“What Kim presents in her ‘meta-psychology’ of music is a story, circa 1900, in which music theorists and physiologists, economists and educators, physicists and philosophers create a whole new way of thinking about music – a musical thought that starts from the body and takes metaphors such as motion and force seriously. In this wide-ranging book, Kim shows how these discussions have not lost any of their relevance but strongly resonate with current musical concerns.”

Alexander Rehding,
Fanny Peabody Professor of Music,
Department of Music, Harvard University

“Youn Kim is one of the very few contemporary musicologists whose work is of true value to both historians of music as well as historians and philosophers of science. Her new book, Body and Force in Music: Metaphoric Constructions in Music Psychology captures the emergence of a complex new way of imagining music in the course of the rise of the new sciences of biology and human nature by psychologists and philosophers (Darwin, Spencer, William James) in the course of the late nineteenth century. Concepts such as ‘soul,’ ‘force,’ and ‘body’ become at this time simultaneously scientific ‘facts’ and powerful metaphors that shape an understanding of music as phenomenon and relocate the question of its social and cultural meanings. Youn Kim’s book offers a rethinking not only of what music means today but how it came to have such meanings. Anyone engaged with discussions about music as a ‘scientific’ or ‘social’ phenomenon, ethnomusicologists and those engaged in post-colonial studies of music; any one captured by the idea that our musical minds both pre-determined by genetics and yet shaped by our environment, will benefit from reading Youn Kim’s seminal work.”

Sander L. Gilman, Distinguished Professor of the Liberal Arts and Sciences and Professor of Psychiatry (Emeritus), Emory University;
Author of “I Know Who Caused COVID-19”:
Pandemics and Xenophobia (2021)
“What exactly is music? Scientists have long wrestled with this question, often resorting to metaphors about movement, force, and the human body. In this well researched volume Professor Kim surveys the historical landscape that eventually becomes the modern field of music psychology. Along the way we are introduced to a singing sloth, a mechanical voice, and all manner of graphical representations as writers from previous centuries wrestle with the fleeting experience of music. The author brings together a chorus of fascinating voices – performers, critics, scientists, historians, dancers, neurologists – all grappling, as we still do today, with the mysteries of music.”

Robert O. Gjerdingen,
Professor Emeritus of Music Theory and Cognition,
Northwestern University
Body and Force in Music

Our understanding of music is inherently metaphorical, and metaphoricity pervades all sorts of musical discourses, be they theoretical, analytical, philosophical, pedagogical, or even scientific. The notions of “body” and “force” are the two most pervasive and comprehensive scientific metaphors in musical discourse. Throughout various intertwined contexts in history, the body – force pair manifests multiple layers of ideological frameworks and permits the conceptualization of music in a variety of ways. Youn Kim investigates these concepts of body and force in the emerging field of music psychology in the late nineteenth and early twentieth centuries. The field’s discursive space spans diverse contexts, including psychological theories of auditory perception and cognition, pedagogical theories on the performer’s bodily mechanism, speculative and practical theories of musical rhythm, and aesthetical discussion of the power of music. This investigation of body and force aims to illuminate not just the past scene of music psychology but also the notions of music that are being constructed at present.

Youn Kim obtained her PhD in music theory from Columbia University and is currently Associate Professor of Music at The University of Hong Kong. Kim’s previous publications include a monograph History of Western Music Theory (2006) and articles in Journal of Musicology, Psychology of Music, and Journal of Musicological Research, among others. She also co-edited The Oxford Handbook of Music and the Body (2019) and co-authored several articles published in Scientific Reports and PLOS One.
Body and Force in Music
Metaphoric Constructions in Music Psychology

Youn Kim
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Introduction

The human body and musical instruments

Music and science – particularly the scientific study of human beings – are two fields that are closely intertwined with metaphors that borrow from each other. Most immediately, musical instruments have long served as powerful analogies in understanding human physiognomy. To name but a few examples in history, Renaissance physician Robert Fludd conceptualized that the microcosm of the human body, as well as the macrocosm of the universe, can be mapped onto a huge monochord, thereby reflecting the ancient Greek notion of *musica humana* (Fludd 1617–24; Gouk 2002). In his *Traité de l’Homme* (1633), René Descartes employed a church organ as a metaphor to illuminate mechanistic human neurophysiology ([1633] 1972, 71). Seventeenth-century French philosopher Denis Diderot famously asserted:

> We are instruments endowed with sensitivity and memory. Our senses are as many keys that are played by Nature which surrounds us and often by themselves too... An animal is an instrument capable of sensitivity and perfectly similar to another, endowed with the same conformation, mounted with the same strings that can be played in the same way by joy, by sorrow, by hunger, by thirst, by illness, by admiration, by fear.

(Diderot, *Entretien entre d’Alembert et Diderot*, [around 1770] 1965, 51 and 55; my translation)

These are just a few examples of the long history of the intertwined conceptions of the human body and musical instruments. In the late nineteenth- and early twentieth-century life sciences, which will be the focus of this book, mechanical instruments emerged as a new illustrative conceptual model of the human nervous system. Physiologist Johannes Müller (1842) wrote that “the fibres of all the motor, cerebral and spinal nerves may be imagined as spread out in the medulla oblongata and exposed to the will like the keys of the piano-forte” (934). In like manner, Hermann von Helmholtz (1863) famously compared the anatomy and function of the inner ear to the piano in a model that later became known as the “cochlear piano,” the “nervous piano,” or “Frankenstein’s piano.” German physician Adolf Kußmaul (1881, 126) used expressions such

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as “cortical sound keys” (die corticalen Lauttasten) and “the keyboard” (die Claviatur) in the brain in his book on speech pathology (quoted in Kittler 1999, 189).³ Neurologist and psychiatrist August Forel commented that neurons “play piano on each other by means of the nerve waves” (Forel 1894, 19–20).⁴ German surgeon and writer Carl Ludwig Schleich, who first recognized the interactive and supportive role of glial cells in the nervous system, compared aspects of the neural network with a piano’s damper pedal (1922, 233; Dierig 2001, 431). Constantin von Monakow, a pioneer in early interdisciplinary brain sciences, coauthored with Raoul Mourgue their Introduction Biologique a l’étude de la Neurologie et de la Psychopathologie (“Biological Introduction to the Study of Neurology and Psychopathology”). They compared the relationship between the mind and the brain with that between a melody and a music box. The brain is a music box – a spatial object – whereas the mind is a melody, a process that unfolds in time (Monakow and Mourgue 1929, 21; see also Harrington 1999, 81).

This relationship also works conversely. For example, the nineteenth-century piano pedagogue Ludwig Deppe once said, “the pedal is the lungs of the piano” (cited in Fay 1891, 297; see also Caland 1901, 63).

These examples illustrate several metaphors that relate to two different conceptual domains. Our account of music is inherently metaphorical, and this metaphoricity pervades all sorts of musical discourses, be they theoretical, analytical, philosophical, pedagogical, or even scientific (Scruton 1983; Zbikowski 1998, 2002; Watkins 2011; Spitzer 2015). The human body often provides the source of our understanding of the world, which includes all modes of thoughts from everyday perceptions to scientific knowledge (Lakoff and Johnson 1999; Danziger 1990; Leary 1994; Harrington 1995; Brown 2003). The human body and

Figure 0.1 The schema of a music box compared to the human brain in Monakow and Mourgue (1929, 21). The spring is compared to the instinct, the oil to the circulation of blood, and the trigger apparatus to the conduction pathways.
its senses are thus seen as the basis of most of our interactions with the world. The relation between musical instruments and human beings is not unilateral but mutual. Musical instruments offer powerful and effective analogies for understanding human beings through their structural and anatomical resemblances to the human body and nervous system, as well as their functional similarities to the human mind. As sociologist and anthropologist Marcel Mauss once pointed out, “the body is man’s first and most natural instrument. Or more accurately . . . man’s first and most natural technical object, and at the same time technical means, is his body” (Mauss [1935] 1979, 104). On this ground, an instrument can be reconstructed outside the body, extending the human body. As John Durham Peters points out, Alexander Graham Bell had worked on “a piano as an ear” in his attempt to construct a harmonic telephone based on Helmholtz’s model of the ear (Peters 2004, 187).

**Conceptual dimension of metaphoric construction**

The correspondences existing between these two domains are not only constitutional; they are conceptual features common to the understanding of both musical instruments and human beings. Archaeologist and anthropologist Clive Gamble’s work is worth mentioning here. Arguing that metaphors can be expressed materially as well as linguistically, Gamble distinguished two basic forms of bodily actions and accordingly classified the artifacts and material proxies into *instruments* and *containers* (2007, 103). Hands, feet, and limbs are primarily *instruments* that inscribe and alter other objects, whereas the trunks of our body are often literal *containers*, encompassing bodily organs. This can also be extended to musical instruments that can be classified according to how the body is related to sound production. Objects that produce sounds by “plucking and hitting with the limbs” are *instruments* and those that require “blowing and breathing through the lips and nose” are *containers* (Gamble 2012, 92). As acknowledged in his previous work, this bipartite division is never clear-cut and the “homology of the body-whole is never forgotten” (2007, 103). Nevertheless, Gamble’s categorization presents a useful theoretical framework against which we can consider music(al) instruments, the body, and the metaphoric construction between them more closely. For example, keyboard instruments belong to both categories in Gamble’s classification. Keyboards produce sounds through the bodily action of “touching” (*toccare*) and are thus an *instrument*. A piano is nevertheless classified as a *container*. It is also noticeable that both stringed instruments (violins, cellos, etc.) and pianos are defined as *containers*. However, the metaphors of stringed instruments and pianos carry very dissimilar connotations. The metaphors belonging to the piano (and the music box), which were popular in the late nineteenth and early twentieth centuries, carry the mechanical understanding of both the functioning of the human body and its mental procedures, which is different from the analogy of the human body to a gigantic string in the seventeenth century. These bodily metaphors disclose the epistemology of music and the human body and mind. From the metaphors of musical instruments in music-pedagogical and