

# Music and Its Resonating Body<sup>\*</sup>

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Traditionally, music analysis has been score-oriented and “disembodied” in the sense that the analysts have tended to regard themselves as external observers of musical structures inherent in the score. In recent years, however, one has seen many attempts to broaden the scope of music analysis, so as to include both the analysts’ own involvement and aspects of musical meaning which cannot be accounted for in the score. This article focuses on one essential source of musical meaning which has traditionally been excluded from analysis: our musical body. More precisely, the article seeks to show how both sounding music and score are understood in terms of our own embodiment, and how musical analysis can benefit from the inclusion of this aspect of meaning. What, then, do I mean by “our musical body”? This is a body which transcends Cartesian duality, as it includes both auditory, visual, emotional, kinesthetic, linguistic, and other modes of cognition.<sup>1</sup>

In an attempt to throw light upon the workings of the musical body I will discuss the notion of metaphorical projection as it is understood within cognitive semantics, a discipline which studies the cognitive processes underlying our experiences of meaning. Since Aristotle, metaphor has been regarded as a linguistic phenomenon where an entity from one semantic field is transferred to another semantic field (cf. the etymology of the term “metaphor”: carrying-over). Cognitive metaphor theory regards metaphor not as a matter of language alone but as a basic cognitive principle where the transfers occur between conceptual domains; thus, the cognitive linguist George Lakoff defines metaphor as “a cross-domain mapping in the conceptual system”.<sup>2</sup> The notion of conceptual domains has the same function within cognitive science as the notion of semantic fields has within traditional semantics – however, whereas semantic fields are strictly linguistic, conceptual domains comprise both language and the sensory modalities. Another difference between traditional metaphor theory and cognitive metaphor theory is that according to cognitive metaphor theory, the motivation for meta-

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<sup>1</sup> In the following I will distinguish between modalities of perception (sensory modalities) and modes of cognition as complex modes of cognition like music and language can involve several different sensory modalities at one and the same time.

<sup>2</sup> George Lakoff, “The Contemporary Theory of Metaphor”, A. Ortony (ed.): *Metaphor and Thought*, second revised edition, Cambridge 1993, p. 203.

phorical mappings can be both iconic and indexical, as the music semiotician Robert Hatten has pointed out.<sup>3</sup> An example of the latter is the ubiquitous metaphor which Lakoff and Johnson have named *more is up* (e.g., “My income *rose* last year”),<sup>4</sup> where the mapping is based on a correlation rather than on an underlying similarity.

The use of metaphors to describe music – especially metaphors with strong emotional connotations – has often been rejected as hopelessly subjective and unscientific by music analysts. However, as the music theorist Marion Guck has demonstrated, even the most scientifically oriented analyses abound in metaphorical language.<sup>5</sup> Metaphorical projections seem to be ubiquitous in musical experience, and are manifested not least through cross-modal associations, which are so pervasive that we tend to regard the most common associations as intrinsic to the music itself (e.g., the color metaphors used to describe sonorous qualities, as in the German term *Klangfarbe*). I wish to argue that many of the body-based metaphors which arise through our encounters with music can in fact be intersubjective, due to shared biological and cultural dispositions, and that much of the music is lost if we focus solely on the “disembodied” score in music analysis.

How, then, can metaphorical mappings operate in music? Let us start out with a metaphorical conception that is particularly important in art; that of balance. According to the philosopher Mark Johnson, our different uses of the term “balance” derive from a limited number of basic conceptual structures which he calls “image schemata” and describes as “recurring structures of, or in, our perceptual interactions, bodily experiences, and cognitive operations”.<sup>6</sup> He emphasizes that these structures are experientially based, developing through our encounters and interactions with our environments. This implies that image schemata are dynamic, and that they are modified during the course of our development. However, they are constant enough to be recognized both across time and between individuals, due to our shared biological dispositions and basic bodily experiences (e.g., the experience of gravity). In his discussion of image schemata pertaining to the notion of balance, Johnson singles out four prototypes – “axis balance”, “twin pan balance”, “point balance”, and “equilibrium” (see Fig. 1) – which can be metaphorically projected onto many different domains of physical and psychological experience, thereby forming the basis of highly complex conceptual structures and inferences. Although Johnson both names and illustrates these image schemata, he emphasizes that one must not confuse the illustrations with the things themselves. Image schemata are skeletal structures which can be regarded neither as propositions nor as rich images. Instead they involve operations that are analogous to spatial manipulation, orientation, and movement.

<sup>3</sup> Robert S. Hatten, *Musical Meaning in Beethoven: Markedness, Correlation, and Interpretation*, Bloomington 1994, p. 164.

<sup>4</sup> George Lakoff & Mark Johnson, *Metaphors We Live By*, Chicago 1980, p. 16.

<sup>5</sup> Marion Guck, “Analytical Fictions”, *Music Theory Spectrum* 16/2 (1994).

<sup>6</sup> Mark Johnson, *The Body in the Mind: The Bodily Basis of Meaning, Imagination, and Reason*, Chicago 1987, p. 79.

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*Fig. 1. Mark Johnson's prototypes for balance image schemata, from Mark Johnson, *The Body in the Mind*, Chicago 1987, pp. 86-87. © 1987 by The University of Chicago (rendered with permission).*

Returning to music, I will take an excerpt from Palestrina's *Missa Papae Marcelli* (1556) as my point of departure, focusing on the melodic lines in the opening of the first of the two "Agnus Dei" movements. The Danish musicologist Knud Jeppesen's renowned study of Palestrina's counterpoint technique puts great emphasis on the *well-balancedness* of Palestrina's melodic lines (cf. Renaissance art in general); a melodic balance which is not only heard but also felt and which contributes greatly to the serene beauty of Palestrina's music. But how does this sense of balance come about? Jeppesen sought to elucidate Palestrina's composition technique through an inductive study of his music and ended up with a set of norms which it is unlikely that Palestrina himself was fully conscious of, but which nonetheless are operative in his music. To give a few examples: "All in all the melody is surely restrained and well-balanced; up and down are approximately equilibrated, as is most often the case in Palestrina's music. [...] One will, moreover, notice that the large intervals are treated in a special way, as they are balanced by stepwise progression".<sup>7</sup> We find a musical realization of these norms in the opening of the first "Agnus Dei" movement of *Missa Papae Marcelli*, the score of which is rendered in Ex. 1, but which is better experienced on a recording (e.g., by The Tallis Scholars, dir. Peter Phillips on Gimell). The main theme of this movement, which recurs throughout the mass, is often called the "l'homme armé" theme, as it was derived from a chanson titled *L'homme armé*. Due to its

<sup>7</sup> Knud Jeppesen, *Kontrapunkt: Vokalpolyfoni*, Copenhagen 1968, pp. 82-83. The translations of Jeppesen's original Danish text are my own.

A - gnus De - i, A - gnus

A - gnus De - i, A - gnus De - i, A - gnus

De - i, A - gnus De - i, A - gnus

De - i, qui tol - lis pec - ca - ta mun - di

i, qui tol - lis pec - ca - ta mun - di

i, qui tol - lis pec - ca - ta mun - di

i, qui tol - lis pec - ca - ta mun - di

Ex. 1. Opening of "Agnus Dei I" from Palestrina's *Missa Papae Marcelli*.

melodic well-formedness, this theme was used also by several other Renaissance composers, most notably by Josquin des Prez.

How is it that the notion of balance – which in its most primal form is related to fundamental somatic experiences like that of our own center of gravity – can be so aptly applied to music which, strictly speaking, is nothing but a constellation of soundwaves? This brings me back to the notion of image schemata. Interest-

ingly, Johnson emphasizes the amodal quality of image schemata, noting “It would seem that image schemata transcend any specific sense modality, though they involve operations that are analogous to spatial manipulation, orientation, and movement”.<sup>8</sup> I believe that this brings us straight to the heart of music which is commonly heard as metaphorical movement in metaphorical space (cf. the basic metaphor which George Lakoff has called *nonvisual perceptual space is physical space*<sup>9</sup>). The metaphor can also be recognized in Western musical notation which places pitches in a visual, though two-dimensional, space. And like all other things moving in space, the movements of music can be heard as more or less balanced, judged on the basis of our biological and cultural dispositions. Rising melodic lines, for example, are often heard as an increase in tension; much like our understanding of potential energy, which is proportionate to the elevation of an object. In the same way as physical objects, melodies seem to return to their original energy level when they return to their registral point of departure.

Interestingly, Jeppesen also uses energy metaphors in his description of Palestrina’s music:

[One] can often see a relatively large downward leap followed by another leap (in the opposite direction, of course); whereas a large upward leap is almost always followed by stepwise downward progression. The reason for this is probably that the note towards which one leaps is in the first case a “bottom note”, and in the second case a “top note”. Consequently, one notices the upward leaps more than the downward leaps, and one therefore lets the upward leaps be followed by effects which lead to a decrease in energy [...].<sup>10</sup>

This simple correlation with potential energy can throw light upon one aspect of musical balance – however, I wish to emphasize that the sensation of musical balance is far more complex than what I can account for by any one model or image schema. Musical balance should rather be regarded as a gestalt quality dependent on both melodic, registral, contrapuntal, harmonic, rhythmic, dynamic, idiomatic, and many more features; many of which are more culturally and less biologically dependent than the example I gave above (note that this does not imply that these aspects of music are any less embodied for that reason). Furthermore, musical balance means much more to us than just dynamic patterns of tones which are heard to be in “auditory equilibrium”. How, for example, can Palestrina’s music have such a soothing effect on me when I am troubled? I am inclined to answer that it helps me regain my mental equilibrium – and like Johnson, I do not believe that it is a coincidence that I experience it this way. In *The Body in the Mind* he writes:

<sup>8</sup> Jeppesen (1968) p. 25.

<sup>9</sup> George Lakoff, *Women, Fire and Dangerous Things: What Categories Reveal about the Mind*, Chicago 1987, p. 513.

<sup>10</sup> Jeppesen (1968) p. 88.

The “mental” is understood and experienced in terms of the “physical”. The notion of “emotional balance” is a good example here, because our emotional experience is typically thought of as having both a bodily and mental aspect. We experience our emotions on a homeostatic model in which health depends on a proper balance of emotional forces and pressures.<sup>11</sup>

Using a metaphor related to that of balance, the ancient Greek Harmonia metaphor, I could say that Palestrina’s exceptionally harmonious music puts me in a harmonious mood (or even more romantically, that the beauty of his music attunes my soul). Here the projections have gone well beyond the bounds of kinesthetic experience and have entered into the realm of feelings, which are characterized by an interplay between somatosensory information – information about the state of the body – and our cognitive evaluations of this information and of the particular circumstances in which we find ourselves. How, then, can we evaluate our bodily sensations? One possible principle of evaluation has been discussed by the developmental psychologist Daniel Stern,<sup>12</sup> who believes that we are predesigned to be able to recognize certain basic affective contours. Interestingly, Stern believes that these contours – like Johnson’s image schemata – can transcend the different sensory modalities. As Stern’s views can throw interesting light upon musical meaning, I will now make a short excursion into his work before returning to the primary subject matter of this article: sounding music.

In the book *The Interpersonal World of the Infant*, Stern describes infant development in terms of what he calls “domains of [interpersonal] relatedness”. Most relevant in this context is the domain of emergent relatedness, which according to Stern is our earliest domain of experience. He uses the term “domain” rather than the more common psychoanalytical term “stage”, so as to emphasize that we continue to experience our world in terms of all of the different domains throughout life – although we tend to be most aware of the very last domain of experience to develop; the domain of verbal relatedness.<sup>13</sup> Thus, unlike the classical psychoanalysts, Stern does not believe that there is anything regressive about experiencing the world in terms of the domain of emergent relatedness.

According to Stern, the domain of emergent relatedness is characterized by three interrelated phenomena: amodal perception, “physiognomic” perception, and vitality affects. Starting with the first, Stern refers to Meltzoff and Borton’s famous psychological experiment where blindfolded three-week-olds were given knobbed or smooth pacifiers to suck. These infants could afterwards recognize the pacifier that they had felt in their mouth just by looking at it (that is, they looked significantly longer at the pacifier which they had sucked). To quote Stern, “Infants are predesigned to be able to perform a cross-modal transfer of informa-

<sup>11</sup> Johnson (1987) p. 88.

<sup>12</sup> I am grateful to Mark Johnson for having introduced me to the work of Daniel Stern.

<sup>13</sup> Daniel N. Stern, *The Interpersonal World of the Infant: A View from Psychoanalysis and Developmental Psychology*, New York 1985, pp. 32-33.

tion that permits them to recognize a correspondence across touch and vision".<sup>14</sup> Stern also points to research indicating that infants are capable of performing audio-visual, temporal, and visual-motoric cross-modal matching as well (cf. infants' instinctual imitation of facial expressions even before they are able to recognize their own face in a mirror), concluding:

Infants appear to experience a world of perceptual unity, in which they can perceive amodal qualities in any modality from any form of human expressive behavior, represent these qualities abstractly, and then transpose them to other modalities. [...] These abstract representations that the infant experiences are not sights and sounds and touches and nameable objects, but rather shapes, intensities, and temporal patterns – the more "global" qualities of experience.<sup>15</sup>

Stern's views have been confirmed through a number of psychological experiments, and also adults have been shown to be able to perform intersubjective cross-modal associations. The Argentinian color researcher José Luis Caivano, for instance, has found that we have a tendency to make certain very specific correlations between qualities of sound and qualities of color – for example between luminosity of color and loudness of sound, saturation of color and timbre of sound, and "size" of color and duration (temporal extension) of sound.<sup>16</sup> Thus, amodal perception would seem to be a reality also in adult life.

Until now I have focused primarily upon relatively "structural" forms of amodal perception. However, in the case of music the more affective forms of amodal perception, which Stern approaches by means of the notions of physiognomic perception and vitality affects, are at least as important. The term "physiognomic perception" was coined by the psychologist Heinz Werner,<sup>17</sup> who believed that the phenomenon he was describing had to do with our ability to categorize different facial expressions and bodily movements. According to Werner, humans can also experience inanimate things in terms of categorical affects, and Stern elaborates upon this discussion, claiming that we tend to perceive both lines, colors, and sounds in terms of different affects (see Fig. 2). As we will see in "Dido's Farewell" shortly, this corresponds well with the convention of using falling melodic lines to express sadness, a convention which is in accordance both with our facial and postural expressions of sadness.<sup>18</sup>

<sup>14</sup> Stern (1985) p. 48.

<sup>15</sup> Stern (1985) p. 51.

<sup>16</sup> José Luis Caivano, "Color and Sound: Physical and Psychophysical Relations", *Color Research and Application* 19/2 (1994) pp. 126-33.

<sup>17</sup> Heinz Werner, *The Comparative Psychology of Mental Development*, New York 1948.

<sup>18</sup> Interestingly, many of the expressive cues and devices used in music performance are also in accordance with our bodily expressions of emotion; see for example Mayumi Adachi & Sandra E. Trehub, "Children's Expressive Devices in Singing", B. Pennycook & E. Costa-Giomi (eds.), *Proceedings of the Fourth International Conference on Music Perception and Cognition*, Montréal 1996; Patrik Juslin & John Sloboda (eds.), *Music and Emotion: Theory and Research*, Oxford 2001.





Fig. 2. Heinz Werner's happy, sad, and angry lines (from *The Comparative Psychology of Mental Development*, New York 1948).

The third term to be discussed here, “vitality affects”, was coined by Stern himself in an attempt to grasp certain basic qualities of feeling that often escape our attention:

[...] many qualities of feeling that occur do not fit into our existing lexicon or taxonomy of affects. These elusive qualities are better captured by dynamic, kinetic terms, such as “surging”, “fading away”, “fleeting”, “explosive”, “crescendo”, “decrescendo”, “bursting”, “drawn out”, and so on.<sup>19</sup>

Stern draws upon the philosopher Suzanne Langer's discussion of the different “forms of feeling” that are correlated with vital life processes like breathing or the coming and going of emotions and thoughts, and he emphasizes that vitality affects can exist independently of the traditional categorical affects – “For example, a ‘rush’ of anger or of joy, a perceived flooding of light, an accelerating sequence of thoughts, an unmeasurable wave of feeling evoked by music, and a shot of narcotics can all feel like ‘rushes’.”<sup>20</sup> He mentions abstract dance and music as prototypical examples of the expressivity of vitality affects, and writes further:

Because activation contours (such as “rushes” of thought, feeling, or action) can apply to any kind of behavior or sentience, an activation contour can be abstracted from one kind of behavior and can exist in some amodal form so that it can apply to another kind of overt behavior or mental process. These abstract representations may then permit intermodal correspondences to be made between similar activation contours expressed in diverse behavioral manifestations.<sup>21</sup>

I see this as a very promising approach both to musical emotions and to the more kinetic features of music, such as gesture – which is essential to musical meaning but notoriously difficult to grasp by means of traditional music-analytical methods. As an example of a musical gesture, I will refer to the music semio-

<sup>19</sup> Stern (1985) p. 54. Interestingly, the neuroscientist Antonio Damasio (private communication) has compared Stern's vitality affects with his own notion of background feelings; feelings which originate “in ‘background’ body states rather than in emotional states”; Antonio R. Damasio, *Descartes' Error: Emotion, Reason, and the Human Brain*, New York 1994, p. 150.

<sup>20</sup> Stern (1985) p. 55.

<sup>21</sup> Stern (1985) pp. 57–58.



tician Robert Hatten's analysis of Schubert's *Piano Sonata in A*, D. 959, where he points to an especially important gesture involving "two sound events separated by a lift, with the first given less weight and duration than the second"<sup>22</sup> (see its first appearance in Ex. 2). Why does this gesture give us such great pleasure? Perhaps because we relate the gesture to the experience of arriving at a goal, followed by a gratifying sense of completion (although the sense of arrival is only temporary in this case, due among other things to the anticipatory harmony)? Or perhaps because we can recognize intimately familiar physical patterns like inhaling followed by exhaling, or like the upbeat-downbeat effect of our own pumping heart?<sup>23</sup> Perhaps this can also explain why we say "A-HA!"; often accompanied by a hand gesture, when we finally arrive at the gratifying goal of understanding something that has been puzzling us?



Ex. 2. Franz Schubert, *Piano Sonata in A*, D. 959, first movement, mm. 7-10.

To elaborate upon such emotionally laden metaphorical mappings in music, I will now turn to "Dido's Farewell" from Henry Purcell's opera *Dido and Aeneas* (see the excerpt from the score in Ex. 3; or better, listen to Véronique Gens, William Christie, and Les Arts Florissants' interpretation on Erato). In the recitative and aria we hear Dido's last words, as she seeks her own death after having been abandoned by Aeneas. The music beautifully depicts the mood of the scene, and is so powerful that it at times draws our attention away from the words and the dramatical situation, directing us towards the sheer beauty of the musical sounds themselves.<sup>24</sup> For those familiar with baroque *Figurenlehre*, however, these sounds convey not only musical beauty and relatively undifferentiated feelings of sadness, but also very precise "extramusical" meanings (a notion put in quotation marks as I plan to problematize it later on). The dominant figure in "Dido's

<sup>22</sup> Robert S. Hatten, "Schubert the Progressive: The Role of Resonance and Gesture in the Piano Sonata in A, D. 959," *Intégral* 7 (1993) p. 44.

<sup>23</sup> If we listen carefully, we can hear two different cardiac sounds, corresponding to the closing of different valves. The first cardiac sound is weaker than the second, and the interval between the first and second cardiac sound is shorter than the interval between the second and the next cardiac sound; thereby creating an upbeat-downbeat effect. However, as Hatten has pointed out (private communication) this cardiac gesture also differs from the above-mentioned musical gesture in that it is repeated continuously.

<sup>24</sup> As the music semiotician Eero Tarasti has pointed out, we have a tendency to glide into "absolutistic" modes of listening even in program music; Eero Tarasti, *A Theory of Musical Semiotics*, Bloomington 1994, p. 209.

*Dido*

When I am laid, am laid in earth, may my wrongs cre -

*Vl. 1*

*Vl. 2*

*Vla.*

*Basso*

ate no trou - ble, no trou - ble in thy breast; Re -

mem - ber me, Re - mem - ber me, but ah! for - get my

fate Re - mem - ber me, but ah! for - get my fate.

Ex. 3. "Dido's Farewell" from Henry Purcell's opera *Dido and Aeneas*.

Farewell" is a descending chromatic melodic line which is termed "passus duriusculus" in the baroque figure catalogs, and which has traditionally been used to depict death, sadness, descent, and related phenomena.<sup>25</sup> The figure is most prominent in the bass accompaniment of Dido's aria, where it is repeated over and over as a basso ostinato, a convention common to lamento arias. Now the question is: Are the meanings that we attribute to these structures arbitrary, or are they in some way motivated (note that they can nonetheless be highly culture-dependent, due to the relatively indeterminate nature of musical meaning)?

Let us begin with the most obvious metaphorical mappings, those from our spontaneous vocal expressions of sadness. Spontaneous lamentations take the form of falling glissandi; or, placed within the traditional Western notational system, falling chromatic lines – as we can find both in the bass figure of "Dido's Farewell" and in the highly chromatic, predominantly falling melodic line of the soprano (cf. "laid, am laid in earth", and note the "sobbing" effect of the dotted rhythm, as well as the affect-laden tritone contour of the melody). Furthermore, the first "laid" is one of many examples of suspensions, a figure that is commonly experienced as plaintive or yearning. I regard all of these effects as musical metaphors for sadness; however, it should be noted that the effects also have specifically sonorous, self-referential musical meanings.<sup>26</sup> Yet another example of falling melodic lines is to be found in the choir's musical illustration of "drooping wings" in the chorus following "Dido's Farewell" (see Ex. 4); a case where the metaphor of melodic motion in space is employed as a word-painting device (cf. also the choir's melodic imitation, which is a conventional way of depicting a group of people, or as in this case: cupids).

It is, however, not only the downward motion that has metaphorical function in "Dido's Farewell": The repetition of the words "Remember me", for example, illustrates Dido's great earnest and yearning for eternity, her wish to lie in *memoria*.<sup>27</sup> Both the repetitions themselves and the affective contour of crescendo and rising pitch create an increase in intensity that brings us to the aria's climax: the third "Remember me", sung on a high G, followed by a meandering sigh which gradually brings the melody to an end an octave below. We find this basic affective contour both in discontented newborns and everyday speech, as well as in

<sup>25</sup> Finn Benestad, *Musikk og tanke: Hovedretninger i musikkestetikkens historie fra antikken til vår egen tid*, Oslo 1976, p. 128. It is probable that Purcell has drawn explicitly upon the conventions of *Figurenlehre*, as *Dido and Aeneas* is clearly influenced by Cavalli's *Didone*, written 50 years earlier. In Cavalli's opera we find chromatically descending basses in several of the laments; Claude V. Palisca, *Baroque Music*, second edition, Englewood Cliffs, New Jersey 1981, p. 249.

<sup>26</sup> The above-mentioned musical structures are metaphors for sadness by virtue of mappings between a nonmusical mode of vocal expression and music. However, they also have metonymic function, insofar as they represent sadness by means of our vocal expression of sadness. (Metonymies are based on contiguity or causal relations and usually have referential function.) Such interactions between metaphor and metonymy are very common.

<sup>27</sup> The listeners' only consolation may be that Dido achieves eternity through the very tragedy which bears her name, in accordance with the myth of the Muses' birth by Mnemosyne, the goddess of memory.

*Andante* *p*

With droop - ing wings, ye Cu - pids, come, With droop - ing wings, with droop -  
 In sanft - em Flug, ob kommt her - ab in sanft - em, Flug, in sanft -

*p*

With droop - ing wings, ye Cu - pids, come,  
 In sanft - em Flug, ob kommt her - ab

*p*

With droop - ing wings, ye Cu - pids, come, With droop - ing, droop - ing, wings, with  
 In sanft - em Flug, ob kommt her - ab In sanft - em, sanft - em Flug, in

*p*

With droop - ing wings, ye Cu - pids, come, With droop -  
 In sanft - em Flug, ob kommt her - ab In sanft -

Ex. 4. The final chorus in Purcell's *Dido and Aeneas*.

many familiar patterns of motor activity (cf. Stern's vitality affects). It is also interesting to note that this contour has been found in music all over the world. In its most primal form, as found in many aboriginal cultures, it is termed "tumbling strains".<sup>28</sup> And according to many singing teachers, professional singing is based on just such primal, affect-laden sounds – which can give us a clue as to why music plays such a great role in our lives. Oren Brown, professor emeritus of singing at the Juilliard School of Music, has 1996 published a book with an enclosed CD where he demonstrates such primal sounds.<sup>29</sup> Interestingly, his demonstration of "crying" is strikingly similar to the first vocal line of Dido's aria: He starts on a G, glides approximately a minor third upwards, falls back slightly, and then starts anew approximately on C above the G. Brown's approach to a student performing "Dido's Farewell" at a master class in Oslo some years ago, can also throw interesting light upon this discussion. After the first performance, the student was forced to moan, groan, and whimper on stage, and to sing while pulling Brown's arm so as to create a "pulling force" in her melodic line. Thereafter, she sang the aria once more, and the difference was striking: She now had an emotional nerve in her singing, a nerve which made her performance both musically convincing and emotionally moving. Thus, it would seem that the bodily metaphors are an essential part of the music itself.

<sup>28</sup> Curt Sachs, *The Wellsprings of Music* (ed. Jaap Kunst), New York 1962, p. 51.

<sup>29</sup> Oren L. Brown, *Discover Your Voice: How to Develop Healthy Voice Habits*, San Diego & London 1996.

There is nothing new to comparing music, and especially singing, with affective contours in our most important expressive medium, the voice; this was done already by Jean-Jacques Rousseau in the eighteenth century. However, one has often used the term “iconicity” rather than “metaphor”, as these musical effects are grounded upon sonorous similarities. I have chosen to apply the notion of metaphor both to these and other cases of onomatopœia, as the source sound and the musical sound – for example crying and singing in a lamenting way – belong to different cognitive domains. Furthermore, it seems highly plausible that the conceptual mappings follow the same principles whether they occur within or across the sensory modalities.

Turning now to cross-modal mappings, I will focus upon what it feels like to be sad, and how we carry our bodies when we are sad. We feel excessively heavy and sluggish, we sink together, our shoulders crouch, and our head falls; in other words, we experience our body in terms of downward motion – much like the downward motion of the melodic lines of “Dido’s Farewell”. We have all experienced how bodily posture can reflect emotions, and this has also been demonstrated experimentally, among others by the cognitive psychologists Mayumi Adachi and Sandra Trehub.<sup>30</sup> They filmed children who had been asked to sing either in a sad or a happy way; and although they gave no indications as to bodily posture or other expressive means, virtually all of the children who had been asked to sing in a sad way let their heads drop, sank together, and sang extremely slowly.

Sadness not only affects our posture, however: It also has ideational consequences, and interestingly, these ideas often reflect underlying conceptual metaphors. For example, we may feel that we are *walking in circles, never getting anywhere* – much like the basso ostinato, which seems to be ruminating over its own fate; or like the chromaticism of the melodic line, which slowly weaves its way through the song. (Not surprisingly, falling chromaticism is conventionally used to depict sadness or pain.) Pathological depression is characterized by obsessive (or shall we say obstinate?) thoughts of sadness, as well as by a change in the patients’ perception of time: Time moves more slowly when we are sad or depressed; in fact our whole system – heartbeat, digestion, intellectual efficiency, and all – slows down. This corresponds strikingly well both with Adachi & Trehub’s sad singers and the slow, floating rhythm of “Dido’s Farewell”.

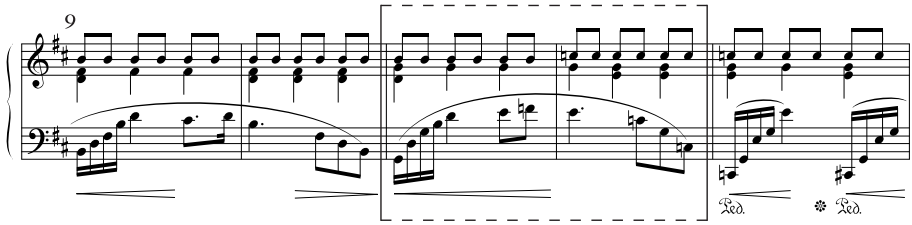
I have now demonstrated a number of correspondences between musical features in “Dido’s Farewell” and our bodily expressions and sensations relating to sadness, finding it highly plausible that we draw upon these bodily patterns and reactions when listening to the aria. The metaphor drawing upon bodily patterns and reactions is carefully chosen, as it can include both the so-called “cognitivist” and “emotivist” positions within music philosophy.<sup>31</sup> I do not wish to take sides in the “ancient quarrel” between these positions, as I am convinced that our

<sup>30</sup> Adachi & Trehub (1996).

<sup>31</sup> See Peter Kivy, “How Music Moves”, P. Alperson (ed.), *What is Music? An Introduction to the Philosophy of Music*, University Park, Pennsylvania 1987, pp. 148–63.

experience of expressivity in music can result both from a simple recognition of music's expressive properties ("cognitivism"), and from our identifying with and actually feeling the expressivity of music ("emotivism"). In my view, these positions can best be regarded as different listening strategies, in accordance with the cognitive psychologist John Sloboda's belief that the cognitive stage of a listener's response to music "is a necessary precursor of the affective stage [...]. However, the affective stage does not *necessarily* follow the cognitive stage".<sup>32</sup>

Skeptics might maintain that, fair enough, we may experience "Dido's Farewell" as sad due to the underlying text and figures which guide our ears – but what about absolute music, which is without any text, title, or figures that will bring us outside of the purely musical domain (note the values inherent in these terms)? To argue for my view that the same mechanisms apply in so-called absolute music, I will turn to the music theorist Marion Guck's studies of metaphors used by her students and herself in discourse about Chopin's B minor prelude, op. 28, no. 6 (see Ex. 5, or better: listen to Maurizio Pollini's interpretation of the prelude on Deutsche Grammophon).



Ex. 5. Chopin's B minor prelude, op. 28, no. 6, mm. 9-13.

Guck conducted an experiment where she asked music students to describe a passage (mm. 11-12) from this prelude in non-technical terms, and her results are highly interesting in light of the Lakoff-Johnson theory of metaphor. She noticed that the presented metaphors often entailed new, related metaphors, indicating that the metaphors were situated within an associative web of significance. Certain metaphors were ascribed a central role in the students' understanding of the passage, thus determining a web of secondary metaphors which revolved around what she called the "organizing metaphor". Interestingly, all of the organizing metaphors she found described music in terms of bodily experience:

My experience indicates that, though there is no single appropriate organizing metaphor for a particular musical context, organizing metaphors for a given passage often seem to convey similar conceptions of structure. Of four groups that discussed the Chopin passage, three developed organizing metaphors, and all are, in my opinion, similar in significant ways. These

<sup>32</sup> John A. Sloboda, *The Musical Mind. The Cognitive Psychology of Music*, Oxford 1985, p. 3.

images are: a pole-vaulter just releasing the pole; a labored breath; and a person diving off a diving board. All three describe the activity of a person and suggest an arching shape with steadily increasing tension culminating in a point of climax with subsequent sudden release. Differences between the three seem to be differences in emphasis rather than fundamental disparities in conception.

Organizing metaphors that are useful for analysis specify the shape or progression of events (e.g., up–climax–down), the quality of the events (e.g., labored), and the degree of the events (e.g., a *deep* breath).

[...] Physical processes, especially processes as essential as breathing, are powerful metaphors that associate what is described to what is most important to us.<sup>33</sup>

In a later passage of the article, Guck describes our understanding of music in a way that comes very close to the notion of image schemata:

[...] we are struck by direction of line, repetitions, rate of ascent and descent as influenced by duration and interval size, and temporal and registral distance between pitches. This reliance on ideas like up and down or repetition may sound simple-minded, but these are relation- or process-oriented concepts; from such a simple base rich analyses can be derived. [...] Finally, the apparent significance of such simple ideas suggests that we interpret pieces using basic thinking processes like recognition of identity, similarity, and change to understand music as we understand other things.<sup>34</sup>

Through her study of the students' breathing metaphor Guck made an observation that supports our belief that music is fundamentally embodied:

The intimate physical familiarity of breathing is equally evident in its supporting metaphors, tension and release, for example. In fact, supporting physical metaphors seem so obviously responses to the passage that I am inclined to say that they are less metaphors than misplaced ascriptions – that players have confused the piece with their responses to it.

One wonders if the power of familiar physical metaphors lies in the fact that *responses to pieces are experienced in physical terms*, including tensions in muscles and alterations in breathing. In interpreting such physical responses we often speak in emotional terms, summarizing various physical processes by describing our feelings. Is music compelling because it is strongly evocative of fundamental physical processes, the most basic and familiar patterns known to all of us?<sup>35</sup>

<sup>33</sup> Marion Guck, "Musical Images as Musical Thoughts: The Contribution of Metaphor to Analysis," *In Theory Only* 5/5 (1981) pp. 34–35.

<sup>34</sup> Guck (1981) p. 41.

<sup>35</sup> Guck (1981) pp. 41–42 (*italics in the original*).



Marion Guck concludes the article by arguing for the rehabilitation of physical metaphors in musical analysis: "If perceived musical structure is indivisible from physical and emotional responses, then metaphors may offer an embryonic structural interpretation reinforced by – explained through – physical-emotional responses".<sup>36</sup> In an article written ten years later she elaborates upon this point by basing an analysis of the same Chopin prelude upon one simple metaphor, the metaphor of an arch; and this analysis is a striking example of metaphorical projection between different domains of experience. She starts out with visual images of arches in the score (including phrase arches), and goes on to show how these can be associated with the movement and tension qualities of bodily gestures. Another layer of meaning is added when one projects arch structures into the domain of emotions: "The tensions and sensations of physical acts can be extended to the realm of feeling. Increases and decreases can be of emotional tension, and ups and downs can be of mood."<sup>37</sup> She notes that the arch structures of the piece can be heard as nested within one another, and she is ultimately led to regard the piece's overall arch structure in terms of a narrative curve. Guck believes that these projections are essential both to the performer and the listener:

External, physical gestures are taken in; and the perceiver, remembering what that complex of gestures feels like and what it means when he or she performs it, identifies the mood and reconstructs its progress from the physical symptoms. Similarly, one can take in the gestural interplay in a piece's sounds and correlate them with physical gestures, interpreting those gestures as if they were symptomatic of real moods in an individual.<sup>38</sup>

It is interesting to compare this quote with the neurologist Antonio Damasio's account of how our bodies participate in our experiences of the world:

[...] when we see, or hear, or touch or taste or smell, body proper *and* brain participate in the interaction with the environment.

Think of viewing a favorite landscape. [...] Sooner or later, the viscera are made to react to the images you are seeing, and to the images your memory is generating internally, relative to what you see. Eventually, when a memory of the seen landscape is formed, that memory will be a neural record of many of the organismic changes just described, some of which happen in the brain itself (the image constructed for the outside world, together with the images constituted from memory) and some of which happen in the body proper.<sup>39</sup>

To conclude the discussion based on Guck's studies: It would seem that body-based metaphorical mappings are essential to musical meaning whether the music

<sup>36</sup> Guck (1981) p. 42.

<sup>37</sup> Guck (1991) p. 7.

<sup>38</sup> Guck (1991) p. 8.

<sup>39</sup> Damasio (1994) pp. 224-25 (*italics in the original*).

is “absolute” or “programmatic”. One important question remains, however: To what extent are these mappings universal, and to what extent are they culture-dependent? As mentioned in the discussion of the Palestrina example, certain basic bodily experiences (such as the experience of gravity) are universal, and it seems plausible that these experiences entail universal metaphorical mappings. However, culture-dependent bodily experiences seem to be at least as important to musical meaning. To elaborate upon this I will now turn to the workings of Western functional harmony, which has been incarnated in our ears and bodies in terms of a set of image schemata that are essential to music – the force schemata (cf. especially the attraction schema).<sup>40</sup>

Interestingly, one of the founders of modern harmonic theory, Jean-Philippe Rameau, was a contemporary of Isaac Newton, and Rameau seems to be drawing explicitly upon Newton’s theory of gravity when he writes that the tonic

must be seen as the centre of the mode, towards which is drawn all our desires (*auquel tendent tous nos souhaits*). It is effectively the middle term of the proportion to which the extremes are so tied (*liés*) that they cannot stray from it for a moment. If [the progression] passes to one of them, it must return back right away (*y retourner sur le champ*).<sup>41</sup>

According to Riemann’s later functional theory of harmony, the main driving force of harmony is the tension between the dominant and the tonic as epitomized by the dominant chord’s leading tone being pulled towards the tonic. In our culture we both hear and feel this pull as a major source of musical tensions and releases – and accordingly, as an important expressive means in tonal music. I will demonstrate this by means of the famous “Adagietto” from Mahler’s Fifth Symphony, a movement of exceptional beauty and sensuality (see Ex. 6, or better: listen to Leonard Bernstein and Wiener Philharmoniker’s recording on Deutsche Grammophon). The slow, floating sensation of the piece can be felt as an expression both of unspeakable sadness and unspeakable happiness; what is certain, is that the music immerses us in feelings of overwhelming power. The deep yearning of this movement is, I believe, due largely to the combined forces of its extremely slow tempo, delicate instrumentation, and harmonic suction created

<sup>40</sup> Johnson (1987) p. 47. Among other music theorists who have studied music and musical discourse in terms of force schemata, thereby contributing to my own thinking, I especially wish to mention Steve Larson and Janna K. Saslaw, see for example Steve Larson, “Musical Forces, Step Collections, Tonal Pitch Space, and Melodic Expectation”, I. Deliège (ed.), *Proceedings of the Third International Conference on Music Perception and Cognition*, Liège 1994; Steve Larson, “Musical Forces and Melodic Patterns”, *Theory and Practice* 22–23 (1998); Janna K. Saslaw, “Forces, Containers, and Paths: The Role of Body-Derived Image Schemas in the Conceptualization of Music”, *Journal of Music Theory* 40/2 (1996); Janna K. Saslaw, “Life Forces: Conceptual Structures in Schenker’s *Free Composition* and Schoenberg’s *The Musical Idea*”, *Theory and Practice* 22–23 (1998).

<sup>41</sup> Rameau rendered in Thomas Street Christensen, *Rameau and Musical Thought in the Enlightenment*, Cambridge 1993, p. 189. I am grateful to Janna Saslaw for having introduced me to the work of Thomas Christensen.

by the dominant pedal point which seems *never* to reach the longed-for tonic. In fact, even when the pedal point is reinterpreted, becoming a fifth in the tonic chord as the bass instruments go below the pedal point to reach the tonic, it retains some of its dominant feeling – both because of its prominence in the sonorous landscape, and because it is sustained for so long that we tend to hear it as one continuous function. Thus, there is no complete feeling of resolution until we reach the very end of the movement.

80 4 rit. Zögernd

Harfe

Erste Viol.

Zweite Viol.

Violon

Vielle

Bass

87 Noch langsamer

Harfe

Erste Viol.

Zweite Viol.

Violon

Vielle

Bass

94 viel Ton! Drängend lang

Harfe

Erste Viol.

Zweite Viol.

Violon

Vielle

Bass

(103)

attacca Rondo-Finale

Ex. 6. Final section of Mahler's "Adagietto" from Symphony no. 5. Reprint with permission of C.F. Peters Music Publishers Frankfurt/M., Leipzig, London, New York.

I have now given several different examples of metaphorical projection in music, but I have left out one very important source domain for musical meaning: the experience of our own fundamental kinesthetic and/or visceral body rhythms. These basic body rhythms are regarded by many as a key to the powerful effects of musical rhythm – which can put us to sleep (cf. the seemingly universal lullaby pulse around 60, which is analogous to our heartbeat at rest), perk us up, move us into a state of trance or Dionysian frenzy, make us belligerent, awaken our sexual desires, put us in a contemplative mood, dissolve our sense of temporal progression in favor of a sense of stasis, or simply inspire our motor programs to move with the music. As an example of the powerful effects of musical rhythm, I have chosen the Norwegian composer Rolf Wallin's *Stonewave* (1990), composed by means of a fractal-generating algorithm; a work so *moving* that it was chosen for the Olympic dance at the opening of the 1994 Winter Games in Lillehammer (see Ex. 7 for the final section of the score, or better: listen to Kroumata Percussion Ensemble's recording on BIS).

As a composer Wallin is preoccupied with movement as evidenced by the title of his first solo-CD *move*, and one of the most characteristic features of his music is precisely its life-like movement, which has resulted in collaborations with a number of Norwegian contemporary dance groups. Even the static sonorous fields commonly found in his music often have movements as their point of departure, as Wallin is fascinated by the idea of freezing movements in the form of musical "stills" (cf. titles like *Stonewave* and *Onda di ghiaccio*, It. "icewave"), where a fleeting instant of a movement is prolonged by means of sustained chords or pulsating reverberations of the frozen instant.

*Stonewave* has an almost obsessive power, due to its driving, motorial rhythm and its audaciously long build-up of tension towards the end. Wallin has described the mathematical system behind *Stonewave* in the booklet of Kroumata Percussion Ensemble's recording, but he is just as interested in the work's metaphorical level of meaning:

The sound world of *Stonewave*, however, is not one you would associate with maths books. The steady, insistent pulse, the choice of instruments (only drums and non-pitched metal instruments) and the use of almost monomaniac sequences put up squarely against each other or divided by long rests suggest an invisible ritual. A ritual for what?

Well then, let it be a ritual for the exorcism of some "evil spirits" which now ride our part of the world under the name of Liberalism, making people the servants of the Market Forces instead of vice versa. *Stonewave* is therefore an incantation, as it seems that only divine forces can save European culture from a political system that proclaims the Jungle Law as the guiding principle in social and cultural life.<sup>42</sup>

<sup>42</sup> Rolf Wallin, CD booklet for *Stonewave*, BIS CD-512.

Measures 131-135 of the score. The staves are labeled I through VI. Above the staves, the time signatures are 4/4, 6/8, 2/4, 3/8, and 4/4. The music features complex rhythmic patterns with many beamed sixteenth and thirty-second notes. Dynamic markings include *ff* (fortissimo) and *mf* (mezzo-forte). A double bar line with two slanted lines follows measure 135.

Measures 136-140 of the score. The staves are labeled I through VI. Above the staves, the time signatures are 9/8, 9/8, and 2/4. The music continues with complex rhythmic patterns. Dynamic markings include *cresc.* (crescendo), *ff* (fortissimo), and *fff* (fortississimo). The score ends with a double bar line and a final *fff* marking.

Ex. 7. Final section of Rolf Wallin's *Stonewave* for 6 percussionists (from the composer's autograph, printed with the composer's permission).

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*Ex. 7. Final section of Rolf Wallin's Stonewave for 6 percussionists (from the composer's autograph, printed with the composer's permission).*