Chapter 9. Embodiment in musical performance

Martin Clayton and Laura Leante

Introduction

The role of the body in musical performance and musical experience has always been a central focus of the EMMP project. Our initial concerns were primarily with studying gesture in performance, and with the idea that bodily movement might provide useful clues as to the entrainment of participants. As other chapters in this volume demonstrate, however, our interests in embodiment have been further enriched in a number of ways, and it therefore seems appropriate to place this chapter on embodiment at the end of the volume: to some extent it serves as a review of this theme as treated in the book as a whole.

The notion of 'embodiment' has received increasing attention in a number of research fields in recent years, with interest growing exponentially in the first decade of the twenty-first century. The concept is now well established in cognitive science, philosophy and linguistics (albeit coexisting with versions of body-mind dualism and the 'mind as computer' metaphor it seeks to replace). Its influence is starting to be felt in music scholarship too, especially in the form of a number of recent studies on musical gesture. The idea of embodied cognition is one which recurs frequently also in this volume, and so this is an opportune moment to summarise our understanding of the concept and its application and significance for music research. Our aim here, in the first half of the chapter, is to reflect on the relevance of embodied cognition for the study of musical performance and experience with reference to some of the observations presented earlier in the volume. In the second half we expand further on some of these themes with reference to our work on Indian music performance.

Embodied cognition

There are several versions of embodied cognition theory currently in circulation, but a succinct and productive starting point for our discussion is Raymond Gibbs's statement of his 'embodiment premise':

> People's subjective, felt experiences of their bodies in action provide part of the fundamental grounding for language and thought. Cognition is what occurs when the body engages the physical, cultural world and must be studied in terms of the dynamical interactions between people and the environment. Human language and thought emerge from recurring patterns of embodied activity that constrain ongoing intelligent behaviour. We must not assume cognition to be purely internal, symbolic, computational, and disembodied, but seek out the gross and detailed ways that language and thought are inextricably shaped by embodied action. (Gibbs 2005, 9)

A number of interrelated themes can be picked out of this statement, which may be helpful when we consider issues of music cognition and performance. First – and this is, unsurprisingly, common to all presentations of embodied cognition – it implies a critique of the mind-body dualism that we associate historically with Plato and Decartes, and which underpinned the initial development of cognitive science in the 1950s. There is no need to rehearse this critique once again here, but it is worth picking up on some of its ramifications, which are implicit in Gibbs's premise.

> [The] bifurcation of the person into mind and body has subsequently given rise to many other dualisms, including subjective as opposed to objective, knowledge as opposed to experience, reason as opposed to feeling, theory as opposed to practice, and verbal as opposed to nonverbal. Cartesiansim has also led to the romantic view of the body as the last bastion of what is natural, unspoiled, preconceptual, and primitive in experience. Bodily movement is viewed as

> behavior, with little relevance to language, thought, or consciousness, and not as meaningful action. (Gibbs 2005, 4)

The attempt to overturn mind-body dualism has also brought all of these other dualisms into question. Where cognition was once seen as a form of computation, independent of the bodily experience of the individual, we increasingly see our cognitive capacities as emergent and continually shaped by ongoing embodied interactions with our environment. Perception and action are understood as mutually dependent: on the one hand, our perceptions of the world guide our actions; on the other, we act in order to better perceive the world.

A major implication of Gibbs's premise that may be problematic when it comes to thinking about music cognition is the pairing (and perhaps conflation) of the terms 'language' and 'thought'. A lot of the seminal work on embodiment is concerned with language, and in particular with metaphor: George Lakoff and Mark Johnson proposed that linguistic metaphor is underpinned by bodily experience, an idea amplified by Johnson in his theory of embodied image schemata (Lakoff and Johnson 1980, 1999; Johnson 1987). According to these studies, basic spatial-relations concepts structure a great deal of our reasoning (Lakoff and Johnson 1999, 30ff), while a limited number of 'primitive image schemas' such as part-whole, centre-periphery, cycle, iteration and so forth are found to be important cross-culturally (35).

The challenge for music studies is that on the one hand we wish to emulate this approach – since verbalised music theories are as richly endowed with embodied metaphors as any other discursive domain – but on the other we need to go beyond it. As Gibbs himself hints, we should be looking to question the dualism that pits bodily experience as natural, preconceptual 'behaviour' against language, thought, consciousness, and meaningful action. It is one thing, indeed, to recognise that verbalised, formal music 'theory' is expressed in metaphors that suggest an embodied origin, and quite another to value untheorised, nonverbal

musical behaviour itself as meaningful action. This latter proposition, indeed, is one that is explored by Andy McGuiness in the present volume: we suggest that the challenge in understanding music performance is to do both of these things.

Another recent approach to embodied cognition is that of Shaun Gallagher (2005), who bases much of his account on a distinction between the concepts of body image and body schema.

> A *body image* consists of a system of perceptions, attitudes, and beliefs pertaining to one's own body. In contrast, a *body schema* is a system of sensory-motor capacities that function without awareness or the necessity of perceptual monitoring. (Gallagher 2005, p.24)

This distinction resonates with others to be found in the embodied cognition literature between automatic or unconscious aspects of cognition and concepts accessible to conscious reflection. Cognitive science, in fact, recognises different kinds or levels of embodiment. Varela et al for instance, drawing on Merleau-Ponty, describe embodiment as essentially double, in the sense that it is both phenomenological and biological: "it encompasses both the body as a lived, experiential structure and the body as the context or milieu of cognitive mechanisms" (1991, xvi).[1] The distinction between Merleau-Ponty's two levels, the biological and the phenomenological, is an important one for our discussion.

In the 'biological' category we can place a wide range of phenomena studied as part of music cognition: auditory stream segregation, the categorical perception of pitch and duration, recognition of timbre, and so on. It must also include – although Lakoff and Johnson, unlike Gibbs, do not integrate a dynamical systems view into their 1999 book – the dynamical processes that lead to entrainment and the perception of metre, and which also suggest that processes of interpersonal synchrony can take place at an unconscious level. These ideas are developed elsewhere in this volume: Nikki Moran investigates interpersonal coordination

through subtle body movements and orientations, while Byron Dueck's study of metrical negotiations also invokes a sense of musical interactions being mediated through the embodiment of metrical structures. For both authors, unconscious processes of interaction involve behaviours of considerable cultural specificity (e.g. the gestures of North Indian classical musicians): thus, 'biological' here should not necessarily be understood as 'pre-cultural'.

At a phenomenological level, music cognition is embodied in the primary sense that it relates to the production of sound either within bodies or through the action of bodies on external sound-producing objects, as well as through our conscious experience of being in time with others. But it is also embodied in that we make sense of music through metaphors derived from our general bodily experience of the world as well as through our specific bodily experiences of engaging with music. In the 'phenomenological embodiment' category we can therefore discuss a wide range of music-theoretical concepts such as melody, harmony, tonality, rhythm, and form that are experienced in relation to embodied image schemas such as 'path', 'cycle', 'balance', 'attraction', 'centre-periphery', and 'collection' (see Johnson 1987, 126).

The remainder of this section will summarise a number of other key features of embodied cognition research: in most cases our summary begins with Gallagher's account. These are, in order, the role of gesture, the development of the self, mimesis and simulation, social embodiment and joint action. These issues will necessarily be considered only briefly, but each is relevant to music research and therefore they are all worth touching on here, with reference to some applications in music.

Part of Gallagher's embodied cognition theory is a communicative theory of **gesture** worked out in collaboration with David McNeill and others, according to which gestural movement falls into a separate class from both instrumental and locomotive movement and is

inseparable from language (Gallagher 2005, 118-121, McNeill 1992, 351). Gallagher also asks what unconscious gesture may achieve *apart from* communication, and speculates that it may implicitly help to shape our cognition, for instance by lightening a speaker's cognitive load (2005: 121-2, cf. Goldin-Meadow 2003: 246-7). Gesture has attracted increasing interest from musicologists in recent years (see for instance Godøy and Leman 2010, Gritten and King 2006 and 2011), work which has drawn on the foundational gesture research of McNeill and of Adam Kendon (cf. Moran, this volume). Work on gesture in music performance is arguably still in its infancy, but clearly no account of embodied cognition in music would be complete without considering this topic. Sound-accompanying gesture is often clearly a integral expression of some aspects of the structured sound it accompanies, just as McNeill argues that gesture is the complement of speech, revealing information that verbal utterance alone cannot convey. Gesture is also an important means through which participants in a musical performance share their intentions and coordinate their actions.

Amongst other arguments, Gallagher ties an innate body schema to the development of a 'primary embodied' sense of **self** in infants, arguing that since neonatal imitation draws on body schema, consciousness is structured by embodiment from birth (78ff). Body schemas are implicated in perceptions of the actions of others, and thus in mimesis and simulation. Since the identification of 'mirror neurons' (McGuiness and Overy 2011, Rizolatti and Craighero 2004), cognitive science understands that when perceiving the actions of others, areas of the perceiving subject's brain associated with *making* the perceived movement are activated. In other words, perception itself involves a kind of simulation of action within the mind: a kind of transduction of visual perception into imagined bodily movement. If body schemas can develop over time and temporarily incorporate physical extensions (e.g. clothing, tools), and if that developing body schema is implicated in the development of self-consciousness, then what effect might situations in which different individuals closely

coordinate and synchronise movements – as in music – have for the development of both selfhood and intersubjectivity?

Not surprisingly, some musicologists have begun to explore the implications of this understanding for music cognition. We can perceive actions aurally as well as visually, after all: might our perception of music involve simulations of bodily actions which transduce aural stimuli into perceptions of bodily movement? Leante's study of the reception of Indian music in this volume explores just such an idea. This is also effectively Rolf-Inge Godøy's motor-mimetic hypothesis:

> Motor-mimesis translates from musical sound to visual images by a simulation of sound-producing actions, both of singular sounds and of more complex musical phrases and textures, forming motor programs that re-code and help store musical sounds in our minds. (Godøy 2003, 318).

Perceptions always arise in context, and perceptions of others' intentions or emotional states also arise in the context of embodied **social interactions**. We understand another individual's intentions, Gallagher argues, because they are expressed in the other's embodied actions and mirrored in our own capabilities for action (1995, 223-4). The notion of embodied cognition therefore relates not only to the individual cognising subject in relation to his environment: since social interactions are embodied, the social dimension is also an essential component of embodied cognition. Although this aspect is not always stressed in the literature on the subject, it does inform a particular body of research, defined by the term 'social embodiment', in which Lawrence Barsalou has been prominent. This approach draws on many of the same insights as other works cited above, but mobilises them more explicitly in the interpretation of social interaction. Barsalou et al. describe four interrelated 'social embodiment effects' identified in the social psychology literature, as follows:

> First, perceived social stimuli do not just produce cognitive states, they produce bodily states as well. Second, perceiving bodily states in others produces bodily mimicry in the self. Third, bodily states in the self produce affective states. Fourth, the compatibility of bodily and cognitive states modulates performance effectiveness. (Barsalou et al 2003, 45).

Barsalou et al.'s third category – the relationship between bodily and affective states – is one which we will return to later in this chapter in referring to case studies of Indian music. The relationship between bodily states and socio-musical interactions is a theme that crops up repeatedly in this volume, in the chapters of Dueck and Moran in different ways and perhaps most strongly in Glaura Lucas's chapter. Congado performance in her account is fundamentally about bodily movement, including the channelling of energy through dance, the ritual significance of physical location and orientation, and the performance of certain ritually significant dance movements. In this case it is ritual actions and interactions that are being mediated through movement: we might think of these as especially intense and meaningful forms of social interaction which are mediated through particular movements and somatic states.

Developing similar ideas, recent work by Knoblich and Sebanz and others discusses the notion of '**joint action'** as grounded on both our capacity of mutual entrainment and simulation; built on these are joint attention and a final stage in which people "form intentions to act together while simultaneously distinguishing between their own and the other's part of a joint action" (Knoblich and Sebanz 2008, p.2021, cf. Chapter 2 of this volume). This approach too has begun to be applied to music, for example by Keller (2008).

This brief summary illustrates how far-reaching and diverse the implications of an embodied cognition paradigm are. Gallagher's distinction between body image and body schema suggests a fundamental distinction between the body as perceived and consciously understood, and the body as the locus of unconscious cognitive processes that may have important implications and yet remain inaccessible to consciousness; this distinction is echoed in that between phenomenological and biological embodiment. Both of these levels are relevant to music cognition: music involves the body, in both performance and reception, in a variety of ways that are available to consciousness and reflection; playing and listening to music draws on unconscious cognitive processes that are also embodied, but at a different level. Embodied cognition theories suggest that our physical gesturing both expresses and plays an active role in constituting our thought, and also that our use of linguistic metaphor (including that employed in music theories) is based on embodied image schemas. We perceive others' intentions and feelings through their bodily movement, and thus embodied interactions underpin our sense of self, our social relations and our capacity for intersubjectivity and joint action. Again, in every case one can readily find links to musical applications, and to ways in which music research could in turn potentially enrich embodied cognition theory in general. Before we can move on to that stage, however, we need to go back to musical phenomena themselves and consider the different senses in which musical experience might be said to be embodied.

Embodiment and music

Although a lot of musicological reflection, especially in the second half of the twentieth century, has seemed to be concerned exclusively with the manipulation of disembodied symbols, reflections on the importance of bodily movement to musical experience have a long and distinguished history (Leman 2008: 43-45). Recent authors who have begun to draw

on theories of embodied cognition develop these ideas for a variety of ends. Godøy's motor-mimetic hypothesis has already been cited above, and forms part of a larger programme of research on music, movement and mimesis. Lawrence Zbikowski grounds music theory in (partly embodied) theories of cognition (2002); in recent work he engages with McNeill's work to claim that "both music and gesture draw on a common pool of cognitive resources to create analogical representations of dynamic processes" (2011, 97). Marc Leman, on the other hand, aims to establish a robust theoretical framework within which to explore new forms of technological mediation in music-making (2008), an aim which informs a considerable proportion of current work on music and gesture. Much of the recent work in this area, from a variety of orientations, is summarized in a 2010 collection edited by Godøy and Leman. Our reflections above on the embodied cognition literature suggest, however, an enormous potential for further work in this area.

In order to start demonstrating how this challenge may be tackled, the remainder of this section will consider some of the ways in which the body is implicated in musical performance and thought, and the ways in which each has been (or could be) brought into a theory of embodied music cognition.

a. The first and most obvious sense in which the body is implicated in musical performance is in the production of vocal sound. Singing, of which virtually all humans have at least some direct experience, recruits a variety of different physiological mechanisms (involving, for instance, the propulsion of air through the vocal tract, the tightening and loosening of the vocal chords, and the manipulation of the resonant cavities of mouth and throat to modify the sound produced). This gives us each a direct and embodied knowledge of the relationship between physical tension and musical pitch, for instance. This would seem to provide a detailed and nuanced experiential basis for mimetic understanding of vocal and vocal-like music. Similarly we are aware

of relationships between different forms of vocal production, from speech to song to weeping: through bodily experience we relate song performance to a range of other experiences and expressions (Feld 1990).

Beyond this, of course, the flow of air which we both cause and directly experience in our own bodies can be linked to other real or metaphorical flows (for example, of energy, soul or spirit), and thus our embodied experience provides a grounding for spiritual or cosmological ways of understanding and relating to our environment. These issues have been discussed in ethnomusicological studies such as Lucas's chapter in this volume, or in Marina Roseman's work with the Temiar of the Malaysian rainforest (Roseman 1991). 'Flow' in the sense of the movement of the soul or spirit can of course be read as a *metaphor* based on an embodied image schema (Johnson 1987). What is less explored, perhaps, is the phenomenology of this sense of flow, and the correlation between these experiences and the physical experience of air flow and vibration.

b. Secondly, and similarly, we know that action in relation to external objects can create sound: or to put it another way, acting on our environment produces sound. Some observations tend to hold true across different kinds of sound-producing objects – for instance, putting more energy into the action tends to produce a louder sound, and smaller objects tend to produce higher pitches than larger objects (the term 'higher' in this case is of course another instance of an embodied metaphor) – while other mappings are complex and/or arbitrary. Nonetheless, sound-producing objects are activated by movement of our body parts, and therefore, inevitably, the instrument – or that part of the instrument with which we interact physically, such as an organ manual – is commensurate with the size of our own bodies and 'gesture spaces' (gesture space describes the volume, roughly a quarter of a sphere, within which our arms and hands can move in speech-accompanying gesture – see McNeill 1992, 86ff; see also Jensenius

et al 2010, 21-23 on spatial aspects of gesture). It follows from this that many, if not all, musical sounds can be conceptualised in terms of the movement of our bodies and/or external objects within spaces which are roughly commensurate with the human body and its capacity for reach. This aspect of embodiment relates to the work of Blacking (1976) and Baily (1985) on movement patterns in performance, for instance.

c. The movements of our bodies are not only functional in terms of sound production: gesture also frequently accompanies sound production in ways that appear analogous to speech-accompanying gesture. As mentioned above, McNeill argues for the complementarity of speech and gesture in verbal communication – the former as linear, propositional and divisible, the latter holistic and imagistic. Similarly, musical utterances are often produced together with gestures or movement patterns that, although not strictly speaking sound-producing, complement the sounds of music by illustrating an image or action which is an integral aspect of that utterance's musical meaning. Gesture in music is of course highly complex: musical gestures can sometimes be regarded as essential to sound production, or as exaggerated versions of essential sound-producing movements; at other times musicians use gestures for cues or other forms of interpersonal communication (Clayton 2005, 2007c). A number of other recent studies in this area are cited above, either directly or via Godøy and Leman 2010.

d. On a larger physical scale, many kinds of music are produced, reproduced or danced to by means of the movement of a whole body or bodies through a physical environment. Examples of this include processional music such as the Congado rituals described by Lucas in this volume, or the movement of a dancer around a stage. In the former case, the musical sounds produced change over the course of a journey, whether because each part of the environment affords a different kind of sound production or resonance, or because different stages on the journey may have different ritual or

symbolic meanings to which musicians respond.

It is also true that many people report the experience of listening to music as a kind of journey or narrative. Is this directly related to our experience of music's relationship to bodies in motion? Or is it an example of a more general image schema of temporal process as a moving body?

e. As Barsalou argues, embodiment also has a social dimension: in this regard we might expect musical studies to tell us a great deal, given the importance of embodied socio-musical interactions in performance. Yet despite the fact that musicians communicate with each other and coordinate their actions through physical gesture, and music recruits its performers and listeners to particular bodily states and practices, musicology has hardly considered this important aspect of social cognition. Tomie Hahn's study of the transmission of Japanese dance does consider this topic, stressing both the embodiment of culture and also the subtle effects of embodied practice on awareness and perception. The embodied practices of music and dance, for instance, shape practitioners' 'experiential orientation': "Through practice, systems of transmission structure experience so that, within the social group, the world appears similarly constructed and members know how to interact with it." (2007: 5). This perspective points also to the significance of awareness and attention as cultural and well as psychological issues: different musical practices invite and afford different attentional behaviours, and heighten awareness of some aspects of our environments at the expense of others, achieving these effects by means of embodied practices.

f. At a more abstract level, embodied metaphors seem to be an essential part of explicit knowledge about music. Music 'moves', tracing 'trajectories' between 'places'; it creates and inhabits 'spaces'. Indian musicians follow the paths (chalan) of a particular raga, while Western musicians move in and out of keys. These notions have

> been explored in some detail in Western music theory, for instance in the theory of 'tonal pitch space' (Lerdahl 2001). Nonetheless, just as musical 'gesture' is often tackled in musicology as if it were purely metaphorical and divorced from actual bodily movement, the 'movements' and 'spaces' of music theory are more often than not idealised or metaphorical spaces whose relationship to actual bodies and spaces is not explored.

Musical performance and cognition are therefore 'embodied' in multiple senses and at both biological and phenomenological levels. Embodied cognition theory suggests that the concepts with which we consciously and verbally make sense of musical experience are likely to be shaped by the structure of our bodies and by our experience of interacting with our environment. It also points to multiple levels and ramifications of embodiment: to the actual phenomenal movements of bodies that underpin our musical experiences, to the role of the body in structuring our musical concepts and metaphors, and to the embodied basis of the basic image schemas that we use to reason about music. Embodied music cognition is a large and sometimes confusing field precisely because it functions at each of these levels.

Embodied cognition offers us a coherent world view in which the individual comes to know the social, physical, and cultural world through a continual process of bodily interaction with the environment. As noted above, this is either implicitly or explicitly linked to an ecological view of the complementarity of organism and environment, while perception and action are understood as two sides of this same ongoing relationship. The individual relates to his or her environment through sound, gesture and other modalities. One of the purposes of actions which produce sound or visible movement is to act on the environment in order to generate further information about it. (For instance, making sounds affords aural feedback on the nature of the environment, and produces reactive or complementary actions in other

individuals.) Other individuals are also part of the environment, and this same process allows us to explore and develop interpersonal relationships.

In order to understand all of the ramifications of embodied cognition for music – and vice versa – it is inadequate to investigate only music theory's metaphorical concepts. It is also essential to explore the actual physical movements that people make while making and engaging with music with and for one another, as well as ethnographic and phenomenological accounts of those embodied experiences. Once again, then, we return in this volume to the central role that a combination of ethnographic and empirical investigation can play in investigating musical experience and meaning.

Embodiment in ethnographic music research: Some examples from India

While the influence of embodied cognition theory on musical research has been felt only in recent years, concern for the body and the relationship between bodily movement and musical structure has been a recurrent strand in music research for much longer. The reviews in Shove and Repp (1995), Leman (2008) and Godøy and Leman (2010) attest to this history in musicology and music psychology. In ethnomusicology one can point to John Blacking's take on Hornbostel's 1928 injunction to researchers to pay attention to the unsounding upward arm movements of drummers, to much of Blacking's later work in the field and to numerous others (see e.g. Baily 1985, Stokes 1992). This is not the place, however, for a thorough review of ethnomusicological literature on the body. The aim of this section is, rather, to consider some further instances of work carried out within the EMMP project which relates to the theme of embodiment, and to reflect on these examples in the light of the foregoing sections. What, we ask, does embodied cognition theory offer to the

ethnomusicological study of musical performance, meaning and transmission – and what do these ethnographic examples offer to the cognitive sciences?

Two primary case studies are described below. Both are drawn from our work in the Indian state of Maharashtra, and involve professional musicians' use of manual gesture while either singing or describing the experience of singing. Both examples of gesture emerged spontaneously in the course of our research, although the structure of that research did of course identify embodiment as a key theme, and this is reflected in the use of video recording which provide the data for the case studies.

"Go, go from here!"

One of the aims of our ethnographic work on north Indian raga performance was to gather information relating to the embodiment of musical features, such as individual motives or phrases, rhythmic structure, dynamics and timbre – whether these relate to a specific raga and the meanings associated with it or cut across a wider repertory.[2]

A case study which proved a fascinating topic for this research is Raga Marwa, a very distinctive melodic entity, and one which rewards detailed investigation in many ways. Briefly, Marwa is based on a hexatonic scale with no fifth degree: the second (Rishabh or Re) is flat (komal) and the fourth (Madhyam or Ma) is sharp; its pivotal notes are the flat second and the sixth (Dhaivat or Dha). In most interpretations of the raga, the system tonic (Shadja or Sa) – highlighted by the drone in the background – is used very sparingly by the soloist: the emphasised komal Re (Re)[3] is dissonant and its resolution is deferred for long periods. Marwa is a raga with a long documented history, considered not to be suited to romantic or light interpretations, but rather believed by most to convey a contemplative, serious, austere – possibly even sombre – mood.

[Figure 9.1 here]

Given this raga's importance within the tradition as a whole and its unique characteristics, it is not surprising that many musicians have a lot to say about it: most talk about a feeling of restlessness and many depict images conveying a sense of loss. This emerges for example from the words of sitar and tabla artist Nayan Ghosh:

> [T]here's something elusive in that rag. You get something but before you could enjoy the company of that it went away, and that's because of … the game [which] is being played by Sa. Whenever Sa comes back you feel "Oh, finally I got…what I was looking for", but it's gone in no time again … You feel … a kind of an unrest in your mind. (Nayan Ghosh – Mumbai, 23rd May 2005)

Similarly, the description of Marwa provided by harmonium player Seema Shirodkar focuses on the opposition between Re and Dha, and Sa, which is depicted as "soothing" can "calming":

> One feels calm on reaching the Shadja [Sa]. As if one has reached his destination. Rishabh [Re] and Dhaivat [Dha] create disquiet. But Shadja soothes and calms. (Seema Shirodkar – Pune, 20th February 2010 – translated from Hindi)

Khyal singer Veena Sahasrabuddhe explained how one of the challenges in performing this raga lies for her in the ability to stress the Re and "resist" resting on the Sa, while the drone and the tabla[4] highlight the first degree; she describes this as "disturbing", to the extent that she says she can even get headaches:

> Sa is a weak note … one is supposed to just touch Sa … Marwa rag is a very restless rag … There are complaints and complaints and complaints. And those complaints are not actually solved … when I am singing Marwa

> I just get headache… the tanpura and the tabla [are] tuned to Sa, all the time [are] hammering and I am trying to avoid that, I am saying: "No, I am not going here, I am going to Rishabh [Re]". So it's really very disturbing … definitely [the] artist [would] like to rest on Sa. But no! Go, go, go, from here! … In a one hour rendition, maybe [it takes] five-ten minutes [before] you are singing the Sa. You feel so relaxed! But no, then again go!" (Veena Saharsabuddhe – Mumbai, 18th May 2005)

[INSERT OWN SPEAKER ICON HERE]

Like Seema Shirodkar's account, Veena Sahasrabuddhe's words reveal how her experience of the performance of this raga is very much a physical one, as she mentions feelings of temporary relaxation and ongoing tension (the headaches being a striking example of the embodiment of the tension deriving from constantly opposing the urge to rest on the first degree of the scale). Interestingly, both times she mentioned the imperative to move away from the Sa, she accompanied her words with gestures of the arm moving away from her body. These gestures embody and reinforce the meaning expressed in her words (Figure 9.2). As demonstrated in research on embodied cognition, bodily movement can in turn affect one's emotional state; a gesture moving away from one's body, in particular, can convey that sense of 'avoidance' and 'negativity' reflected not only in the singers' words, but also in her description of feelings of restlessness and physical discomfort (Barsalou et al. 2003; Cacioppo, Priester, and Berntson 1993).

[Figure 9.2 here]

Veena Sahasrabuddhe's image of "moving away", the words "go, go!" and the arm movements are all part of a single process[5], and this process is grounded in the embodied experience of the performance of Marwa.

The descriptions here, and the physical gestures which form an integral part of them, suggest therefore a close linkage between the musical features of certain ragas (in particular the emphasis on the unresolved dissonance of the komal Re), their meanings (restlessness, longing[6], distance and loss) and their embodiment (Figure 9.3).

Marwa is a rich and complex melodic entity: it is rather misleading to reduce it to the tension of an unresolved flat second, but talk about the raga tends nonetheless to focus on the feature. The examples above are typical of the kind of discourse around this raga, in which the Re comes to stand as a microcosm of Marwa as a whole. In this way, a particular kind of unresolved dissonance becomes an aesthetic focus and allows creative musicians to elaborate on the themes of restlessness and loss. The connection between music, discourse and gesture demonstrates emphatically that tension and relaxation are more than figures of speech: Veena Sahasrabuddhe's physical unease suggest strongly that the tension here is a real and embodied one.

This case study relates to a number of the themes discussed earlier in this chapter. Gesture is clearly important here: but note that Veena Sahasrabuddhe's hand movement is not a part of her musical performance of Marwa – it does not accompany the singing of the Re – but a part of her discourse when talking about the experience of singing. The peculiarity here is that the music's non-movement – the Re refusing to resolve to the Sa – is dramatised in the form of physical gesture. It might be objected, then, that this gesture is a natural accompaniment to talking about avoidance and restlessness, rather than an expression of this specific musical feature. We would argue, though, that the function of the gesture here is precisely to make the spoken description more specific: the word 'restlessness' has a range of meanings, but this

specific combination of words and gestures expresses the *particular* kind of restlessness experienced by this performer in relation to this raga, and thus does provide additional information about her experience as a performer.

This example also illustrates the embodiment of social constraint, that is, the requirement to follow the canonical rules of the raga even when these run strongly counter to the singer's own impulses. What this example of gesture demonstrates is that raga rules – that is, normative practices – can in fact override the impulses of the musician, who must discipline herself, with the guru's guidance, in order to produce an acceptable performance. More broadly, this observation offers a critique to the Cartesian notion discussed earlier in this chapter that 'natural' bodily experience can be contrasted with 'rational' thought: in this case, Sahasrabuddhe's bodily experience arises in response to a rationalised and socially mediated musical construct.

If Godøy's motor-mimetic hypothesis is to be employed here then the idea needs to be extended from the "simulation of sound-producing actions" (2003, 318) to a kind of encoding of a physical state of tension relating to that of the performer. As for reception, for the listener to experience similar feelings of restlessness and loss, he or she must surely feel the same urge to resolution, and embody the tension resulting from its denial. In this way we see that the embodied cognition of music can, paradoxically, extend well beyond the theme of bodily movement. As discussed in part 3, embodied metaphors are an essential part of our explicit knowledge about music: in this case the musical feature is tied to an embodied feeling expressed in the words "Go, go from here!": the musical structure is being experienced in terms of spaces, trajectories and an urge (or command) to move. It is equally clear that these embodied metaphors are closely linked to the music's affect: its meaning (so far as this can be put into words) and its emotional content. Similarly, one could argue that

the serious, sombre character attributed to Raga Marwa's own identity is dependent at least in part on this process of embodiment (Figure 9.3).

[Figure 9.3 here]

Not surprisingly, perhaps, this case study makes the point that different aspects of embodiment are less easy to tease apart in practice than they are in theory: earlier sections of this chapter pulled embodied cognition apart into a number of distinct themes, but what we see in a real-life example is that different aspects of this complex whole come packaged together. This is perhaps the most obvious and most powerful benefit of a case studies approach: that it forces us to acknowledge that different aspects of embodied cognition come bundled together, and that acknowledging this may help us to understand better how, for instance, metaphors are linked to emotional states.

"The performance is a sort of design"

The example described above relates to the identity of a specific raga, to musical features (such as the highly dissonant, unresolved Re) which are largely shared across the north Indian tradition, and to the relationship between a musical feature and its discursive presentation. This second case study draws on a lesson given by singer Manjiri Asanare-Kelkar on Raga Jaunpuri which we documented in 2006,[7] and relates to a notion of melodic pattern as 'design' that cuts across raga classification and features; it is possibly more personal but also highlights the role of musical embodiment in the transmission process.

Following the widespread pedagogical practice in North Indian classical music, Manjiri's session was based on brief vocal demonstrations followed by a repetition of the same phrases by the student. In such contexts, the teacher sometimes deliberately employs gesture in order to communicate some essential characteristic of the passage being taught: in fact it is not

uncommon to see the pupil imitating (more or less timidly) the teacher's hand movements while performing (and Amruta, Manjiri's student, was no exception). During the lesson, Manjiri illustrated a melodic phrase (as transcribed in Figure 9.4) accompanying her singing with a movement of the hand which seemed to describe a repeated circular motion before coming to rest on the Sa. The initially imprecise performance by the student was accompanied by inaccuracies in the gestural imitation; the process of correction of the mistakes corresponded to a gradual improvement of the hand movements until these matched those of the guru closely. In the lesson context this gesture seemed to play an important function: indeed, it makes little sense to distinguish between the production of the vocal passage and the bodily movement; rather, these are two complementary aspects of a single act of performance and transmission of musical knowledge.

Having recorded the teaching session, we used this circular motion as way of developing the topic of gesture in interview, and Manjiri was able to elaborate further on the relationship between the hand movement and her singing. In this conversation she repeated the vocal phrase and the gesture, and she explained how she imagines the melody as "two linked circles" (Figure 9.4). She also added that, according to her, "[a]ll the rag [and] the presentation of the rag is [a] sort of design. There [are] different designs in different compositions" (Manjiri Asanare-Kelkar – Pune, 11th December 2006).

[Figure 9.4 here]

[INSERT OWN SPEAKER ICON HERE]

Other musicians have made similar points to us on numerous occasions: the melodic line is seen as a kind of design, the singer traces patterns in time just as one can paint a canvas or trace a line through the air with a hand or finger. The beauty of this example, though, is that the singer was able to describe a particular gesture, and visual image, as it relates to a specific

melodic phrase. It is neither an obvious nor a trivial example: it is not clear from just listening to the audio recording, that circles are being represented. On the other hand, once presented, the image can be interpreted. The melodic movement is up-down-up, with the upward motion that had been reversed at the flat seventh degree extended higher, to the upper tonic Sa on the second ascent: the gesture tells us that the movement should flow smoothly rather than forming, for example, a jagged up-down-up shape; the 'interlinking' of the circles tells us that the movement is conceived in two phases, but that these two phases overlap. In a way analogous to the phenomenon McNeill highlighted in his study of verbal narratives (1992), here gesture conveys information which sound alone could not provide. In a teaching session, the student's imitation of the gesture of the singer helps to ensure that she not only picks up the bare bones of the melodic phrase (as a sequence of tones) but learns and memorises it as a very particular quality of movement, making it much less likely that what she reproduces will be inappropriate.

This raises interesting questions about the ways in which particular musical features are learned and remembered. Musicians learn raga 'rules', of course: explicit knowledge about the order in which notes can and cannot be employed, which are to be given most prominence and so forth. This example suggests that qualities of movement are equally important, and that once again the metaphor of melodic motion has an embodied basis. Since gestures such as Manjiri's interlinked circles are rarely the subject of verbalisation, they can be difficult to recall in the context of a discussion, except in the most general sense. We know that many performers are aware of and value the notion that melodic movements are associated with the tracing of patterns in space; we can observe in teaching situations that specific gestures are used to teach specific patterns. There are many other things that are, at this stage, much less clear. For example, how consistently is a particular melodic movement linked to a specific visual or kinetic image? Which of these images are raga-specific, and which cut across raga

distinctions? (This chapter has discussed two examples, but more thorough research is needed on both these categories, as well as on possible overlaps between the two). Moreover, what kind of constraints do visual-kinetic images place on singing (for example on pace, phrase structure, the speed at which one might ascend or descend in pitch)? What effect does the attenuation of physical gesture in public performance have on the music performed? These are not easy questions to answer, for sure, but they point to the potential importance of a focus on embodiment for the understanding of musical performance.

Conclusions

The relationship between embodiment and music research has not always been a comfortable one. Musicology has frequently striven to keep the body out of view, or at most to allow bodily movement a place in its discourses only as (apparently disembodied) metaphor; at other times, it has broken through these constraints to temporarily assume a central importance, before fading from view once again. The rise of theories of embodied cognition in recent decades presents music researchers with new opportunities – especially those who look to ground theories in music in an understanding of psychology. Notwithstanding the earlier contributions of scholars such as Hornbostel and Blacking, embodied cognition seems to offer a new perspective to ethnomusicology too, and we are at an early stage in terms of discussing how an ethnographic approach might connect with this branch of cognitive science. This chapter has attempted to fill in some of the gaps in this area. We began by surveying some recent studies in embodied cognition and picking out some of the main strands in current theory and debate; several of these themes link to observations made in different chapters of this volume, all of whose authors have taken an interest in embodiment in some sense or other. In the final section we presented two brief ethnographic case studies which show how different facets of embodiment might be investigated, how the theoretical

framework of embodied cognition may be of use in making sense of the variety of issues but also how the intricate connections between different facets of embodiment may themselves shed light on the fundamentals of embodied cognition. If we are right about the potential of this approach, then it is to be hoped that future studies will dig ever more deeply into some of the questions which we can now start to ask. In terms of the EMMP project, embodiment is a theme which was prominent in our thoughts from the beginning, but which we have come to understand as being a broader and more significant topic even than we had believed. The breadth of the topic, its complexity and the ease with which one may slip between levels of analysis, mean that our main aim at the end of this project has been to help clarify the nature and scope of the topic and its relationship to musicology, and ethnomusicological study in particular.

Acknowledgements:

We would like to thank the following musicians for their time and enthusiastic support for this project: Manjiri Asanare-Kelkar, Nayan Ghosh, Amruta Mughal, Veena Sahasrabuddhe, Seema Shirodkar. We also thank Adrian Poole, Yasmin Dandekar and Morgan Davies for their interview transcriptions.

This research was supported by the AHRC (research grants MRG-AN6186 and AH/G012911/1)

---

[1] Cf. Lakoff and Johnson, who expand the two levels to three (neural embodiment, the cognitive subconscious, and phenomenological embodiment, 1999, 102-4); and Gibbs (2005, 10).

[2] Work on ragas Shree and Jhinjhoti and the significance of embodiment for their reception can be found in Leante's chapter in this volume.

[3] In the next pages the komal Re is indicated with an underline (Re), in a manner consistent with Indian notation (See also Figure 9.1).

[4] The tabla comprises a set of two drums, one of which is tuned to the first degree of the scale being performed.

[5] See also McNeill 1992.

[6] Interestingly enough, another raga characterised by a strong emphasis on the Re, Shree, discussed in Chapter 8 of this volume, is also associated with a sense of longing. The embodiment of Shree's distinctive upward slide between the flat second and fifth degrees can also be expressed by a movement of the arm away from the body (although, in this case, the gesture replicates the ascending movement of the melody).

However, Shree's longing is very different from Marwa's and not as strongly associated with a sense of loss, but rather with a feeling of "reaching out", which – accordingly to a number of artists and listeners we have met – can be ultimately fulfilled. One can argue that this is due to the fact that in Shree the tension created by the upward Re-Pa slide can ultimately be resolved on the system tonic (see also Leante, 2009).

[7] Pune, 11th December 2006. Manjiri Asanare-Kelkar was teaching raga Jaunpuri to her student Amruta Mugal.