Musical Cultures of the Twentieth Century
Series Editor: Gianmario Borio
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The music of the twentieth century is a composite and variegated entity. Recent works of historiography have revealed the difficulty of arriving at a coherent representation of the multiplicity of conceptions, artefacts, events and communities which characterised musical life in this century. This plurality, which is manifested at all levels (linguistic, stylistic, geographical, institutional, socio-cultural), requires adequate research strategies. The series *Musical Cultures of the Twentieth Century* tackles some crucial questions by setting up research groups, whose members collaborate closely over a time span determined by the complexity of each topic.

The principal site of the projects is the Institute of Music of the Giorgio Cini Foundation, Venice, which, from its very beginnings, was conceived as a forum for musicological discourse. After the initial phases of preparation and research, a conference is held for each project that aims to present findings and act as a platform for an exchange of views. Individual research, therefore, has the opportunity to interact with many authors, leading to volumes that are intended to play a positive role in international debates, update research criteria and open up new perspectives. In designing these projects, we pay special attention to methodological pluralism: complex phenomena can only be adequately dealt with through a combination of various currents of contemporary thought and an intense dialogue between scholars of different nationalities, ages and theoretical backgrounds.

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Sound and Motion in Contemporary Discourse

Edited by
Patrizia Veroli and Gianfranco Vinay

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3 Ways of knowing

Social dance, music, and grounded cognition

Lawrence M. Zbikowski

Near the opening of the second tableau of Igor Stravinsky and Bronislava Nijinska's *Les Noces*, a tableau that celebrates the consecration of the bridegroom, there is a brief and seemingly unremarkable moment, one in which music and dance are in happy synchrony. As shown in Figure 3.1, in the staging done in the Royal Ballet's production, recorded by Ross MacGibbon in 2001 (*Les Noces* 2001), the tableau begins with the bridegroom standing centre stage, right hand over his heart, with his entourage arrayed in a semi-circle behind him.[1] The bridegroom then turns around to face the members of his entourage: They bow to him, bending at the waist; he bows to them; they bow again to him. These formalities concluded, the bridegroom begins to stamp his right foot in time with the music, a movement synchronised with the bass soloist's 'Kinemsya, brosimsya [We'll be off, we'll dash off]'.[2] Continuing to stamp, the bridegroom turns back around to face the audience, and with the

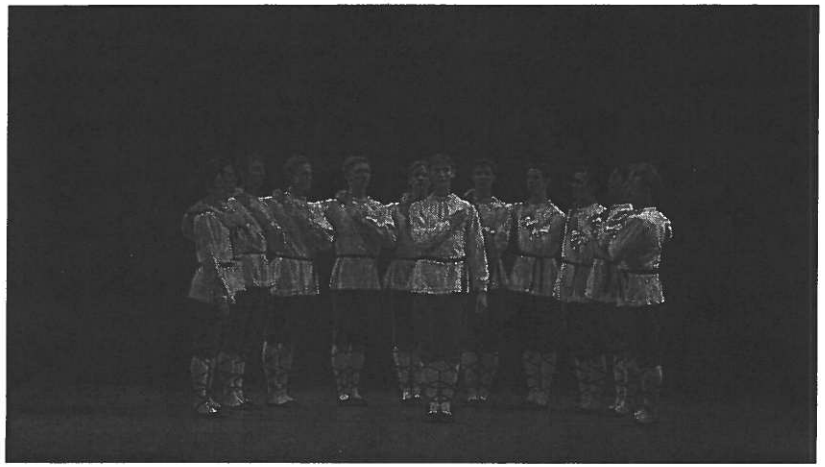
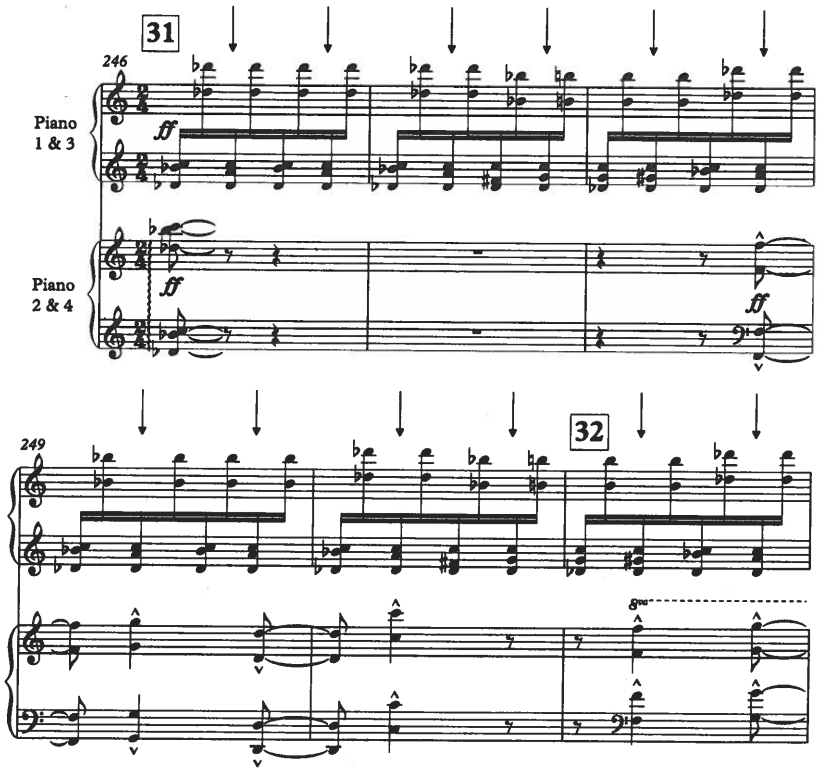


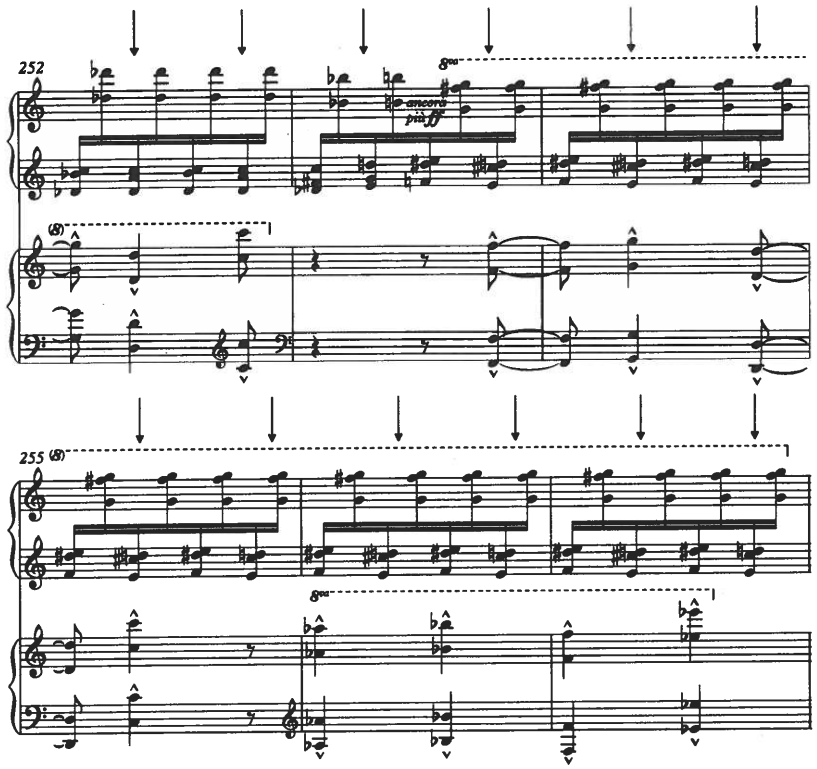
Figure 3.1 *Les Noces* (2001), still image: 06.13, Tableau 2, opening: the bridegroom and his entourage.
Source: © 2002 BBC Radio & Music.

tenor's entrance on 'Kupim mï, kupim mï [We'll buy, we'll buy [some oil]]', the bridegroom's entourage joins his rhythmic stamping. The movement – always synchronised with the driving rhythms of the piano and percussion battery – then becomes further energised with the tenor's 'Raschesim, rasmaslim [We'll part [his hair], we'll anoint [his curls]]', the dancers repeatedly rising en pointe with both feet before stamping down with their right foot.

I should like to point out two relatively small things about the coordination of movement and music in this brief passage – again, minor features from a relatively unexceptional moment in a truly exceptional choreography – that will be important for the perspective on music and dance that I wish to develop in this chapter, not least because this coordination provides a framework for understanding how Stravinsky's music and Nijinska's choreography relate to one another. First, there is the tight coordination between



Example 3.1 Igor Stravinsky, *Les Noces*, rehearsals 31 and 32, piano parts only; arrows indicate the foot stamps of the dancers.



Example 3.1 (Continued).

movement and music – indeed, as we watch the performance, we may not even realise that the dancers are stamping on the offbeats (indicated by the arrows added to the piano parts shown in Example 3.1). This is perhaps due to the regularity of these offbeats, which are emphasised by the melodic line that is doubled by Pianos 2 and 4 and reinforced by the percussion. The second aspect of this passage that is important for the perspective I wish to develop is, in a manner of speaking, a complement of the first: In the embellished version of the foot stamps that is introduced as the passage continues, the dancers' weight continues to fall on the offbeat, even when the melodic lines in Pianos 2 and 4 shift into alignment, in measure 256, with the main pulse. That is, in this brief passage, movement and music, while continuing to be synchronised, are both aligned and *not* aligned with one another. I would like to suggest that this latter case – when the movements of dance and the sound events of music are synchronised but not aligned – offers

unique expressive resources for the choreographic coordination of music and dance.

My point of departure for my consideration of relationships between movement and music, then, is the ease with which we pair physical movements and sonic events, as demonstrated by this passage. There is, indeed, no requirement that the dancers' footfalls match just so with the music – it is not as though their movements are the *sources* of the musical sounds – and yet we quickly and effortlessly link together what are in truth two quite different phenomena. In the first section that follows, I wish to propose that this linkage reflects humans' capacity for analogical thinking, a capacity that not only makes possible the correlation of structure and events from different domains but which also constrains the kind of relations we can draw. The second thing the passage demonstrates is the way different alignments of media can shape our understanding: I believe an attentive observer will note the merest flash of tension between movement and music when, against the continued steps of the dancers, Pianos 2 and 4 shift their orientation to the beat. In the next section, I wish to explore an approach that grounds this sense of tension in embodied experience. To put it another way, I conceive this tension, to the extent that it exists, as not simply a result of a dispassionate contemplation of the misalignment of two patterns but as a manifestation of the way proprioceptive information shapes our cognitive processes.

Both of these ideas have informed my recent work on social dance of the eighteenth and early nineteenth centuries (Zbikowski 2008, 2012). In this work, I was particularly interested in the close relationships between the steps and the music of social dance, adopting the view that movement and music mutually specify one another: To know the dance is to know the music, and to know the music is to know the dance. The focus of my research over the past couple of decades has been on how we conceptualise music, and so I find the idea that we can learn much about musical structure from the study of social dance to be thoroughly stimulating. This idea also suggests another way to view both musical and dance practice, which is as manifestations – indeed, enactments – of social structure. According to this view, music and dance inform what Pierre Bourdieu called the *habitus*, the 'structuring structures' that shape the behaviour of individuals in social contexts (Bourdieu 1990). In the third section, I should like to explore ways this idea is activated by Stravinsky's compositions up to and including *Les Noces* with the aim of better understanding the conceptualisation of works involving music and dance in the early twentieth century. I should note here that thinking about the social implications of the second tableau of *Les Noces* requires a bit of art, not least because the ritual Stravinsky sets out there is, for the most part, an imagined one. Although rituals aimed at preparing the bride for marriage are richly documented within the traditions of Russian folklore, there are few parallel rituals aimed at preparing the groom. As Richard Taruskin has shown, however, Stravinsky's ultimate vision for *Les Noces* led him to

give equal weight to the bride and the groom in the first two tableaus, so that all that they stood for could be brought together in a dramatic confluence in the third and that their union could then be celebrated in the fourth and final tableau (Taruskin 1996: 1343–7). In consequence, it is wise to tread very carefully around the events depicted in the second tableau: At best, these represent the idea rather than the actuality of a range of ritual practices associated with weddings in the Russian countryside.

Therefore, in what follows, I should like to explore the different ways of knowing indicated – indeed, activated – by the sort of coordination of movement and music evident in this brief passage from Stravinsky and Nijinska's *Les Noces*. My proposal is that this knowledge is rather different from the knowledge we build up through language and that it contributes much to the understanding of music and dance in the twentieth century.

Analogical processes

Over the past few years, I have come to understand that linkages between music and other communicative media – music and language, music and dance, music and gesture – are grounded in humans' capacity for analogical thought (Zbikowski 2015). Most discussions of analogy begin with similarity because it is the similarity of one thing to another that is the point of departure for any analogy. For instance, a pen and a pencil are similar to each other both in appearance and in function, although the kind of marks these tools make on a writing surface (permanent or impermanent; of relatively consistent colouration or subject to gradation) are different. Analogy takes as its point of departure similarity judgements of a more abstract sort. For instance, a finger is analogous to a pen in that it is an approximately cylindrical structure that ends in a point; unlike a pen or a pencil, however, the finger leaves no discernible marks on the writing surface and its 'cylinder' is firmly attached to the larger structure of the hand. Making the analogy between a pen and a finger, then, involves drawing structural correlations between the two: The cylindrical shape of the pen maps onto the shape of the digits of the finger, and the point of the pen maps onto the tip of the finger. With the analogy in place, we can imagine using a finger to 'write' or a pen as an extension of our hand. More generally, analogies involve mapping systematic structural relationships between a source domain (such as that which includes writing instruments) and a target domain (such as that which includes bodily appendages) for the purpose of extending knowledge from the source to the target and – at least in some instances – from the target back to the source (Gentner 1983; Gentner and Kurtz 2006; Holyoak 2005; Holyoak and Thagard, 1995: ch. 2).

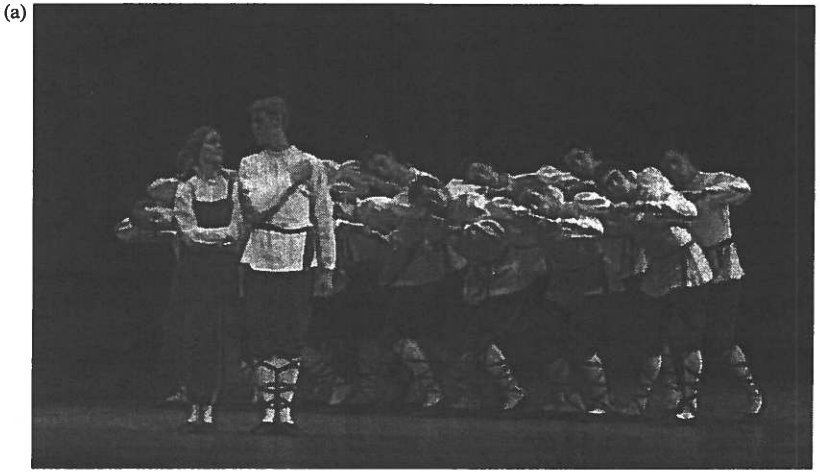
It bears emphasis that analogy is not simply about correlating elements from one domain with elements in another domain but about mapping relationships between these domains as part of a process of inferential reasoning. It is thus often described as concerned with relations among relations

(or 'second-order' relations): In the analogy between a pen and a finger, for instance, the relationship between *pen* and *finely tapered device for delivering ink* (by which I mean the business end of the implement) is correlated with the relationship between *finger* and *tapered appendage for guiding communication*.[3] And so, while other species are able to make some very sophisticated similarity judgements – there is research, for instance, suggesting that chimpanzees can understand the second-order relations basic to analogy (especially for spatial reasoning) and that bottle-nosed dolphins can perform sophisticated body-mapping analogies – current evidence indicates that no other species comes close to making or using analogies with the facility and speed of humans (Call and Tomasello 2005; Gentner 2003; Herman 2002). And this capacity is available from a very early age: Children as young as ten months are able to solve problems by analogy (Chen et al. 1997), and by the age of three, analogical abilities are quite robust (Gentner 2003; Goswami 2001).

The ability to map systematic structural relationships between disparate domains bears witness to a capacity for abstract thought – for thinking about relations between relations – of enormous flexibility and wide application. Analogy has been recognised as a key factor in human creativity and has been linked to the conceptual flights of fancy and processes of meaning construction created through metaphor and metonymy (Fauconnier and Turner 2002: 14; Holyoak and Thagard 1995: 213–23). Given evidence of the capacity for analogy demonstrated by primates and prelinguistic children, it also seems apparent that the conceptual domains involved in analogical mappings need not be restricted to those involving language.

For an example of how analogical reasoning shapes our understanding of the expressive resources offered by music and dance, let me turn to a later moment in the second tableau from *Les Noces* when the bridegroom receives the blessings of his mother and father. In the section of the choreography on which I would like to focus, the groom and his mother hold a pose in the foreground while the groom's entourage dances in the background. For the purposes of my analysis, I shall divide the movement of the entourage into three subsections: As shown in Figure 3.2(a), the first subsection begins with the dancers arranged in two ranks in hunched-over poses. As the scene continues, the dancers in the second rank hold this pose while those in the first rank crouch further down. The dancers in the second rank then straighten up and make a series of abrupt gestures (shown in Figure 3.2(b)), throwing their arms in the air and describing jabbing motions downwards. In the second subsection, the dancers in the first rank, still crouching, pivot to the right and left before kneeling down; the dancers in the second rank respond with swinging movements, shown in Figure 3.2(c), and go on to throw their arms up in the air. In the third and shortest subsection, the dancers in the first rank stand and step back toward the second rank of dancers, and then both ranks step forward and, as shown in Figure 3.2(d), throw their arms in the air in time with the chorus's shout of 'Oy!'.

(a)

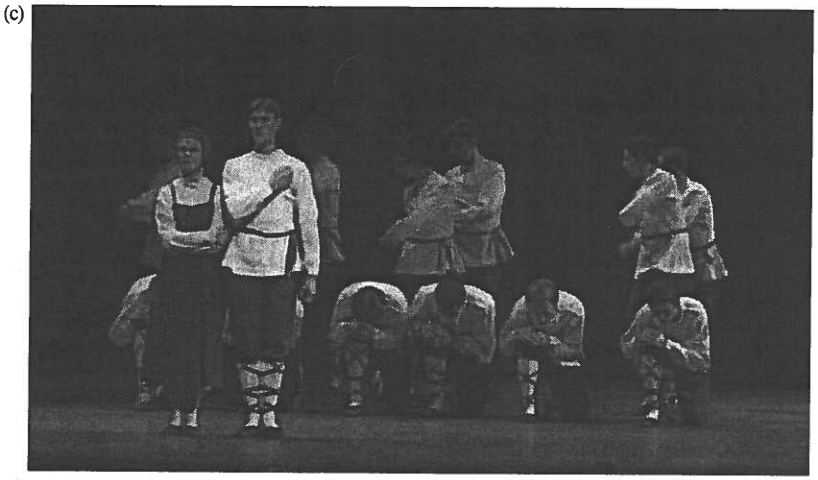


(b)

Figure 3.2 *Les Noces* (2001), still images: 10.07, Tableau 2, (a) the bridegroom receives the blessings of his mother and father: starting pose for the entourage; (b) the dancers in the front rank kneel while those in the back rank throw their arms into the air; (c) the dancers in the front rank kneel while those in the back rank perform swinging motions; (d) both ranks of dancers throw their arms into the air.

Before proceeding, I should point out that the movements I have just described could be correlated with a wide range of sonic phenomena or, in conformance with a choreographic aesthetic that emerged during the twentieth century, not correlated with music at all. That said, I would like

(c)



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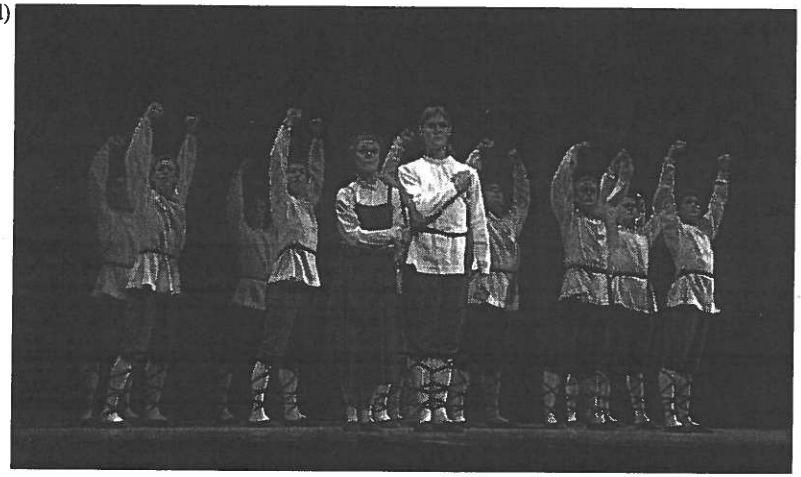


Figure 3.2 (Continued).

to propose that where such correlations do exist, they are constrained by structural relationships between movement and music, and they contribute to our understanding of what is being expressed through music and dance. In the case of the passage I am considering here, there are certainly correlations between the rhythmic patterns set out in Stravinsky's music and the steps Nijinska's dancers make; that said, the correspondence I find most striking is between movement and dynamics. When the dynamic levels of the music that accompanies the movements captured in Figures 3.2(a–d) are

low, the movement is slow and typically supplemented by body positions that are compact. Over the course of this passage, the dynamics increase in volume, the orchestration becomes more brilliant, and the dancers become more animated, the whole culminating with all of the dancers in the entourage standing with their arms stretched heavenward to the chorus's forceful 'Oy!'. As the passage continues beyond what is captured in Figures 3.2(a–d), Nijinska builds on this correlation: *piano* dynamics are correlated with frozen crouches by the first rank of dancers, and *fortissimo* dynamics are correlated with exuberant movements by all of the dancers.

I would like to emphasise that there is nothing necessary about this correlation of movement and sound – indeed, the sounds that the dancers actually make when performing this passage will be quite different from the sounds made by the musicians. The goodness of fit instead reflects structural correspondences between the domains of sound and movement: Sounds produced by an attenuated activation of the sounding medium (which we hear as 'quiet') are correlated with movements that involve a limited activation of the motor system (which we see as 'restrained'); sounds produced by a vigorous activation of the sounding medium (which we hear as 'loud') are correlated with movements that require a sudden and energetic activation of the motor system (which we see as 'animated'). It is this correlation that makes Nijinska's choreography for this passage seem natural and supports the sense that movement and music together celebrate the elevation of the bridegroom to the status of a king.

It bears mention that analogical correlations of the sort demonstrated by this passage indicate two important resources for expressive communication that employs non-linguistic media. First, since the phenomena from both of these domains belong to dynamic processes – be they sequences of sound events, in the case of music, or sequences of bodily dispositions, in the case of dance – it is possible to bring these phenomena into temporal alignment (as when one moves with the beat) or have them go their separate ways (as when one moves with no regard for the beat). In general, phenomena or patterns that are aligned with one another contribute to an overall sense of harmony (in part because of mutually reinforcing structural relationships); by contrast, harmony – at least of a simple sort – is less well represented by phenomena or patterns that are not aligned. As a result, the simple compositional strategy of aligning music and movement with one another, pulling them out of alignment, and then bringing them back together again can summon a process of moving away from and back toward a harmonious state.[4] From the perspective I have developed in my ongoing work on a cognitive grammar of music (Zbikowski 2017), processes like these create meaning, although of a sort not easily captured by language: We know, in a physical and immediate way, what it means for our bodies to be in a state of harmony with their physical environment – that is, we know what it means to be comfortable – and we also know what it means for this state of harmony to be disrupted – that is, we know what it means to be uncomfortable.

The second resource for expressive communication offered by analogical correlations between music and movement follows when correspondences between the two are well established. In the case of many social dances, for instance, listeners familiar with the steps of a dance like the waltz can summon these in their imagination when they hear waltz music; in a similar fashion, dancers may well hear in their inner ear the music of the waltz when they perform its steps. In this way, familiar music may evoke dance steps even when one cannot dance, and familiar dance steps may evoke music even when there is only silence.

In summary, then, although connections between music and movement can seem immediate, they instead reflect a capacity to make complex analogies; the way this capacity develops and is implemented by humans appears to be unique within the animal kingdom. Analogical mappings extend far beyond surface similarities, reaching into abstract relationships shared between correlated domains. Indeed, a close consideration of the basis for analogies between music and movement takes us beyond first immediacies and deep into the constituent features of each. Finally, analogical correlations between non-linguistic media can prompt the construction of meaning without the intervention of language.

Grounded cognition

As is evident from my account of how we draw links between music and movement, the perspective that I have developed in recent years is informed by research in cognitive science. Early work in cognitive science was not particularly encouraging for the development of such a perspective: The focus was on the mind as individual and incorporeal and on thought as the exclusive province of language. Beginning around 1990, however, researchers in cognitive science started to recognise that the human mind is also a social mind; that experience shaped by the mediation of the human body does much to shape human cognition and that language captures only a portion of what can properly be called thought. There is now clear evidence that a wide range of cognitive processes – including those concerned with language, abstract thought, imagery, memory, and social interactions – are shaped in significant ways by bodily experience (Barsalou 2008; Pecher and Zwaan 2005).

Among the most telling discoveries of the past two decades have been those concerned with the neurological structures through which motor movements are controlled, which are collectively called the motor system. For much of the twentieth century, the motor system was assumed to be relatively passive: Commands that originated elsewhere in the brain told the motor system what to do, and it followed those commands. Beginning in the late 1980s, however, it became evident that the design of the motor system was not quite as simple as this, and in 1996, a group of researchers led by Vittorio Gallese reported discovering a group of motor neurons that became active both when macaque monkeys performed a given action and when the

monkeys observed a similar action performed by the experimenter (Gallese et al. 1996).[5] That is, simply seeing an action being performed caused certain groups of neurons to fire, an activation that was a mirror image of what occurred when the monkey performed the same action. More generally, primates recognise and understand the actions of another agent by simulating that agent's action in their own motor system (Barsalou 2008: 623).

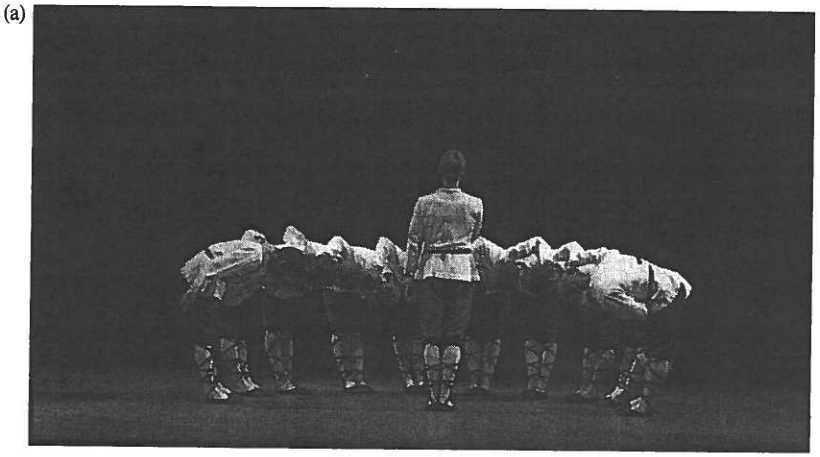
It should be noted that most of the research on canonical and mirror neurons has been conducted on monkeys, using invasive techniques of a sort not suitable for human subjects. That said, there is evidence both from brain-imaging studies and from single-neuron studies that similar structures are a feature of the human brain (Bangert et al. 2006; Mukamel et al. 2010). These include a recent functional magnetic resonance imaging (fMRI) study by Valeria Gazzola and her associates, which showed similar patterns of brain activation when subjects performed a motor action (such as tearing a sheet of paper) and when they heard a recording of the motor action's being performed (Gazzola et al. 2006). Taken together with other brain imaging work demonstrating a strong correlation between hearing musical sounds and performing motor actions (Bangert et al. 2006; Haslinger et al. 2005),[6] a good case can be made that our understanding of musical sound is, in neurological terms, a thoroughly embodied one.

The notion that simply listening to music activates portions of the motor cortex is quite suggestive, but research on the mirror neuron system is still at a relatively early stage, and the application of this research to human behaviour remains a matter of considerable debate (Gallese and Sinigaglia 2011). This is all the more so with complex cultural practices such as those associated with music and dance. For instance, Beatriz Calvo-Merino and her colleagues recently showed that when expert dancers observed dance actions that were in their personal motor repertoire, the motor areas in their brains showed more activity than when they observed kinematically comparable dance actions that were not in their repertoire (Calvo-Merino et al. 2005: 1243–4). One inference from this study is that hearing the music of a well-known dance would result in more activity in the listener's motor cortex than would hearing the music of a completely novel dance. It should also be noted that, while research on the activation of mirror neurons through sound is certainly tantalising for a musician, most of the evidence only connects the sound of specific physical movements (such as that made by tearing a sheet of paper) with the discharge of motor neurons involved in making those movements. The best evidence that we have for a connection between sound sequences that are *not* tied to specific physical movements and neuronal activity comes from a set of brain-imaging studies by Steven Brown and his associates, which show a correlation between listening to periodic rhythms and the activation of portions of the motor cortex associated with dance movements (Brown et al. 2006).

With these thoughts in mind, let me return to the opening of the second tableau of *Les Noces* and the movements of the groom and his entourage

that I described in my introduction. In considering the role of embodied experience in our apprehension of the movements the dancers make, I should like to point out three basic movements: First, the bowing motion performed as the chorus sings (shown in Figure 3.3(a)); second, the right-foot stamps, introduced with the bass soloist's exhortation to hurry with the preparation of the groom (shown in Figure 3.3(b)); and third, the highly energised version of this stamp that takes over toward the end of the passage, for which

(a)



(b)

Figure 3.3 *Les Noces* (2001), still images: 06.13, Tableau 2, (a) opening: the entourage bows to the bridegroom; (b) the bridegroom and entourage stamp their right feet; (c) the bridegroom and entourage midway through the intensified stamping motion.

(c)

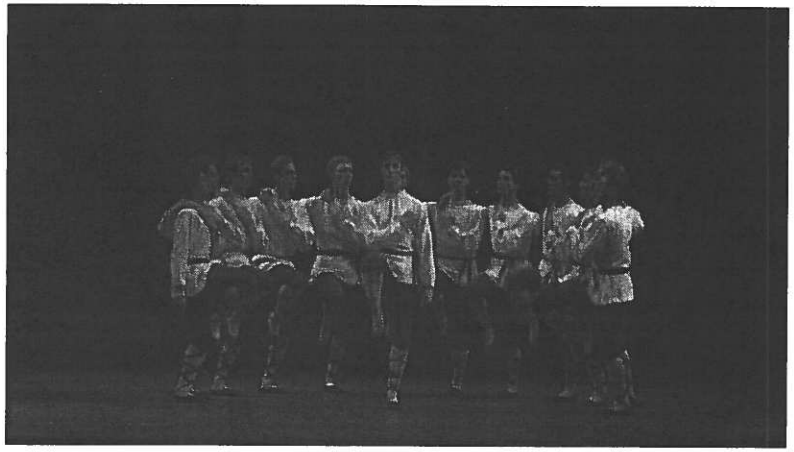


Figure 3.3 (Continued).

the dancers briefly rise en pointe with both feet before stamping down with their right foot. Figure 3.3(c) shows the degree to which the dancers have increased the lift of their right leg in the course of performing this intensified movement. While the bowing motion is essentially ametrical, as I noted in my introductory observations the foot stamps are closely coordinated with rhythmic patterns in the music.

The research on the motor system that I outlined above suggests that simply watching these movements activates the portion of our own motor cortex that would be involved with making similar movements. As we watch the dancers bow toward one another, the portion of our motor cortex that would be involved in a similar motion becomes active, preparing us for the sense of being off-balance and the change of perspective that would come with a comparable act of obeisance; as we watch the dancers rhythmically stamp their feet, that portion of our motor system involved with foot stamping would be activated, supporting our ability to entrain (albeit briefly) to Stravinsky's rhythmic impulses; and as the dancers' foot stamps become further energised, our motor engagement would be further intensified. This sort of engagement reflects deeply ingrained cognitive structures: Simply hearing the interlocking rhythmic cycles typical of many sorts of music activates our motor systems and prepares them for entrainment. As a result, an observer closely attending to both movement and music at the point when the brief melodic motive played by Pianos 2 and 4 shifts into alignment with the main beat of the bar – and thus *out* of alignment with the foot stamps of the dancers – could experience a brief moment of disorientation – or reorientation – when the correlation between music and movement suddenly changes. Part of the meaning of this moment – brief but woven

into the fabric of the whole – would thus come from our embodied experience, something that even novel combinations of movement and music can activate.

Although bowing motions and stamping one's foot are common enough movements for many, I should note that current research suggests that we need not ourselves have made similar movements to understand them in an embodied way: In research that has broad implications for the ways members of an audience conceptualise performance, Sian Beilock and her colleagues demonstrated that portions of the motor cortex of ice hockey fans – even those who had never played the game – were activated by various words and images associated with the sport (Beilock et al. 2008). To be sure, such activations capture only a part of the effect of actually making a movement; what they do capture, however, contributes immeasurably to the way members of an audience understand the performances they view.

In summary, then, there is now ample evidence that human cognitive processes – including those not directly concerned with bodily states – are shaped by bodily experience. The existence of such evidence for those who study dance will hardly come as a surprise; its importance for the study of music may, however, be less apparent until we consider interactions between movement and music and the extent to which the former sheds light on the embodied features of the latter.

Constructing the social

Let me now turn to the third and final topic I should like to explore in this chapter, which concerns the framework provided by music and dance for structuring social behaviour. The notion of such a framework reflects ideas developed by Pierre Bourdieu in the 1970s, in particular his notion of the *habitus*, the 'structuring structures' that shape the behaviour of individuals in social contexts (Bourdieu 1990: 53). As Bourdieu conceived it, the *habitus* reflected affective responses produced when the body confronted its environment. In his words,

> We learn bodily. The social order inscribes itself in bodies through this permanent confrontation [with the environment], which may be more or less dramatic but is always largely marked by affectivity and, more precisely, by affective transactions with the environment.
>
> (Bourdieu 2000: 141)[7]

Thus, from this perspective, the bodily practices of social dance are both a manifestation of social life and part of the way social life is constructed.

Bourdieu's work was, of course, framed within the context of the discipline of sociology as it was developed in continental Europe in the mid-twentieth century. On the one hand, continental sociology was, at best, profoundly sceptical about accounts of human cognitive organisation developed at this time, not least because these made little room for the way social and cultural interactions shaped human cognitive processes; on the other hand, sociology was still beholden to a model of knowledge for which language – and in particular, the view of language developed by Noam Chomsky – was the gold standard.[8] In consequence, Bourdieu did not have a way to explain *how* bodily learning came about: There was no obvious way to connect thought processes with bodily experience. Research on the role of analogical processes in human understanding and on grounded cognition offers a way to correct this situation. As I proposed in my analysis of relationships between movement and dynamics in the second tableau of *Les Noces*, correlations between different non-linguistic expressive media offer a way to create meaning without the mediation of language. And as I suggested in my account of the opening of the second tableau, our apprehension of music and dance reflects the ways bodily knowledge shapes our understanding – we do indeed, as Bourdieu proposed, learn bodily.

Although Bourdieu's ideas about how bodily knowledge shaped social structure were expounded in the latter half of the twentieth century, Carrie Noland has recently shown the importance of such knowledge for a number of thinkers in the early twentieth century, many of whom influenced Bourdieu (Noland 2009). For these thinkers, the knowledge created through bodily practice was something obscured by modern industrial society. The practices of 'primitive' societies were thus not simply a matter of ethnographic interest but were instead manifestations of deep forms of knowledge from which contemporary intellectuals were cut off. This provides another way to think about Stravinsky's major compositions up to and including *Les Noces*: These works, which appropriated the myths, legends, and practices of Russian folklore, provided a way to access realms of experience from which contemporary artistic expression was estranged. The works can thus be seen as part of a deliberate exploration of a species of knowledge that fascinated a broad range of thinkers and artists in the early twentieth century, knowledge that was compelling not simply because it was exotic, the product of an imagined Other, but because it had a depth and a texture beyond the reach of rational thought.

Conclusion

In an autobiography first published in 1936, Stravinsky recalled the consolation he found in Russian folk poems during his isolation in Switzerland at the beginning of the First World War – indeed, at the very time he was working on *Les Noces*. In his recollection, he drew a contrast between the effect of these poems and music:

> What fascinated me in this verse was not so much the stories, which were often crude, or the pictures and metaphors, always so deliciously unexpected, as the sequence of the words and syllables, and the cadence they create, which produces an effect on one's sensibilities very closely akin to that of music. For I consider that music is, by its very nature, essentially powerless to *express* anything at all, whether a feeling, an attitude of mind, a psychological mood, a phenomenon of nature, etc. *Expression* has never been an inherent property of music. That is by no means the purpose of its existence.
>
> (Stravinsky 1962 [1936]: 53–4)

Stravinsky went on to propose that the sole purpose of music is to order sonic phenomena in time such that they can be contemplated in the abstract, much as one might contemplate the interplay of architectural forms (Stravinsky 1962 [1936]: 54).[9]

The notion that music does not express anything is one of Stravinsky's most well-known pronouncements, but it should be taken in context: His autobiography, ghost-written by Walter Nouvel, came from a time when Stravinsky was actively trying to situate himself in the vanguard of composers (Taruskin 2011: 171–2). As such, the assertion that music was not about anything – that it was pure construction, having nothing to do with everyday life – placed Stravinsky and his music above the fray and beyond the reach of the long nineteenth century.

As a musician, I have never been completely comfortable with the idea that musical utterances have no expressive value, although I am the first to admit that I do not think that music serves the needs of human communication in the same way that language does. Accordingly, over the past few years, I have developed the notion that the primary role of music in human cultures is to provide sonic analogues for a range of dynamic processes, including those related to the emotions, to expressive gestures, and to movements of the human body. The repeated accents in the opening of the second tableau of *Les Noces* can thus serve as a sonic analogue for the foot stamps of Nijinska's dancers, and the increases in dynamic levels and orchestral colour later in the tableau can serve as an analogue for expansive bodily movements. These passages could also be correlated with different dynamic processes – they could, for instance, summon a series of emotions or different sorts of physical gestures – but as I have tried to show here, such correlations will be constrained by the nature of analogical mappings: The most convincing mapping will be that with the most robust set of structural correlations between the domains drawn in by the analogy. In the case of correlations that involve bodily movement, our understanding will also be shaped in a more immediate way as the observation of such movements will activate portions of our motor cortex and draw us deeper into the mystery of non-linguistic communication. It is precisely this mystery that is fundamental to Bourdieu's notion of the *habitus* and that may well explain the enduring attraction of the magic that can be created through music and dance.

Notes

1 Stephanie Jordan, whose chapter on *Les Noces* was incredibly valuable for my study, prefers the earlier version by Bob Lockyer (from 1978), and it does indeed seem that, in the interests of making the ballet more gripping for television viewers, MacGibbon's production sacrifices a clear view of the relationship between music and dance. See Jordan (2007): 332.
2 Translations here and in the following from Taruskin (1996): 1346.
3 The notion that fingers provide a 'tapered end for guiding communication' reflects work by Michael Tomasello and others on the role of pointing – most typically, with individual fingers – in human communication. See Tomasello (2006) and (2008).
4 This sort of strategy, in which music and dance are in a flexible relationship, can also be seen in the notated choreographies of French noble dance; for a discussion, see Zbikowski (2014): 156–7.
5 For a review of research on mirror neurons, see Rizzolatti and Sinigaglia (2008); for a critique of research on mirror neurons, see Csibra (2008).
6 For a review and discussion, see Overy and Molnar-Szakacs (2009).
7 On the bodily aspect of the *habitus*, see also Noland (2009): 7.
8 In this connection, see Bloch (1974).
9 Stravinsky concludes the passage by invoking the notion, first formulated by Friedrich von Schelling, that architecture is solidified music, a notion he attributes to Goethe. See Schelling (1989): 165, 177.

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