Introduction: Music for/into/as Motion – and Vice Versa
Exploring the Field in Artistic Practice and Theory

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At first it seems self-evident that music has something to do with movement: it is unavoidable and unmistakable that we move when we make music. On the one hand, we make movements that are required to produce a sound: for example, the pressure that must be exerted on a key in order to make a string vibrate. On the other hand, we use movements to implement a certain sound idea or to create nuances of expression and thus further above all our artistic intention. To the extent that it makes sense at all to distinguish between primarily functional and expressive-formative motions, movements that are intended for sound production can be described as motion *for* music.[1]

Apart from these movements, music stimulates us almost involuntarily to make small gestures such as rhythmic rocking or tapping (even if only with the tips of the feet or fingertips) or movements with the whole body such as dance in the most primordial sense (i.e. independent of specific forms or styles). Music moves us—but not always visibly. It also triggers invisible, "inner" motions such as imagination,[2] an indispensable source of artistic and creative work, and

1 Although "movement" and "motion" are often used as synonyms, I will use "motion" as an umbrella term that also includes invisible motions, while movements refer primarily to visible (body/physical) motions. In this respect I roughly follow Clarke, who takes "motion" "to denote the abstract category of spatial displacement in time, and 'movement' to denote specific examples of particular spatial displacements." Eric Clarke, *Ways of Listening. An Ecological Approach to the Perception of Musical Meaning* (Oxford and New York: Oxford University Press, 2005), 209 (note 1 of chapter 3).

2 For further reading on this subject: David Hargreaves, Dorothy E. Miell, and Raymond A.R. MacDonald, eds., *Musical Imaginations. Multidisciplinary Perspectives on Creativity, Performance, and Perception* (Oxford and New York: Oxford University Press, 2012), and for a comprehensive overview: Mark Grimshaw-Aagaard, Mads Walther-Hansen, and Martin Knakkergaard, eds., *The*

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emotions[3] that sometimes literally drive us (cf. Latin *emovere*: to move out, to set in/to motion). While listening to music not only our sense of hearing is activated, but sometimes also our sense of sight, touch, or our sense of taste and smell,[4] and above all our (often overlooked) sense of movement, also known as kinesthesia.[5] In this respect, music is directly linked to motions that do not primarily relate to music production, but above all to music reception—and which in turn allow valuable insight into our music perception, i.e. our hearing/listening. From this perspective music is set and/or heard *into* motion, whereby these motions can express themselves (more or less) spontaneously (in improvisation) or can be consciously designed (in choreography)—or remain hidden (in our imagination), especially since we have learned to sit still at concerts.[6]

Oxford Handbook of Sound and Imagination, 2 vols. (Oxford and New York: Oxford University Press, 2019).

3 The extensive field of musicological research into emotion cannot be discussed at this point. For an overview, see: Patrik N. Juslin and John A. Sloboda, eds., *Handbook of Music and Emotion. Theory, Research, Applications* (Oxford and New York: Oxford University Press, 2010), or especially for an "enactive" approach to this aera: Dylan van der Schyff, Andrea Schiavio, and David J. Elliot, eds., *Musical Bodies, Musical Minds. Enactive Cognitive Science and the Meaning of Human Musicality* (Cambridge, MA and London: The MIT Press, 2022), 91–108 (chapter "Music and Emotion").

4 For an introduction to this phenomenon cf. for example Solange Glasser, "Synesthesia and Performance", in *The Oxford Handbook of Music Performance*, vol. 1, ed. Gary E. McPherson (New York: Oxford University Press, 2022), 670–88.

5 The term "kinesthesia" goes back to the British neurologist Henry Charlton Bastian (1817–1915) and is derived from the Greek κινέω meaning "to move" and αἴσθησις "sense/perception". Confusion surrounding the term "kinesthesia," sometimes referred to as the "sixth" sense, continues, ultimately creating a broad inter- and transdisciplinary field both within the humanities/social sciences, the arts/cultural sciences, and within the natural sciences as well, cf. among others: Mark Paterson, *How We Became Sensorimotor. Movement, Measurement, Sensation* (Minneapolis and London: University of Minnesota Press, 2021); David Howes, ed., *The Sixth Sense Reader* (Oxford and New York: Berg, 2009); Nima Rezaei and Amine Saghazadeh, eds., *Biophysics and Neurophysiology of the Sixth Sense* (Cham: Springer, 2019). Below, this field will be narrowed down through discussion of approaches relevant to the interaction between music and movement (see note 31 and my contribution to chapter 3 of this volume, especially note 14).

6 The development of an advanced musical culture largely decoupling itself from movement took place over the course of the eighteenth century and became a hallmark of a specifically bourgeois musical culture in the nineteenth century. For this phenomenon illustrated by the example of Paris, see: James H. Johnson, *Listening in Paris* (Berkeley: University of California Press, 1995); Stephanie

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In addition, gestures and motions are also inscribed in music, so to speak–be it because composers refer to dance models that they musically abstract, i.e. stylize,[7] or be it because they (more or less consciously) take up ideas of motion that provide a metaphoric basis for their compositions.[8] Pursuing this approach, one can speak of an "inner motion" of the music itself, of a motion *in* music or (from the perspective of perception) of music *as*

Schroedter, *Paris qui danse. Bewegungs- und Klangräume einer Großstadt der Moderne* (Würzburg: Königshausen & Neumann, 2018).

7 Such phenomena are linked to research on musical gesture. This branch of research received a significant impetus in Anglo-American musicology through Wye Jamison Allanbrook's monograph *Rhythmic Gesture in Mozart. Le Nozze di Figaro and Don Giovanni* (Chicago and London: University of Chicago Press, 1983), in which she impressively demonstrates the influence of eighteenth century ballroom dance practice on Mozart's musical compositions. Following up on this came Mary Ann Smart's, *Mimomania: Music and Gesture in Nineteenth-Century Opera* (Berkely, Los Angeles, and London: University of California Press, 2004). Robert Hatten's *Interpreting Musical Gestures, Topics, and Tropes. Mozart, Beethoven, Schubert* (Bloomington: Indiana University Press, 2004) deals with this phenomenon in instrumental music and led to overarching reflections on Western music: *A Theory of Virtual Agency for Western Art Music* (Bloomington: Indiana University Press, 2018). Also insightful for this topic are the two anthologies edited by Anthony Gritten and Elaine King: *Music and Gesture* (Farnham: Ashgate, 2006) and *New Perspectives on Music and Gesture* (Farnham: Ashgate, 2011). Further publications are more oriented towards a) performance practice as e.g. Gertrud Meyer-Denkmann, *Körper, Gesten und Klänge am Klavier. Improvisation, Interpretation und Komposition Neuer Musik* (Saarbrücken: Pfau Verlag, 1998) and *Mehr als nur Töne. Aspekte des Gestischen in neuer Musik und im Musiktheater* (Saarbrücken: Pfau Verlag, 2003), Alexandra Pierce, *Deepening Musical Performance through Movement. The Theory and Practice of Embodied Interpretation* (Bloomington and Indianapolis: Indiana University Press, 2010) and with an emphasis on artistic research in the field of performance art with music the contribution of Winnie Huang to this volume; b) historiographical aspects as e.g. Arne Stollberg, Jana Weißenfeld, and Florian Besthorn, eds., *DirigentenBilder. Musikalische Gestik–Verkörperte Musik* (Basel: Schwabe, 2015); c) perspectives from music theory and aesthetics as e.g. Katrin Eggers and Christian Grüny, eds., *Musik und Geste: Theorien, Ansätze, Perspektiven* (Paderborn: Wilhelm Fink Verlag, 2018); or d) pedagogical contexts as e.g. Constanze Rora and Martina Sichardt, eds., *Gesten Gestalten. Spielräume zwischen Sichtbarkeit und Hörbarkeit* (Hildesheim: Georg Olms Verlag, 2018).

8 Cf. for an example Christian Thorau, *Vom Klang zur Metapher. Perspektiven der musikalischen Analyse* (Hildesheim: Georg Olms Verlag, 2012) and also, but explicitly with regard to experimental music, Drake Anderson's contribution in this volume.

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motion, which therefore also has a specific audible but not visible physicality.[9] Considerations in this regard focus on our cognitive understanding of music,[10] analyzed by a music theory, which springs from linguistic research and is trained in metaphor theory,[11] or by music psychology.[12] Both fields are

9 While the relationship between music and the body has recently received increased attention from a variety of perspectives, the fact that music itself also has a certain physicality has tended to remain neglected. For an overview of this far-reaching and by no means exhausted field of research, see: Stephanie Schroedter, "Körper und Klänge in Bewegung–Körperliche Dimensionen von Musik zwischen Embodiment und Enaction," in *Music in the Body–The Body in Music. Körper an der Schnittstelle von musikalischer Praxis und Diskurs*, ed. Christine Hoppe and Sarah Avischag Müller (Hildesheim: Georg Olms Verlag, 2021), 29–56; and "Musik, Körper und Bewegung. Konturen eines musikalisch-bewegten 'Body Turn'" in *Körper(lichkeit) in der Musik des 20. und 21. Jahrhunderts*, ed. Nadine Scharfetter and Thomas Wozonig (Bielefeld: transcript, 2023), 11-41 and also my contribution to chapter 3 of this volume, especially note 2.

10 See Arnie Cox, *Music & Embodied Cognition. Listening, Moving, Feeling, & Thinking* (Bloomington and Indianapolis: Indiana University Press, 2016), who defines "cognition" as follows: "I am taking cognition to be the sum of the process of coming-to-know and coming-to-understand and to thus subsume all forms of perception, comprehension, and conceptualization" (15).

11 Significant impulses in this area came from the linguists and philosophers George Lakhoff and Mark Johnson, who first presented their "Conceptual Metaphor Theory," which is still influential today, in their publication *Metaphors We Live by* (Chicago: University of Chicago Press, 1980); for a more up-to-date status cf. Ezequiel A. Di Paolo, Elena Clare Cuffari, and Hanne De Jaegher, *Linguistic Bodies. The Continuity between Life and Language* (Cambridge, MA: The MIT Press, 2018). With reference to specific musical issues, see among others Lawrence M. Zbikowski, *Conceptualizing Music. Cognitive Structure, Theory, and Analysis* (Oxford and New York: Oxford University Press, 2002) as well as his *Foundations of Musical Grammar* (Oxford and New York: Oxford University Press, 2017). Further, cf. Steve Larson, *Motion, Metaphor, and Meaning in Music* (Bloomington and Indianapolis: Indiana University Press, 2012); Cox, *Music and Embodied Cognition* (see note 10); Jonathan De Souza, *Music at Hand: Instruments, Bodies, and Cognition* (Oxford and New York: Oxford University Press, 2017); Mariusz Kozak, *Enacting Musical Time. The Bodily Experience of New Music* (Oxford and New York: Oxford University Press, 2020); Mark Reybrouck, *Musical Sense-Making. Enaction, Experience, and Computation* (London and New York: Routledge, 2021).

12 In this context, but from a music systematic/psychological approach, the focus lies often on rhythm and musical gestures. Cf. for example Rolf Godøy and Marc Leman, eds., *Musical Gestures: Sound, Movement, and Meaning* (New York: Routledge, 2010) as well as Leman's monographs *Embodied Music Cognition and Mediation Technology* (Cambridge, MA: The MIT Press, 2008), *The*

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influenced by cognitive sciences, especially the so-called 4E cognition or enactivism (see below), which goes far beyond primarily musical issues, additionally investigating relations to our everyday world of experience in order to be able to draw conclusions about our "conceptualization" of music.[13] This approach seems to me fundamental for a praxeological and/or theoretical-analytical approach to the interweaving[14] of music/sounds[15] and movement/dance[16].

Expressive Moment. How Interaction (with Music) Shapes Human Empowerment (Cambridge, MA: The MIT Press, 2016). Furthermore Wilfried Gruhn, *Musikalische Gestik. Vom musikalischen Ausdruck zur Bewegungsforschung* (Hildesheim: Georg Olms Verlag, 2014); Christoph Wöllner, ed., *Body, Sound and Space in Music and Beyond: Multimodal Explorations* (Abingdon/Oxon and New York: Routledge, 2017); and an anthology that brings us even closer to dance: Christoph Wöllner and Justin London, eds., *Performing Time. Sychrony and Temporal Flow in Music and Dance* (Oxford: Oxford University Press, 2023).

13 For an comprehensive overview cf. *The Oxford Handbook of 4E Cognition*, ed. Albert Newen, Leon Bruin, and Shaun Gallagher (Oxford: Oxford University Press, 2018); and especially with regard to music: van der Schyff, Schiavio, and Elliot, eds., *Musical Bodies*, *Musical Minds* (see note 3).

14 The term "interweaving," which refers to an organic structure with relational connections, is intended to offer an alternative to the terminology of "interactions" that is prevalent in Anglo-American research and which refers to models of communication theory (see: Erving Goffman, *Interaction Ritual. Essays on Face-to-Face Behavior* [New York: Anchor Books, 1967]) and ultimately actions of input and output. Accordingly, this terminology has also become firmly established in technological contexts (see, among others: Micheline Lesaffre, Pieter-Jan Maes, and Marc Leman, eds., *The Routledge Companion to Embodied Music Interaction* [London and New York: Routledge, 2017]). For artistic-pedagogical issues that are central to music and movement pedagogy/rhythmics and also for choreomusical and sound-performative performance analyses (see below), this terminology seems to me to be misleading.

15 The concept of sound in this context stands for an expanded concept of music which also includes sound art/design/installations and is aimed at a primarily auditory perception which is therefore not necessarily dependent upon musical scores or notation. This concept of sound has undoubtedly become significantly more important since the beginning of the twentieth century. See Makis Solomos, *From Music to Sound. The Emergence of Sound in 20th- and 21st-century Music* (London and New York: Routledge, 2020). Nevertheless, for the present context I would like to retain the term "music" as a denotation of musical phenomena in the broadest sense.

16 In contrast to everyday movement, dance as artificially designed movement does not have to fulfill any function and does not necessarily have to be goal-oriented. Conversely, everyday movement does not have to, but can meet

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And yet, in these discussions, one phenomenon is mostly neglected, one that is an important prerequisite for that rich interweaving of music and motion—right up to its analogization on the level of perception. What I mean is our already mentioned sense of movement, alias kinesthesia and its (also physiologically justified) proximity to our sense of hearing/listening (see below). This phenomenon was given particular attention by Émile Jaques-Dalcroze (*1865 in Vienna, †1950 in Geneva), who, as a teacher of ear training and harmony, founded the field of "(eu)rhythmics,"[17] the basis of the current music and movement pedagogy program of the University of Music and Performing Arts in Vienna. This aspect will be explained in more detail in the following.

From Émile Jaques-Dalcroze to a Kinesthetic Listening

The pianist, composer, and music educator Jaques-Dalcroze, trained in his hometown of Vienna but also in Geneva and Paris, presented the first drafts of his movement-emphasized music lessons at what was then Vienna's "K & K Academy for Music and Performing Arts" as early as 1909. They were received

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creative demands or aesthetic criteria (e.g. in Performance Art). Regardless of this important difference between movement in general and specifically dance movement, it is advisable to define the topic more broadly at the outset, that is, to start primarily from movement/motion and to understand dance (in artistic or socio-cultural contexts) as a specific performative movement. In this sense, the relationship between music and movement can be explored anew, regardless of specific forms, styles, genres or aesthetic concepts—without however categorically excluding dance as an artistic and creative form of movement.

17 "Rhythmik" as a pedagogical-didactic concept founded by Jaques-Dalcroze is usually referred to as "eurhythmics" in the Anglo-American community (cf. the contribution of Dorothea Weise in this volume). This often leads to confusion with the "Eurhythmie" resp. eurythmy developed by Rudolf Steiner, which in turn has no connection with Jaques-Dalcroze's approach. After all, many representatives of the life reforms of the early 20th century were in search of a "good rhythm" (greek: εὖ ῥυθμός) – which makes it all the more urgent to critically question this term. I would therefore prefer "rhythmics" as translation of the German term "Rhythmik", even if this entails the danger of reducing rhythmics primarily to rhythmic components in a narrower musical understanding. However, rhythmic parameters are only one aspect of Dalcroze's concept of "rhythmics". He included all musical parameters in his teaching method and used the term "Rhythmik" to describe a holistic understanding of music.

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extremely positively: people sought to incorporate his method (deemed groundbreaking throughout Europe) of experiencing the shape and essence of music and thereby at the same time releasing psychological and creative forces through "body rhythms" into training for instrumental classes, opera singers, and actors.[18] Gertrude Wiesenthal (1890–1981) was appointed as the first teacher of "Rhythmic Gymnastics according to Dalcroze" at the Vienna Music Academy in 1914/15 (until 1952)—after she had received a scholarship from the Board of Trustees for an eighteen-month training course at the newly founded (1911) "Educational Institute for Music and Rhythm" in Dresden-Hellerau (later to become the Festspielhaus Hellerau and today's European Center for the Arts Dresden). Soon afterwards she was supported by her sister Grete Wiesenthal (1885–1970), who, having enjoyed an international dance career on stage, was appointed to a professorship in dance from 1934. Against this background, it is hardly surprising that right from the start there was, especially in Vienna, a strong affinity between Jaques-Dalcroze's "rhythmic gymnastics" and dance. But to what extent did this connection also correspond with Jaques-Dalcroze's theoretical conceptualization? Is it not just due to fortunate circumstance?

Certain early writings of Jaques-Dalcroze, which surprisingly, but perhaps understandably (due to their primarily theoretical orientation), have so far received little attention, seem to contain an answer to this question. These are Jaques-Dalcroze's early, almost manifesto-like lectures from 1907, which were published under the title *Rhythm as a Means of Education for Life and Art*,[19] and

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18 After Lynn Heller (unpublished manuscript from 1994) quoted by Eleonore Witoszynskyj, "Auf dem Weg zum Studium der Musik- und Bewegungspädagogik/Rhythmik an der Akademie, späteren Hochschule und gegenwärtigen Universität für Musik und darstellende Kunst Wien," in *Leben ist Bewegung ist Musik. Entwicklungen und Konzepte der Wiener Rhythmik an der Universität für Musik und darstellende Kunst Wien*, ed. Angelika Hauser-Dellefant and Eleonore Witoszynskyj (Wiesbaden: Reichert Verlag/zeitpunkt music, 2016), 10 (english edition: *Life Is Movement Is Music. Education in Music and Movement at the University of Music and Performing Arts Vienna*, ed. Angelika Hauser-Dellefant and Eleonore Witoszynskyj [ibid., 2023:11).

19 Émile Jaques-Dalcroze, *Der Rhythmus als Erziehungsmittel für das Leben und die Kunst. Sechs Vorträge zur Begründung seiner Methode der rhythmischen Gymnastik*, published in German by Paul Boepple, Basel 1907, quoted here from the first lecture, hereafter abbreviated as J-D, *Rhythmus* [lecture number in Roman numerals]/[page number in Arabic numerals]. According to Kugler, the original text, a handwritten French manuscript, has been lost. This circumstance is all the more regrettable as some of the German formulations are misleading if not incorrect. See Michael Kugler, *Die Methode Jaques-Dalcroze und das Orff-Schulwerk. Elementare Musikübung. Bewegungsorientierte Konzeptionen der Musikpädagogik* (Frankfurt am Main, Berlin, and Bern etc.: Peter Lang Verlag,

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which are extremely informative for understanding his conception of "rhythmics," both in terms of the historical dimensions of this subject as well as in terms of the innovative potential for holistic musical education that is still inherent in this field today.

When reading these early writings, it is immediately noticeable how excessively one phenomenon is discussed that was barely researched at the time: a "muscular sense" ("Muskelsinn") that Jaques-Dalcroze considered essential for nuanced musical expression. For example, he posits the cause of an immature sense of style in the interpretation of a piece of music to be a "lack of muscular sense," ultimately a lack of feeling "for the relationships between movement and sound, between cause and effect, goal and means."[20] In this context he emphasizes: "The knowledge of the relationship between muscular effort and tone production is generally valid and applicable to every instrument,"[21] whereas "particular attention must be paid to uniform dynamic development of each muscle with a constant increase in strength, [to] bring the organs into the correct relationship of dependency to the activity of the will."[22] At this point he continues:

> In this way, the player is trained to know exactly which muscles are required for each movement he wants to make based on the energy of will triggered in the brain. He is able to estimate the degree of effort with absolute certainty and does not initiate passive or sometimes contrary activity in carefully modulating the muscles which are directly involved.[23]

2000), 352. For a more detailed discussion of these lectures, see Stephanie Schroedter, "The Mind Is a Muscle—Or: The Muscle Is a Mind" on the digital platform of the Universität der Künste Berlin https://doi.org/10.25624/kuenste-1951 or in the *Altas of Eurhythmics* (https://www.kmh.se/in-english/atlas-of-eurhythmics.html, accessed 8 February 2024) under the column "Results From the Project/Verbs: A Glossary" with cue word: "Interweaving."

20 J-D, *Rhythmus* I/9: "Dieser Mangel an Stil hat seinen guten Grund; er ist allmählich aus Mangel an Muskelsinn entstanden, aus Mangel an Verständnis für die Beziehungen zwischen der Bewegung und dem Klange, zwischen Ursache und Wirkung, Ziel und Mittel."

21 J-D, *Rhythmus* I/10: "Die Erkenntnis der Beziehung zwischen der Muskelanstrengung und und [sic] der Bildung des Tones ist allgemein gültig und für jedes Instrument anwendbar."

22 J-D, *Rhythmus* I/17: "Ausführliche Muskelbewegungen, wobei besonders auf gleichmässige dynamische Entwickelung jedes Muskels mit steter Steigerung der Kraft zu achten ist, müssen die Organe in das richtige Abhängigkeitsverhältnis zur Willenstätigkeit bringen."

23 J-D, *Rhythmus* I/17f.: "Der Spieler wird auf diese Weise dazu erzogen, bei jeder Bewegung, die er zufolge einer im Gehirn ausgelösten Willensenergie vornehmen will, die hierzu nötigen Muskeln genau zu kennen, den Grad

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Ultimately, it is precisely these "muscles" that not only become the center of a fitting musical interpretation practice, but also form the nucleus of Jaques-Dalcroze's concept of "rhythmic gymnastics" with which he sought to develop this (as we put it today) sensorimotor ability:[24] "The study of rhythm is the study of muscle strength, of the dimensions of time and space, and the influence that the amounts of these three factors exert on each other."[25] He then justifies this "study" again from a broader perspective:

> Rhythm is physical in nature. It is the movement of matter in time and space in a logical and constantly proportional division. The life task of every muscle is to produce movements of a certain strength [= force/dynamics, note St.Sch.] and a certain length [= time, note St.Sch.] and within a certain space. By logically arranging the relationships between these three elements of movement, each muscle creates a rhythmic impression within the brain; the brain converts the sum of these impressions into will, i.e. into regular habits, into constant spontaneous readiness for action and into complete freedom of imagination. In these way, the movement forces of the mind are formed.[26]

Such and similar statements about the "muscular sense" run like a common thread throughout Jaques-Dalcroze's discussions of his concept of "rhythmics" as a teaching method "for life and art"–as he emphatically emphasizes. This "method" for training a subtle dosage of "muscle strength" as a prerequisite for nuanced sound creation initially emerged from a pianistic seed which

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des Kraftaufwandes mit absoluter Sicherheit abzuschätzen und die passive oder zuweilen entgegengesetzt wirkende Tätigkeit der nicht direkt beteiligten Muskeln sorgfältig zu modulieren."

24 Cf. for this topic and to place Jaques-Dalcroze's ideas into a larger, also historically grounded context: Paterson, *How We Became Sensorimotor* (see note 5).

25 J-D, *Rhythmus* I/22: "Das Studium des Rhythmus ist das Studium der Muskelkraft, der Zeit- und Raummasse [gemeint ist: Maße, Anm. St.Sch.] und des Einflusses, den die Grössen dieser drei Faktoren gegenseitig aufeinander ausüben."

26 J-D, *Rhythmus* I/22f.: "Der Rhythmus ist physischer Natur, er ist die Bewegung der Materie in Zeit und Raum in logischer und verhältniswahrender Einteilung. Die Lebensaufgabe eines jeden Muskels besteht darin, Bewegungen von gewisser Stärke [= Kraft/Dynamik, Anm. St.Sch.] und gewisser Länge [= Zeit, Anm. St.Sch.] und in einem gewissen Raume hervorzubringen. Indem man die Verhältnisse dieser drei Bewegungselemente logisch ordnet, ruft jeder Muskel einen rhythmischen Eindruck im Gehirn hervor und dieses setzt die Summe der Eindrücke um in Willen, d.h. in regelmässige Gewohnheiten, in stete spontane Aktionsbereitschaft und in gänzliche Freiheit der Vorstellung. So werden die Bewegungskräfte des Geistes gebildet."

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was then generally applied to practical instrumental and vocal challenges and finally to whole-body or holistic movement exercises. These latter, which were also referred to as "plastiques animées,"[27] no longer served to produce sound; instead, sounds were transferred into (body) movement—modeled by the whole body, so to speak, as training for a differentiated use of the very muscle strength that Jaques-Dalcroze considered elementary for the development of musicality.[28] In this way, Jaques-Dalcroze lent his theses on the "muscular sense" temporally/spatially augmented contours which were even more clearly recognizable because they were expanded. Against this background, the "movements for music" on which Jaques-Dalcroze initially concentrated resulted in "music for movements," sometimes very demanding movement exercises for which specific music was composed (initially, of course, by Jaques-Dalcroze himself).[29] At the core of these two areas is the "muscular

27 Though Jaques-Dalcroze pursued a pedagogical-didactic or eductional context for musicians, "plastique animée" as a secondary field of rythmics can also be used for musical training for dancers, who, as it is well known, also attended Jaques-Dalcroze's courses in large numbers. See Gunhild Oberzaucher-Schüller, "Auftauchen lassen. Über das körperliche Fundament des Modernen Tanzes in Mitteleuropa," in *Zum immateriellen Kulturerbe des Modernen Tanzes*, ed. Claudia Fleischle-Braun, Krystyna Obermaier, and Denise Temme (Bielefeld: transcript, 2017), 61-94; as well as the music visualizations that were popular at the time and also find their echo in Jaques-Dalcroze's rhythmics: Stephanie Jordan, *Moving Music. Dialogues with Music in the Twentieth-Century Ballet* (London: Dance Books, 2000), especially 15.

28 At this point, it should be strongly emphasized that Jaques-Dalcroze intended primarily to reform music education and didactics. In no way did he intend to develop a musically-oriented method of dance training, even if numerous dancers, especially those with an art reformative or avant-garde orientation, attended his classes in the short term, then to turn away from him because they felt his "method" restrictive for their choreographic freedom. See the insightful discussion of Jaques-Dalcroze's concept of "rhythmics" by Daniel Zwiener: *Als Bewegung sichtbare Musik. Zur Entwicklung und Ästhetik der Methode Jaques-Dalcroze in Deutschland als musikpädagogische Konzeption* (Essen: Die Blaue Eule, 2008). A valuable, source-based documentation of rhythmics according to Jaques-Dalcroze can be found here: Joachim Gobbert, *Zur Methode Jaques-Dalcroze. Die Rhythmische Gymnastik als musikpädagogisches System. Wege und Möglichkeiten der plastischen Darstellung von Musik durch den menschlichen Körper*, 2 vols. (Frankfurt am Main: Peter Lang, 1998).

29 Composing or improvising "music for movement" is an integral part of music and movement pedagogy/rhythmics studies, be it as music for "accompanying" movement (which aims at supporting or illustrating a movement expression) or as a music in "dialogue" with movement (which seeks a direct exchange with the movement/dance).

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sense" on which Jaques-Dalcroze very perceptively insisted, although it was hardly researched at the time and its importance obviously continues to be underestimated.

From an almost diametrically opposed perspective—namely issuing from dance and from there arriving at an intersection of a philosophically based anthropology and phenomenology—the more than ninety-year-old American dance scholar and philosopher Maxine Sheets-Johnstone has spent her entire academic life researching what Jaques-Dalcroze described as "muscular sense"—the "sense of movement" also known as kinesthesia.[30] "Why is there such opacity and even avoidance of the sense modality of kinesthesia and its experiential reality and why is there so much confusion of kinesthesia with proprioception?" she asks at the beginning of her "extended critical overview," thus drawing attention to this (unfortunately) still under-researched sense[31] with which we perceive ourselves and others as moving, living beings, and more importantly, without which we could not live. The essential meaning of kinesthesia, "the original source of our concept of force," is according to Sheets-Johnstone so evident that, as she emphasizes, "the real-life, real-time significance of the 'muscle sense' can hardly be doubted."[32] Sheets-Johnstone

30 Cf. note 5.

31 Maxine Sheets-Johnstone, "Kinesthesia: An Extended Critical Overview and a Beginning Phenomenology of Learning," in *Continental Philosophy Review*, 52/2 (2019), 143–69, here 144, https://doi.org/10.1007/s11007-018-09460-7. It is hardly surprising that dance studies in particular have recently shown increased interest in the importance of kinesthesia. See for example: Mary M. Smyth, "Kinesthetic Communication in Dance," in *Dance Research Journal*, vol. 16, no. 2 (fall 1984), 19–22; Jeroen Fabius, "Seeing the Body Move. Choreographic Investigations of Kinaesthetics at the End of the Twentieth Century," in *Contemporary Choreography. A Critical Reader*, ed. Jo Butterworth and Liesbeth Wildschut (London: Routledge, 2009), 331–45; Matthew Reason and Dee Reynolds, "Kinesthesia, Empathy, and Related Pleasures: An Inquiry into Audience Experiences of Watching Dance," in *Dance Research Journal*, vol. 42, no. 2 (winter 2010), 49–75, as well as their anthology *Kinesthetic Empathy in Creative and Cultural Practices* (Bristol: Intellect, 2012); Susan Leigh Foster, *Choreographing Empathy. Kinesthesia in Performance* (Abingdon/Oxon and New York: Routledge, 2011); Gabriele Brandstetter, Gerko Egert, and Sabine Zubarik, eds., *Touching and Being Touched. Kinesthesia and Empathy in Dance and Movement* (Berlin: Walter de Gruyter, 2013); Irina Sirotkina and Roger Smith, *The Sixth Sense of the Avant-Garde: Dance, Kinaesthesia and the Arts in Revolutionary Russia* (London and New York: Bloomsburg Publishing, 2017, [2]2019).

32 Sheets-Johnstone, "Kinesthesia: An Extended Critical Overview" (see note 31), 148.

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points out again and again that even in the most recent research (in cognitive science) there is fundamental confusion in this regard, which ultimately leads to the continued and fatal underestimation of this sensory modality.

Kinesthesia refers primarily to the perception of our own movements (i.e. the spatial position of our body limbs in relation to one another) as well as to our orientation of movement in space (through the control of the direction and speed of our active and passive movements as well as the amount of force which is necessary when executing a movement or using resistance in order to either maintain our balance or ensure stability). Here we see established the existential necessity of this sense. In contrast to our sense of hearing, sight, smell, taste, and touch, we are dealing with a sense that cannot (more or less) clearly be localized to an organ, but rather to a sense that is based on a receptor system extending through muscles, tendons, and joints. As a sense whose workings are hidden from us, it controls our everyday movements so naturally that we often only notice it when this naturalness is restricted or fails—for example, due to an accident or with advancing age, and particularly in diagnoses of Alzheimer's or Parkinson's. However, kinesthesia not only includes the perception of our own movements, but also our self-perception through movement, i.e. it is also generally responsible for our sensations of body and movement, and ultimately for our self-perception as (independently) moving beings. According to Sheets-Johnstone, the (self-)consciousness of being able to do something (in the sense of mastering something) is primarily due to this awareness of movement. "I can" would therefore be synonymous in the most elementary sense with "I move," based on kinesthesia as a "pan-human ability to learn one's body and learn to move oneself." After the sense of movement was already established at the center of her "Phenomenology of Dance,"[33] she continued building upon this base to found a "Phenomenology of Learning."[34]

Without at this juncture being able to go into the far-reaching (pedagogical) consequences of this approach, I would like to point out a very insightful comment from Sheets-Johnstone with regard to Jaques-Dalcroze's writings. Referring to Eckart Scheerer's study on the historical origins of the "muscular sense" and "innervation feelings,"[35] she states that the author, theater director,

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33 This is the title of her dissertation, which appeared in print in 1966 and is still considered a foundational work: *The Phenomenology of Dance* (Madison: University of Wisconsin Press, 1966/Philadelphia: Temple University Press, 2015 [Reprint]).

34 Cf. her monograph: *The Primacy of Movement* (Amsterdam and Philadelphia: John Benjamins Publishing Company, 2011).

35 See Scheerer, "Muscle Sense and Innervation Feelings: A Chapter in the History of Perception and Action," in *Perspectives on Perception and Action*, ed. Herbert

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and philosopher Johann Jacob Engel (1741–1802), who was well known in the German-speaking world at the time and worked in Berlin and other cities, was probably the originator of this term. It seems that Engel found it important to emphasize that we perceive our environment differently through our "muscles" (with which he seems to mean deep sensitivity, which at the time was still largely unexplored) than through our sense of sight. If we now remember that Jaques-Dalcroze also mentions "muscular innervation"[36] or "muscle innervation"[37] several times, it becomes obvious that, in relation to his comments on the "muscular sense," he is referring to older sources which he does not name. Further research in this area would undoubtedly be an informative undertaking in order to place his concept of rhythmic training also in the context of medical history.[38]

However, Jaques-Dalcroze was not concerned with muscle sense or deep sensitivity as such, but, as we have seen above, with sensorimotor skills to increase musical expression. For him it was not kinesthesia per se that was important, but rather a rhythmically and dynamically differentiated training of the sense of movement in order to be able to implement subtle sound ideas/imaginations (on the instrument or vocally)—that is, a rhythmic and dynamic way of being able to perceive and/or shape differentiated sound events with the entire body. In technical language, this is also referred to as a musical embodiment.[39] At this point we can build a bridge to Edmund Husserl,

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Heuer and Andries F. Sanders (Hillsdale, NJ: Lawrence Erlbaum Associates Inc., 1987), 176.

36 J-D, *Rhythmus* II/28: "die muskuläre Innervation."

37 J-D, *Rhythmus* II/36: "Muskel-Innervation."

38 In this context, Kugler refers to the Geneva psychophysiologist Éduard Claparède (1873-1940), with whom Jaques-Dalcroze actively exchanged ideas and who received his doctorate in 1897 with a thesis on the *Sens musculaire* and, in 1905, published his highly acclaimed *Psychologie de l'enfant et pédagogie expérimentale*. Kugler, *Die Methode Jaques-Dalcroze und das Orff-Schulwerk* (see note 19), 49. For further information from the perspective of natural sciences cf. E.G. Jones, "The Development of the 'Muscular Sense' Concept During the Nineteenth Century and the Work of H. Charlton Bastian," in *Journal of the History of Medicine and Allied Sciences*, vol. XXVII, issue 3 (July 1972), 298-311, https://doi.org/10.1093/jhmas/XXVII.3.298.

39 See Marja-Leena Juntunen's dissertation, *Embodiment in Dalcroze Eurhythmics* (Oulu: University of Oulu, Faculty of Education/Department of Educational Sciences and Teacher Education, 2004), and further publications by her as e.g. "The Dalcroze approach: experiencing and knowing music through embodied exploration," in *Approaches to Teaching General Music: Methods, Issues, and Viewpoints*, ed. by Carlos R. Abril and Brent M. Gault (New York: Oxford University Press, 2016), 141–167; or others from the field of Rhythmics after

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who dealt with kinesthesia in detail in the course of his development of a phenomenology and also emphasized a direct connection between the sense of movement and the sense of hearing: "In moving myself, I bring the ear closer in order to hear."[40] Here we see, from another perspective, a reinforcement of the assumption that Jaques-Dalcroze knew and referred to ideas circulating at the time, and sought to use them to explain his empirical observations in music teaching which he integrated into his concept of music education with movement.[41]

Dalcroze like Karin Greenhead and John Habron, "The Touch of Sound: Dalcroze Eurhythmics as a Somatic Practice," in *Journal of Dance and Somatic Practices*, vol. 7/1 (June 2015), 93–112, https://doi.org/10.1386/jdsp.7.1.93_1.

40 "Mich bewegend nähere ich das Ohr um zu hören." Husserliana (Edmund Husserl, *Gesammelte Werke*), vol. IV (= *Ideen zu einer reinen Phänomenologie und phänomenologischen Philosophie* [1913]), 56–here cited by Daniel Schmicking, *Hören und Klang. Empirisch phänomenologische Untersuchungen* (Würzburg: Königshausen & Neumann, 2003), 116 (chapter "Die kinästhetische Organisation des Hörfeldes im Vergleich zum Sehfeld"). See also: Edmund Husserl, *Ding und Raum. Vorlesungen* 1907 (Hamburg: Felix Meiner, 1991), 155–63.

41 For futher information cf. Rainer Bayreuther, "Die Rhythmusbewegung im frühen 20. Jahrhundert und ihre Grundlegung in der empirischen Ästhetik," in *Die Musikforschung*, issue 69, vol. 2 (2016), 143–56; as well as a continuation of this discussion by Rolf Großmann, "Zur Aktualität der Rhythmusbewegung im 21. Jahrhundert. Eine Respondenz," in ibid., 157-60. For a corresponding artistic context, especially concerning correspondences of music and dance, see: Stephanie Schroedter, "Musik als Bewegung. Transformationen musikalischer Energetik in Tanz", in *Energie! Kräftespiele in den Künsten*, ed. Katrin Eggers and Arne Stollberg (Würburg: Königshausen & Neumann, 2021), 369–81, as well as: "Als die Musik im Film das Laufen lernte …–Musikalischer Kinetismus im Umfeld von Gestaltheorie, Kinästhesie und künstlerischem Experiment," in *Laute(r) Bilder. Musik in Manga, Comic & Co. Jahrbuch Musik und Gender*, ed. Melanie Unseld and Akiko Yamada (Hildesheim: Olms, 2024), 147-64.

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This brings me to a concept of kinesthetic listening[42] which I initially tried to develop from the perspective of music and dance studies and ultimately from performance analysis,[43] in order to understand firstly why music (apparently) continues to be naturally associated with movements/dance across time and cultures, and secondly to understand the diverse efforts initiated by choreographers at the beginning of the twentieth century to emancipate themselves from music, efforts which have since increased but ultimately not (yet?) been able to gain widespread acceptance.[44]

In the course of my research into the rhythmics developed by Jaques-Dalcroze, I came across two articles that also focus on a close connection

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42 So far I have come across four concepts of kinesthetic listening, two of which originate in the fields of dance studies/dance pedagogy. Despite the insightfulness of these discussions, the term "listening" is not used to refer to musical/sound issues in a narrower sense in the following contributions to this topic: Gabriele Brandstetter, "'Listening …'–Kinaesthetic Awareness in Contemporary Dance," in *Synaesthesia and Kinaesthetics*, ed. Fingerhut, Flach, and Söffner (see note 5), 51–68; Kimberly L. Oliver and Jim Garrison, "Reflective Writing and Kinesthetic Listening: The Other Half of the Dance," in *Journal of Physical Education, Recreation and Dance*, vol. 67, no. 6 (1996), 37–9. Two other concepts of kinesthetic listening stem from musicology. In their article "Formulating a Revised Taxonomy for Modes of Listening," in *Journal of New Music Research*, vol. 41, no. 2 (2012), 137–52, https://doi.org/10.1080/09298215.2011.614951, Kai Tuuri and Tuomas Eerola build upon David Huron's concept of kinesthetic listening, published on a handout entitled "Listening Styles and Listening Strategies," which was distributed as part of his talk at the Society for Music Theory in Columbus/Ohio 2002, and which was available on the internet for many years. Huron used this term to describe movements that relate solely to rhythm (such as rhythmic tapping; this means a hearing which I would call "kinetic listening"). Tuuri and Eerola subject Hurons draft of "Listening Styles and Listening Strategies" to a fundamental revision, adding significantly expansion and differentiation (see below). In addition, John Toenjes mentions "auditory kinesthesia" in his contribution to this volume with reference to the PhD dissertation of Ryan Ingebritsen (see note 5).

43 See, among others: Stephanie Schroedter, "Neues Hören für ein neues Sehen von Bewegungen […]," in *Bewegungen zwischen Hören und Sehen. Denkbewegungen über Bewegungskünste*, ed. Stephanie Schroedter (Würzburg: Königshausen & Neumann, 2012), 43–110; as well as her, "Musik erleben und verstehen durch Bewegung," in *Musik und Körper. Interdisziplnäre Dialoge zum körperlichen Erleben und Verstehen von Musik*, ed. Lars Oberhaus and Christoph Stange (Bielefeld: transcript, 2017), 221-43.

44 Cf. from a contemporary of Jaques-Dalcroze: Fritz Böhme, *Der Tanzende Mensch. Vom musiklosen Tanz* (Leipzig: Kunstverlag Wilhelm Backhaus, 1921), which here becomes a mouthpiece for a tendency withing expressive dance that was very strongly represented at the time.

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between listening and kinesthesia, which similarly consider his approach to music and movement education to be particularly forward-looking. The Hanover-based music physician and music physiologist Eckart Altenmüller[45] describes the close interweaving of "auditory perception, somatosensory and visual experience and movement structuring" practiced in rhythmics from a neuroscientific perspective as a form of "multisensory-motor integration" which leads to "audiation," that is "the ability to think in sound, i.e. to recognize, remember and manipulate complex musical patterns mentally." Jaques-Dalcroze's "embodied approach"[46] means that the musical experience is also embedded[47], enacted[48], and extended[49]. Altenmüller sums up:

> [...] perception and action are not separated entities somehow encapsulated in autonomous and independent modules. Rather, they are always mutually integrated through a complex network of sensorimotor connectivity, involving anticipatory mechanisms that enable the system to respond adequately to the demands of the environment. [...] [Jaques-]Dalcroze anticipated in theory and practice the neuroscientific findings of multisensory-motor-integration, he based his ear-training on audiation and brain plasticity and he developed the concept of embodiment long

45 This article, entitled "Émile Jaques-Dalcroze as a Visionary of Modern Brain Sciences. His Anticipation of Multisensory-Motor Integration, Audiation and Embodiment" was created as a written version of his keynote address at the *2nd International Conference of Dalcroze Studies: The Movement Connection*, Vienna 26–29 July 2015, and was published in: *Le Rhythme*, ed. Fédération Internationale des Enseignants de Rhythmique (FIER), vol. 2015, 70–81, https://fier.com/documents/le-rythme/.

46 "[M]usical acting is embodied" because "[m]usical acting does not depend solely on brain processes, but results from structures widely distributed across the whole body," ibid., 79. For more detailed information to a 4E cognition approach to music cf. Schyff, Schiavio, and Elliot, eds., *Musical Bodies*, *Musical Minds* (note 3) and my contribution to chapter 3 of this volume, especially the section "Music, Motion, and Cognition."

47 "[M]usical acting is embedded" because "[m]usical acting arises from interactions with the social and physical environment; it is actively immersed in the world," ibid.

48 "[M]usical acting is enacted" because "[m]usical acting is sense-making, understood as an emergent, skilful 'knowing-how' that consists in interactions between the individual and its environment. Through this dynamic interplay, the individual enacts (or brings forth), its own domain of meaning," ibid.

49 "[M]usical acting is extended" because "[m]usical acting can reach beyond the boundaries of skull and skin, integrating resources internal and external to the individual," ibid.

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> before it became a fanciful new paradigm of understanding our being in the world.[50]

Although he attaches great importance to the "kinaesthetic sense" in this context, he unfortunately does not go into it in more detail.[51] The only point he emphasizes is the control function of kinesthesia in order to adapt the (music-making) movements as precisely as possible to the sound ideas–a connection that Jaques-Dalcroze repeatedly points out in the context of his discussions of the "muscular sense." However, Altenmüller does not go so far as to describe an instantaneous feeling of "music as motion," which to me seems the distinguishing element of kinesthetic listening in terms of pointing out its importance not only for music practice/pedagogy, but also for the importance of movement/dance/performance within the field of rhythmics (in the sense of Jaques-Dalcroze), not least for a musically ambitious dance/performance practice/pedagogy.

The neuroscientifically trained psychologist Jay A. Seitz also refers several times to the importance of kinesthesia in his discussion of rhythmics according to Jaques-Dalcroze.[52] Even if he only vaguely suggests physiological connections pertaining to this sense, he still attributes Arnie Cox's "mimetic hypothesis"[53]–a hypothesis that (in short) states that we learn primarily through visible or invisible imitation[54]–to a combination of "kinesthetic, visual,

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50 Ibid., 80.

51 "Here, the kinaesthetic sense, which allows for control and feedback of muscle and tendon tension as well as joint positions that enable continuous monitoring of finger, hand, or lip position in the frames of body and instrument coordinates (e.g., the keyboard, the mouthpiece), is especially important." Ibid., 73.

52 The article appeared with the title "Dalcroze, the Body, Movement and Musicality," in *Psychology of Music*, ed. Society for Education, Music and Psychology Research, vol. 33, no. 4 (2005), 419–35, https://doi.org/10.1177/0305735605056155.

53 "We thus understand and relate expressively to music because of our own previous experiences in making similar sounds and engaging in similar movements as a result of correspondences (largely unconscious) arising among our kinesthetic, visual, and auditory experiences." Seitz, "Dalcroze, the Body, Movement and Musicality" (see note 52), 426. See further: Arnie Cox, "The Mimetic Hypothesis and Embodied Musical Meaning," in *Musicae Scientiae*, vol. 5 (2001), no. 2, 195–212, as well as his monograph which continues this discussion, *Music and Embodied Cognition* (see note 10).

54 See Cox, *Music and Embodied Cognition* (see note 10), 11f.: "By imitation I mean not only the overt behavior of 'monkey see, monkey do' but also covert imitation that occurs only in imagination. These forms of imitation occur whenever we attend to the behavior of others, whether in the performing arts or athletics,

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and auditory experiences." Finally, he also builds a bridge between music and dance[55] based on kinesthesia: "A number of observers have suggested that movement is predominant in all forms of human intellectual activity (e.g. Rudolf Laban), […] that dance as well as many aspects of music originate in a distinct bodily kinesthetic 'intelligence' (e.g. Howard Gardner) […]."[56] Unfortunately, he does not expand on this far-reaching statement; this important remark remains "en passant."

In comparison to these music-physiological and (cognitive) psychological interpretations of Jaques-Dalcroze's conception of rhythmics, which unmistakably revolves around the phenomenon of kinesthesia in relation to a musical performance practice, Kai Tuuri and Tuomas Eerola focus on kinesthesia from the perspective of perception and explicitly speak of "kinaesthetic listening" in the context of "action-sound couplings"—again with an approach grounded in cognitive science, but now based on research into human-technology interactions.[57] Although their "taxonomy" is certainly contestable, as the individual 'taxons' overlap and cannot be clearly distinguished from one another (besides the debatable distinction between a "connotative listening" and a "denotative domain of listening"), it is nevertheless remarkable that they link kinesthetics directly to listening. Tuuri and Eerola basically distinguish between three domains for "modes of listening":

1) *an experiential domain of listening*, which is further divided into three subareas: *reflexive listening* as spontaneous, intuitive listening, *kinesthetic listening* as movement-based listening, *connotative listening* as listening that

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or in learning a particular skill from someone else's demonstration, or in merely taking an interest in what others are doing. When we imitate overtly or covertly, in effect we are responding to two implicit questions: *What's it like to do that*? And its twin question, *What's it like to be that*? We answer these questions in part by overtly and covertly imitating the behaviors of others." Cf. for this topic also my contribution to chapter 3 of this volume, especially the section "Listening to Music with our Sense of Movement—Understanding Music Kinesthetically".

55 He refers specially to rhythmic influences (but unfortunately only very unspecifically): "Ruth St. Denis, Doris Humphrey, Bessie Sch[ö]nberg, and Meredith Monk, among others," ibid., 425.

56 Seitz, "Dalcroze, the Body, Movement and Musicality" (see note 52), 431. Apart from the global reference to Rudolf [von] Laban Seitz refers here to Howard Gardners *Frames of Mind. The Theory of Multiple Intelligences* (New York: Basic Books, 1983, [2]1993).

57 Tuuri and Eerola, "Formulating a Revised Taxonomy for Modes of Listening" (see note 42). I would like to thank Jin Hyun Kim for critical discussions on this topic—far beyond her comments on this taxonomy.

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tends to focus on "action-sound objects," "action-sound intersubjectivity" or "action-sound-habit[s],"

2) *a denotative domain of listening*, in which listening is either more "[sound] source oriented" or "more context oriented," and is accordingly further divided into four modes: *causal listening*, more specifically *empathetic listening* or *functional listening*, more specifically *semantic listening*
3) *a reflective domain of listening*, which either as *reduced listening* tries to refer exclusively to the music (itself) or as *critical listening* consciously takes a position on the listening event, "constantly judging the appropriateness of listening-based interpretations."[58]

For their definition of a "kinaesthetic mode of listening" Tuuri and Eerola start from a "sensorimotor view," which states that "perceptual invariants are action-dependent in a motor-specific way, and thus need to be conceived of as referring to co-occurring regularities in both motor and sensory patterns […]."[59] Against this background they conclude that "sound perception essentially has a certain haptic or kinaesthetic character, and requires sensorimotor skills."[60] They summarize:

> Kinaesthetic action-sound couplings refer to kinaesthetic affordances of a perceptual experience; an imaginative sense of motor-movements on the basis of sound perception. This gestural character of sound perception is arguably based on ideomotoric processes that manifest innate or early developed structures of kinaesthetic schemata concerning bodily movements, coordination and postures.[61] In the light of vitality

58 This "taxonomy" is based on a in-depth examination of previous approaches to distinguishing between different modes of listening (especially those of Pierre Schaeffer's and Michel Chion's contributions to this field). See further: "Revised scheme for listening modes," in Tuuri and Eerola, "Formulating a Revised Taxonomy for Modes of Listening" (see note 42), 147ff.

59 The authors refer to: Matteo Mossio and Dario Taraborelli, "Action-dependent perceptual invariants: From ecological to sensorimotor approaches," in *Consciousness and Cognition*, vol. 17, no 4. (2008), 1324–40. Cf. further for this approach: Ezequiel A. Di Paolo, Thomas Buhrmann, and Xabier E. Barandiaran, *Sensorimotor Life. An Enactive Proposal* (Oxford: Oxford University Press, 2017).

60 Tuuri and Eerola, "Formulating a Revised Taxonomy for Modes of Listening" (see note 42), 146.

61 The authors refer to: Marc Johnson, *The Body in the Mind: The Bodily Basis of Meaning, Imagination, and Reason* (Chicago: University of Chicago Press, 1985) and Maurice Merleau-Ponty, *Phenomenology of Perception* (translated by Colin Smith) (London: Routledge, [1945] 1962).

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> affects,[62] kinaesthetic perception can also be seen as bodily resonated contours (or patterns) of feeling. These dynamic patterns may concern, for instance, sensitivity to the haptic and tactile feelings relating to movement (e.g. tensions and textures), sensitivity to gestural signatures of an interpersonal affect [...], and in general, sensitivity of coping with the physical world. It has been suggested that musical involvement in listening strongly comprises different levels of imitative effort, which relate to the experience of corporeal movement in accord with music.[63] The gestural dimension of sound perception is also discussed in the present author's previous article.[64]

It is immediately apparent, that Tuuri and Eerola do not concentrate exclusively on music produced by conventional instruments and certainly not on a movement practice intended to increase musicality (as with Jaques-Dalcroze), but rather they use their "taxionomy" to search in particular for criteria for the analysis of electronic music and sound design. Rhythmics can certainly benefit from this, as (starting from Jacques-Dalcroze) musical advancement since the second half of the twentieth century—especially in the areas of so-called new music, electro-acoustic and electronic music, as well as the emergence of sound art/sound installations and sound design—has been increasingly included in this field's teaching spectrum. Tuuri and Eerola's final summary of the intentions of their "Taxonomy for Modes of Listening" also explicitly suggests pedagogical fields of application—though they mostly omit dimensions of bodily movements in space which are ultimately the starting point for kinesthetic listening.[65]

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62 In reference to Daniel Stern, *The Interpersonal World of the Infant: A View from Psychoanalysis and Development Psychology* (New York: Basic Books, 1985) as well as Mark Johnson, *The Meaning of the Body: Aesthetics of Human Understanding* (Chicago: University of Chicago Press, 2007). On this topic, cf. also the contributions by Dorothea Weise and myself in this volume.

63 In reference to Marc Leman, *Embodied Music Cognition and Mediation Technology* (see note 12).

64 This is in reference to Tuuri, "Gestural Attributions as Semantics in User Interface Sound Design," in *Gesture in Embodied Communication and Human Computer Interaction*, ed. Stefan Kopp and Ipke Wachsmuth (Berlin and Heidelberg: Springer Verlag, 2012), 257–68.

65 At this point it should be emphasized that Dorothée Legrand and Susanne Ravn discuss in their contribution "Perceiving Subjectivity in Bodily Movement: The Case of Dancers," in *Phenomenology and the Cognitive Sciences*, 8/3, 389–408, "how they [dancers, note St.Sch.] 'listen' to the 'kinaesthetic logic' of the musculoskeletal dimension of the body to perform movement and to use movement to investigate corporeality." It is precisely this perspective that

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> Besides developing the methodology for empirical studies on listening, further work could also extend to the other putative listening dimensions of attention and disposition. We also want to bring forward the idea that, to some degree, the sensorimotor integration and the imaginative nature of experiential meaning-creation provide a basis for cross-modal applicability to the presented taxonomy—beyond the auditory domain of listening. We consider that the taxonomy presented could be applied at least to the sense of touch, as many studies have demonstrated perceptual integrations between the auditory and tactile/haptic domains [...]. It also intuitively seems that, for example, causal, empathetic and functional perceptions could be plausible via the sense of touch.
> Finally, we see that an ultimate practical implication of the taxonomy of listening modes concerns the awareness of our sonic interactions with an environment at the personal level. By understanding the processes of knowing about the world and how meanings become coupled with sounds, we fundamentally understand more about ourselves as a part of our natural and sociocultural environment. From an educational perspective, such understanding would permit a broader repertoire for expressing ourselves either musically or in any other sound-mediated way.[66]

Although this is not the place to expand on Tuuri and Eerola's "ideas" with concrete examples and further discussions, their explanations should nevertheless be emphasized as a stimulating starting point for research into the interweaving of sound and performative movement as a field for rhythmics—to explore perceptual phenomena praxeologically, that is, linking practice and theory to one another in a meaningful way for analysis or reflection.

Research Into the Interweaving of Sound and Performative Movement

While in music and dance ethnology, music and movement analyses have been carried out in close proximity since the middle of the twentieth century in order to analyze different dance practices on the basis of "thick descriptions,"[67] it was only in the 1990s that "choreomusical research," also known as "choreomusical studies" or "choreomusicology" became established, aiming to develop research methods for analyzing the interrelationships between music and dance in

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should also be taken into account in a research perspective that combines music and movement/dance.

66 Tuuri and Eerola, "Formulating a Revised Taxonomy for Modes of Listening" (see note 42), 150.

67 Following up on Clifford Geertz, "*Thick Description: Toward an Interpretive Theory of Culture*," in *The Interpretation of Cultures: Selected Essays* (New York: Basic Books, 1973), 3-30.

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choreographies, be it from a primarily historical or (empirical) analytical perspective, but preferably on the basis of "close readings."[68] The now numerous publications within this field of research focus on the one hand on Western stage productions that were created for commissioned compositions or for pre-existing music (also primarily of Western provenance), and on the other hand on dance practices, particularly in areas of Western influence.[69] Recently, there has been an increasing tendency not to distinguish between ethnochoreomusical and choreomusical studies in order not to emphasize the separation between Western and non-Western music-choreographic phenomena, but instead to focus on overarching connections.[70] Very promising is also the increasingly growing interest of popular music studies and pop musicology in (physical) movements in the context of a performance (both on stage and in the auditorium)—and vice versa: popular dance studies concerning musical phenomena.[71] These studies in particular reveal areas that have so

68 Paul Hodgins provided a significant impetus to this branch of research, which oscillates between music and dance studies, with the publication of his dissertation, entitled: *Relationships Between Score and Choreography in Twentieth-Century Dance: Music, Movement, and Metaphor* (Lewiston, New York: The Edwin Mellen Press, 1992). Further developments were significantly influenced by Stephanie Jordan's publications, especially by the following monographs: *Moving Music. Dialogues with Music in Twentieth-Century Ballet* (London: Dance Books, 2000); *Stravinsky Dances. Re-Visions Across a Century* (Alton/Hampshire: Dance Books, 2007); and *Mark Morris. Musician, Choreographer* (Binsted/Hampshire: Dance Books, 2015). She also fundamentally addressed the methodological challenges of this field of research: Jordan, "Choreomusical Conversations: Facing a Double Challenge," in *Dance Research Journal*, vol. 43, no. 1 (2011), 43–64; and general developments and tendencies of the field: Jordan, "Choreomusicology and Dance Studies—From Beginning to End?," in *The Routledge Companion to Dance Studies*, ed. Helen Thomas and Stacey Prickett (Abingdon/Oxon and New York: Routledge, 2021), 141–56 as well as her contribution to this volume.

69 For examples in this aera cf. the contributions by Anja Arend with Mathias Geuting, Jeremy Coleman, Barbara Dobretsberger, Christoph Flamm, Stephanie Jordan, Adrian Kuhl, Daphne Leong, Amy Ming Wai Tai, Dorothea Weise, and Leila Zickgraf in this volume.

70 See further: Elina Seye and Kendra Stepputat (Guest Editors), "Choreomusicology I. Coporeality and Social Relations" as well as "Choreomusicology II. Translocalities, Local Ontologies," in *The World of Music (New Series). A Journal of the Department of Musicology of the Georg August University Göttingen*, ed. Birgit Abels, vol. 9, issues 1–2 (2020). See further the contribution by Birgit Abels in this volume.

71 See further the contributions by Florian Heesch and Daniel Suer in this volume as well as—in the opposite direction, so to speak—on musical aspects from the

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far been largely excluded from choreomusical analyses, too: spontaneous dance movements (beyond specific forms or styles) to live music events. Ultimately, contemporary dance performances do not only refer to scores that require a reading understanding of music—alongside the increased use of new music since the second half of the twentieth century, up to contemporary commissioned compositions.[72] In addition, in this area—as in theater music in general[73]—music improvisations and sound design has also become widely accepted along with electro-acoustic and electronic music,[74] the analysis of which requires not only media-specific contextualizations but also (at least some) knowledge of programming technology and therefore goes far beyond the previously defined scope of "choreomusical research." And while film, TV and video productions at the interface of music and choreography have already expanded the stage perspective,[75] sound installations that specifically work with movement impulses and choreography completely eliminate the traditional separation between stage and auditorium.[76]

Against this background, it seems advisable to expand the so far established concept of choreomusical research and, with regard to these more recent tendencies, to speak of research into the interweaving of sound and performative movement, in which scholarly debate must no longer be interdisciplinary, that is, changing between individual disciplines, but transdisciplinary, that is, drawing upon different disciplines with regard to the object of investigation (as was outlined above using the example of kinesthetic listening). This field of research would focus on analytical reflection on the various phenomena surrounding music for/into/as motion—and vice versa: motion for/into/as music—both on stage and beyond.[77]

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perspective of popular dance studies: Sherill Dodds and Susan C. Cook, *Bodies of Sound: Studies Across Popular Music and Dance* (Surrey and Burlington: Ashgate Publishing, 2013), among others.

72 For an example see Gerald Siegmund's contribution in this volume.

73 See further, for example: David Roesner, *Theatermusik. Analysen und Gespräche* (Berlin: Theater der Zeit, 2019) as well as this author's contribution in this volume.

74 For an example see Gerko Egert's contribution in this volume

75 For examples see further Sophie Benn's and Leo Dick's contributions in this volume.

76 For an example see Julia Schröder's contribution in this volume.

77 In addition to Fabian Czolbe's contribution to this volume see for further collections of very different approaches to this aera: Wolf-Dieter Ernst, Nora Niethammer, Berenika Szymanski-Düll, and Anno Mungen, eds., *Sound und Performance. Positionen · Methoden ·Analysen* (Würzburg: Königshausen & Neumann, 2015); Sabine Karoß and Stephanie Schroedter, eds., *Klänge in Bewegung.*

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It is precisely this expansion of choreomusical research towards a research into the interweaving of sound and performative movement that the project "Bodies and Sounds in Motion–Between Choreomusical Research and Sound Related Performance Analysis", founded by the German Research Foundation (DFG), instigated, and from which (among other projects and publications) the present anthology has emerged.[78] The results of these investigations move–within the context of music and movement pedagogy/rhythmics–in the direction of a specifically sound-performative artistic research.[79] Questions about the relationships between visible and audible motions remain key: How are music/sounds and (body) movements/dance–beyond established routines–related to one another in artistic creation (including rehearsal processes)? What kinds of models can be identified in this regard and to which aesthetic intentions do they correspond? What consequences do these results

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Spurensuchen in Choreografie und Performance (Bielefeld: transcript, 2017); as well as Patrizia Veroli and Gianfranco Vinay, eds., *Music-Dance, Sound and Motion in Contemporary Discourse* (London and New York: Routledge, 2018).

78 After my appointment as professor of transdisciplinary theories at the interface of music and movement at the University of Music and Performing Arts Vienna, I was able to transfer this project to Austria and continue it there. At this point I would like to thank the German Research Foundation (DFG) very emphatically for their generous support of my research project and for their cooperative agreement to allow me to continue this project in Austria. Another heartfelt thank you goes to the Rectorate at of the University of Music and Performing Arts Vienna (mdw) which financed translations of the German-language contributions into English.

79 For a groundbreaking concept of artistic research cf. Robert Nelson's *Practice as Research in the Arts. Principles, Protocols, Pedagogies, Resistances* (Basingstoke, Hampshire: Palgrave Macmillan, 2013); and more recently Falk Hübner, *Method, Methodology and Research Design in Artistic Research. Between Solid Routes and Emergent Pathways* (London and New York: Routledge, 2024) in addition to a flood of other publications that have appeared on this topic in recent years. Especially for collaborative constellations within this aera cf. Martin Blain and Helen Julia Minors, eds., *Artistic Research in Performance Through Collaboration* (Cham: Palgrave Macmillan as imprint of Springer Nature CH, 2020); and with a focus on choreographic/dance movement issues: Susanne Quinten and Stephanie Schroedter, eds., *Tanzpraxis in der Forschung–Tanz als Forschungspraxis. Choreographie–Improvisation–Exploration* (Bielefeld: transcript, 2016), as well as with very different approaches to practice-oriented music/movement-research the contributions by Ivo Berg, Ulrike Brand, Philip Feeney, Keir GoGwilt with Bobbi Jene Smith, Winnie Huang, Barbara Lüneburg, Hannes Pilgrim with Adrian Artacho Bueno, Leonard Horstmayer and Markus Kupferblum, Simon Rose with Ingo Reulecke, John Toenjes, and Jan Schacher in this volume.

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have for perception, that is, listening and watching motion, as well as for their analysis?

In the course of the research to date, three basic aesthetic models emerge from these questions which dramaturgically refer not least to developments in media technology–from film collages and montage processes to the virtual worlds of modern computer technologies. In general, these models can be described as:

a) *interruptions* or *alienations* between music/sound and movement/dance, causing "V-effects" ("Verfremdungseffekte" after Bertolt Brecht)
b) *breakthroughs* or *estrangements* (as increased alienations) between these two arts, causing "D-effects" (experiences of difference, "Differenzerfahrungen")
c) *interdependencies* with the special case of *interferences*, changing between "EM-effects" (experiences of emergence, "Emergenzerfahrungen"), if not even "IM-effects" (experiences of immersion, "Immersionserfahrungen"), as well as V-effetcs and D-effects[80]

For example, the model of interruptions or alienations took on particularly striking forms in Pina Bausch's early dance theater productions which were obviously influenced by Bertolt Brecht's epic or dialectical theater that used the so-called alienation or distancing effect ("Verfremdungseffekte" or "V-effects"). It is obvious that Bausch dealt intensively with this impactual device, which particularly suited her early dance theater aesthetics,[81] in the course of developing the dance evening *The Seven Deadly Sins* (1976) to music by Kurt Weill. In the immediately following "play" *Bluebeard: While Listening to a Tape Recording of Béla Bartók's Opera "Duke Bluebeard's Castle"* (1977), the original music was intensely "alienated" by being stopped and repeated again and again; ultimately (as an analogy to the "drama" of the piece) it is literally

80 In my further development of Bertolt Brecht's concept of alienation effects I would like to retain the term "effects" in order to emphasize their derivation from V-effects. In principle, however, it makes more sense to speak of experiences rather than effects in order to, on the one hand, exclude any associations with mechanistically conceived effect models and, on the other hand, emphasize the perspective of perception.

81 Even in their early choreographic opera productions, the so-called dance operas, an alienating approach to the scores is noticeable. For example, in Christoph Willibald Glucks *Iphigenie auf Tauris* (1974) and *Orpheus und Eurydike* (1975), the dance melodies are choreographed remarkably sparingly (if they have not been deleted at all) in order to strongly highlight the arias through dance.

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"fragmented."[82] Against this background, Bausch arrived at a collage technique (on a dance and musical level) that would remain decisive for her further productions. The resulting and often striking re-contextualization or new connotation of music pieces became a "trademark" of her "Tanztheater" and as such not only contributed significantly to her international breakthrough, but also profoundly changed the use of music in dance theater since the late 1970s.[83] However, with the advent of digital music editing programs, which Pina Bausch accepted openly in order to make the musical spectrum of her productions even more diverse, these collages changed into sophisticated montage processes in which the transitions between the decidedly very divergent music pieces are increasingly concealed. The originally intended clear breaks between selected pieces of music and their new contextualization through the choreography, which was often perceived as a provocation, was largely leveled out in these montages. In this way, music and dance (regardless of their artistic independence, which still had to be preserved) come closer together again in Pina Bausch's later pieces—right down to a fusion of music and dance with "EM-effects," if not "IM-effects," which are particularly inserted

82 See further: Petra Maria Meyer, "Der audio-visuelle Raum. Pina Bauschs Choreographie *Blaubart—Beim Anhören einer Tonband-Aufnahme von Béla Bartóks Oper 'Herzog Blaubarts Burg,'*" in *Die Kunst und der Raum—Räume für die Kunst? Raumerkundungen und Raumentwürfe in künstlerischen, kunsttheoretischen, medialen und pädagogischen Feldern*, ed. Sabine Autsch and Sara Hörnak (Bielefeld: transcript, 2010), 29-52.

83 In analogy to the (German) concept of "music theater" ("Musiktheater") the term "dance theater" should (in a broader sense) refer not only to productions that are based on Pina Bausch's aesthetics (which is just a special form of "Tanztheater"), but in general to plays in which the dramaturgy and drama (narratives in the widest sense) are largely conveyed through dance/choreography.

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in centrally positioned solos.[84] They form, so to speak, a diametrically opposite pole to the alienation effects ("V-effects") of her early pieces.

The model of breakthroughs or estrangements of music and movement/dance represents an intensification of the alienation model and was unmistakably created in the spirit of postmodern aesthetics which champions experiences of difference ("D-effects").[85] In contrast, in the model of mutual dependencies (interdependencies) between music and dance, there are permanent exchange processes. The currently most prominent representative of this approach is Anne Teresa de Keersmaeker,[86] who already worked with choreographic interference in her early pieces with music by Steve Reich. In doing so, she created dance movements that "interfere" with the movements of one or more bodies as well as with (the motion of) the music.[87] Under this condition, audible or visible motions become intertwined, which in turn leads to emergence effects ("EM-effects"): new artistic figures/events arise that are more than the sum of their individual components (in this case music/sound

84 While the music collages of the early pieces were primarily constructed by the "classically" trained but ultimately comprehensive and cross-stylistic musician Mathias Burkhard (who worked for Tanztheater Wuppertal beginning in 1979), the music montages were mainly made by the sound engineer Andreas Eisenschneider (he joined Tanztheater Wuppertal in 1995). These montages can at least partly be considered independent compositions based on pre-existing musical works. For more informative see: https://www.pinabausch.org/de/person/matthias_burkert as well as https://www.pina-bausch.de/de/person/10/andreas-eisenschneider, accessed 5 September 2023. For general information on this topic, see: Gabriele Klein, *Pina Bausch's Dance Theater: Company, Artistic Practices and Reception* (Bielefeld: transcript, 2020) (German first edition: *Pina Bausch und das Tanztheater: Die Kunst des Übersetzens*, Bielefeld: transcript, 2019).

85 See for example the installation performance series *Eadweard's Ear–Muybridge extended. Environment für Tänzer, Musiker und Interface* (in four editions, which were performed between February 2017 and Oktober 2018): Penelope Wehrli and Vera Pechel, eds., *Eadweard's Ear–Muybridge extended. Envirnoment für Tänzer, Musiker und Interface. Gespräche, Überlegungen, Notizen* (Basel and Berlin: Edition Achsensprung, 2022); Stephanie Schroedter, "Permanent Negotiations of Translation Processes–Interactions and Correspondences between Music/Sound and Dance/Movement," in *Music, Dance and Translation: Intersectional Practice in Music-Dance Works*, ed. Helen Julia Minors (London: Bloomsbury, 2024), 49–62.

86 See further Daphne Leong's contribution in this volume.

87 For more information, see: Stephanie Schroedter, "Audio-visuellen Bewegungen auf der Spur. Zum Konzept eines klangperformativen Spurenlegens und Spurenlesens," in *Klänge in Bewegung. Spurensuchen in Choreografie und Performance*, ed. Karoß and Schroedter (see note 77), 25-44.

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and movement/dance). On the level of perception, this can create experiences of immersion as well as difference, that is, one can be absorbed by these artistic creations just as they can be highly offputting. Likewise, in the case of interferences in which music/sound and movement/dance overlap each other synchronously and then move away from each other again, there can be a permanent oscillation between these two modes of perception–an challenging alternation between experiences of immersion ("IM-effects") and difference ("D-effects").[88]

Starting from such considerations, which also take into account intendent effects and possible perceptions, a key concern of the present publication is to take an analytical approach to the diverse interweavings of music/sounds and artistically designed movements/dance (of human and non-human bodies[89]). A decidedly broad spectrum of productions across genres and styles has been assembled–including genres that transcend stage boundaries such as installations or film, TV and video productions. First, case studies after the historical avant-garde of the early twentieth century to contemporary practices are discussed in detail (Chapter 1). Then, specifically artistic and praxeological research approaches are presented (Chapter 2). Finally, (and still including concrete examples), research methods and theories are developed, spanning the spectrum from choreomusical research to cross-cultural, performance analyzes focussing interweaving of sound and performative movement that also incorporate current media technologies (Chapter 3).

88 A further example of this is Elisabeth Schilling's choreography to the eighteen Piano Etudes of György Ligeti (composed between 1985 and 2001), premiered in 2020 with the title *Hear. Eyes. Moves*. On the basis of these compositions, Schilling developed a choreographic concept that, on the one hand, reflects the polyrhythmic structures of music in dance and, on the other hand, draws upon synesthetic associations to create dance movements (for further insights into this choreography, see my contribution to chapter 3 of this volume). Continuing on this project, she worked with students of music and movement pedagogy/rhythmics at the University of Music and Performing Arts Vienna to develop the first etude from the first book ("Désordre"), into a choreography which was performed as part of my inaugural lecture there in Oktober 2022.

89 See further the contribution by Rainer Nonnenmann in this volume.

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If, as Jin Hyun Kim suggests,[90] we were to understand as "musical" all those phenomena which are based on dynamic, moving forms of vitality (with reference to Daniel Stern)[91] then dance (even without music) would be a fundamentally musical phenomenon.[92] For just as we can experience music "as" motion, we can perceive motion "as" music. A basis for this is the kinesthetic listening that Émile Jaques-Dalcroze attempted to train in the context of his concept of rhythmics as a pedagogical-didactic "method" "for life and art" (see above).

The task of contemporary music and movement pedagogy/rhythmics could be to develop an artistic research combined with a cross-generational and inclusive mediating practice at the interface of music and motion, which also theoretically reflects dimensions of our existential, yet far too little noticed, sense of movement, alias kinesthesia, as a key to comprehensive musical experiences. A challenge for this approach would be to understand kinesthesia as a basis for lifelong learning "with and through movement" (according Sheets-Johnstone) "to and through music" ("pour et par la musique" according Jacques-Dalcroze),[93] whereby music (in the sense of "musical practices" according to Kim) encompasses all phenomena that are based on dynamic, moving forms of vitality as such performative movements or dance (in the broadest sense).

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90 Jin Hyun Kim, "Musicality of Coordinated Non-Representational Forms of Vitality," in *Journal of Comparative Literature and Aesthetics*, *Special Issue–Contemplating Music Across Cultures and Contexts: Philosophical Perspectives*, vol. 46, no. 1 (2023), 59–69, open access: https://jcla.in/wp-content/uploads/2023/03/JCLA-46.1_Spring-2023_Jin-Hyun-Kim.pdf. See further the contributions by Jin Hyun Kim with Marta Rizzoneli and myself in this volume.

91 Daniel Stern, *Forms of Vitality. Exploring Dynamic Experience in Psychology, the Arts, Psychotherapy, and Development* (Oxford and New York: Oxford University Press, 2010). For this topic cf. also note 62.

92 Analogous to this, it could also be formulated that music (even without the implementation of dance) can be understood as a fundamentally dance-related phenomenon. This analogy can also be applied to the relationship between composition and choreography. For example, compositions can be designed choreographically (as is clearly demonstrated by sound art) as well as choreographies can be based on decidedly (music) compositional processes, as seen in the work of dancer/choreographer Jonathan Burrows together with the the musician/composer Matteo Fargion (see: https://www.burrowsfargion.com with recordings under: https://vimeo.com/showcase/burrowsfargion, accessed 5 September 2023).

93 See further: Marie-Laure Bachmann, *La rythmique Jaques-Dalcroze. Une éducation pour la musique et par la musique* (Genf: La Baconnière, 1984).

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