

The Body and the Mind in Piano Teaching: Bodily Perception and Mental Representation through Embodied Metaphor

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Abstract: Piano teaching has long relied on metaphorical language such as “like a feather settling gently” or “hang the weight of the arm on your fingertips” to guide students. Traditional views of piano pedagogy have treated such expressions as unverifiable impressionistic talk. This article draws on embodied cognition and conceptual metaphor theory to reconsider the cognitive work that such language does in piano teaching. It argues that embodied metaphor is not decorative rhetoric that could be dispensed with, but the intermediate link that ties the performer’s bodily sensations to mental representation. The discussion first reviews the embodied turn in cognition and the bodily roots of musical meaning, showing how the “musical motion” described by Johnson and Larson, and the “musical forces” that Larson proposes, including melodic gravity, magnetism and inertia, derive from the body’s experience of force and movement^[1]. It then treats, in turn, the dimensions of bodily perception in piano teaching that center on touch, proprioception, weight and gesture, and the dimensions of mental representation that center on auditory imagery, motor imagery, motor anticipation and affective imagery. On this basis, it puts forward a “perception–metaphor–representation” coupling model, showing that embodied metaphor, through two-way translation, encodes inarticulate bodily experience as stable mental representation and projects that representation back onto bodily movement. The article offers an integrative theoretical framework for understanding the coupling of body and mind in piano teaching, and gives grounds for turning metaphor from a tacit habit of practice into a teaching tool that can be used deliberately.

Keywords: Embodied metaphor; Piano teaching; Bodily perception; Mental representation; Conceptual metaphor; Musical forces

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1. Introduction

In the piano lesson, what the teacher says rarely points directly at finger position or dynamics. It works instead through images: asking the student to sing the sound out, to imagine a phrase as a balloon inflated

in a single breath, to hear a crescendo as a tide rolling in layer upon layer, or to play a staccato as though a small bird had alighted on the fingertip and taken flight in an instant. Research has shown that speech occupies a large share of instrumental teaching, and that metaphor is used with great frequency. On one side, experienced piano teachers commonly reach for metaphor. On the other, it is dismissed as unverifiable impressionistic talk and excluded from the technical work and aural training that can supposedly be taught and practiced. Schippers argues that metaphor should not be waved away as impressionistic talk, and observes that in the formal training of professional musicians, teaching strategies concerning metaphor are seldom made explicit ^[2].

The reason lies in an underlying dualism of body and mind. On this view, the body merely carries out the brain's instructions. Piano playing is split into technique and music, technique being the mechanical training of the fingers and music being the aesthetic judgment of the ear, while bodily sensation itself counts neither as a source of knowledge nor as an object of teaching. Because metaphor is at once a technical instruction and an aural description, it falls naturally into the grey zone of what can be grasped but not stated. The question is whether metaphor really is no more than airy rhetoric. If so, why does it persist so stubbornly across different regions, instruments and traditions, and why does it keep working?

The embodied turn in cognition, which has gained ground over the past three decades, offers a fresh way of answering this. Embodied cognition holds that human concepts and thought are not abstract symbol manipulation carried on apart from the body, but are rooted deeply in the body's sensorimotor experience. On this account, metaphor in piano teaching ceases to be optional ornament and becomes an indispensable thread between bodily experience and musical understanding. Working within embodied cognition and conceptual metaphor theory, this article restores the standing of metaphorical language in piano teaching and advances one central claim: embodied metaphor is the mediating mechanism that connects the pianist's bodily perception with mental representation. Taking this claim as its support, the article proceeds through three parts: the theoretical basis of embodied metaphor, the two dimensions of bodily perception and mental representation in piano teaching, and a model of the mechanism by which metaphor couples them, before drawing out teaching strategies.

2. Theoretical basis: From embodied cognition to embodied metaphor

2.1. The embodied turn and music cognition

The basic claim of embodied cognition is that cognition belongs within the interaction of body and environment. It rejects any account of mind as symbol processing unconnected to the body, and it takes the deep links among perception, action, and concept seriously. In music, this turn gave rise to the study of embodied music cognition. In their review of the body in music education, Bremmer and Nijs argue that the bodies of students and teachers play a pivotal role in the learning and teaching of music. They take synchronization, co-ordination and prediction as the key concepts for understanding how the body takes part in musical learning, noting that the bodies of listeners and performers synchronize spontaneously with the rhythm of the music. These mechanisms show that musical meaning is not received through the ear but generated through bodily participation.

The deeper import of this turn is that it questions the dualism of body and mind that has persisted since Descartes. Within the dualist frame, mind and body are separate, and the body becomes a machine driven by the mind. In piano teaching, this shows itself in the severing of understanding music from being able to

play, the former assigned to the intellect and the latter to the mechanics of the fingers, with the connection between them either vaguely credited to talent or simply left to more practice. Embodied cognition holds that understanding and performing are two aspects of one process. Much of a performer's understanding of the music is formed gradually through the body's exploration of the keyboard, through the arm's sense of weight, and through the repeated pairing of movement and sound. The body is neither an obstacle to understanding nor an instrument of it, but the place where understanding occurs. This position lays the ground for reassessing the standing of metaphor, because if understanding is itself embodied, then metaphor, which draws on bodily experience, cannot be a mere appendage to understanding but reaches deep into understanding itself.

Embodied cognition meets metaphor research in conceptual metaphor theory. Its main claim is that metaphor is a basic structure of human thought as well as a figure of speech: people habitually make sense of abstract domains that resist direct grasp by way of concrete things that can be experienced directly. Music is a case in point, being highly abstract. Pitch has no high or low, melody has no rise or fall, and sound does not travel through space.

3. The dimension of bodily perception in piano pedagogy

The previous section established the general principle that musical meaning arises from the body. This section examines how, in the teaching of the piano in particular, bodily perception takes part. Piano playing calls for fine motor control and tactile feedback, and the performer's bodily perception involves at least three connected aspects: touch and proprioception, action–sound coupling, and tacit knowledge.

3.1. Touch, proprioception and weight: The bodily basis of key contact

The piano sounds through the action of the fingers, arms and even the torso on the keys, so touch, the reaction force of the key against the fingertip, and proprioception, the inner sense of limb position, tension and movement, become the performer's most basic perceptual routes. The frequent talk in piano teaching of “weight”, “support” and “release” is at bottom a way of cultivating the student's inner perception. “Let the weight of the arm sink to the bottom of the key” refers to the performer's awareness of how gravity travels through relaxed joints to the fingertip. “The shoulder hangs the arm like a coat-hanger” refers to a proprioceptive sense of support and suspension. It is worth noting that all these instructions take a metaphorical form, because proprioception is a private experience that is hard to describe directly in objective, third-person language. A teacher cannot copy their own fingertip sensation straight into the student, and can only call up the student's inner perception through shared bodily experience such as weight, hanging and sinking. This already suggests that metaphor is indispensable in the teaching of perception ^[3].

Bremmer and Nijs regard touch as an important embodied teaching strategy, in which the teacher guides the student's movement and posture directly through the body, for instance by lightly supporting the wrist to convey a sense of release, or by pressing on the shoulder and back so the student feels support. Because bodily perception cannot be reached through words alone, it has to be conveyed through direct body-to-body demonstration.

3.2. Action–sound coupling: Gesture as a unit of meaning

Movement and sound are not two independent parts but two aspects of a whole that bear on each other. The

breathing of a phrase goes with the rise and fall of the arm, a crescendo is bound up with the shifting weight of the body, and a cadence shows the closing of movement. In *Musical Gestures*, edited by Godøy and Leman, the authors argue on theoretical grounds for the importance of gesture as the meeting point of sound, movement and meaning: gesture is the physical action that produces sound and the expressive unit that carries musical meaning.^[4] In his studies of Mozart, Beethoven and Schubert, Hatten treats musical gesture as a basic category of interpretation, holding that the performer turns the notes on the page into living music through a gestural manner of playing^[5].

The coupling also has a plain external side. Davidson argues that earlier research on music perception attended only to sound and overlooked the part played by watching the performer's bodily movement, whereas an audience can in fact read the manner and intention of a performance from the performer's movement alone. Bodily movement in piano playing is therefore a way of producing sound and, at the same time, a form of expressive communication in its own right. The implication for piano teaching runs deep. When the teacher shapes the student's movement and posture, such as the circling of the arm, the breathing of the body, or the preparatory motion before touching a key, this is not a technical refinement but a direct carving of musical meaning. The link between the unseen musical intention and the visible bodily posture is usually made through metaphor, as when a conductor traces a long arc, or a phrase falls away like a sigh.

3.3. Tacit knowledge: Perception hard to put into words

The two aspects above show that bodily perception in piano teaching is strongly tacit. It is knowledge that the performer has lived through, yet can hardly state accurately in propositional form. The "just-right depth" of a key contact, or the "released but not collapsed" tension of relaxation, cannot be reduced to a set of mechanical parameters to be applied by rote. This is why purely technical instruction fails again and again in the teaching of perception, since telling a student to press with the third joint of the finger does not summon the matching bodily sensation. Another route passes on tacit knowledge. It has to draw on bodily experience shared by teacher and student, turning a private inner sensation into experience that the other's body can re-enact. Metaphor is the means by which this conversion is carried out. The examination of bodily perception thus points naturally to the mediating role of metaphor, a role that can be understood in full only in relation to mental representation.

4. The dimension of mental representation in piano pedagogy

Bodily perception and mental representation support one another, the latter being the reflection of the performer's inner mental activity. Mental representation is the inner schema of sound, movement and affective meaning that the performer forms in the mind. Because piano playing is highly automatic and anticipatory, mental representation becomes the underlying determinant of how well a performance goes. This section proceeds through three aspects: the dual coding of auditory and motor representation, the way representation anticipates performing movement in advance, and the affective dimension of representation.

4.1. The dual coding of auditory and motor representation

Before going further, the actual sense of mental representation in piano playing needs to be made clear. It is not the mechanical memorizing of the score, nor abstract knowledge of some correct answer, but a multimodal, executable mental model. The performer can hear in advance, in the mind, the timbre and

inflection about to be played, can feel the movement the fingers are about to make, and holds a clear grasp of the relation between the two. Because there is such an inner model, one that can be activated before playing and drawn on during it, rapid and complex piano playing does not turn into a passive reaction to the score but becomes active expression led by inner expectation.

A skilled performer can, without actually touching a key, hear the sound of the piece and feel the movement of the fingers in the mind. This is auditory imagery and motor imagery. In their study of auditory and motor mental practice in memorized piano performance, Highben and Palmer found that inner auditory and motor imagery both take part in the memory and control of performance, and that performers differ individually in how far they rely on each ^[6]. Brown and Palmer argue that skilled performers such as athletes and musicians can improve their performance by imagining the movements or sensory outcomes tied to a skill, and that differences in a performer's capacity for auditory and motor imagery affect the outcome of sensorimotor learning. Mental representation is therefore not a single inner recording but a compound structure in which auditory and motor coding cue each other, so that thinking of a sound prompts the matching motor preparation, and making a movement prompts the matching expectation of sound ^[7].

4.2. How mental representation anticipates performing movement

An important function of mental representation is to prepare the movement about to be made. Bernardi and colleagues argue that mental practice lets the performer rehearse forthcoming movements in advance, giving motor preparation for performance and improving its fluency and accuracy^[8]. This accords with the mechanism of prediction in embodied music cognition mentioned earlier, in which body and mind, working from existing representation, keep predicting how sound and movement will unfold. For piano playing, representation-driven expectation matters greatly. A fast passage sounds even and connected because, before the movements occur, the performer's mental representation has already laid down the whole track of the movement. The classroom insistence on singing and hearing well in the mind before playing amounts, at the cognitive level, to activating a stable mental representation first and then using it to guide bodily movement.

4.3. The affective dimension of representation: imagery and expressivity

Mental representation bears on affect as well as on sound and movement. In his study of the acquisition of performance skill, Woody notes that many teachers use imagery and metaphor to direct the student's attention to the affective qualities of the music^[9]. The kinetic character of music, carried by images such as "flowing" or "leaping", is taken to be the link between the music played and the affect felt, and among accomplished performers there exists a shared but fairly limited affective vocabulary. This finding shows that affective representation usually reaches performance by way of a kinetic image. The performer does not play sadness directly, but first represents sadness as a heavy, slowly falling kinetic image, and lets that image guide bodily movement.

Laukka's study of instrumental teachers' views on expressivity at music conservatoires bears this out. Teachers place great weight on the teaching of expressivity and generally use various images, metaphors and affective descriptions to guide the student's playing ^[10]. This again shows that in high-level piano teaching, affect, imagery and metaphor are the principal means of shaping mental representation and thereby shaping performance, and are far from trivial ornament. The question now stands out plainly: through what mechanism do the two dimensions of bodily perception and mental representation connect and convert into each other? The answer offered here is embodied metaphor.

5. Embodied metaphor: the mediating mechanism linking bodily perception and mental representation

The two preceding sections described bodily perception and mental representation in piano teaching. If the two are kept apart, teaching collapses into the one-sided training of fingers or the vague demand for feeling. This article holds that genuinely effective piano teaching occurs precisely where the two are coupled, and that the mediator realizing this coupling is embodied metaphor. This section puts forward the “perception–metaphor–representation” coupling model and takes up in turn its function of two-way translation, its grounding in bodily experience, and the situations in which it fails in practice.

5.1. The “perception–metaphor–representation” coupling model

Embodied metaphor sits between bodily perception and mental representation as the pivot of their mutual conversion, and it lets teaching form a loop that can cycle and iterate. Its working can be described as a circuit. A bodily perception, such as the sinking sense of the arm’s weight when a key is struck, is encoded through an embodied metaphor, “like a stone sinking into water”, into a stable mental representation, a sound–movement schema of “sinking”. That representation, guided once more by metaphor, “let the next phrase sink in the same way”, is projected back onto a concrete adjustment of movement. The adjusted movement yields fresh bodily perception and aural feedback, which re-enter the loop, and so on, drawing gradually nearer the ideal performance. Metaphor is not a fixed label but a dynamic device that keeps perception and representation calibrated against each other. It can take on this role because its source domain rests on the ground of bodily experience: weight, sinking, hanging and flowing can all be perceived by the body and represented in the mind, so metaphor is built on the same bodily ground and joins perception to representation.

A teaching scene makes the model concrete. A student plays the singing phrase of a nocturne flatly and stiffly. If the teacher only says “play it more legato, with more feeling”, the instruction hangs in the air, touching neither the body nor its representation. On this model, the teacher proceeds differently. First, the student is asked to attend to the striking quality between finger and key, which is bodily perception. Then a metaphor is offered, “let this phrase be sung by a singer carrying the melody on one long breath”, which is the embodied metaphor. The source domain of “singing” and “long breath” calls up the student’s bodily experience of continuous breathing and the even flow of force, forming in the mind a sound–movement representation of “connected singing”, which is the mental representation. The teacher then guides the student to adjust the movement, with the wrist leading laterally, force passing between the fingers, and a slight rise and fall at the breathing points of the phrase, which is the adjustment of movement. The fresh sound and feel then return as feedback, on which teacher and student make further small adjustments. A single short phrase can complete one turn of the perception–metaphor–representation loop. Metaphor is not an appraisal that vanishes once the phrase is finished. It runs through the whole process of calibration and is used again and again.

5.2. The two-way translation function of metaphor

The crux of the model lies in the two-way translation that metaphor performs. The first direction runs from body to representation. Faced with a tacit bodily sensation that resists words, the teacher encodes that sensation into a mental representation the student can understand and remember. When a teacher says to play a note “like a feather landing”, a complex bodily experience of dynamics, key speed and timbre

is compressed into an image that the student can call up from everyday experience, so that a perception that could not be stated directly is represented, stored and reproduced. The second direction runs from representation to body. When the student has already formed some musical image or affective representation, metaphor turns that inner representation into executable movement. A student who wants a “sighing descent” gives the representation body through the experience carried by a sigh, the breath let out and the release of force, which becomes the falling of the arm and the easing of dynamics. This two-way character is what sets metaphor apart from a bare technical instruction or a bare aural description. A technical instruction acts on the body without touching representation, an aural description depicts sound without guiding movement, and only embodied metaphor links perception and representation, body and mind, at once.

5.3. The grounding in bodily experience

Embodied metaphor can serve as the central mediator, in a way that no arbitrary comparison could replace, because its source domain rests on shared bodily experience. Take Larson’s theory of musical forces. People can generally feel the downward gravity of a melody or the inertia of its motion because gravity, attraction and inertia are lived bodily experiences that everyone shares in the physical world. The most effective and most direct metaphors in piano teaching come almost entirely from bodily source domains, namely movement (rising, running, flying), force (pushing, pulling, sinking, holding), space (high and low, near and far, opening and closing) and weight (light, heavy, suspended, dropping). These source domains work because they are at once perceptible and representable: the student can feel “sinking” through the body and can also form a representation of “sinking” in the mind. Where a metaphor’s source domain departs from shared bodily experience, its mediating function weakens. This shows too that abstract, obscure comparisons rarely work in teaching, while plain bodily images turn out to be effective tools, because the pedagogical power of a metaphor lies in its closeness to bodily experience.

To make this clearer, the metaphors common in piano teaching can be grouped by their bodily source domain. From the domain of weight come “sink the weight to the bottom of the key”, “the arm feels filled with lead”, and “light as a feather”. From the domain of movement come “the phrase runs forward”, “the melody climbs layer by layer”, and “the notes flow like water”. From the domain of force come “push this note out”, “as if held back by a force”, and “suspended in tension”. From the domain of space come “place the sound far away”, “give the top note an open space”, and “draw the two voices apart”. These varied classroom phrases return, without exception, to the body’s basic experience of weight, movement, force and space in the physical world, and they chime with Larson’s musical forces and with the musical motion described by Johnson and Larson. From the side of teaching practice, this shows that embodied metaphor is the interface between bodily experience and musical meaning.

5.4. Pitfalls in metaphorical mediation

To grant embodied metaphor a mediating role is not to hold metaphor omnipotent. This mechanism fails in several situations that teachers should watch for. The first is a source domain that is not shared. Through cross-cultural teaching cases, Schippers shows that metaphor is rooted deeply in the bodily and lived experience of a particular culture. An image that is vivid and effective in one culture may fail with a student who lacks the matching experience. The teacher therefore needs to choose the source domain according to the student’s daily experience, rather than applying it by rote. The second is the blurring of metaphor.

Schippers observes that although metaphor is used often in teaching, its strategy is seldom made explicit. When a metaphor stays at the level of a vague exclamation, “play it more beautifully”, and is not tied to concrete bodily movement, it becomes empty talk that cannot be carried out, which is why metaphor has been criticized in traditional teaching. The third is over-reliance on a single image at the expense of the dual auditory and motor structure of representation itself, so that the metaphor stirs only a vague mood and does not convert into a concrete adjustment of movement. For metaphor to mediate, then, it must be designed deliberately, rooted in a bodily source domain the student shares and anchored clearly to movement and sound that can be perceived and executed.

6. Piano teaching strategies based on embodied metaphor

Following the perception–metaphor–representation coupling model, this section tries to turn the theory above into workable teaching strategies. Their common aim is to raise metaphor from a tacit habit of practice into a teaching tool that the teacher can use deliberately and design consciously.

6.1. Metaphorical key-contact training: guiding perception through bodily source domains

For strongly tacit perceptions that resist words, such as key contact, weight and release, the teacher should choose metaphors rooted in bodily experience to awaken the student’s inner sensation, rather than giving only abstract mechanical requirements. “Pour the weight of the arm into the fingertip like water” can guide the transfer of weight, “the finger steps on soft ground” can guide a contact that is deep without being hard, and “the shoulder holds the arm like a coat-hanger” can guide the balance of support and release. The key is that the chosen source domain should fall within the student’s existing bodily experience, and each metaphor should correspond to a sensation the body can re-enact. “Sinking”, “holding” and “flowing” cannot remain adjectives but should become movements the body can repeat. Where necessary, the teacher can also use the touch strategy proposed by Bremmer and Nijs, demonstrating the bodily sensation a metaphor describes through direct hand-to-hand contact.

6.2. Representation–movement translation exercises: mental practice and image guidance

For the cultivation of mental representation, the teacher can design representation–movement translation exercises drawing on the principles of dual auditory and motor coding and of motor anticipation. On the one hand, before touching a key, the student first sings and hears the phrase in the mind and rehearses the finger movement, so as to prompt stable auditory and motor representation, and then uses this perception to drive the actual playing, which is the effect of mental practice on motor anticipation. On the other hand, the student is asked first to represent an emotion or musical image, such as a sigh, a question or a departure, as a kinetic image, and then to use metaphor to turn that kinetic image into concrete choices of dynamics, speed and timbre. The exercise is therefore not the simple repetition of finger movements but a process in which perception and representation are translated and calibrated against each other through metaphor, running continually in the student’s own practice.

6.3. Bodily modelling and gestural demonstration

Teachers should attend to demonstration at the bodily level. Bremmer and Nijs treat bodily demonstration

as a core embodied teaching strategy, holding that teacher or peer demonstration invites the student's imitation and so achieves synchronized co-ordination with the beat and expressive elements of the music. Following Davidson's view that bodily movement can be perceived directly as a mode of expression, and drawing on Hatten, Godøy and Leman on gesture as a unit of meaning, the teacher can trace the breathing and direction of a phrase with a gesture, and can demonstrate crescendo and diminuendo through the rise and fall of the body, so that the student imitates the musical gesture on the basis of seeing it and forms a mental representation in the imitation. Gestural demonstration works because it turns an abstract musical intention directly into visible, imitable bodily movement. Teacher gesture and verbal metaphor appear together. As the teacher's hands trace the long arc of a phrase in the air, the teacher explains in words the feeling of "letting out the string of a kite little by little", so that the visible movement and the verbal image answer to each other, and the student more readily builds the matching movement-sound representation in the body.

The teacher can also use bodily demonstration to diagnose the student's problems. Since a mode of expression can be perceived directly, the teacher can read a poverty or tension of mental representation from the student's stiff shoulder, tight wrist or breathless torso, and give targeted metaphorical guidance accordingly. The body thus becomes a screen in teaching that can be read both ways: it displays the student's current state of representation and receives the teacher's intended meaning. This again bears out the basic view of this article, that bodily perception, embodied metaphor and mental representation form one whole in effective piano teaching.

7. Conclusion

Working from embodied cognition and conceptual metaphor theory, this article has offered a new understanding of the metaphorical language in piano teaching that seems airy yet proves indispensable. Its main claim is that embodied metaphor is not impressionistic ornament but the mediator between the performer's bodily perception and mental representation. From this claim the article sets out the bodily sources of musical meaning, describes the dimensions of bodily perception in piano teaching that draw on touch, proprioception, weight and gesture, and the dimensions of mental representation that draw on auditory imagery, motor imagery, motor anticipation and affective imagery, and puts forward the perception-metaphor-representation coupling model. It showed that embodied metaphor, through two-way translation, encodes tacit bodily experience as stable mental representation and projects that representation back onto adjustments of bodily movement, letting teaching form a loop that can iterate. On this basis, it derived teaching strategies, including metaphorical key-contact training, representation-movement translation exercises, bodily modeling and gestural demonstration.

The value of this framework is that it breaks through the technique-ear dualism of traditional piano teaching and re-establishes the body, from a passive tool of execution, as the ground of musical understanding and teaching. It also gives theoretical support for turning metaphor from a tacit habit of practice into a teaching means that the teacher can design and use deliberately. As a piece of theoretical construction, the article has not been tested empirically, so whether the perception-metaphor-representation model and its teaching strategies hold in practice awaits later empirical study for testing and revision. What is certain is that only by facing the cognitive place of the body in piano playing, and the mediating role of metaphor between perception and representation, can piano teaching truly break down the wall between body and mind, letting the student understand music through bodily experience and settle the body within the understanding of music.

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