulus (Fredrickson 1995, 2000; Krumhansl 1996). Krumhansl and colleagues showed that continuous judgements of tension were correlated with measures of affect and with a variety of physiological measures (Krumhansl 1997; Krumhansl & Schenck 1997). Tension in vision has not received as much attention in research, but dance theorists hypothesized that the following aspects of visual stimulation are likely to cause tension for an observer: initiation of movement, force, weight, rate of travel and rate of movement (Frego 1999), as well as the interaction between different forces, including those generated by the body and by the force of gravity (Sheets 1966).

The phrasing judgement revealed time points of perceptual segmentation for each participant's experience, as well as the sense of phrasing contour over time. Music, like language, organizes unique perceptual units into a hierarchical structure with meaning that unfolds over time (Cooper & Meyer 1960; Lerdahl & Jackendoff 1983; Levitin & Menon 2003). The musical phrase has an objective perceptual reality, as does the phrase in speech (Fodor & Bever 1965; Gregory 1978), and past research has used measures related to phrasing to study segmentation in the perception of music (Clarke & Krumhansl 1990; Deliège & El Ahmadi 1990; Krumhansl 1996; Krumhansl & Schenck 1997).

Techniques in the field of functional data analysis (Levitin et al. 2005; Ramsay & Silverman 1997) were used to analyse the continuous measurements of tension and phrasing. These tools are ideal for use with judgements drawn from continuous processes, such as the experience of listening to a piece of music as it unfolds over time. Vines and colleagues have generated applications for functional data analysis in multi-modal research with music, and conceptual tools for research in musical emotion and temporal dynamics (McAdams et al 2004; Vines et al. in press).

Our data revealed that the visual aspect of the performances proved to contain a great deal of structural and emotional information. The clarinetists' movements, including their facial expressions, postures, breathing and effective gestures, augmented participants' experience in three ways: (1) by reinforcing the information available in sound, (2) by contributing unique information to the overall experience and (3) by conveying the performer's musical interpretation of the score.

The clarinetists that we chose for this research performed with very different movement styles. Performer 3 moved with smooth and controlled contours for the most part. His feet never shifted during the performance and he rarely deviated from a front-facing orientation. Performer 4 used highly idiosyncratic and expressive movements throughout the piece; for example, he would remain nearly motionless while playing fast runs until just at the end of the run, when he would have a great burst of expressive movement. This movement strategy is not unlike that of Performer 5, as can be seen in figure 10.12. These different movement styles led to variations in the tension induced while watching the performances, which we discuss below. Relations between audition and vision differed for the phrasing judgement and the tension judgement; hence we will consider the results of each measure in turn.

Tension Judgements

The visual aspect elicited different experiences of tension for each performer (Figure 10.13). For those who could only see the performances, the mean response to Performer 3 was relatively static and low in magnitude. Visual-only responses to Performer 4 were more dynamic and greater in overall magnitude. This is evidence that the impact of seeing a performance varies significantly across musicians. Different movement styles did generate different experiences of tension for the observers.

When both visual experience and hearing were available to participants, the auditory component of the clarinet performances dominated the contour of experienced tension. Generally, the group mean for those who could both hear and see the performances correlated highly with the group mean for those who could only hear the performances. The visual-only contour followed a unique path for the most part: visual information generally conveyed a different dynamic contour of experienced tension compared to auditory information. This is evidence that body

movements of musicians and the musical sound carry streams of emotional information to the audience that are largely independent of one another. There were some periods of time during which the tension experienced from vision alone followed the same contour as the tension experienced by the auditory-only group. The presence of such convergent sections, though few in number, confirms Krumhansl and Schenck's (1997) finding that visual stimuli and auditory stimuli can induce similar dynamics of emotion.

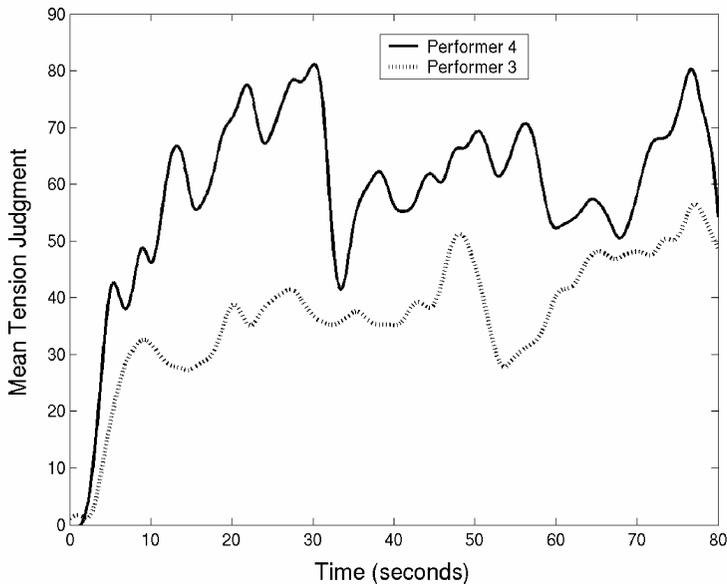


Figure 10.13 Comparison of mean tension judgement ratings for the visual only group made in response to Performer 4 and Performer 3. A linear transformation between major section boundaries was used to time warp the data for Performer 3 to fit the length of Performer 4's performance

Krumhansl and Schenck found a strong correlation between tension and emotion ratings elicited by seeing the dance without sound and by hearing the sound alone. The movement and music consistently elicited comparable emotional experiences in their study. Why were similar affective experiences for hearing and seeing relatively rare for the perception of musical performances? We posit that constraints due to playing the instrument restrict musicians' ability to express emotion in visual terms. Dancers, such as those used in the ballet study, move freely, whereas musicians have to maintain a consistent relationship with their instruments as they produce sound. The clarinet does allow for a variety of movements, which is one reason why we have chosen to focus on this instrument.

However, the hand and arms are tightly constrained, as are facial expressions. Perhaps there would be greater similarity between emotion conveyed visually and emotion conveyed aurally for instruments that facilitate freedom of body movement and facial expression such as the piano, the guitar and the voice. Future research will explore these other instruments.

Though sound largely determined the contour of tension experienced in the auditory-visual condition, visual input did affect the overall magnitude of tension experienced. This effect was especially pronounced when visual content contradicted auditory content – when the tension level in vision differed strongly and consistently from the tension level in sound. For example, during the first section of Stravinsky's second piece for solo clarinet, Performer 3's calm and controlled movements contradicted the many high, loud and fast notes in sound. The tension registered by the auditory-only group was very high while the tension registered by the visual-only group was low. The auditory-visual mean followed the same contour as the auditory only group, but was lower in magnitude during the section; that difference reached significance, as determined by a functional *F*-test. In this example, the visual information served to dampen the overall experience for those who could see as well as hear the performer. In another example, Performer 4's movements served to increase the overall experience of tension. His emotive and active movement pattern contradicted the quiet low notes in sound. The visual aspect induced a high magnitude of tension for those who could only see the performance while the tension induced by sound was low. Again, the auditory-visual group mean followed a contour that was similar to the auditory only mean, but this time with an increase in magnitude; that increase also reached significance by a functional *F*-test.

We also found evidence that the visual component can convey affective information in advance of the sound. An example of this kind of visual influence occurred for Performer 3. During a pause in sound, and before a new section began, Performer 3 adjusted his posture and facial expression (eyebrows rose perceptibly) to match the mood of the following section, which was lighter and lower in tension than the previous. The cues in gesture anticipated an affective change in the music and led to a difference in perceived tension for participants who could both see and hear the performance as compared to those who could only hear it. The changes in Performer 3's expression gave those who could see the performance an indication of the emotional tone of the section to come, before the sound actually started. A functional data analysis (with phase-plane-plots) of the same transition segment for Performer 4 yielded a complementary finding (Vines et al. in press). The patterns of emotional experience conveyed by sound and by vision were similar in form, though the dynamics of change were shifted forward in time (occurred earlier) for participants who could see the performance. Thus, the movements of clarinetists can anticipate emotional changes in the music and can draw attention to them. Similar findings for phrasing are discussed below.

In general, the tension findings support the hypothesis that a 'mirror system' in the brain influences communication between a performer and his or her audience. Such a neural system would enable emotional communication between musician and observer (Buccino et al. 2001; Rizzolatti & Arbib 1998). The

movements and gestures did influence the experience of tension for observers, especially at important points in the musical score, and the effect of seeing the musician depended upon the individual musician's movement style.

Phrasing Judgements

Phrasing judgements yielded a different set of relations across sensory modalities than did tension ratings. We found evidence that a similar experience of structure was conveyed both by the visual aspect of the performances and by the sound itself. Even though visual-only participants did not hear the sound at all, they still extracted the underlying pattern of phrasing in the music. Many peaks and troughs in the mean curves were aligned for all presentation conditions, providing evidence for a similar pattern of perceptual segmentation across presentation conditions. This shows that the visual component of a musical performance can convey the structural information in a musical piece and that similar experiences of structural form can be conveyed through vision and hearing.

We chose to use the Stravinsky piece for our perception research because there is no underlying pulse or metre in the music. Clarinetists tend to entrain their movements to the underlying pulse if there is one (Wanderley 2002). The players, therefore, were free to move about with idiosyncratic expressive patterns that were not constrained by any metrical consideration. In spite of these complex movement patterns, the participants who only saw the visual aspect of the performances were still able to abstract the structure of the music being played from the moving image. This implies that the movements of musicians are related to the musical structure, a finding that resonates with the work of Delalande (1988). It also shows that the human brain has an incredible capacity to abstract meaningful structure from complex movement patterns – though there was no simple relationship between gestures and musical phrasing, the viewers were able to recognize the underlying structure of the piece just by watching the clarinetist perform. It is likely that points of breathing in the performances provided cues for segmentation, especially for the visual perception of immobile performances (Figure 10.14), though no participant's judgement was driven only by breathing cues.

Further analyses showed that gestures played a role analogous to co-articulation movements in speech (Levelt 1989). The process known as *co-articulation* refers to (1) movements of vocal articulators that begin before a target sound is produced in speech and (2) the influence of previous muscular movements on the muscular pattern used to create the current syllable. In our musical context, the musicians' movements both anticipated the coming sound and extended beyond it; both kinds of movement influenced participants' judgement of phrasing in the piece. For example, certain gestures extended the sense of phrasing during a pause in sound. Though the sound came to an end at a major transition between musical sections, the performers' gestures and postures continued into the silence. As a result, those who could see the performers gauged a sense of phrasing that extended beyond the end of the note and into the silence. Similarly, certain gestures anticipated the beginning of the new section: Performer 4 swooped his

clarinet downwards before the new note began and Performer 3 took a breath and made a postural adjustment in anticipation of the coming sound. In this way, the clarinetists' movements served to cue the beginning of a new section for the participants. Clearly, musicians' gestures can complement the sound by anticipating the beginning of sound and by extending beyond the sound in different ways. An observer's experience of phrasing in a piece of music is enhanced by these extra-musical cues that create anticipation, expectation and a sense of continuation that is complementary to the musical sound.

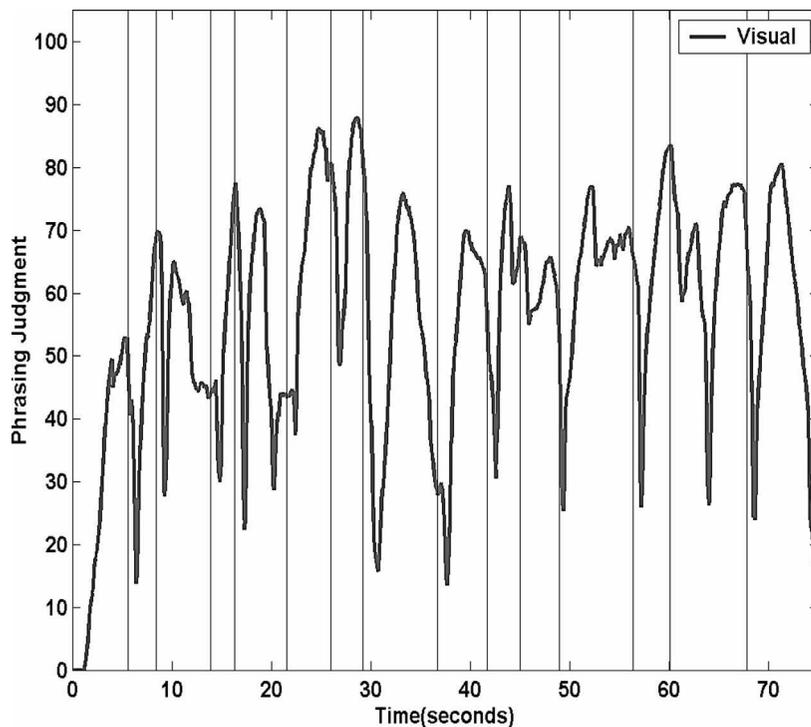


Figure 10.14 This figure shows the mean phrasing judgement for the visual-only group made in response to an immobile performance by Performer 4. Vertical lines correspond to points in time when the clarinetist took a breath. A breath preceded many of the perceived phrase boundaries, which are indicated by troughs in the curve

Body movements also served to convey the performers' musical interpretations of the score. An independent analysis of each performance by a music theorist revealed differences in the clarinetists' interpretations of phrasing in the Stravinsky piece. In particular, towards the end of the score, Performer 4

added an extra major phrase boundary, thus segmenting into two phrases what Performer 3 interpreted as one continuous phrase. Perceptual cues in both vision and sound conveyed the difference in performance intentions, which were mirrored in the participants' judgements across presentation conditions. This finding supports the assertion (Runeson & Frykholm 1983) that body movements reveal mental states and intentions. In the case of musical performance, the intentions are related to intended perceptual segmentation and expressive content.

The visual modality was found to convey the underlying phrasing content in each performance, as well as the performers' individual musical intentions and interpretation of the score. The movement levels discussed above (*material/physiological, rhythmic/structural* and *interpretative*), and the constraints on movement that these levels entail, may account for the temporal correspondence between body movement and musical sound. However, in addition to providing redundant phrasing information with sound, musicians' body movements also serve to extend and to anticipate phrasing boundaries to influence the overall experience of an observer.

Summary: The Perception of Ancillary Gestures

In general, we have found that the visual aspect of musical performances contributes importantly at specific points in the music. The gestures and movements of clarinetists augment the experience of tension and the sense of phrasing by complementing, anticipating, following and sometimes contradicting the information available in sound. It is clear that the interaction between vision and sound in musical performance is rich and complex and that an observer's experience of the music is significantly enhanced when the performer can be seen as well as heard.

Conclusion

The study of gestures in music is an important research field for several reasons, including its contribution to psychological work on performance and cognition. In this chapter, we have focused on the analysis of ancillary gestures produced by clarinetists and their impact on the perception of performances. In the context of clarinet performance, our previous work has shown that ancillary gestures are common in performances, although not essential (clarinet players were eventually able to play excerpts of pieces with almost no expressive movements). In the case of the same expert clarinet player performing one piece multiple times, a strong correlation between the player's movements at the same points in the score was found across performances, suggesting that ancillary gestures by clarinet players are not randomly produced, or just a visual effect, but that these gestures play an integral role in the performance process and mental representation of the music.

Quantitative data from performances of different players showed that ancillary gestures were idiosyncratic for each player, though movement features

related to structural characteristics of the piece (e.g. tempo) and to material/physiological aspects tended to be largely invariant across performances of different musicians. A three level typology of ancillary gestures according to their possible origin was proposed (*material/physiological, rhythmic/structural* and *interpretative*) in order to take into account similarities and differences among the different gestural patterns.

But apart from the analysis of pure movement, the study of ancillary gestures raises many questions about what a musician's movements convey to an audience. In everyday speech, gestures of the hands and body, along with facial expressions, are continually reinforcing, modifying, or negating the meaningful content in speech (McNeill 2000). Non-speech gestures also contribute to the emotional essence of an utterance (Planalp, DeFrancisco & Rutherford 1996), and they help speakers to time their exchange in a conversation (McFarland 2001). Do the expressive body movements of musicians play a similar role in relation to the musical sound? Music is analogous to speech in that the sound carries the core content.⁵ Though a great deal of music is experienced without seeing the musicians (by means of CDs, MP3 players, computers and so on), many enthusiasts do seek opportunities to see live performances or to watch video recordings. We have found evidence that contributes to explaining why people enjoy seeing musical performances.

There may be a musical parallel to the proposition of Quek and colleagues (2002) that gesture and speech *proceed together from the same 'idea units'*, otherwise referred to as '*growth points*' (McNeill, 2000). We posit that the musical sound and the musician's gestures (ancillary and effective) proceed from the same *performance 'expressive units'*. Such a relationship could explain the tight correspondence between expressive body movement and sound, as if part of the musical expression comes through the auditory sense, and the other part comes through the musician's gestures. This perspective is in accordance with Alexander Truslit's view that a musician's sound and body movements both originate in the same 'inner motion' ('innere bewegtheit' (Repp 1993)). Future research will explore relations between musical sound and ancillary movements that are analogous to relations between vocal speech and paralinguistic gestures. The investigation of musicians' gestures, their relation to the musical sound and their impact on the observer's experience augments knowledge of human communicative processes spanning language and music.

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Notes

1. 'On doit donc conclure qu'au moins dans cet exemple le comportement de Gould se partage entre deux orientations. L'une, incarnée par la main gauche, est une lecture de la partition alors que l'autre, tournée vers la réalisation de l'objet sonore, est concrétisée par le jeu de la main droite.'

2. Since July 2004, we have been using a Vicon System 460 with 6 M2 infrared cameras with passive markers, available at the Input Devices and Music Interaction Laboratory, McGill University.

3. For a thorough analysis, see Wanderley (1999, 2001, 2002) and Wanderley and colleagues (2005). More holistic approaches, including the use of Laban-Bartenieff movement fundamentals to describe movements of clarinetists, are currently being explored in our laboratory (Campbell et al., unpublished).

4. Only once, a performer gave up on one immobilized performance (Stravinsky, Second Piece) and claimed he could not do it. This was the only case out of four performers and several pieces.

5. This statement might be less applicable to music traditions outside of the Western Classical genre. John Baily (1985), for example, argues that body movements are primary to certain African musical traditions.

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Chapter 11

Listening in the Gaze: The Body in Keith Jarrett's Solo Piano Improvisations

Peter Elsdon

Critical accounts of Keith Jarrett's piano playing abound with a language of physical excess, from Chip Stern's description of Jarrett playing with Miles Davis around 1970, 'his body contorted like an electric cobra' (1991: 6), to John Litweiler describing 'autoerotic groans, sighs, grunts, and moans as he leaps from his chair to thrust his pelvis at the keyboard while he plays' (1984: 234). Worth quoting at length here is Andrew Solomon (1997: 32):

During his solo improvisation concerts of the 1970s, he would go into a state of what appeared to be ecstatic pain. While playing the notes urgently and self-referentially, he would slide off the bench so that he was sometimes on top of the piano and sometimes beneath it and most often wrapped around it. His face could not possibly have gone through a more anguished and peculiar range of expressions; he grunted and groaned audibly, periodically shaking with spasms and shivers. He looked as though he were giving birth to a square baby.

The implication here is that this physical excess draws attention away from Jarrett's playing and towards the unnecessary contortions of his body. As Jairo Moreno has pointed out, implicit in Litweiler's critique of Jarrett's playing are the spectres of Elvis Presley and Jerry Lewis: 'When critics compare Jarrett to [...] Elvis Presley and Jerry Lewis, their intention is not to elevate Jarrett to their status; rather, they are claiming that his body movement during performance is nothing more than superficial show-business posturing, an empty, if at times entertaining façade' (1999: 83). Lawrence Kramer's description of the Lisztian virtuoso rings true in this context: 'He can be identified equally well with the extremes of transcendental expressiveness and cheap, flashy display' (2002: 69).

The consensus that often emerges from the jazz press is that Jarrett may be a great pianist, but take away the physical posturing and vocalizing and he would be an even better one. In other words, Jarrett's performing body somehow obscures the essence of his playing. Jairo Moreno has demonstrated how, in writing on Jarrett, critics distinguish the 'pure' musical sound of his playing from the sound of his vocalizings. Jarrett's physical motions in performance are, Moreno suggests, 'significations of the flesh' (1999: 86). David Ake has also discussed how Jarrett's physical posturing at the piano helps to signify for his audience a 'sense of artistic and personal depth' (2002: 83). So Jarrett's performances foreground the body

through physical and verbal gestures which are seen by many commentators as extrinsic to the music, traces of physicality which bleed through into an idealized space marked out for purely aesthetic contemplation. Such a position works towards constructing an autonomous music, free from the physicality that is a necessary part of its production.¹

The recent focus on performance within musicology recognizes that music only acquires meaning through performance. Nicholas Cook has recently theorized the position like this: '[Music] is always received in a discursive context, and [...] it is through the interaction of music and interpreter, text and context, that meaning is constructed' (2001b: 180).² And if we understand music to mean in this way, then the performing body has not just to be recognized and acknowledged but seen as an important part of this discursive context. So the question I want to ask in relation to Jarrett's pianism is this: in this context, what exactly does the body signify other than itself?

Expression and Jazz Aesthetics

Quite naturally, the growing literature on the study of performance has concerned itself primarily with music from the Western classical tradition. One of the central issues for such studies is that of expression, what we might take to mean the negotiation and exercise of flexibility within the limits of notation. But as Cook has suggested, this has often meant assessing how the performer expresses the underlying structure of the music, a point of view which, Cook suggests, 'explain[s] expression away, and with it the performer' (1999: 243). Studies of gesture in performance by Jane Davidson (1993) have suggested a much more wide-ranging approach to this issue, for instance, examining how important visual information is to an audience in interpreting the expressive content of a performance. Davidson's study of singer Annie Lennox's performance style provides an example of how a performer employs a range of expressive gestures which serve a number of different functions, including self-stimulation, signalling to co-performers and gestures which help articulate the narrative of a song. Davidson argues that these gestures 'add a dimension to the performance which allows for different levels of interpretation' (2001: 246). This suggests that a performer's gestures can be read as expressive on a number of different levels and in a number of different ways. But before proceeding further, I want to explore something of what the expressive might mean in relation to jazz.

Improvisation is generally thought to be one of the defining aspects of jazz, not merely in terms of its musical construction, but its whole aesthetic outlook. Witness, for instance, Jeff Pressing: 'The nucleus of all jazz is creative improvisational expression [...] a process that brings into the music the joy of discovery, the magic of communication, and the uniqueness of both the moment and the individual' (2002: 202). Thus, improvisation is valued by musicians, critics and fans as the locus of creative expression. Improvisatory expression in most jazz is generally focused in the solo, that is at the point at which the performer has the

most freedom to create (or to ‘express themselves’ as musicians sometimes say) within the confines of the piece (usually the harmonic, temporal and formal structure). Expression in this sense involves the creation of a new musical statement in the context of a composition, a statement which is created (improvised) by the performer, rather than the performer acting as a kind of mediator between a score and the sounding object. Bruce Johnson translates this understanding of improvisation into a blunt dichotomy between jazz and score-based music: ‘The body is the primary site of the music. Compared with music that is “stored” in a score, jazz is stored in the performer’ (1993: 3).

Johnson’s location of the body is important as it reflects a deeply held aesthetic in the jazz world. This aesthetic grounds expression physically, as if performance is the externalization of the personal interior. This idea of the expressive runs deep throughout jazz, but it might first be identified by understanding how notions such as ‘feel’, ‘groove’ and ‘swing’, all highly elusive in their own way and important yardsticks of stylistic competence, are evaluated and understood physically. According to jazz pedagogy, for instance, swing has to be felt and cannot merely be imitated; it has therefore to be internalized and made physical in some respect. The development of a player’s own ‘voice’ or ‘sound’ is thought to reflect some aspect of their unique identity.³ Indeed, this identification of players with their sound can be quite literal. Robert Walser, for instance, points out how Duke Ellington’s trumpeter Cootie Williams described the two playing styles for which he was best known as ‘my two ways of being’ (2002: 319). For some jazz historians the music is at its most powerful when it acknowledges this aesthetic of a physical/emotional ‘authenticity’, thus, for instance, Samuel Floyd’s comment that bebop ‘expressed the emotional realities of musicians in the midst of a powerful verisimilitude’ (1995: 138). The effect of all these conceptions is to ground expression in the body: indeed this is an aesthetic which has been described by many commentators as one of the defining characteristics of African-American music.⁴ My point is that such conceptions of expression in jazz have important consequences for understanding what Jarrett’s performing body signifies.

Ritual and Myth

Jarrett began playing improvised solo concerts in 1972 and developed a format that consisted of two halves of music, each usually around forty minutes in duration. The development of these solo piano concerts was documented by a series of recordings, most notably the 1973 album *Solo Concerts* and the subsequent 1975 *Köln Concert*, one of Jarrett’s best known recordings.⁵ Jarrett has continued to perform in this format for most of his career, although during the latter part of the 1990s the solo concerts have all but ceased. These concerts have usually taken place in concert halls, not the jazz clubs which are still considered by purists to provide the most authentic experience for the jazz fan. In the solo concerts Jarrett created a very particular and individual kind of performance context, which Ake has described as a ‘type of sensual-sacred music ritual’ (Ake 2002: 102). According to Christopher Small, ritual can be understood as a form of behaviour through which ‘those taking part in the ritual articulate relationships among

themselves that model the relationships of the world as they imagine them to be' (Small 1998: 95). Seen in this way, Jarrett's performances place a particular importance on a ritualized relationship between performer and audience. Witness Edward Strickland's account of a Jarrett concert (Strickland 1983: 90):

Opening the second half of the concert, Jarrett started for the piano, stopped and, after the applause had half-subided, began to speak to the audience. [...] It was a brief and quietly moving speech, as spontaneous, tense, and inspired as his piano improvisations. [...] [H]e went on to suggest that the nature of his enterprise in concert improvisation was fraught with risks. He suggested that the audience, by their presence in the auditorium, had themselves undertaken a commitment at some level to share those risks and asked them to offer the support of their trust even when he seemed to them to have become temporarily derailed, to grant him the benefit of the doubt as to whether he knew what he was doing, or the music did. Saying that he did not view the context as me-up-here-and-you-out-there, but rather as a creative collaboration, he concluded by stating that he/we were risking our lives or our selves at this concert.

Such public statements from Jarrett, supplemented by interviews and liner notes to recordings, have had the effect of creating a particular discourse around these performances. I would suggest this constitutes an acting out of myth in the sense that Small describes: 'Myths are stories of how the relationships of our world, or of a part of it, came to be as they are. They deal with exemplary acts of creation and destruction, carried out by exemplary heroes and villains' (Small 1998: 99). In this sense, Small considers myth to be an idea or conception which is powerfully embedded in human thought, avoiding the idea of the fictional that its modern usage implies. The myth that the solo concerts tap into is that of the virtuoso in the Lisztian sense, a figure whose artistry is located in their ability to reach into a realm beyond themselves for inspiration. By articulating what he believes their role is to the audience and outlining the risks involved (even if in such hyperbolic terms), Jarrett involves them in the drama of the performance. The result is that the very act of musical creation itself is brought figuratively to centre stage. Jarrett is keen to emphasize as much as possible that these concerts are improvised, and as we will see this has the effect of creating a complex of meanings in which the body acts as a powerful signifying force.

In previous work on Jarrett, I have employed a kind of topical approach in analysing this music (Elsdon 2001). The solo improvisations have often been described in critical writing as surveying a wide musical territory, or sometimes in quite literal terms as a journey through a series of different musical styles. Ake describes Jarrett's approach like this (Ake 2002: 102):

[H]is stylistic palette included a seamless blend of quasi-Romantic rhapsodies, diatonic folklike passages, 'free' counterpoint, angular atonality, extended techniques (plucking or strumming the piano strings, striking the frame, etc.), and protracted ostinatos.

Gernot Blume has talked of Jarrett as an artist who absorbs influences from different styles and idioms, before then reworking them through his own language, or as he puts it creating a 'style out of his melange of styles' (Blume 1998: 115). My approach was to delineate these styles in topical terms, as commonly understood elements of a musical language.⁶ Consideration of Jarrett's physical gestures in performing immediately presents one possibility, that somehow these styles might be articulated through physical gesture. That is, if the improvisations assume specific stylistic characters at certain points, are there sets of physical gestures appropriate to these characters which Jarrett employs? If this were the case then Jarrett's body might be understood to be articulating musical structure, a conception of the expressive close to that structuralist ideal I mentioned earlier. But this supposition does not stand up to close scrutiny based on observation of video recordings of Jarrett's solo performances. In other words, it is impossible to align musical styles to specific sets of physical gestures. In the following discussion I will instead explore how physical gestures can assume expressive importance, through reference to a video recording of a solo concert given in Tokyo in 1984.⁷

Ballads

Ballads in jazz are generally slow tempo pieces, and those from the American song book played by jazz musicians are often love songs, expressing feelings of sentimentality or loss. What I class as a Jarrett ballad is grounded in a typical diatonic language for jazz, with harmonies extended through typical alterations – flattened fifths and ninths, the addition of upper chord extensions, and so on. In this respect Jarrett's playing can be identified in terms of the one pianist most often considered as his forebear: Bill Evans. Evans was known for a sophisticated harmonic approach which had the effect of thickening the harmony of the standards he played, through the use of harmonic alterations, substitutions and block voicings. At the same time though, Jarrett's ballads avoid adopting the cyclical structures of most jazz and Tin Pan Alley songs. Rather, the harmonies will often orbit around one particular tonal centre without necessarily ever affirming that tonality, only to move further afield to other areas. In this way Jarrett's ballads create a restless harmonic sense, and as they tend to occur particularly at the start of improvisations they seem to function as a means of easing gently into more expansive musical material.

The passage which opens the first improvisation from the 1984 Tokyo concert is typical of most Jarrett ballads. The performance begins with Jarrett sitting still over the piano for a number of moments, before beginning to play. Jarrett tends to maintain an upright posture at this point, apparently concentrating intently (Figure 11.1).⁸ This is one particular ritual which has become integral to a Jarrett performance. There is no particular outward physical sense in which he is preparing to play, rather the preparation is unseen and the lack of physical movement attests to that.⁹ This has the effect of making the viewer aware of what is unseen in this performance: the mind.



Figure 11.1 Jarrett before the start of play

Once Jarrett begins to play his head drops forward and his upper torso bends, so that his head is bowed above the keyboard (Figure 11.2a). All the while his head frequently shakes from side to side, sometimes during melodic phrases and sometimes between phrases. This is one particular physical attitude which Jarrett adopts during this ballad passage. He also moves from this position to an attitude in which his back is held straight, sometimes leaning back so that his arms stretch straight out and downwards to the keyboard (Figures 11.2b and 11.2c). In this attitude much of the movement comes from the head. Close camera shots also reveal a level of facial detail which is interesting. At the opening of the performance Jarrett seems to almost consciously regulate his breath, appearing to inhale at the start of phrases and then exhale towards their end.

Constructing some kind of reading of this gestural attitude might involve considering the musically expressive qualities of a Jarrett ballad aligned to his physical attitude while performing. Performing a ballad in jazz is thought to require engagement with the melody, to the point of knowing the words to the song. Even while a musician may elaborate the melody of a piece through ornamentation and improvisation on the chord changes, there is still a sense in which performing a ballad requires identification with the sentiments of the original song. In Jarrett's ballads what is conveyed physically is very much this kind of engagement. The motions of the body are easy to imagine as traces of melody acted out physically, such as the way in which Jarrett's head shakes and twitches during a phrase. The attitude of bowing the head over the keyboard is also extremely evocative. Ake points out how this gesture is often thought to convey an attitude of quiet devotion, contemplation, or even prayer, and how it was particularly associated with Evans, a pianist to whom Jarrett was inevitably compared early in his career (Ake 2002: 97). This might even suggest that absorbing the influence of Evans, as Jarrett undoubtedly did, meant adopting a particular physical attitude most associated with Evans.



(a)



(b)



(c)

Figure 11.2 (a-c) Jarrett's attitudes during play

But at the same time much of Jarrett's physical attitude at the piano is quite unlike Evans, who was known to spend most of his time playing in the same physical posture. The identification which Ake suggests for Evans as the sensitive, white, intellectual pianist (iconically referencing the notion of 'cool') breaks down for Jarrett at any number of points, not least as we will see later due to his grooving at the piano.

These physical gestures I have pointed out might be understood in relation to accounts of the mental and physical processes involved in improvisation. Jazz pedagogy has always stressed the importance of intention and control with regard to improvisation. The improvised solos most often lauded in jazz textbooks and cited as models for aspiring musicians are those which bear out a certain kind of intellectualism in their construction. The importance of this aesthetic is emphasized by the way in which students are taught to imagine their ideas before playing them. In his account of improvisation in the jazz tradition, for instance, Paul Berliner talks about the pervasiveness of the idea of singing for improvisers, the notion that improvisers should be able to sing their solos as well as playing them on their own instrument (Berliner 1994: 180–81). Berliner also characterizes a kind of dialogue between the 'singing mind' and the 'body', whereby sometimes ideas are 'preheard' and then executed, which suggests that some kind of musical 'imagining' is taking place (: 189–90). In this sense, musical ideas are conceived in the mind, before being executed by the body.¹⁰ In David Sudnow's account of learning to improvise in the jazz tradition, he identifies a certain point at which he started 'going for the sounds' (Sudnow 1978: 37). He describes how before choosing a set of notes to play in his improvisations he was deciding to aim for the sounds those notes would produce, rather than simply playing them because they constituted a learned pattern which he knew would be stylistically compatible in that context.

This 'imagining', as I will call it, might serve as a way of understanding Jarrett's bodily gestures. Moreno has already suggested as much about Jarrett's singing, saying that 'imagining sound [...] entails embodying it in mind, soul, *and* body (here, body signifies the voice)' (Moreno 1999: 79). In an interview in 1987, Strickland suggested to Jarrett a parallel with Gould: the idea that, like Gould, Jarrett sang along with his own playing because he was 'hearing the piece played in a way he couldn't play it on the piano' (Strickland 1987: 328). Jarrett appeared to agree, and more specifically in 1992 he was quoted as saying, 'I hate the piano. [...] What I hear when I play the piano is not the piano but the voice. [...] When I play the piano I almost never want to hear it' (Shadwick 1992: 13).¹¹ But Jarrett's comments about hearing the voice not the piano also suggest something more than imagining. They imply that there is some kind of conceptual disparity between what the improviser imagines and the sounding reality of their ideas. In some respects then, the body might be said to signify both the imagining of the music and the improviser's response as this music takes sounding form.

All of this might appear to belong in the realm of theorizing about improvisation, or even a kind of phenomenology. But I want to argue that such ideas also emerge in what Lawrence Kramer calls the 'listening gaze'. Kramer

describes the listening gaze as something capable of producing ‘new modes of musical response, new forms of musical meaning’ (Kramer 2002: 77).¹² These modes of response relate specifically to the body of the performer, and the way in which the performing body can in some circumstances directly invite such a gaze. For instance, Richard Leppert suggests in relation to Liszt’s solo piano performances that viewers recognized the performer’s body as ‘a text to be read’ and saw the spectacle as ‘the language of the soul, speaking through the language of the body’ (Leppert 2002: 205–6). I have already suggested that an important aesthetic ideal in jazz has always been to understand the body as the site of the music. But at the same time, for the viewer the physical behaviours of the performing body are understood as manifestations of something unseen; to put it differently, bodily gestures are taken to represent interior mental states. And this is key to how I see the listening gaze operating in this context. In the gaze the body of the performer is taken to signify not only their physical engagement with the act of music-making, but the creative interior itself, and those processes and states of mind which produce the music being played. This is a form of what we might term folk psychology, in that it draws on a wealth of commonly understood concepts about how certain behaviours are the result of certain mental or emotional states.

The listening gaze is particularly likely to function in this way when the bodily motions of the performer cannot easily be aligned with musical structure and thus explained away in a structuralist sense, as here. That is, the gaze works to interpret these gestures, and the absence of any obvious correlation between physical and musical gestures prompts these kinds of folk psychological interpretations. And given the ritual kind of context in which Jarrett performs, there is further encouragement for the audience to direct a gaze of this sort at the body of the performer, and observe and interpret the spectacle going on before them. So the listening gaze sees Jarrett’s motions as enactments of the process of improvisation, intrusions into the physical world of an interior creative process. These intrusions are seen to form not some kind of physical analogue to the music, but a complex embodiment of the mental effort involved in improvisation. The gaze works to interpret these physical movements, seeing them both as bodily imaginings of the music, and as responses to the music as it takes sounding form. Jarrett’s body then, acts as a signifier of the act of improvisation itself.

Grooves

Jarrett’s groove passages are particularly recognizable features of his improvisations. These are essentially ostinato passages in which the rhythmic momentum is generated by left-hand vamp figures. These figures typically consist of octave roots with fifths and sevenths added. Indeed this aspect of Jarrett’s playing constitutes a modern rereading of jazz piano styles such as boogie-woogie, which were similarly founded on left-hand vamp figures. Most Jarrett groove passages are founded on single harmonies, reiterated over long periods of time. Some groove passages use alternating chords, typically I–IV over a simple vamp bass line, giving a blues-tinged character. Others are coloured differently, often with phrygian minor qualities, a particularly distinctive Jarrett trait.

The groove passage which I discuss here comes from approximately five minutes in to the second improvisation from the Tokyo concert. Perhaps the most distinctive aspect of Jarrett's physical attitude during this groove passage is the act of standing up from the piano stool (Figure 11.3). In this posture Jarrett's whole manner of addressing the piano keyboard changes completely. Standing up has the effect of drawing attention away from the hands, not least because this is an unconventional manner in which to address the keyboard.



Figure 11.3 Jarrett in the groove

At the same time Jarrett's feet become particularly active: at the start of the passage he taps the sustain pedal with his right foot, not so hard as to actually engage the mechanism but still creating a resonant 'thud' which serves as a rhythmic effect. Later on in the passage he stamps regularly with his left foot on the wooden floor of the stage, this time in an explicit backbeat pattern. Indeed, usually in Jarrett groove passages one finds some kind of physical articulation of pulse independent from gestures directly concerned with the production of sound. In this case when Jarrett is standing he regularly rocks from back on his heels down onto his toes, and it is this movement that generates the left-foot backbeat effect.

This kind of physical engagement with pulse is hardly surprising. Most jazz musicians have certain ways of maintaining a pulse physically, most usually a tapping of the foot, although the manner in which this is done varies greatly from one player to the next. In this case the pulse-keeping aspect of Jarrett's playing seems to visually reinforce the strong rhythmic momentum of the music. His hands often stay quite still over the keyboard even when playing such strongly rhythmic passages as this. So in some respects this 'rocking' to the beat makes sense – it provides that visual articulation of the beat that we as viewers might expect.

Along with this articulation of pulse Jarrett's upper body is also extremely active. He tends to sway from side to side while leaning slightly forward, and sometimes bends backwards with hips moving forwards. Figure 11.4 is a series of stills which present a typical sequence of moves, from standing up with the upper torso bent slightly forwards over the keyboard (a), coming rapidly upwards with

the upper torso (b and c), then coming back down again and twisting slightly to the right (d).



(a)



(b)



(c)

Figure 11.4 (a–d) Typical sequence of moves by Jarrett

continued



(d)

Figure 11.4 (a–d) concluded

Much as with the ballad passage there is a kind of restlessness to this in that Jarrett never maintains one physical attitude for long. As a pianist I have tried imitating movements such as these to understand the physical effect they have. What is particularly clear is that the movements up and away from the keyboard generate a different kind of sensory feedback; the piano feels quite different to play standing up as opposed to sitting down. It is almost as though Jarrett moves this way in order to generate as much feedback as possible, or for the purposes of what Davidson (2001) has called self-stimulation or self-comfort.

In considering what Jarrett's gestures express in this passage we need to consider the concept of groove, an idea which is fundamentally physically grounded. Steven Feld talks of how '[g]etting in to the groove [...] describes a feelingful participation, a positive physical and emotional attachment. [...] A groove is a comfortable place to be' (Keil & Feld 1994: 111). And in her book on jazz performance and interaction, *Saying Something*, Ingrid Monson talks of the emotional and interpersonal aspects of the way jazz musicians talk about groove, specifically the idea that playing 'in the groove' is almost like letting the music 'play itself' (Monson 1996: 68). Therefore what we mean when we talk about groove is not just a series of stylistic features, but an experiential quality both for players and listeners. As much as Jarrett's physical gestures articulate the rhythmic aspect of a groove passage, they convey the feeling of groove, visually representing what it is to be 'in the groove' or to 'get down'. The physical articulation of pulse I have described signifies this 'getting down' as much as it serves a practical function for the performer.

The idea of the music 'playing itself' which is a part of groove, is a vitally important one in perceptions of jazz. There are many solos valorized as classics in jazz because the stance of the performers seemed to embody the ideal of 'forgetting oneself'. Consider the famous solo by tenor saxophonist Paul Gonsalves with Duke Ellington's band at the Newport Jazz Festival in 1956. Gonsalves's solo on an interlude to the Ellington piece 'Diminuendo and Crescendo in Blue' lasted for twenty-seven choruses of blues changes, and ignited an ecstatic reaction from the

crowd.¹³ What is famous about the solo is not so much the way Gonsalves constructed his ideas so much as his demeanour. He stood with his eyes closed throughout the performance, apparently little aware of anything around him. Such moments of forgetting in jazz have been mythologized within much jazz writing. Floyd, for instance, describes this as an ideal many improvisers strive for, while quoting at length an account of saxophonist Art Pepper apparently undergoing such an experience (Floyd 1995: 139). This was also a vitally important notion for the new jazz of the 1960s, specifically the free jazz movement spearheaded by musicians such as Ornette Coleman and John Coltrane.

If groove is necessarily about some form of forgetting or of surrender to the pulse, then I suggest that in this passage the listening gaze understands Jarrett's physical gestures as enacting the feeling of loss; he appears to be played 'by' the music rather than playing the music. Indeed the way in which his bodily gestures seem to draw attention *away* from physical execution encourages the gaze to function in this way. So the gaze understands the apparent physical abandon as indicative of an inspired creative state. In what I have suggested is the ritualized context of these performances in which Jarrett makes such a play of the risk involved, such a state of forgetting is loaded with dramatic potential. It testifies to the romantic stereotype of the performer surrendering to some creative power outside of themselves. Jarrett's grooving body testifies to what the solo concerts dramatize: the spectacle of a performer who seems to publicly battle with his muse.

The fact that critical opinion draws attention to Jarrett's body in performance tells us much about normative ideas regarding physicality and performance in the concert hall. But as I have suggested, the body in these performances does much more than just signify itself, making us aware of the physical and mental exertions of improvisation. Jarrett's performing body invites what Kramer calls a listening gaze. In the listening gaze we as viewers continually strive to make sense of what we see and hear together. The fact that Jarrett's physical gestures do not appear to fit with musical gestures leads us to see them as expressions of something unseen and unheard. The gaze sees through these physical gestures the improviser's imagining of the music, enacted through what sometimes seems like a physical struggle. The listening gaze can also work to construct narratives based on viewing performance, narratives in which the very act of musical creation takes centre stage. To conclude, in the context of Jarrett's solo performances the body acts as a powerful signifier of improvisation itself. It enacts simultaneously the struggle, tension and release which is necessarily a part of this process. The spectacle of the solo concerts involves the direction of a gaze at the improvising body, a spectacle that has formed a crucial part of the appeal of jazz during the twentieth century.

Acknowledgements

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Notes

1. Calls for the acknowledgement of the body in musicology were made in the early 1990s by Robert Walser (1991) and Susan McClary (McClary & Walser 1994). For some recent moves in this direction, see Cusick 1994 and LeGuin 1999.
2. Cook's language implies the practice of score-based performance through its terminology ('music' and 'interpreter'), but I take it as a broadly based formulation.
3. Paul Berliner's discussion of 'emotional substance' in jazz is relevant here (1994: 255–9).
4. For instance, see Brian Ward's book on *Rhythm and Blues* (1998) or Ben Sidran's *Black Talk* (1971).
5. Keith Jarrett, *Solo Concerts*, ECM 1035/37 (1973); *The Köln Concert*, ECM 1064/65 (1975).
6. The idea of topicality is drawn from Leonard Ratner's influential account of the Viennese classical tradition (Ratner 1980). See also Powers (1998) for a useful discussion of this approach.
7. Keith Jarrett, *Last Solo*, Image Entertainment DVD, ID5721ERDVD (1987).
8. This particular image is taken from the second improvisation from the Tokyo concert, since at this point the camera shot provides a better image than in the first improvisation. However, Jarrett maintains the same posture in both cases.
9. Phillip Strange has talked about this aspect of Jarrett's performance philosophy as a kind of 'negative preparation', in which 'the vigilant rejection of repetitive habit is central' (2003: 36).
10. Berliner also acknowledges that improvisation cannot be reduced to such a simple top-down model, but rather that the body can play a role in interpreting sound and suggesting new patterns and ideas.
11. See also Phillip Strange's discussion of how Jarrett describes the limitations of the piano and his attempt to transcend them (2003: 50–52).

12. I take Kramer's listening gaze to be a deliberate nod to Laura Mulvey's notion of the male gaze in cinema, theorized in a famous article (Mulvey 1975).

13. See Duke Ellington, *Ellington at Newport*, CBS 4509862. Stanley Dance's liner notes provide a first hand account of the events at Ellington's performance.

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Chapter 12

‘She’s the one’: Multiple Functions of Body Movement in a Stage Performance by Robbie Williams

Jane W. Davidson

This chapter explores ideas that have been central to my research and performance for over a decade. As a music psychologist, singer and music theatre director, I have been fascinated by the ways in which body movement represents, generates and presents music in performance. A single performance of ‘She’s the one’ by Robbie Williams provides a focus for discussion and illustration. This chapter begins by outlining the theoretical issues that are central to understanding the role of the body in music as a communicative force. It goes on to demonstrate how our bodies influence performance capability, including how instruments are designed in response to our physical shape and capacities. An exposition of the importance of body movement and gesture to construct and deliver a musical narrative is then made. Following this, parallels between the gestures used in everyday speech and in musical performance are drawn, and it is hypothesized that these movement-language gestural equivalents occur across all types of musical performance in all social and cultural contexts. It is argued that singers can give us helpful insight into the specific meanings of the gestural codes used in music as they are often tied to text and the literal narrative. At this stage, the function of the singer within Western popular music is defined, explaining how several levels of meaning are produced. These are then discussed in relation to the performance of ‘She’s the one’ by Robbie Williams, demonstrating that much of the information is primarily contained in the body movements of the performer.

The Significance of Movement in Musical Communication

Origins

The vocalization typically used to soothe and stimulate infants seems to have a clear adaptive advantage for the baby: to promote sleep (Auers 1985). Owing to the additional proximity achieved by cuddling and bouncing during this activity, it appears that the song/play activity facilitates the cultivation of reciprocity and communication in one-to-one relationships (Trevarthen 1999/2000). Compelling

video and spectrographic analyses of the sound and movement interactions of infants and care-givers strongly support the notion that there is a mutual 'tuning in' which promotes adaptation to the social world. Stephen Malloch (1999/2000) has described these behaviours as 'communicative musicality'. He demonstrates, working with mentally ill mothers, that when mothers show depressed symptoms, they interact with their infants in a very constrained, low energy manner. When a mother is in a manic state, she displays extremely hypertense and over-aroused behaviours which often make her raise her voice or move in a jerky and aggressive manner. In such cases, the infants are often disturbed. In depression or hypermania, none of the typical 'musical' play and interaction occurs, and so the infants do not – in the short term at least – progress as well in their general development. Such findings seem to suggest that the care-giver's voice and physical movement need to combine and function together in a 'musically oriented' interaction with the child in order to facilitate socio-emotional growth during the child's early development. That is, 'communicative musicality' both listened to and participated in seems to function as a key part of mental and social development – a core channel of human communication – that brings us from isolation to social interaction. This research indicates that: (1) musical-movement behaviours are positive and socio-emotional in nature leading to enjoyable and stimulating communications; and (2) these early 'communicative acts' of movement and vocalized turn-taking seem to have adaptive functions which might be argued to be at the core of all musics. Of course, a strict and formal definition of music is difficult to make since different traditions have different products, but if viewed as organized sounds (timbres, rhythms, pitches in single and multiple lines) and silences, juxtaposed according to specific socio-cultural rules, it is the symbolic communicative force of music which dominates the adult experience.

Contemporary Life

Music in the twenty-first century – across a range of social and cultural styles – has become a sophisticated abstracted language dependent on many subtle rules. Thus, it is a deeply encoded communication, requiring decoding skills based upon social and cultural knowledge. Increasingly, research is showing that the understanding and training of musical skills can be facilitated when basic bodily concepts such as weight, time, space and flow are highlighted (see the work of Rudolph Laban as explored by Eden Davies (2001)). Indeed, in some music, such as Brazilian Samba, trying to 'understand' the inherent quality of this music from a score or from a verbal explanation is useless; the rhythms and pulse of the music need to be felt and expressed in body movement in order for players to coordinate musical timing and to establish the overall 'feel' of the piece. Similar principles seem to apply in African and many other forms of national and traditional musics, as well as jazz, Western contemporary and Classical musics, too. However, it is only latterly that the last two categories of music have really begun to be understood in these ways. A recent conversation with a contemporary composer led me to discover that his meticulously scored music was an attempt to capture physical qualities such as the action of throwing. When I suggested that the bodily nature of these stimuli might

be communicated to the performers by asking them to create or imagine body movement, the composer did indicate that such a suggestion had the potential to direct the performer towards the goal of the music.

Writing about tonal music from the Classical and Romantic periods, David Lidov (1987) and Robert Hatten (2001) have demonstrated that a page of musical code (a score) can be meaningfully decoded and interpreted in performance, especially when the physical movement that both articulates the musical phrases and which is elicited in response to the musical phrase are explored by performer and audience. Related to this idea, Alexandra Pierce (2003) has offered movement classes and physical techniques to Western musicians to improve their capacities both to understand and to express their thoughts and actions in relation to the music they are performing. By investigating musical sounds in terms of their physical properties – that is, the music's action on and within the body of the performer – she has discovered that greater insights into how the music can be used affectively is achieved. Indeed, to reiterate the point I made to my composer friend, we often have visceral responses to music. Listening to music, for example, might cause shivers down the spine or a lump in the throat. This suggests that musical activity itself might, therefore, be akin to the elicitation of powerful physical/affective states, which may have analogies with interpersonal interactions, and so the action of one body on another (Sloboda 1991).

Within this broad theoretical framework, I intend to show how the movements of a music performer – Robbie Williams – do indeed display his ideas about the music, but also how they help him to construct the musical performance itself, such as to 'shape' the expressive elements. Furthermore, the work will demonstrate that the movements underlying, supporting and embellishing his musical performance also assist in the communication of his ideas to the audience, which in turn the audience share in and respond to, often in similar or additional physical expressions. Finally, it seems that it is through Robbie's body movements that the audience is able to access information about him not only as a 'showman', engaging in affect display, but also as an ordinary man revealing intimate inner states about himself through small and subtle 'adaptive' behaviours (such as stroking the side of his face with his hand, or shaking his arms gently as he walks along). Prior to investigating the specific case, however, it is important to establish how much we know about how the body and mind of the performer coordinate and develop in the acquisition of musical performance skills.

Mind and Body in Performance

Proficient, fluent music performance demands the interaction of cognitive, perceptual and action processes. The level of fluency in the generation and use of these processes is a function of knowledge and practice. The crucial bodily engagement of the music performer obviously incorporates performance goals (technical and expressive aims) and self-monitoring during the course of the performance, with the whole performance being dependent on combined

intellectual/conceptual understanding and motor skill (Lehmann & Ericsson 1997). But, just as knowledge and skill shape fluency, so an individual's anatomy and the instruments played will have a critical role in further shaping the action processes involved in delivering a musical performance, and so will also shape the musical outcome. For example, a small cellist will develop his or her way of playing to achieve expressive effects which will be slightly different from a larger person, even if the technicalities of playing are based on the same principles. Physical factors are also crucial when playing different repertoire on the same instrument, such as an electronic keyboard versus the piano, or a jazz guitar versus a folk guitar. Adapting to the ergonomics of the particular instrument and creating musical effects of similar ideas is a central concern (Baily 1985; Baily & Halstead 2004).

A further point to be emphasized is that motor plans in memory (mental representations) are often established to enable actions to be undertaken with as little extraneous effort as possible, that is, to produce an economy of movement (for example, rowing (Bernstein 1967)). In music, there are other types of physical manipulations which are dependent on mental representations of the musical expression. Thus, two kinds of movement information are involved in the physical action of music performance: those for the requirement of playing the notes and those to achieve musical effects. When a skilled performer plays a well-learned piece, these actions become co-specified, especially if the piece is extremely well-learned and performed with a high degree of automaticity (Shaffer 1982, 1984; Davidson 2002).

Additionally, musical communication seems to use body movement 'grammars' which have semantic codes, determined by their specific cultural contexts. Studies of different musicians (Davidson 1993, 1994, 1995, 1997, 2002) demonstrate that these movements have a similar function to the physical gestures that accompany speech. For example, one male pianist made a small wiggling movement with his upper torso during a phrase, and as he ended the musical section his head and upper torso nodded as he played the final chords. It might be that he was making *illustrative* movement – emphasizing the ending – or indeed that he was *regulating* the timing of his performance – keeping the musical phrase under technical and temporal control. These categories are certainly major gesture types used in most non-verbal communications in social situations (Ekman & Friesen 1969). But the gestures might have had discreet moment-by-moment meanings as the musical discourse unfurled (Kendon 1980). The following four categories clarify these functions:

1. *Iconic function*, where some feature of the action or event is being described in the gesture. For example, 'make sure you hold it at both ends' with the hands tracing the precision of the potential action;
2. *Metaphoric function*, such as 'it dragged on and on' being illustrated in a rolling and stretching process hand gesture. The *conduit metaphor* is particularly common in speech. For example, saying 'next I shall', the speaker might contain the word 'next' in a box-shaped hand gesture;

3. *Deictic function*, locating aspects of the discourse, such as gestures with fingers pointing left and then right when saying ‘she didn’t know which way to look’;

4. *Beat function*, those small baton-like hand gestures that do not change in form over the content of the speech, and which appear to have a pragmatic function, commenting on the speaker’s own linguistic contribution. For example, in speech repairs and reported speech, the hands flap up and down as the speaker says ‘no, no, I mean put it down, don’t pick it up’.

It was also noted in this research that musicians often make swaying movements which vary in direction and size, but which are consistently present in their interpretations. Neil Todd (1999) may be correct to observe that we enjoy vestibular activity, especially that involved in moving with music (we tap our toes, we sway, we dance), and it could be that in generating the performance, the swaying helps in the production of the expressive timing effects by providing a *regulatory* device around which the local tempo typically ebbs and flows as rubato effects operate. Such a proposal would seem to fit with the earlier observation that some musics need to be ‘felt in the body’ in order to be played rhythmically and cohesively.

With a growing literature on music of different styles and cultures, it is becoming possible to identify the tasks specific to different kinds of performer. The pop singer – the focus of this chapter – has already been summarized by a number of key authors, and this enables us to consider his or her performances within a fairly well-established theoretical framework.

The Pop Performer’s Tasks

The pop performer seems to have multiple social tasks to execute in a performance situation: they present their musical material and its narrative; they interact with their co-performers to coordinate the performance task; and they have to communicate with and sometimes interact with the audience. Simon Frith has argued that these many layers make pop performance a skilled task: to ‘become’ the character in the song is about ‘enacting [...] the protagonist in the song’ (1996: 198). In accordance with Sverker Runeson and Gunilla Frykholm’s (1983) principle that actions specify their causes, we know that physical behaviour contributes to this enactment and hence to the achievement of a certain character. But Frith also observes that ‘acting performance involves gestures that are both false (they are only put on for the occasion) and true (they are appropriate to the emotions being described, expressed, or invoked)’. He goes on to note that solo pop singers are always creating a ‘tension between an implied story (content: the singer in the song) and the real one (form: the singer on the stage)’ (: 209). He states that pop stars must keep both ‘a star personality and a song personality in play at once’ (: 212).

Clearly, the semantics of body movements and gestures in musical performance involves codes of social etiquette; for example, there are behaviours

between co-performers, and co-performer and audience, such as an agreed way of greeting and being received. This was observed in the behaviour of pop star Annie Lennox (Davidson 2001), who prolonged silences between phrases of her well-known songs in order to enable audience participation through anticipation.

So, stage behaviours in the form of non-verbal information – gestures and other codified behaviours – express communicative musical intention, performer style and individuality to co-performers and audience. These are critical forces between co-performers, and performer and audience, providing information to enable musical coherence and giving insight into the performer's state and focus. It is with the multiple roles of the pop singer in mind that a stage performance by Robbie Williams is now considered in order to investigate how body movements are used for musical and other communicative purposes within performance.

Robbie Williams

Robbie has become one of the most popular solo male singers of the last seven years. He co-writes some of his own material, as well as covering popular classics such as songs performed by Frank Sinatra. He has also made musical collaborations with some top soloists and movie celebrities, including Kylie Minogue and Nicole Kidman. I have chosen to consider his work for two reasons:

1. A specific interest in how he performs his chart topper 'She's the one', using his body to generate, regulate and send crucial social cues to his live audience at Knebworth in 2003;¹
2. The fact that Robbie is interested in his role as a performer. In the documentary which accompanies the Knebworth DVD, Robbie states that he is interested in how he flicks between his 'stage persona' and his 'intimate, shy self'. Thus, he seems to be aware of some of the techniques he employs to capture the audience; 'Let me entertain you' is of course the title of a song. But also, he has an awareness of the tension this public self presents when he is in a personal context, or when the shy Robbie surfaces in a public context.

'She's the one'

The song complies with the typical features of a pop hit: it has a verse/chorus structure, it is in 4/4 time, a major key and primarily contains alternating tonic, sub-dominant and dominant harmony (Figure 12.1). However, and specifically, the sung melody uses step-wise ascending and descending scalic fragments, and tends to begin each new phrase on an off-beat, giving it a 'catch'. The chorus literally takes off, stretching the vocal range and creating a faster moving but more sustained vocal line. In short, the song is repetitive, 'hooking' the listener into its musical groove, and the lyrics are simple but attractive, playing with the ideas of

closeness and the intermingling of self and other experiences of intimacy: Robbie sings, 'I was her. She was me. We were one. We were free.'

She's the One

Intro
 B⁹ E^{b9} B⁹ E^{b9}
 I was her...

Verse 1
 14 B⁹ E^{b9} B⁹ E^{b9} /D Cm F⁷ B⁹ E^{b9}
 she was me, we were one, we were free, and if there's some bo - dy - cal - ling him on, she's the one. If there's some bo
 22 Cm F^{sus4} F B⁹ E^{b9}
 - dy - cal ling me on, she's the one. We were young.
 Kel-ly's the one.

Verse 2
 35 B⁹ E^{b9} B⁹ E^{b9} /D Cm F⁷ B⁹ B⁹
 we were wrong, we were fine, all a long. And if there's some bo - dy - cal - ling me on, she's the one.

Chorus (1)
 43 E⁹ B⁹ B⁹ E⁹
 When you get to where you wan - na go... and you know the things you wan - na know, you're (smi - ling)... When you said what you wan - na say... and you
 48 /D Cm F¹¹ F
 know the way you wannaplay... yeah. You'll be so high you'll be (fly - ing.) Though the sea...

Verse 3
 61 B⁹ E^{b9} B⁹ E^{b9} /D Cm F⁷ B⁹ E^{b9} /D
 will be strong, I know we'll car-ry on, if there's somebo - dy - (cal - ling me on), she's the one. If there's some bo
 69 Cm F^{sus4} F B⁹ B⁹
 - dy - cal - ling me on, she's the one.

Chorus (2)
 82 E⁹ B⁹ B⁹ E⁹
 When you get to where you wan - na go... and you know the things you wan - na know, you're (smi - ling)... When you said what you wan - na say... and you
 87 /D Cm F¹¹ F
 know the way you wan - na play... yeah. You'll be so high you'll be (fly - ing.) I was her...

Figure 12.1 Aural transcription of Robbie Williams’s live stage performance of ‘She’s the one’, Knebworth, 2003

continued

3. An over-arching feature of Robbie’s movement style in the performance involves him nodding his head or his whole upper torso in time to the music. Though not described in the transcription, it is to be noted that when camera shots of Robbie include members of his band, they can be seen to make similar rocking movements.

4. Other specifically identifiable movements involve: *emblematic* gestures (bows, salutes, blown kisses, peace signs); *illustrative* gestures (upwards thrusting hand gestures highlighting the upwards musical phrase, or arm-flapping movements demonstrating the action of flying); *adaptive* gestures (arm relaxing and flopping by Robbie’s side); *display* gestures (posing with the microphone over the shoulder, or turning the back to the audience in a dramatic manner); and *regulator* gestures (raising arms and bringing them down in order to coordinate the band to commence the final verse together). [These descriptions come from Ekman and Friesen 1969 and were mentioned earlier in terms of illustration and regulation only.]

But, what does this analysis enable us to learn about Robbie and the performance as a whole?

Table 12.1 Robbie Williams, ‘She’s the one’, live stage performance, Knebworth, 2003. Movement descriptions of his actions (Column 3) and the audience’s actions (Column 4) shown in relation to his spoken/sung lines (Column 1) and his stage position (Column 2)

Robbie’s spoken/sung lines	Robbie’s position on stage	Robbie’s movement	Audience’s behaviours as seen through the camera
Instrumental Introduction			
“How long have you been married? That’s entertainment, right there! That’s beautiful.”	Down-stage centre.	Bows, looks at man and woman to right. Fiddles with ear-piece.	Cheering, applauding.
“I’ve got one of these! Here, I’ll give it to you back.”	Walks slightly upstage.	Wags right finger at audience. Catches a t-shirt thrown by a woman.	Cheering, but attentive.
“I’ve got one of these! Here, I’ll give it to you back.”	Same position, facing into crowd, towards woman and man.	Turns to face the man and woman. Smiles and gently throws t-shirt back.	Woman playfully sticks tongue out at Robbie, listens attentively, then catches t-shirt. All the time, woman is swaying held in the arms of the man (her husband).

continued

Table 12.1

Verse 1			
<i>I was her, she was me. We were one. We were free.</i>	Same position, facing into crowd, towards woman and man.	Looking intensely at the couple. Starts fiddling with an ear-piece. Holds it in position until it seems to be fixed.	Continue to sway. Woman tightly held in man's arms. Whole audience singing words and swaying gently.
<i>And if there's somebody calling him on.</i>		Outstretching of right arm towards couple. Points at the woman.	
<i>She's the one.</i>			
"What's your name?"		Removes ear-piece, bends forward, away from mic., and speaks. Fiddles with ear-piece again.	Woman shouts back 'Kelly', husband gives her a squeeze. They look at one another, still swaying.
Kelly's the one!	Walks further upstage.	Points at woman, smiles and sings. Bows.	Kelly blows Robbie a kiss.
Verse 2			
<i>We were young. We were wrong.</i>	Facing out towards audience.	Making small head movements, nodding in time with the music. Changes mic. From left to right hand and back again.	All sway and sing along.
<i>We were fine all along.</i>		More frequent and exaggerated series of head nods.	
<i>And if there's somebody calling me on.</i>	Turns around.	Right arm up in air. Index finger points to sky. Spins around with back now to the main audience. Places mic. over right shoulder to allow audience to sing into it.	All singing.
<i>She's the one</i>	Faces audience.	Turns and points to whole audience.	

continued

Table 12.1

Chorus 1			
(instrumental bridge into singing)	Running downstage.	Full dance-like spin, moves energetically downstage towards the band, using upwards scooping hand gestures seemingly to encourage the audience to join the singing.	More aroused, and cheering.
<i>When you get to where you wanna go,</i>		Punches air with right hand. Slows to a walking pace.	Some screams.
<i>And you know the things you wanna know, You're smiling.</i>	Close to band.	Smiling. Uses relaxed freely swaying arm movements.	See Kelly and husband swaying and nodding their heads to the music.
<i>When you said what you wanna say, and you know the way you wanna play. You'll be so high you'll be flying.</i>	Swirls around to 'face' all sides of the audience.	Gradually raises both arms and makes a flying gesture and spins.	All lift arms together, like Robbie. They all sing, and some swirl.
Verse 3			
<i>Though the sea will be strong,</i>	Returns to his starting position.	Rocking whole of upper torso, strongly in time to the music.	Kelly and husband sway in time to music.
<i>I know we'll carry on.</i>		Whole body shakes.	Kelly wipes a tear from her eye.
<i>If there's somebody (calling me on.)</i>		Starts to fiddle with mic. as he takes his jacket off.	Kelly stifles sobs by placing hand over mouth.
"Give that to Kelly."	Faces Kelly.	Passes over jacket through crowd.	She puts Robbie's jacket on. Husband embraces her.
<i>She's the one. If there's somebody calling me on. She's the one.</i>	Facing out towards main audience.	Bows to Kelly. Nods several times. Leans head to side. Spins mic. in his hand (like a revolver), then places it on his shoulder and smiles and gives 'knowing nod'.	Kelly sways with husband.

continued

Table 12.1

Chorus 2			
<i>When you get to where you wanna go,</i>	With band, but facing audience.	Moves further downstage to join his band. Functional walking movement to position himself, including relaxed small arm swaying gestures.	Audience continue to sing and sway.
<i>And you know the things you wanna know,</i>			
<i>You're smiling.</i>		Lifts hands in 'flying position' as earlier.	
<i>When you said what you wanna say, and you know the way you wanna play. Yeah.</i>		Whole body 'nod'. Continues nodding. Right hand now strikes out the beats, with very strong movements.	All make 'flying' movement, with singing.
<i>You'll be so high you'll be flying.</i>		Repeats the 'flying' movement.	
Verse 4			
		Gestures a military-style salute.	
<i>I was her, she was me.</i>		Walks up steps onto a raised stage so that he is 'mingling' with the band.	Continued screams, dancing, swaying.
<i>We were one. We were free.</i>		Looks down to floor. Seems introspective.	
<i>If there's somebody calling me on. She's the one.</i>		Looks out into audience, makes the V sign for peace with right hand, arm held up. Nods. Leans to right, allows his arm to drop.	

continued

Table 12.1 concluded

Outro		
<i>If there's somebody calling me on. She's the one.</i>	Strolling to a central position.	
<i>If there's somebody calling me on. She's the one.</i>	Turns to audience.	
<i>If there's somebody calling me on. She's the one.</i>	Strolls on and places hand on shoulder of keyboard player. Both nod together, 'empathically'.	
<i>If there's somebody calling me on. She's the one.</i>	Dances in rhythm, clicks fingers. Moves mic. to and from mouth. Very emphatic. Walks to and places hand on mic. stand. Puts mic. in stand.	
<i>If there's somebody calling me on. She's the one. She's the one.</i>	Both hands on mic., leans back singing with great physical engagement and 'effort'.	
<i>If there's somebody calling me on.</i>	One hand on mic. All his attention focused on the mic. Sings very intensely into mic.	
<i>You're the one. She's the one.</i>	Both hands into air, looks around to band.	Kelly's husband lifts her up. She waves.
<i>You're the one. She's the one.</i>	Makes a 'peace sign' with right hand.	Kelly blows Robbie a kiss.

Discussion of the Stage Performance

Robbie the Narrator

There is evidence that Robbie does indeed 'tell the story' (Table 12.1). In particular, in the final verse, through a section in which he uses his eyes in a downwards looking pose and keeps much stiller than in the rest of the song, a sense of intimacy and emotional intensity is evoked as he sings '*We were one*'. An additional level of meaning is added at this point, through this pose, for as he is singing in the past tense, and the downward look hints at melancholy, a sense of loss is also apparent. The flick back into the present tense in the chorus refrain, and the generally much more positive upwards and strongly projected body movements suggest that this woman is still '*calling him on*' with motivation, joy and hope. But, Robbie is much more than a narrator, he is also the 'show off', the person on whom all the attention is focused.

Robbie the Star

Intermingled with the delivery of the narrative of the song, there is an array of display gestures such as throwing the microphone over his shoulder, spinning it like a revolver and so on. These behaviours make references to other types of performance: the microphone movement is what might be seen in a stage show or a trick performance; the revolver spinning is reminiscent of a slick cowboy or James Bond in a movie. So, bodily codes inform us that Robbie is indeed a 'showman', a 'movie star'. In other words, he is a larger than a real-life character when on stage.

Robbie the Manipulator

Along with the 'show' comes another 'story' which parallels that of the song and seems to be used for specific affective ends. These ends seem complex. There is the use of Kelly and her husband onto whom Robbie projects the narrative of the song. Robbie sings the words as if he were Kelly's husband and/or if he were a man for whom Kelly could indeed 'be the one'. The effect on Kelly is striking: she swoons at Robbie – seen in the blowing of kisses and the offering of her t-shirt; she is overwhelmed by his attention and cries with joy at it. But, she is also held and hugged by her husband – the man she loves – who holds her tightly, kisses her passionately, and aids her in her fantasy of desire for Robbie as he lifts her up at the end of the song, seeming to offer her to Robbie. It is the body movements which tell the story. Furthermore, the husband is like Robbie in appearance, and so the layers of meaning go on: every woman (Kelly) can have a Robbie (Kelly's husband) just for herself.

From the video, the signs and signals being passed between Robbie and his focus couple are incredibly powerful. Moreover, the couple and the audience as a whole enjoy this story. They are all complicit in the construction and delivery of it. The whole audience sighs and cheers as Kelly is more or less focused upon during the song. Are we experiencing a master of manipulation? Well, 'that's entertainment', as Robbie confesses. The audience's pleasure certainly involves participating in the exchange of shared gestures and movements, such as swaying in time to the music, swirling and 'flying'. Of course, they all know the song and so sing along, but the codified postures and gestures which accompany the song clearly feed into the entertainment value.

Robbie as Coordinator

Table 12.1 demonstrates that Robbie also uses his body movements to coordinate musical entrances and exits, and generally to direct the sequence of what happens within the moment-by-moment unfurling of the performance.

Robbie as Responder

Just as Robbie's movements and behaviours shape and coordinate the performance, it is to be noted that he is also interacting with and responding to his audience: in

effect, their presence and cues are crucial to the performance as Robbie uses a specific response to direct his next move.

Robbie in the Groove

There are many occasions during the performance when Robbie, the audience and the co-performers can be seen nodding along in time with the music. The physical movement is evidently pleasurable, perhaps adding to the sense of cohesion, as they all literally coordinate in their body movement, as well as, of course, sharing in singing the song. The effect in the performance is reminiscent of Neil Todd's (1999) and Colwyn Trevarthen's (1999/2000) ideas about music being part of our key sensual and sensory experiences of soothing, comforting, stimulating and uniting.

Robbie's Intimate Self

Amongst all the glitz and glamour of Robbie's performance, he does engage in a number of quite ordinary functional movements, like manipulating the ear-piece, taking his coat off, walking around, casually laying a hand on the shoulder of the pianist and so on. Additionally, he also makes movements of clear *adaptive* intention (Ekman & Friesen 1969). These movements are self-referencing, often self-stimulating (scratching the head, rubbing the ear lobe, for example) and so self-reassuring. On-lookers commonly use this type of information to discover information about the core characteristics of an individual, or a particular state they are in. For example, someone who is extremely puzzled may scratch his or her head. Or, someone who is very nervous might engage in a sequence of highly repetitive gestures, such as pushing their glasses onto the bridge of their nose repeatedly as they attempt to read a passage out aloud. Robbie's adaptive gestures show someone who is calm and relaxed. His arms 'flop' from side to side in evidently familiar and comfortable movements. So, it seems that some insight into Robbie can be gained through these kinds of gestural behaviours.

Conclusion

From the analysis and discussion above, it is evident that the body plays an integral role in musical performance. The expression of the musical sounds and the social intentions of the performer in context are integrated in the bodily production in the performance. It has been demonstrated that a series of gestures serves to clarify and coordinate certain ideas as communication arises between co-performers and the audience, all of which are embedded within a cultural framework. This chapter has revealed that the body is a critical element in understanding and producing a musical performance: it is part of the generation and perception of the performance.

Performers do not have to be seen in order to be understood. Indeed, many of the ideas expressed by Lidov (1987), Hatten (2001) and Trevarthen

(1999/2000) indicate that music itself implies physicality, and as such we can imagine the movement and action of the performer as we hear the music unfurling. But, the significance of cues coming from the visual perception of body movement cannot be underestimated. Moreover, increasingly in live performances where audience numbers run into thousands, video and huge projection screens enable audience members to get close-ups of their performers on stage. Thus, intimate and personal gestures can be clearly seen as if the performer were standing nearby. Moreover, and increasingly culturally important, in pop performances there are often forms of sub-performance going on amongst audience members which add yet another physical experience to it. The example of Kelly and her husband is one such case: they were 'being together' during the show; they were seen 'in close up' in the stadium on huge video screens; and they were 'being interacted with' in a very direct manner by Robbie. It is certain that the interpersonal interactions amongst audience members are crucial areas to be explored and understood as bodily functions in and on performance are to be understood.

As indicated, the audience may well experience the performance partly through a physical identification or empathy with the performer's movements and partly in terms of generating a performance (accompanying hand claps, head shakes, etc.) themselves. This idea suggests that audiences are drawing upon experiences and knowledge similar to those of the performers (this issue is discussed in much greater detail by Davidson and Correia 2002). Additionally, it is important to note that performers often use visual cues from their audiences to develop their own performance expressions. Audience members can thus potentially be physically involved in shaping the performance, though this clearly varies according to the performance tradition, with pop performance being oriented far more towards movement and participation than classical performance.

Given the points presented and discussed in this chapter, it seems that performers can and should study what is effective in the body movements involved in the generation of their music, and what engages their audiences and co-performers. The body and music are intrinsically bound together, especially within the live performance context.

Notes

1. This analysis is based on the DVD recording of the live stage performance (*What We Did Last Summer: Robbie Williams Live at Knebworth*, EMI 7243–599209–9–3).

2. Note that Roger Bakeman and John Gottman (1986) emphasize the necessity for validation of observational analyses. In this study, the author undertook initial observations which were then verified by two independent auditors who observed the video and the analyses and explored the degree of agreement. Where discrepancies were found, discussion ensued and the table presented here represents the agreed version of events by all three observers.

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