

Interpretation and Investigation of Musical Attitudes in Music Therapy among Teacher Training Students

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Abstract

In this study, we examine elements of the relationship towards music in terms of music therapy among teacher training students. We analyze this through considerations of musical intensity and activity, various music-related experiences and our perception of surrounding sounds. In the theoretical background and in the interpretation of the results we look at different points relating to therapy and pedagogy. A self-developed questionnaire was used in the methodology. Students had to mark the most characteristic form of musical intensity and activity, musical experience, and the surrounding sound world in pre-defined response categories. Our personal sample came from students specializing in music and natural sciences. According to the results, the characteristics of the depth musical attitudes – in terms of musical intensity and activity, musical experience and management of the surrounding sound world – appeared in balanced proportions, both for the musicians and for the real students groups. Our results support the music therapy theory that states that music therapy offers musical activities to participants in a different mode and form, with a wider set of tools and sounds, in more complex ways than music pedagogy or if we simply enjoy the arts. And it teaches broader interpretations of musical experiences through one's personal life.

Keywords: music therapy; music experience; musical instruments; music pedagogy

Subject-Affiliation in New CEEOL: Social Sciences – Education – School Education

DOI: 10.36007/eruedu.2021.3.014-025

In this study we attempt to examine the interpretation and appearance which our relation to music creates during music therapy sessions. Based on (Szabadi 2021, 161) national and international analyses about music therapy (see e.g. Lorz 1984, 95–113; Vértés 2010, 90–95; Vist 2011, 277–290) do not specify or link specifically to this phenomenon. Therefore, based on categories applied in music psychology, sociology and studies of music transfer (see e.g. Hunt– Legge 2015, 142–161) we may walk around and call it *musical attitudes in music therapy*. But what is this? It could be the effect of one human who plays music and then the basic elements of music which catalyze each other. We can analyze all this by considering musical intensity and activity, our music experiences and the perception of the sounds surrounding us in ambient ways (Szabadi 2021, 161).

1. The framework of musical attitudes in music therapy

To examine the concept we have developed, we must first distinguish between the musical effects and manifestations that occur in music therapy and music pedagogy and those in average artistic enjoyment. Music is actually a tool in music therapy and not the goal as in professional musical interpretation or musical recreation. Music is a moderator. It acts as a mediator in therapy, namely it catalyzes our experiences. It enhances the impact and deepens the experiences, because musical elements are able to elicit a spiritual and physiological effect in the human psyche. So, in order to moderate and shape the experience, therapists need to have a non-directive attitude. This is the reason why the nature and quality of the personal relationship between the therapist and the participant in such therapy is as important as the relationship between music itself and listeners and individuals. Thanks to this connection, the experienced feelings and the individual's musical production become central elements of the knowledge gained in therapy. This makes the participant in such therapy part of the creative events and feelings. For this, the musical components and the musical instruments provide the framework of the therapy, also the means of communication, which can be combined with further developmental practices (Kemper-Danhauer 2005, 282–285; Szabadi 2021, 161–167).

The practical appearance and role of music in therapy can take place in receptive and active forms. Such methods involve interpersonal (between individuals) and intrapsychic (in person) conflict resolution or the practicing of desirable behavior in dramatic form. This can be consciously moderated by the therapist by raising awareness and interpreting and then processing the experiences brought to the surface by the music for different purposes. These purposes can be social, cognitive or emotional in nature.

Trends in music therapy can be linked to various noted trends in psychotherapy. The analytical trend examines the unconscious experience-related contents that have surfaced as a result of musical experience through awareness and analysis. Behavior-centered direction tries to achieve behavioral change in a positive way by way of music and various dramatic games; and the social-psychological trend focuses on communication with the help of musical components (Pellitteri 2000, 379–391; Konta 2010, 233–247; Szabadi 2021, 161–167).

In the approach of Csépe (2017, 83–88) the receptive form builds on how we listen to music. The sound experience is at the center of this form and process. In the active form, singing and playing an instrument applied in the framework of the therapy is at the center of the interventional application (developmental musical practices). Referring to the neurological basis, the effect of the receptive form enables catalytic brain processes which alert the executing system contributing to the reduction of anxiety. But mostly one's instrumental ability has been proven to affect brain structure and operational processes. For example, it has an influence on the entire cortical network, on the area of the frontal lobe responsible for attention-executive functions, and on the areas of the cortex that provide connections between the two brain hemispheres. The structure and function of auditory perception

and cortical areas that determine motor functions are transformed. Specifically, the volume of the segments of the corpus callosum connecting the areas of detection and motion is duly changed. In addition to cerebral plasticity (formability), the reason for this transfer is the same functional property of overlapping neural networks.

The brain plasticity created by musical experiences is not only possible because music can shape the brain's motor network, but it can also influence neuro-hormonal status. An example could be an increase in serotonin and dopamine levels leading to feelings of reward and joy, altering the components of the limbic system (the subortebraal nerve center responsible for regulating emotions and memories) and the amygdala (limbic area responsible for the content of emotions and memories). Due to neuro-hormonal changes, movement, sound, and emotional contents that arise in or result from such therapy, reinforce, authenticate, and enhance the subject of the communication and the interaction (Csépe 2017, 83–88; Kemper-Danhauer 2005, 282–285, Szabadi 2021, 161–167).

2. The musical dimensions that appear in therapy

Musical intensity is defined as the temperature of one's relationship to music. It can manifest itself in its necessity, awareness, degree and also the quantity of its absence. It plays a role in how much we feel the need to connect with music, and with different sounds on a daily basis. It is a work of chance or a conscious choice if we deal with different sounds. It is worth considering how much we experience the lack of it if we do not consciously expose ourselves to music (Losonczy 1964, 257–266; Losonczy 1969, 220–229; Szabadi 2021, 161–167)?

Musical activity can be manifested in therapy, from the interpretations and performances of various pieces of music to any kind of sound creation, making a sound (making noise, generation of noise), listening to music, listening to sounds. Its elements are the love, the habits, the aptitude, the manner and occasion of different sounds around us. To achieve this in practice, therapy offers the active and receptive forms (Luck et al 2008, 25–45; Szabadi 2021, 161–167).

Active form means improvisation. It is a creative action performed with others that offers a complex opportunity for self-expression, where music is an auxiliary function rather than a central factor. Improvisation requires both creative self-assertion and accepting attention. It also includes individual activity and group participation. In fact, improvisation in music therapy is a social and interpersonal interaction that also carries the elements of individual expression. The therapist's task is to awaken the creative and playful instincts of the participants engaged in the therapy with the help of basic (even archaic) instruments. The aim is to jointly understand the "revelation" offered by this musical game; because music and non-verbal communication appear together in an improvisational situation, the expression of which is driven by our emotions and memories. This is why the psychic content of such activities is important, as they are not related to our musical skills and knowledge, but to our emotional and cognitive functions. At the center of these deep psychological processes is the use of musical sounds for creative self-expression.

A practical example of this is the impulsivity control arising from the psychic effects of improvisation, to which a musical element can be attached, such as rhythm and measurement. This could be in the form of sounds on acoustic instruments, human voices (animal and body sounds) or electronic devices.

In practice, we can sing or play on a melodic or rhythmic instrument, in a way which is not characterized by musical rules, but primarily by emotional expression. This means the improvisation in therapy is uncontrolled sound production without musical guidelines, where the emphasis is on the relationship between emotional experience and musical elements. So such improvisation is an intensive framework for non-verbal interaction which has a natural form.

In addition to the communication aspect of music, another important feature is the temporality, which in music therapy improvisation is related not only to language but also to physical movement. That is, in addition to the time aspect, improvisation is also characterized by spatial appearance (Luck et al 2008, 25–45; Kemper–Danhauer 2005, 282–285; Szabadi 2021, 161–167).

Receptive form of music therapy builds on the emotional style and impact of the individual effect of music choice. The intimate atmosphere created by this effect contributes to the formation of the therapeutic relationship. That is, it builds trust between the therapist and the participant. Influencing factors may include musical taste, which is an expectation formed through prior musical experiences. Because often music with the same aesthetic value can perform different functions, but sometimes works with different aesthetic value, can also have the same function.

Taste is driven by the following issues: liking, dislike, choice and rejection, compliance and non-compliance. These can be shaped by our musical preferences when our current mood is the determining factor in our music choices. The spontaneous choice elements required for this are based on psychical aptitude and basic musical experiences. Because the sounds experienced there has a reassuring and secure power factors that develop or inhibit this are influenced by social, micro-, and macro-social environmental impacts.

But primarily our taste, our awareness and improved skills determine the choice of music, which can be based on our social situation, upbringing and education. In summary, the symbol systems, values and habits formed independently form the nature of individual retention or transform and further influence the currently moving musical currents or fashion phenomena that bring together the spontaneous and conscious elements that lead to our selection of music (Luck et al 2008, 25–45; Kemper–Danhauer 2005, Szabadi 2021, 161–167).

The methodology of therapy based on listening to music was developed by Bonny (2010, 3–5) and it is called the Guided Imagery and Music technique. In this, the therapist gives imaginative instructions to the participants before listening to music. For example, while listening to music, they should paint a picture in their minds, which can be subjected to deep psychological analysis as a symbol after listening to the resulting music. So the goal is to use music to explore our inner world. By choosing music, we evoke our sensory and emotional memories and experiences in the form of images, symbols and feelings. A closed eye or a comfortable location while listening to music can help to achieve the necessary rel

axed state. In summary, receptive therapy is actually a psychodynamic and multimodal therapy that uses music to stimulate the imagination. It includes verbal and non-verbal communication elements, relaxation, moves our attention and concentration skills and it is also a musical program (Szabadi 2021, 161–167).

In the present context, such *musical experience* is interpreted as a complex psycho-physiological and aesthetic experience that includes emotional, cognitive and sensory components; because to gain a deep experience, it is necessary to hear, feel, move, coordinate, remember, assume and anticipate at the same time (Altenmüller-Schlaug 2013, 5–13).

Music can psychologically express and reflect what we feel. It can confront us with not only positive but also negative memories, feelings and moods. Thanks to its effect, we can also experience deep insights into our feelings on different levels.

The main brain areas involved in neurological processing of musical experiences are the cerebral cortex, forehead and temporal lobe, and cerebellum. The cerebral cortex is a repository of complex multi- and somatosensory information. The frontal lobe is the area relating to functions that determine attention, control and planning, and motor readiness, and is responsible for organizing auditory and motor information. This area can be associated with the empathy and imitation required for the emotional expression detailed above and musical experience. The temporal lobe offers storage to complex sensory experiences. This is where the senses of seeing, hearing and touch come together into a typical musical experience. It is mainly the lower and upper surfaces of the temporal lobe, the inner temporal lobe, and the amygdala, the hippocampus and the middle brain that are involved in generating the individual motivation to perceive, hear, interpret and make music. The cerebellum plays a role in motor coordination, which can be linked to the musical elements, for example the rhythm, playing in time and movement synchronization in the playing of a musical instrument (Altenmüller-Schlaug 2013, 5–13).

The *sounds of the environment*: all musical sounds, other noises, the sounds of nature etc. are constant elements of our daily lives. As we perceive, interpret, and select between them, they are able to elicit different psychological reactions. For example, a fire-truck siren can trigger fear, irritation, crying, or even empathy. Or a well-known song on the radio that evokes good memories can evoke joy or nostalgia and a sense of security. Related to this, this aspect of therapy can govern which psychological and physiological effects are elicited by different sounds in participants. In practice, it also examines the cause and origin of the psycho-physiological effects that occur and raises awareness in participants of therapy (Brugnes-Avigne 2003, 816; Losonczy 1964, 257–266; Losonczy 1969, 220–229; Szabadi 2021, 161–167).

Sound-related physiological sensations are caused by sound vibrations amplified naturally by the ear and hearing sense. Perception is the biological foundation of brain processes during musical perception. We are built to organize, systematize, group, and interpret sensory information. In the case of sounds, we do this as a unified whole, not on the basis of separate physical characteristics (Asztalos 2016, 18–38).

Briefly, acoustic physics tells us that sound is caused by the vibration of particles in an object or substance. The states of the vibration process are repeated periodically. The vibration of musical sounds is periodic, and that of noise is not. The latter (non-periodical) is preferred and used in the methodology of therapy.

During therapy, sounds are sensed according to *volume*, pitch, and duration. How strong a sound is depends on the intensity and frequency of the sound wave (the number of vibrations per second. *The pitch* plays a role in musical sounds that contain periodic vibrations. It is related to its fundamental frequency. The *duration* is important too because the sounds that surround us can usually be linked to time-limited events, and sounds need to be of sufficient duration for us to react to. Temporality plays a crucial role in the interpretation of the sounds of natural rhythms, etc... As they have a beginning, a path, and an end as the dynamics of spiritual life. That is why and how sounds can map our emotions (Tarnóczy 1982; Szabadi 2021, 161–167).

According to some (Asztalos 2016, 18–38), musical perception affects emotions while activating the autonomic nervous system and the hormonal system. This is based on the decoding of acoustic information. However, musical information is so complex that our hearing system groups it during decoding in complex ways. These musical characteristics also extend to the simple, physical, and multidimensional properties (e.g. frequency, amplitude, pitch, tone, temporality, spatial location, or the interval, the rhythm, the music structure). Besides this, the steps needed to group the complex audit information are the following. 1. Organizing acoustic information into a musical wave experience, 2. Linking the listening experience to a musical process and 3. Organizing musical processes into a musical unit. From this perspective, the meaning of musical unity makes it essential to such therapy (Szabadi 2021, 161–167).

Hence, processing the meaning of musical processes is at the heart of therapy. So, music acts as an important means of communication. Based on (Koelsch 2012) (Asztalos 2016, 18–38) we can identify three main groups of musical information: extra-musical, intra-musical, and 'muzikogenik'. Extra-musical information is based on matching a musical signal with non-musical content, which can be pictorial, indexical or symbolic. In an intra-musical report, information is derived from the matching of two musical structural elements. The third group, the 'muzikogenik' relates to how we respond e.g. emotionally or via personality-dependent responses (e.g. physical processes, such as movement). These three are split into sub-categories in therapy and the whole gives meaning to their individual meaning during oral processing.

According to Asztalos (2016, 18–38), neuropsychological models of musical meaning processing (see Koelsch 2012) testify that even with the autonomy of sound perception, the brain areas responsible for music processing are connected to other areas of auditory processing and with further cognitive areas, affective responses, and also with psychomotor processing areas that justify the neurological basis of musical transfer effect within therapy.

In summary, music is a catalyst during therapy, a tool to enhance experiences. The use of instruments that appear in the therapy is not tied to the musical profession,

so they can be used and accessed by anyone. With their help, the therapist creates a safe atmosphere and consciously shapes the processing of the experiences in accordance with the nature of the developed goals. The physical parameters of the sounds used in therapy are wider than those of the classical instrument set, so their perception therefore requires a variety of groupings. Their neurological processing makes the musical transfer effect understandable and intense within the therapy.

3. An examination of the musical attitudes in music therapy

3.1. Sample

Our study sample included 64 first, second and third grade trainee teachers in Csongrád County (Hungary). Our selection criterion was that these students had not to have engaged previously with music therapy training or other training with any similar mechanism. Respectively, the same methodological-curriculum program and the same annual university routine were also emphasized. I asked about the ones listed at the beginning and end of the questionnaire line. I was looking for students from the fields of music and natural sciences, humanities and music, as the use and impact of music therapy tools is independent from professions and specialities and also from the average experience of enjoying arts. Students volunteered to fill this out in all cases. The distribution of the sample by sex, major and grade is shown in Table 1.

Men	Women	Music major	Natural sciences major	1st grade	2nd grade	3rd grade
30	34	31	33	23	20	21

Table 1. Distribution of the test measurement sample by sex, major and grade

3.2. The questionnaire and the evaluation system

The self-developed questionnaire explores the depth of students' attitudes towards music therapy through twenty closed questions. The students had to mark the most characteristic manifestations of musical intensity and activity, their musical experience and the perception of the surrounding sound world through self-characterization and through pre-established response categories. The definitions of these categories give the meanings of the musical elements in relation to music therapy, about which the students were given accurate information during the completion process. Their responses mostly indicated advanced, deepened musical relationships, and these were expressed as a percentage, and the degree of correlation between the two groups (humanities and musical sub-sample) was examined using the Krippendorff- α index.

According to the goodness/good match indicators of the questionnaire, their musical attitude in music therapy was independent from the students' specialization ($\chi^2 \geq 0.04$, $p > 0.05$; Cramer- $v \geq 0.10$). It was stable over time (Cronbach- $\kappa \geq 0.87$, %

= 90). Also: independent from an external criteria (perceived, durable, negative musical experience) ($\chi^2 \geq 12.5$, $p < 0.01$; Cramer- $v \geq 0.69$), also: internal consistency ($\chi^2 \geq 18.1$, $p < 0.01$; Cramer- $V \geq 0.66$). Compared to other methods already in use that measure similar musical construct [For example: the Musical data sheet (Lósonczy 1969), Aesthetic Judgment Test (Kyme 1954)] we found two notable characteristics: (1) The personal characteristics of the habit of singing and listening to music should be indicated by the person, *as in our method*, and (2) professional musical tests require instrumental improvisation and aesthetic judgment from the person. These presuppose musical knowledge, musical skills and abilities that are not included in our case.

3.3. Results of the study

musical intensity		
elements	music group	real group
need	20.7 %	22.7 %
awareness	16.7 %	18.2 %
choice	20.8 %	19.2 %
degree of absence	15.1 %	16.7 %
amount	21.8 %	22.7 %

Note: * Krippendorff- $\alpha = 0.91 - 1.00$

Table 2: Results of advanced manifestation of musical intensity (in % values)

The choice and necessity of *musical intensity* showed the greatest degree, and the degree of its absence showed the least degree of deepened, advanced musical attitude. The degree of correlation between the two groups (musical and humanities) (Krippendorff- $\alpha \geq 0.91$) is very high, so there is no significant difference between the students of the two majors in terms of musical intensity.

Based on the answers related to immersion, a higher percentage of students feel the need for a daily musical routine, for example any kind of sound creation, sound making. This can include playing musical instruments, making noise creatively or otherwise, playing with body sounds, applause, finger clicking, or playing with animated sounds, growling, sighing, etc. The framework of music, for example the way, environment, atmosphere and means of sound production (such as musical instruments and noise-making devices) are increasingly being chosen more consciously and intelligently. Individuals also pay more attention to the amount and duration of the music. If this is not met, they will increasingly feel the lack of it and

take action against it.

The above can be accomplished within music pedagogy via an alternative form of practicing a piece. For example, trying out different sound effects when creating the right sound.

musical activity		
elements	music group	real group
love	6.1 %	16.7 %
habit	12.3 %	13.6 %
knowledge	13.3 %	12.5 %
way	8.9 %	9.1 %
occasion	17.5 %	18.2 %

Note: * Krippendorff- α = 0.91 – 1.00

Table 3: Results of advanced manifestation of musical activity (in % values)

In the case of *musical activity*, its love-factor and occasion are the critical factors, and its habit, knowledge and manner refer the least to a deep, advanced musical relationship. The answers received suggest that students love musicality in larger numbers and consciously create opportunities for singing and making music. The way (organizing one's own music activity and managing/using musical instruments) and the habit (individual characteristics of sound production) were given a broader framework in as much as they enrich and give a different character to individuals' musical knowledge and personal assessment of their talents. Hence, we do not focus so much on musical skills and abilities or musical knowledge, but we also take into account other non-musical aspects, which may give rise to a different kind of sound motivation.

Within a class, for example, the forms of movement needed to perform a given music piece can be created in a creative way. These are often detached from the instrument, involving individual movements, spatially extending activities in the classroom during practice.

musical experience		
elements	music group	real group
expression	15.6 %	16.7 %
negative experience	17.7 %	18.2 %
cathartic effect	24.6 %	25.0 %
levels	10.3 %	9.1 %

Note: * Krippendorff- α = 0.91 – 1.00

Table 4: The music experience advanced/experiencing the results (in % of value)

In terms of the *musical experience*, the observed treatment of a negative musical experience, the cathartic effect of music, and the expressive power of music suggest deep musical relationships. Also the psycho-physiological levels of the

musical experience showed the least in-depth, advanced musical attitudes in our sample. And the psycho-physiological levels of the musical experience showed the least in-depth, advanced musical attitudes. These elements can also give personal meaning to these experiences. In the case of the latter, the experiences which may be shocking and frustrating them are treated in their place, after which individuals find their usual and proven musical habits. At the same time, their psycho-physiological reaction to music deepens, i.e. they are able to relax and exclude events from the outside world as well as their own intrusive or disturbing thoughts. The degree of correlation between the two groups (musical and humanities) Krippendorff- $\alpha \geq 0.91$ is very high, so there is no significant difference in the treatment of the musical experience of the students of the two majors.

In connection with a musical piece, we can talk to our student about the personal meaning of the piece and place it in his/her life story.

perception of the surrounding sound world		
elements	music group	real group
detection	16.6 %	16.7 %
awareness	17.8 %	18.2 %
love	25.6 %	25.0 %
indifference	8.3 %	9.1 %

Note: * Krippendorff- $\alpha = 0.91 - 1.00$

Table 5: Advanced surrounding sounding treatment results (in% value)

In the context of conscious management of the *surrounding sound world*, depth responses suggest that students are increasingly able to rule out sound effects that disturb them and thus better focus on their inner world. They are able to sort and group the pleasant and unpleasant, important and neutral ambient sounds for themselves. That is, they are aware of and deal with natural sounds, musical, soft melodies, machine and monotonous noises. They give a personal reason and meaning to everything sonic. Especially paying attention to the nature of silence, and memorizing and naming different sounds – these lead to advanced musical relationship. The degree of correlation between the two groups (musical and humanities) Krippendorff- $\alpha \geq 0.91$ is very high, so there is no significant difference in the sound management of the students of the two majors.

During the study of a music piece, we can name the sounds and dynamic characteristics that a piece contains according to the intention of the composer. And then we can relate these to ambient sounds.

4. Summary

Summarizing the full results, the characteristics of the 'depth musical' attitudes – in terms of musical intensity and activity, musical experience and management of the surrounding sound world – appeared in equal, balanced proportions, both among musician and in the humanities groups. It is no coincidence, based on previous theoretical work (e.g. Missura 2005, 66–77), that music therapy works with a different system of goals and tools than music pedagogy which uses musical goals and methods. Our results support music therapy theory (e.g. Buzasi 2006; Wagner 2006 1–3; Wigram 2004). That is, music therapy offers musical activities, stimulation and opportunities to participants in a different mode and form, with a wider set of tools and beneficial sound complexity than music pedagogy or when we simply enjoy the arts. Also it teaches the interpretation of musical experiences through the story of personal life.

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