
A Polyphony of Dimensions: Music, Pain, and Aesthetic Perception

Music and Medicine
4(3) 163-170
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sagepub.com/journalsPermissions.nav
DOI: 10.1177/1943862112449486
http://mmd.sagepub.com



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Abstract

The article addresses the phenomenon of pain and the music therapeutic treatment of pain, with consideration of the involved functional and representational brain functions and its connected epistemological problems. A 2-fold description of the therapeutic process is presented whereby a transmodal process linking affective–sensory pain with audio music experience and an assignment of musical symbols to pain lead to a modification of the pain experience. A theory of aesthetic perception serves as the framework and as a platform for interdisciplinary discussion.

Keywords

music-imaginative pain treatment, cross-modal processes, symbolic representation, theory of aesthetic perception

Evidence for the effectiveness of music-therapeutic methods for the treatment of acute and chronic pain has been provided by various scientific studies.^{1–9} Existing theoretical explanations for these positive effects include general principles related to a psychotherapeutic relationship. The effectiveness of music therapeutic pain treatment is also increasingly brought about in connection to processes related to neurophysiologic change. However, there seems to be a lack of scientific explanation of how music (ie, reception, production, or reproduction of music) can be related to bio-psycho-social processes, which imply the relief of pain as well as the promotion or preservation of well-being, respectively, the relief of pain-related suffering as well as the enhancement of a healing process in general.

Music is a sound object, which is created by humans. This implies that it is much more than an acoustic event. Its acoustic, dynamic, and rhythmic structures are forms of vital function,¹⁰ which are interrelated with physical, emotional, cognitive, and social processes of the individual living within certain socio-cultural conditions. In all ages and all cultures, music has played an important role for comfort and imagination and creation of a better world. With the assistance of music, human beings can become distracted from their current internal experiences, and this includes pain experience. At the same time, human beings also can become aware of their inner states and can communicate discomfort through a performed expression with the help of music. Therefore, music appears to mean something and to give an individual the feeling of being mirrored, accompanied, or even personally understood.

In this way, it appears virtually impossible to make any general statements that go beyond an individual meaning or experience of music. Within the scope of music therapy

research, this conundrum often has the consequence that the analysis of the object music or of musicking¹¹ is treated rather peripherally. This is due to the fact that in accordance with a concept of objectivity that has found increasing acceptance since the 19th century in scientific investigation, one strives to minimize, whatever is not logically clear and whatever is not invariable. Music is undeniably the “human factor”—it is complex and neither clear nor invariable.

In the past decade music therapists have been striving for some music-centered approaches that take special consideration of that which is particular and essential to a music therapy experience. This has led to the development of 2 core concepts: music as metaphor^{12–14} and music as analogy^{15–17} (to core self-experiences). There have been attempts to bring the 2 concepts closer together,¹⁸ but the discrepancy between the 2 theories is fascinating, as it mirrors the scientific discussion on the mind–body problem since the advent of neuroimaging and the encounter between neurosciences and philosophy of mind. As a small discipline within the broader range of applied sciences, music therapy will experience difficulties in a quest to find a one and only correct position within the complex, controversial and dynamic debates, which already exist in applied sciences in general. Such debates are made more difficult due to the diversity existing in the discourses, and the presenting extreme complexities of the involved fields

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of knowledge further threaten our ability to adhere to a single model.ⁱ But what can be learned by this is that any of the preferred theoretical frameworks has to be flexible enough to allow the continuous integration of new findings from various fields of science and has also to do justice to the wealth, diversity, and subtleness of the phenomenological experiencing of music.

In searching for a scientific explanation of how music (musicking¹¹) can be related to bio-psycho-social processes which include, in medical models, the relief of pain, my own theoretical reflection has led to a 2-fold description of the music therapeutic process, which depicts succinct changes in our understanding of the sensation and perception of pain. The greatest possible correspondence between affective-sensory pain sensation and audio music sensation is considered the effective factor, whereas there also appears to be the creation of a potential space,^{19,20} which emanates from the difference between symbolic presentation by musical sounds and the pain experience.²¹ The apparent antinomy between correspondence and difference can be integrated with the help of a theory of aesthetic perception. According to such theory, what continuously changes in the execution of aesthetic perception is, the manner in which corporal, emotional, and cognitive elements of experiencing are integrated and incorporated into each other.

This double-fold aforementioned descriptive and explanatory approach will be outlined by using as point of reference, the music therapeutic method of entrainment developed by Dileo and Bradt.²² This method has been called in German, a music-imaginative pain treatment,^{23,24} and its structure will be unfolded step by step within the scope of the next paragraphs.

Perspectives of the Pain Phenomenon

Vignette (Part I)

A 59-year-old female patient, Ms Kurtⁱⁱ had severe chronic pain in her lower back and in her right leg following a slipped disc injury and surgical treatment 10 years ago. At present she has been undergoing treatment in the orthopedic ward of a general hospital for 3½ weeks.

The music therapist meets the patient for the first time while on doctors' rounds. From her cautious way of moving about and her reduced mimic expressiveness, one can see that she is not feeling well. In her conversation with the doctor it becomes very clear that she is extremely dissatisfied with the medical treatment she received in the past.ⁱⁱⁱ She suspects that something went wrong during the operation, but that nobody wants to admit it. She has the feeling that nobody really believes that she is in pain. In response to the offer of music therapy, to supplement her medicinal and physiotherapeutic treatments, she reacts sceptically, but nevertheless she makes an appointment.

In the initial session held in the music therapy room, the music therapist experiences the patient as suffering, helpless, and powerless, both in reference to her pain and in connection with the doctors and therapists. The patient describes in great

detail the past year, during which her pain steadily increased, and answers the therapist's questions concerning her life situation and important events of her life history that she believes may be connected with her suffering. Through skilled questioning by the therapist, a description of her pain emerges bit by bit: it shoots down from her lower back into her right leg and down to her toes. Ms Kurt characterizes it as "an extremely strong, mighty, and mean dragging pain, merciless, ice cold, and unpredictable, not exactly a dragging, but more like shooting from top to bottom, a laser ray, burning the flesh with its icy coldness."

Pain—Definition and Explanation

According to the definition of the International Association of the Study of Pain, pain is described as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage."²⁵ This definition does not distinguish between acute and chronic pain. It unties pain from the stimulus and enhances the subjective perspective of experience.

The pain sensation belongs to the elementary sensory-emotional capacities of the human being and its intensity, quality, and significance depend on various internal and external influences. Therefore, the common explanatory model of pain leans on a bio-psycho-social understanding of illness interconnecting physical, psychological, social, cultural, and spiritual dimensions. Each of these dimensions consists of several elements.

For the psychological dimension cognitive, affective, motivational, and behavioral aspects merit consideration. Perhaps the most obvious psychological distinction can be drawn between pain sensation that is the specific sensory quality usually connected with an affective response and perception of pain as an object by a conscious self. Consequently it may also be necessary to distinguish between behavioral expression of pain and talking about the pain experience, the "pain description" in a broad sense.

These distinctions lead to questions concerning brain activities involved and questions concerning the relationship between body and mind or brain activity and consciousness. A systematic bibliography of this huge field, in which researchers in the empirical human sciences as well as philosophers have partaken, cannot be given here. Overviews can be found compiled by Metzinger (until 2004)²⁶ or Chalmers and Bourget.²⁷ They unfold quite diverse neurophysiologic theses concerning the entities under discussion; these range from strict dualism to physicalistic theories of identity each with their own and very far-reaching consequences for the conception of the human being, for his or her self-consciousness, freedom of will, and especially for the enigma of pain.²⁸

No matter how the functional and representational brain processes relate to each other, it can be presumed both being potentially involved in the neurophysiologic processing of pain as well as in treatment procedures. Consequently the terms I have mentioned above are linked to the pain phenomenon as 2 distinct pairs: From the subjective or "first-person"

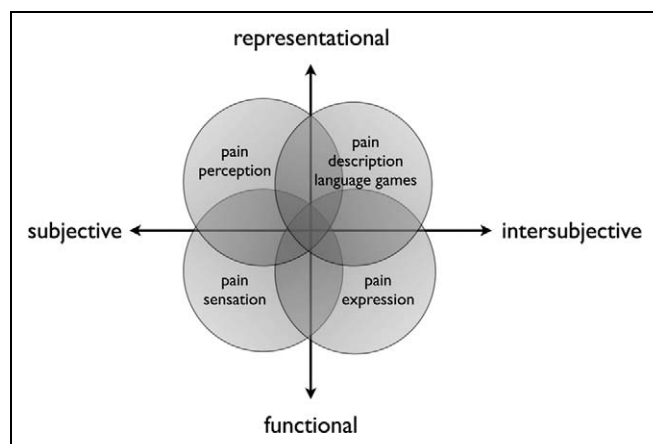


Figure 1. Overlapping processes connected to the pain phenomenon

perspective: pain sensation (functional) and pain perception (representational), and from intersubjective or “third-person” perspective: pain expression (functional) and pain description (representational). Figure 1 illustrates the 4 overlapping processes connected to the pain phenomenon.

Operating with this basic assumption of potentially functional and potentially representational brain processes, one can describe and theoretically explain music-imaginative pain treatment within both the neurophysiologic and the philosophic-psychological perspectives without the urge to define the relation between different brain processes and to answer questions such as are functional and representational brain processes parallel, do they merge into one another, are they interactive, or are they identical?

Pain and Subjectivity

For a person who feels pain, pain is something that is evident, present, and at the same time intangible. Although there can be no error about its presence, not all qualities of pain are equally felt. It is a rather diffuse sensation, similar to the case of “feeling” and—even more so—the notion of “thought.” In a process of watchful monitoring and conscious reflection, specific sensory, emotional, mental, social characteristics of a particular pain experience must first be identified.

The phenomenon of pain is usually not experienced as representational content, although this may at times prove to be the case. The thoughts, which occur in the course of the pain-identification processes, are typically understood as cognitive constructs. However, before any act of identification takes place, pain is endowed with the feeling of having, which is immediately followed by the thought of not wanting. Yet this most elementary representational structure that is relating to pain as an object, is incorporated in the corporal sense of self.²⁹

Pain subsides if it is abreacted in a manner appropriate for the individual and the situation. In case of chronic pain, the degree of flexibility and autonomy in reacting to pain is extremely limited because of various interconnections and feedback loops between the pain experience and physical,

psychological, social, and other dimensions and because of repeated experiences of helplessness. The distressful experience that the affective-sensory pain sensation cannot be influenced has the consequence that the otherwise very subtle background of corporal experience remains in the foreground and the phenomenological presence of corporal self-awareness is focussed on 1 point.^{iv}

Pain and Intersubjectivity

From a third-person perspective, it is not possible to say exactly what pain in general is, although it is clear that everybody has experienced it, nor can one be completely sure about the intensity and the unpleasantness of pain in another person. Although there are various validated assessment tools (questionnaires, scales) and increasing knowledge in which parts of the brain pain is processed and although there is such a thing as pain behavior,^v in other words what makes pain as an internal experience externally visible, such as a squirming body, a grimacing face, a cry (of pain), or verbal declarations, there is no direct evidence for its presence.

As psychotherapeutically informed music therapists we are accustomed to operating with terms such as clinical understanding, empathy, identification, countertransference, or musical participation.^{vi} But from an epistemological perspective we have to admit that we can never be completely sure if our judgment of the pain or the internal states of the other is really true or not. This, however, is a negligible line of thought, because it presupposes that our judgments about the internal states of other subjects have any empirical substance at all.^{30(p208)} Still, it does make sense in that it helps us to pose a much more fundamental question, namely what are the prerequisites that would make possible empirically valid judgments about the internal states of other subjects? Ludwig Wittgenstein,³¹ who developed his theory of knowledge partially on the basis of the pain phenomenon, assumes that no sufficient criteria exist that would allow a judgment about the presence and quality of pain in another person, but what can be observed is how the word “pain” is used by him or her. In representing pain verbally or in our case musically there is always a fundamental elasticity, an inherent vagueness, which Wittgenstein claims is also characteristic of all other “language games.”

Speaking about pain does not begin with the assignment of criteria and signs to the fact of pain; rather it already commences in preverbal interaction, in talking to and with another per se. Thus, the language game is embedded in a practice that is not a practice of cognition and judgment, but essentially a practice of emotional responding. The pre-verbal experience of pain expression begins at birth and reverts back to the cry of pain, which Wittgenstein does not simply assume to be a natural physical expression. Rather he believes that the cry, depending on the context and usage, can be part of the language game, for example, the complaint. “But here is the problem: a cry, which cannot be called a description, which is more primitive than any description, for all that serves as a description of the inner life. A cry is not a description. But there are

transitions.³¹(§189) This statement is relevant because music therapists quite often use the argument that the immediacy, authenticity, and naturalness of the sound (as a substitute for the voice) are decisive for understanding in therapy. Here, Wittgenstein would disagree with music therapists. He believes that the basis for understanding is not the expression, but the description of pain, although he does allow for transitions.

Perspectives of Music-Imaginative Pain Treatment

Music-Imaginative Pain Treatment (Entrainment)

Music-imaginative pain treatment originates^{vii} from entrainment^{1,22,32,33} that concentrates on the treatment of a symptom within the entire bio-psycho-social context of an individual³⁴ and—in particular—on the subjective experiencing of the patient including intensive psychological processes of entering, confronting, exploring, and reflecting the pain. Therefore only a qualified and specialized music therapist with profound musical and psychotherapeutic skills is capable to accompany and support the patient.^{viii} In principle, music-imaginative pain treatment can be applied to all kinds of pain, but patients should be physically and mentally stable. Contraindications depend on context or conditions. Some German music therapists have reported positive experiences even with patients with trauma or other severe mental health problems under inpatient conditions.

Music-imaginative pain treatment is carried out as individual therapy in a room equipped with a variable set of instruments. Generally it lasts at least 2 to 3 sessions and consists of 4 phases:

- extensive interview regarding the pain with indications for treatment and formulation of the contract,
- composition^{ix} of a so-called pain music and a so-called relief music or healing music,
- application phase when the composed music is played to the patient, and
- appraisal and reflective discussion. (If necessary, therapist and patient mutually agree upon further treatment phases depending on the specific case.)

Vignette (Part II)

After the pain interview Ms Kurt is asked to imagine her pain as music (instrument, tone color, dynamics, pulse, rhythm, pitch), and the therapist attempts to realize this music step by step, until the appropriate music is found. Ms Kurt chooses a dreadful sound on the cymbals, which is produced by scraping over it with a metal rod. Following this, the next step is to imagine music, which could alleviate the pain and Ms Kurt has an association of something flowing, something sparkling and first thought of the glockenspiel. However, to Ms Kurt's opinion it does not turn out to be the right choice. For the therapist, it is evident that Ms Kurt does not want to spend a lot of time

on searching for alternatives. Therefore, the therapist decides to talk about the question if the unfolding situation appears familiar to the patient, namely accepting quick solutions even if they were not optimal. Ms Kurt then describes a depressing situation in her marriage. The therapist asks whether there ever was something, which did her good, and Ms Kurt reports of a weekend at the ocean, which was connected with the memory of gushing rain during the night, and so she finally chooses the sound of the ocean drum for her relief music.

Following this Ms Kurt is invited to choose a comfortable sitting position while listening to her composition. However, this phase does not only entail the reception of the music pieces; here the patient also has the opportunity to control the session (beginning and end, tempo, dynamics). In the subsequent conversation with Ms Kurt she says that tears came to her eyes after having broken off the relief music. In answer to the question about her present pain, she says that it is still there, but she has a different kind of feeling about it. It is not as uncontrollable and alien as before; she can now feel it better. Patient and therapist make an appointment for a further session, in which the aftereffects of therapy are discussed and in which the patient expresses her wish to record the pain and the relief music on a cassette so that she can hear it at home.

Explanatory Approach to Music-Imaginative Pain Treatment

A basic anthropological assumption of music-imaginative pain treatment is that the human being requires a medium that enables a capacity to cope with what is experienced.³⁵ Working with a medium, which can be expressed in the outer world enriches behavior and actions through developing options, creating back references, and stimulating decisions. Therefore, it is the task of the therapist to create the prerequisites that provide the patients with a means to identify and reflect the sensory-affective pain sensation consciously and also to provide provisions for the partaking in a series of musical activities (exploring and composing sound events, attentive listening to and conducting musical performance) that can be understood as “language games” in the sense of Wittgenstein.^x Leaving the importance of the therapeutic relationship aside for the moment and taking up the idea of potentially functional and representational brain functions, it is possible to describe the composition and the performance of the composed music from 2 perspectives: on one side, as cross-modal processes (responsiveness to and execution of sound) and on the other side, as perception of the relation between pain and sound and an assignment of musical symbols to pain respite or relief. Figure 2 illustrates the involved processes relating sound events and pain experience.

Cross-Modal Processes Between Affective–Sensory Pain Experience and Auditory Music Experience

In the cross-modal processes between affective–sensory pain experience and auditory sound experience a specific perceptual

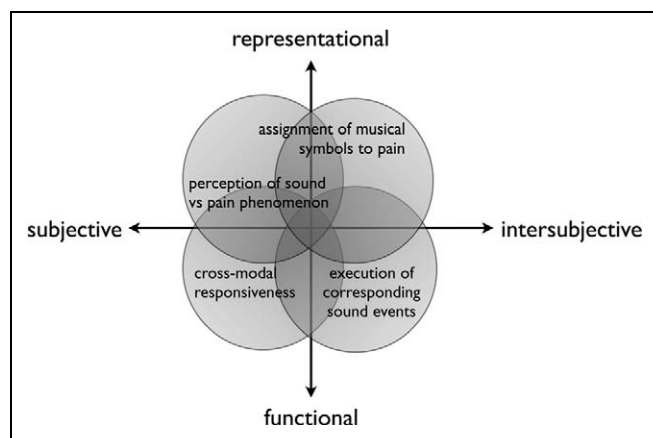


Figure 2. Processes relating sound events and pain experience

mode, which René Spitz described in the 1950s and called *coenaesthetic*³⁶ predominates. Contemporary infant research verifies Spitz's earlier insights. This world of *coenaesthetic* experiencing consists of different categories, which all relate to the body, for example, heaviness of the body, muscle tension, tension of inner organs, contact through the skin, through the body and the social environment, the rhythm of physiological processes, or the speed, duration, and dynamics of movements. The unseparated and cross-modally perceived elements are grasped as a kind of grand composition: types of states, moods, but also dynamic forms of movement^{xi} (eg, swelling, standing still, abruptly changing, disintegrating), in which the individual experiences himself or herself as alive. Interestingly there exist various sound qualities that are in a way similar to sensory pain qualities, for example, throbbing, grinding, sharp, or thumping, but also how pain is alleviated, for example, dissolving, fading, or sparkling.

Achieving the greatest possible correspondence between the receiving–perceiving of sound events (including sound production) and the affective–sensory pain sensation, the simplest and for economical reasons preferential mode of neurophysiologic operation is due to govern, which is that of synchronization. If this was correct, moving on toward the second music composition, being associated with imagination of pain relief, a process of neurophysiologic self-modeling via synchronization might be triggered. This means that in the end the perception of the music would have an effect upon the organization of perception (ie, the neuronal networks in the brain involved). Through the modification of the organization of perception, the object of perception, in this case pain, would be perceived differently. However such neurophysiologic processes are not to be understood as linear cause-and-effect relationships but instead as self-organizing processes in a complex network of neuronal structures, controlled by the interaction with the—in this case—acoustic external world. First neurophysiologic research results^{xii} underline this hypothesis. The positive influence of subjectively relevant (composed or preferred) music on the pain sensation, respectively, the relief of pain, compared to control conditions can also be proved.

Assignment of Musical Symbols to Pain

The same as in the afore-mentioned cross-modal transference processes, the identification of the pain serves as the starting point, however chosen sounds are not only embedded in sensory perception, they also enable the transition from perceptual responsiveness to the symbolic world, where “pain music” stands for pain, and “healing music” stands for relief or healing. This has the consequence that the representation (the music) and the represented (the pain) are not to be seen as one and the same. At this moment, it becomes clear that correspondence is only the idea that guides the attempt of representation in the composition and performance of the music, but the experience that no representation is perfectly adequate, ultimate, and definitive is as important. In music the nonpresentable is alluded to^{39(p90)} and the impossibility of presenting pain and healing musically is felt.

Thus, the work, here the pain music or relief music, is not really to be seen as an object, but rather as something composed or created as a process.^{40(p154)} In other words, since in the composition of and listening to the music the attention is focussed on the relationship between pain and music, a process occurs, which is to be understood as *synthetization*. The representation and the recognition of the difference between representation and object open up the potential space, and this in turn—as we already know from other psychic processes—enables the decisive turnaround toward the active. One must imagine this as an active yielding, opening up a possible space, where pain can appear differently than before the musical play with it.

Highlighting this line of theoretical thoughts: For the mental–emotional and most likely the neurophysiologic reorganization that are relevant for music-imaginative pain treatment, the element of difference also plays a role. The sensing of the—not very big—difference in the sensory–symbolic representation with music spurs cognitive–emotional processes, starting with identification, but also imagination, and especially interpretation (explanation and meaning) and reflection (understanding and processing).

Conclusion

Whereas on the one side the greatest possible correspondence between affective–sensory pain sensation and audio music sensation leading to the process of synchronization on the neurophysiologic level is to be considered the effective factor in music-imaginative pain treatment; on the other side there appears to be the creation of a potential space, which emanates from the difference between the representation and the represented object (pain respectively relief) opening up new *synthetizations*.

As stated above, neurosciences can only state the apparent antinomy between different brain processes but have not yet illustrated a means for integrating it. For music therapy however, there are alternatives to explain scientifically how music (ie, the reception, production, or reproduction of music) can be related to the bio-psycho-social processes, which imply the

relief of pain. My suggestion is to refer to a theory of aesthetic perception that could, rather than any psychological theory, serve as a platform for interdisciplinary discussion and research connected with music-imaginative pain treatment. In my search for an appropriate theoretical approach within the huge and inhomogeneous area of aesthetics, I found the aesthetic theory of appearance by the contemporary philosopher Martin Seel^{41(p146f)} who does not aim for a closed and completely documented system in terms of defining aesthetic objects but who proposes to differentiate processes of aesthetic perception in contrast to the empirical perception:

1. Aesthetic perception is distinguished by openness for the interaction of sensuous receiving-perceiving^{xiii} even there, where it is predominantly a single sense, with which the presence of objects is registered. For this reason, aesthetic perception is principally a synesthetic process, which is based on cross-modal perceptive ability.
2. Aesthetic perception is open for the immediate presence of the situation as it occurs. It understands each momentary constellation of constructions and events, on which it is focused.
3. Aesthetic perception is always open for an imaginary execution, continuation, and extension. In other words, for a sensuous imagination that charges the presence of the real and present object of interest with a realization of representational conditions.

An Attempt to Reformulate Music-Imaginative Pain Treatment Within an Aesthetic–Theoretical Framework

By requesting the patient to identify his or her pain, to describe it in words, and to represent it with sound, he or she is induced to step out of the pure affective-sensory feeling and not wanting to have, and enter an aesthetic perceptual set with regard to his or her pain. In doing this, an interaction of senses takes place, which otherwise would surely go by unnoticed in many day-to-day situations. However, here it becomes increasingly apparent: the patient feels himself or herself listening, feels himself or herself feeling, feels himself or herself imagining and creating. This feeling as such has as yet nothing to do with a reflexive self-referencing, although it can occur. It is a feeling of being aware of one's own presence, which accompanies the dwelling on the sensual particularity of something. Thus, the special presence of the object of perception, in this case, pain, music, or the imagination of relief, is bound to a special presence of the execution of this perception as well as to variations of this perception.

The aesthetic becoming aware of an object at first contrasts with other forms of consciousness, in particular with self-reflection. Nevertheless, at every point in time the patient knows that it is he or she himself or herself who identifies the pain, who composes the music, and who listens to it. It may be true that the attention is temporarily completely absorbed by the aesthetic perception of the pain and of the music, but the subtle background of self-experiencing, which extends into the

vegetative sphere, is not lost in the process and it can open itself up for knowledge and insight, interpretation, and meaning at any time.

An aesthetic-theoretical framework for music-imaginative pain treatment has consequences also for the therapeutic relationship. In the execution of the aesthetic experience, patient and therapist place in the background their knowledge about who they are and why they are who they are. They mutually share a sense for the here and now of their own life, as it is only accessible in the openness for the appearance of an object or a situation. The blazing up of indeterminateness in all what is theoretically and practically determinable and the awareness of unrealized or unused opportunities enable a shift by stirring the transitoriness of each and every presence, including that of pain.

Epilogue

Developing a 2-fold description could only be the starting point. In the end it might have become clear that from any theoretical perspective there remains a polyphony of dimensions, which crisscross and tend to recur again and again. Instead of regarding this as a weakness we should perhaps begin to accept this as a complex logic.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Notes

- i. But even Antonio Damasio, one of the neuroscientists music therapists often refer to, can be criticized for some too visionary theoretical assumptions in his latest publication “Self comes to mind” (2010), while sustainable definitions of “mind” or “self” are missing.⁴²
- ii. Personal data have been anonymised.
- iii. As in this article, the first person perspective of the pain experience is focused. I abstain from verification by objective data concerning previous pain assessments, treatment procedures, and contextual frame.
- iv. Surely it is a matter of interest and of future research to draw finer distinctions between acute and chronic pain, also between deep and surface pain.
- v. Pain behavior too is learned and is based on cultural convention and social agreement.
- vi. In order to complement this European-centric view in some ways I would like to mention some evidence from the shamanistic tradition indicating that through altered states of consciousness it is possible to take on the pain of another person, seemingly in the literal—not the symbolic—sense of the word.

- vii. The change toward the German denotation has been interrelated with the theoretical reflexion presented in this article, building a sustainable fundament for various research projects in the future.
- viii. Since 2011 a postgraduate training program has existed at the University of Applied Sciences Magdeburg–Stendal (http://www.hs-magdeburg.de/fachbereiche/f-sgw/Weiterbildung/Musik_therapeutische_Schmerzbehandlung).
- ix. In English publications often called “improvisation.”
- x. Subsuming music and verbal language under this term does not mean to equate them.
- xi. Stern calls these phenomena forms of vitality.¹⁰ From the musicologist’s side, the “contour theory” by Kivy³⁷ can be mentioned.
- xii. Publication in preparation; prepublication of this interdisciplinary research project see Metzner et al.³⁸
- xiii. Term: Heidegger’s distinctive use of “Vernehmen” is aptly captured by the translation “receiving–perceiving.”

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Bio

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