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BODILY MOVEMENT AS INSEPARABLE PART OF MUSICAL ACTIVITIES

Abstract

Bodily movement plays an important role in musical production, reproduction and perception. Musical performance is linked to expressive movement of the musician which co-influences the perception by the audience. The performer's movements and gestures, which the audience can see during the performance, function as a special communicational means and intensify the whole musical experience.

Research shows that musical performances which attract auditory and visual attention and intensify the listeners' focus cause in them physical, cognitive and emotional-experiential activities.

This paper dedicates particular attention to bodily movements and gestures in piano playing. In connection with holistic learning and musical activities, it highlights the paradigm of embodied music cognition and its place in Émile Jaques-Dalcroze's eurhythmics. In dealing with creative musical expression, it focuses on improvisation, while also pointing out the connection of musical movement with musicality.

Key words: musical activities, musical movement, embodied music cognition, creative musical expression, improvisation, musicality

Izveček

Telesni gib kot neločljivi del glasbenih dejavnosti

Telesni gib ima pomembno vlogo pri glasbeni produkciji, reprodukciji in percepciji. Glasbeno izvajanje je povezano z ekspresivno gibno izraznostjo glasbenika, ki sovpliva na glasbeno percepcijo poslušalcev. Telesni gibi in izvajačeve geste, ki jih poslušalci vidijo ob izvajanju, delujejo kot posebno komunikacijsko sredstvo in poglobljajo celostno glasbeno doživetje.

Raziskave kažejo, da glasbene izvedbe, ki pritegnejo slušno in vidno pozornost ter poglobljajo zbranost poslušalcev, pri njih povzročijo fiziološke, kognitivne in čustveno-doživljajske dejavnosti.

Prispevek namenja posebno pozornost telesnemu gibu in gestam pri pianističnem izvajanju. V povezavi s celostnim učenjem in glasbenimi dejavnostmi sta izpostavljeni paradigma utelešene glasbene kognicije in njena

razvidnost v evritmiji Émila Jaquesa-Dalcroza. Obravnava ustvarjalnega glasbenega izraza se osredinja na improvizacijo, izpostavljena pa je tudi povezanost glasbenega gibanja z muzikalnostjo.

Ključne besede: glasbene dejavnosti, telesni gib, utelešena glasbena kognicija, ustvarjalni glasbeni izraz, improvizacija, muzikalnost

Introduction

Recently, numerous branches of science, from philosophy, natural sciences, humanities, social sciences to arts, dedicate a lot of attention to the study of human body. Body is conceptualised through neurophysiological, cognitive, phenomenological, cultural and sociological aspects (Bresler, 2004). In music as well, there is an increasing interest in the role of the body and bodily movement in music production, reproduction and perception. It has become a forefront issue at international scientific conferences (e.g. 2013 EPTA conference¹ in Dusseldorf).

There are also more and more research studies dealing with the relationship between music and body, particularly in connection with the expressiveness of professional music performance. Music performance skills include bio-mechanical aspects of playing the music fluently, but coexist with expressive intentions manifested through bodily movements and facial expressions that permit the communication of musical intention or meaning (Davidson, 2012). Truslit (1938, as cited in Repp, 1993) states that music is expressively shaped with the help of the performer's body. Through objective measurements of acoustic signals, he found out that different movement curves (open, closed, winding movements) used by performers when they were playing short sections of music created differences in their musical products. Davidson (1993) claims that the performers move differently if they perform the same musical work with different expressive intentions. The greater the expression in the intention, the larger and broader are the movements and vice versa. In a study of movements of clarinetists, from beginners to professional players, Rodger (2010) showed that the amplitude of bodily movements in musical performance increased with better knowledge and acquaintance – i.e. with better defined expressive concepts – of the piece performed. Better technical skills also mean better movement control and expression of musical qualities. Wanderly (2002) studied connections between the quantity of movements and expressiveness in clarinetists. He found out that the majority of movements which are not necessary from the technical point of view are provoked by musical elements, prevailing phrase structure and meter. Influences of performers' movements to musical perception of the audience have also been proven (Davidson, 1993; Dahl, Friberg, 2007).

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So, music is a field in which human body is crucial for the research process, while at the same time representing a basis of knowing, cognition. Music is an important cognitive source not only in what it teaches us about metaphysical spheres of sensing, but above all in what it shows us on the deeply embodied and socially and culturally incorporated character of all human knowledge and existence. This presupposes inseparability of mind and body, material basis of cognition and necessity of bodily experience for all human knowledge (Bowman, 2004).

The term “embodied music cognition” represents an alternative to the historically established belief of separation of body and mind. The embodied approach to cognition presupposes that mental processes are inseparably connected with the body and that the essence needs to be looked for in our activities, not in abstract concepts or ideas, which was already established by phenomenology, the philosophical movement of the beginning of the 20th century represented by, among others, Edmund Husserl, Martin Heidegger, Maurice Merleau-Ponty. The purpose of the “embodiment paradigm” is to clarify that all human understanding has its roots in the way in which the body experiences the world (Bowman, 2004; Bresler, 2004; Pelinski, 2005). Musical understanding stems from the bodily feeling, experience. Embodied music cognition represents the indispensable role of the body in our musical experience.

Bodily Movement, Music Production, Reproduction and Perception

Even though bodily movement is an essential element of musical activity, in the western classical music tradition it is more or less disregarded. In his analysis of the “rituals” in a classical concert hall, Small (1998, as cited in Jensenius, 2007) states, that western classical music is surrounded by many rigid rules of conduct for both, performers and listeners. The audience is expected to sit still and listen, engaging in as little movement and expression of emotions as possible. The same is observed by Canetti (1962, in Bailey, 1992), who, comparing the conductor with the head of the police, says: ‘‘The immobility of the audience is as muchpart of the conductor’s design as the obedience of the orchestra. They are under a compulsion to keep still./.../ While he is conducting no-one may move and as soon as he finishes they must applaud. All their desire for movement, stimulated and heightened by the music, must be blanked up until the end of the work and must then break loose...’’ (1962, as cited in Bailey, 1992, p. 24).

However, music provokes physiological changes in people who are drawn to it, so that they are in a state of increased attention, awareness, interest, agitation. The electroencephalogram shows changes in the amplitude and frequency of the recorded brainwaves. In this state of musical excitement, the electrical resistance of the skin decreases (its conductance increases), the pupils dilate, breathing

becomes either faster or slower, blood pressure and pulse rate usually raise, muscle tonus increases. Electromiograph, which records the action potential of muscles, shows an increased activity of leg muscles while the subject listens to music, even if they are instructed not to move (Storr, 1992). The discovery of mirror neurons showed that we are able to understand and foresee the behaviour of others, using the same neuron areas that are used if we want to carry out that behaviour ourselves. So, if we see somebody grab an object with a hand, we activate the areas in our brains that control that movement. If we hear the sounds related to an activity performed by somebody else, we activate the relevant motor areas of our brains and if we observe emotional states of others, we can feel similar emotions and empathy (Molnar-Szakas et al., 2012). To listen always means to participate, be physically involved, as well.

In fact, a sound-related experience differs from a semiotic experience in its connection with the body, movement and activity (Bowman, 2004). Shepherd (1987, as cited in Bowman, 2004) explains, that musical tones enter the body and are sensed, felt and experienced inside the body in a way, that no other artistic or cultural medium offers. Sound – i.e. the way in which the tone touches the body – is the vibrating essence which allures the world of sound into motion, reminding us that we are alive, feeling and experiencing. One reason for the great influence that sound has on human body and experiencing seems to be the fact that already in the uterus we start experiencing and interpreting the world through sound.

The brain and the body are certainly deeply connected and the neuron system of production and perception connects us among each other. Bodily movement is an integral part not only of musical performance but of perception as well. This is important if we want to understand the various movements of musicians with different intentions, directed, among other, also towards the audience.

Bodily Movement and Gestures as Means of Communication

The most obvious aspect of the connection of western classical music with bodily movement is the production of tone on traditional acoustic instruments. Certain characteristics of movement will influence the pitch, timbre, intensity and duration of the tone, as well as the relationships between tones. However, musicians also move in a way which is not directly linked to the production of tone, but serves the purpose of communication. A study on speech (McNeill et al., 2002, as cited in Dahl, Friberg, 2007) revealed that speech and gestures derive from the same semantic source. Therefore, they are not subordinate to each other, but equally expressive. Given the fact that speech and music have a lot in common (Berkowitz, 2010; Juslin, Laukka, 2003), there is a high probability that the same principles apply to music (Dahl, Friberg, 2007).

In the text books we also often come across the term *gesture*, the definitions of which are various, but their common denominator is direct or indirect connection with human physical behaviour (Cadoz, Wanderley, 2000). According to the American philosopher S. Lange (1973, as cited in Kroflič, 1999, p.28), by linguistic definition this expression means an “expressive movement”, while expressiveness, in her opinion, has two meanings:

1. expression of one self in existing subjective conditions, what she calls “symptomatic expressive movement”,
2. logical expression in more or less factual conditions, what she calls “symbolic expressive movement”. A sign always functions as a symptom and as a symbol. Similarly to word, movement is either self-expressive (spontaneous), symbolically expressive, or both (Kroflič, 1999).

The term *musical gesture* in most cases denotes abstract musical characteristics which are not in direct connection with physical movement, while the term *performer’s gesture* relates to an instrumentalist’s technique. Performer’s gesture includes physical motions which are necessary for production of tone on a certain instrument, and also those movements which are integral part of musical performance, even though they might not be in direct connection with production of tone (Wanderley, 2002). Other authors call the former movement *instrumental gesture* (Cadoz, Wanderley, 2000) or *effective gesture* (Delalande, 1988, as cited in Cadoz, Wanderley, 2000), and the latter *ancillary gesture* (Wanderley, Depalle, 2004), *accompanist gesture* (Delalande, 1988, as cited in Jensenius, 2007) or *non-obvious gesture* (Wanderley, 2002). Davidson and Correia (2002) call the latter body language and point out four aspects of it that can be seen during musical performance:

1. communication with other performers,
2. individual interpretation of narrative or expressive/emotive musical elements,
3. performer’s own experience and behaviours,
4. interaction with or entertainment of the audience.

The audience perceives musical performance auditorily and visually. Davidson (1993) found out that the subjects of the study were equally successful in assessing the performer’s expressive intentions regardless of whether they listened, watched or both. Those without any music education did even better when they only watched than in the other two modes.

Bodily Movement and Gestures in Piano Playing

In a study of Glenn Gould's playing technique, François Delalande (1988, as cited in Cadoz, Wanderley, 2000) suggests a three-level division of the notion of *gesture*:

- *effective gesture*; necessary to mechanically produce the sound (e.g. *press a key*).
- *accompanist gesture*; body movements associated to effective gestures - chest, elbow movements, mimics, etc.). Delalande suggests that accompanist gestures should not be analyzed strictly from a motor control point of view - he considers that its function is as related to imagination as to the effective production of the sound.
- *figurative gesture – mental representation* (perception) without a clear correspondence to a physical movement, communicated only through tone (e.g. melodic balance).

The first two proposed levels correspond to physical actions of the instrumentalist, whilst the third is completely symbolic.

Jensenius (2007) divides bodily movements related to music into four functional categories:

1. *Sound producing actions* (as they are goal-directed, the author uses the term action instead of movement), that actually produce the sound. These are further subdivided into *actions of excitation* (e.g. pressing a key on the piano) and *modification* (e.g. using a piano pedal).
2. *Ancillary movements* are not directly involved in sound production but still have an important impact on the resultant sound. They can be *support* (e.g. pressing a piano key involves not only the finger, but also the hand, arm and upper body), *phrasing* (the performer bends forwards to accentuate a salient point in the melody) and *entertained movements* – movements synchronised with the music, accentuating musical features (e.g. tapping a foot, nodding the head or moving the whole upper body in synchrony with the music).
3. *Sound-accompanying movements* are not part of the sound-production, but rather follow qualities in the sound or music by *sound tracing* (e.g. tracing the melody of a song in the air with a hand) or *mimicking*.
4. *Communicative movements* are intended to be communicative; they may be performer–performer, performer–perceiver or endogenous types of communication. An example of endogenous communicative movements is the interpretation of Gould's movements as him conducting himself (Delalande, 1988, as cited in Jensenius, 2007).

The complex piano playing technique requires several skills. Coordination of the left and the right hand, feet (when using the pedals), sight and hearing is very

important. Fingers have to develop sensitivity and autonomy. It is necessary to know that there are no muscles in fingers. The muscles that control the fingers are mostly located in the lower part of the arm. Tendons spread out of these muscles and move the fingers. The straining of fingers causes tension in the forearms, which prevents free flow of energy into the hands. The consequences are fatigue, limited finger speed and poorer expressiveness. Tense neck and shoulders can also press the nerves leading to the arms, causing pain or torpidity in the arms. The tension in the arms is minimal when the fingers rest on the keys and the wrist is flexible, moving in synchrony with fingers. From the very beginning, an effective body posture has to combine strength, flexibility and the ability to relax the weight of the arm in order to produce a rich sound. Spatial awareness enables free playing, larger movements and performance of larger skips without watching the hands. This requires just the right input of energy in order to land on the right spot, with the right weight and freedom of movement which can involve only the forearm, the whole arm or the entire body. Free movement of shoulder blades enables a more free and accurate playing.

The body has to respond quickly to various visual, auditory and kinaesthetic instructions regarding the needs of music and the way it is experienced, but the energy used must not be excessive in order not to cause tension. Musicians are often not aware of how we use our bodies. It is even more difficult because of the emotional nature of music. Parts of brain responsible for processing emotions influence the body through two basic mechanisms:

1. Release of chemical molecules into blood; this affects various body parts,
2. Extending neuron activity to various brain centres and muscles.

Through these two mechanisms an emotional experience is connected to numerous physiological responses, from muscle contractions, changes in breathing and heart rhythm, changes in blood circulation, sweating (Trainor, Schmidt, 2003). In a wave of emotions we can tighten our arms, neck, back, preventing music from flowing freely through the body. It is important to resist these tendencies, and at the same time remain open to the plenitude of emotions. Intensive expression does not come by straining the physiological mechanism which produces sound, but by releasing this mechanism, so that it can function effectively. Keeping dynamic (not static) balance enables the body to easily respond to the requirements of music and the instrument at any moment. The aim is to have flexible spine and open chest. If the chest is open, the heart and the lungs have enough space for their operation, blood and oxygen circulation feed the body, improving its operation. So the vital energy of the heart, organs and glands becomes available for musical expression (Bruser, 1997).

The aim of performers' movements is to effectively and suitably express various musical qualities; at the same time the performers develop their own

personal, idiosyncratic movements in line with the conceptions they draw from their knowledge, experience, musical style, cultural and social environment, which is reflected in their musical and motor expression. Clarke (2012) states that physical actions in musical performance “lie” on an uninterrupted spectrum from ergonomics to choreography. Ergonomics means that performers try to produce sounds with comfortable movements, while, on the other side of the spectrum, the “choreography” of the performer’s movements represents a potentially strong and convincing way of communicating with the audience. It is difficult to determine, to what extent these movements are intentional, acquired or unconscious, or how much they influence expressiveness.

However, for the development of a musician it is necessary that the body learns the language of music through integration of its elements and develops the necessary skills to perform it, since the body is the source, instrument and basis of understanding.

Embodied Music Cognition – the Basis of Holistic Music Activity and Education

The body had an important role in many old philosophies and cultures. In Hinduism, the body leads to the freedom of mind. In the philosophy of yoga the connection of body and mind is crucial for the spiritual freedom. Body is the basic element of various Buddhist traditions and practices. Western philosophy and spirituality often ignored the body or even condemned it. Dewey (1929, as cited in Bresler, 2004) attributes a great deal of influence for this to Christianity which emphasises the dichotomy of body and soul, with the body being seen as earthly, lustful, passionate, corruptible, averting attention from the eternal, incorruptible spirit. Currently the notion of “embodiment” has been gaining recognition. It can be defined as integration of the physical or biological body and the phenomenological or experimental body into a network which includes thinking, sensing, feeling, acting and interaction with the World (Bresler, 2004). Based on the arguments of embodied phenomenology (Pelinski, 2005) and the evidence of cognitive neuroscience (Molnar-Szakas et al., 2012), music researchers have slowly been laying the foundations of the paradigm of embodied music cognition.

The idea that the soul differs from the body was strongly present already in the Ancient Greek philosophy, with Plato privileging the mind. The western culture used to comprehend the mind as the source of human superior achievements and overcoming the biological, bestial in the human being. In the western philosophy, Descartes strengthened the belief that the mental and physical spheres are separated and that only what the mind comprehends is reliable, while the senses and feelings are deceptive. However, French philosophers, influenced by Nietzsche, started emphasizing knowledge which originates directly in the body.

For Nietzsche the embodied form of mind, connected with passions, is much deeper than superficial rationality. Maurice Merleau-Ponty emphasises the importance of experience. According to him, all human knowledge springs up from physical roots. The mind is inseparably biological and embodied. All we know originates in the material and experiential world (Bowman, 2004).

According to the embodied cognition paradigm, the cognitive, sensory and motor processes are inseparably connected in us. Cognitive abilities develop on the basis of enhanced neural connections between the senses and the motor system. Therefore, the mind is not in the brain, but rather in the vast neural network, spread around the body, and it extends beyond the physical body into the social and cultural environment which influences the body and shapes human experience. Thus, the body and the culture are components of the mind (Bowman, 2004).

Findings in neuroscience show that all psychical processes involve chemical activities in the body. Therefore, the division into sensory, memory, cognitive, emotional and motivational processes, does not make sense, since all our perceptions, ideas, thoughts occur as relationships between molecules and as intercellular activities. In the core of all this are feelings which function in relation to what we experience as important for our psychical, physical and social survival. The main goal of our perception is survival, so senses which function impersonally are useless in terms of personal survival. This means that cognitive brain operations are emotionally coloured. The brain eliminates what is not emotionally coloured as not important for our lives, consequently also for processing, and it does not activate the motivation for acting or for a longer lasting attachment (Rebula, 2013).

Trainor and Schmidt (2003) found out that despite the fact, that in the modern world adults music does not evoke the same reactions as other emotional stimuli, there are many evidence proving that music activates the same cortical, subcortical and autonomous centres as emotions. They presume the reason behind this is that music activates crucial survival centres of the nervous system, even though it does not itself have a survival function in the evolution of child development and care. For a long period, children are helpless and depend on their carers. Emotional ties and communication are crucial for their survival. The carers use music for babies and “musical speech” for emotional communication before babies understand the language. When a loving mother talks to her baby, her voice assumes melodic, singing qualities. In this communication, words are not important, the melody is the message (Fernald, 1989, as cited in Trevarthen, 2012). Perhaps music preserves its survival role in adults as well, in the sense that it is an emotion-experiencing “exercise” containing no risks of the consequences of reactions to these emotions (Trainor, Schmidt 2003).

Whatever the case, emotions have an important role in music education. Music teachers have to bear in mind that musical thinking develops on the basis of experiencing and performing musical contents (Sicherl-Kafol, 2001). Emotions cannot be avoided in other educational areas either, as emotionally neutral education is not possible at all (Rebula, 2011). Everything we think and say is emotionally marked, and so are the cognitive operations of student's brains during a lesson. No entry into our memory can be emotionally neutral.

Music performance requires understanding of rhythm, melody, harmony, tempo, meter, dynamics, sound quality and quantity, phrasing, relations, clarity, style. This calls for holistic approach, uniting body and mind (Camp, 1992).

Lowen (1975) already points out that the educational process is still divided into mental and physical education, detached from one another. He says that we fill a child's head with information that cannot turn into knowledge without experience, which in turn is physical. Similarly, Gardner (1995) claims that there is no clear cut division between physical activities and thinking skills; it is about looking for balance between them. Since the end of 20th century researchers have been putting more and more emphasis on physical action and cognition through action in music education (Juntunen, 2004).

Émile Jaques-Dalcroze's Eurhythmics

Émile Jacques-Dalcroze was the founder of eurhythmics – a method integrating and enhancing the connection between body and mind through kinaesthetic awareness of musical activity. According to him, before meeting all the technical, emotional and intellectual requirements of music, a child should be acquainted with the whole variety of sounds of the selected instrument, e.g. piano. The ear controls the fingers. This acquaintance is possible if all musical aspects (rhythm, tempo, dynamics, etc.) are learned through movement (Vann, 2006).

Even though the topic of embodied music cognition is not well researched yet, Dalcroze's eurhythmics offers a practical example of learning music on the basis of physical experience. In eurhythmics, music is learned by researching, experiencing, analysing and creating in order to enhance connections between mind and body and communication between acting, thinking and feeling (Jacques-Dalcroze, 1915).

Dalcroze discovered ways to harmonise the sensory system, the emotional suggestive influence, memory and creative function (Schnebly-Black, Moore, 1992). However, in his approach, physical experience is not just a means of embodied cognition, but it is important on its own; the experience of moving according to music enrich human life (Juntunen, 2004).

Dalcroze's approach includes exercises which combine listening, movement, singing, thinking, improvisation, imagining – a variety of activities involving mind and body, aimed at researching a certain musical area, topic or phenomenon. In these exercises, the body is the instrument integrating music and bodily movement. There are no determined movements connected to a certain musical phenomenon. Students listen to music with and through movements which often reflect the musical tones they listen to or imagine (i.e. they listen with the so called "inner ear"; Juntunen, 2004). When movement becomes a reference for sound, the abstract concepts become concrete (Findlay, 1971), which is of great importance for children. Behaviour is inseparable from action; behaviour *is* action and always involves the body.

Improvisation as Embodied Type of Musical Performance

Improvisation is an extraordinary skill of human cognition. It is a very specialised case of general human behaviour: spontaneous combining of elements, based on certain rules, in order to create new sequences, suitable in a certain point of time and context (Berkowitz, 2010). Pressing (1987) describes the cognitive process necessary for musical improvisation as the ability of the improviser for a sensory and perceptive encoding in real time of performance, optimum attention distribution, interpretation of what is happening, decision taking, anticipation, memorising and recall, error correction, movement control and at the same time the ability to integrate all these processes into an optimally fluent series of musical statements which reflect a personal view of musical organisation and the ability to influence the audience. These are abstract components and it is difficult to verify how they actually function in an individual case (Clarke, 2012). Clarke also states that improvisation is a much more physical, embodied and socially situated type of musical performance as Pressing believes.

In his book *Ways of the Hand*, jazz pianist David Sudnow (2001) rejects the idea that only the central control in the brain "tells" the body where to go and what to do and emphasises the sensorimotor awareness which is embodied in the relationship between the pianist's hands and the keyboard. For a pianist who improvises there is as much improvisational knowledge in the interaction of the hands, and the entire body connected with them, with the keyboard, as in the brain. The hands choose as much as the pianist himself. Dalcroze (1932, as cited in Bachmann, 2002) says that the hand is our most intelligent and sensitive organ. Bruser (1997) also emphasises the intelligence of the body, saying that instead of forcing the body to control the instrument, we should rather trust the inner coordination and musicality and let ourselves move spontaneously. We should let the body create music, as it has a wonderful intelligence of its own.

Creative Musical Expression

Creative musical expression is an inseparable part of improvisation and of creative activity itself. However, musical creativity is equally recognised in composing, as well as in performing of written music and listening to music. Both, improvisation and composition are about creating “new” music, the difference being that with composition, review and reconsideration are possible during the creative process, while this is not possible with improvisation, since it means creating music in "real" time (Johnson-Laird, 1987). So, the difference is in the creative process as well as in the product and consequently also in the way of expressing creativity. However, it is because it is happening in real time that improvisation offers immediate and direct insight into the creative expression, inseparable from the body. This last aspect offers parallels between improvisation and performance of written music

In the western classical tradition, performance of written music is generally considered a creative activity (Clarke, 2012; Neuhaus, 2002; Persson, 2001). The ability to create a unique and convincing interpretation is highly valued (Chaffin et al., 2006). Creative expression is a complex notion and phenomenon which Chaffin et al. (2006) substantiate with the following arguments: If the performer thinks prevalently about the basic technical elements, the possibilities for creativity are limited. If the performer is focused on the interpretative elements and how the music sounds, the possibilities for creativity are somewhat higher, yet still limited. The goal of musical performance is to evoke musical feelings, and this is best achieved if the performer focuses on the expression. Therefore, a musical performance is most likely to be creative when the performer concentrates on expressive elements. This makes it possible to direct the musical performance into unique possibilities to achieve the maximum effect on the audience.

Keller (1990, as cited in Clarke, 2012) describes performance of written music as improvisational conclusion of a composition. Literature on expressiveness in musical performance only shows in what ways the improvisational flexibility of a performance is organised and achieved. Improvisation itself enables a level of spontaneous innovation that differs from performance of written music, which makes improvisation the most visible example of creativity in musical performance (Clarke, 2012).

Kratus (1996, as cited in Hsieh, 2012) defines abilities and knowledge necessary for improvisation:

1. The ability to internalise music in the short time of the actual duration of the improvisation;
2. Adequate knowledge of the analysis of musical structures,

3. The ability to manipulate the instrument or voice for a convincing and fluent attainment of musical intentions,
4. Adequate knowledge of improvisation shaping strategies and adaptability of strategy changing,
5. The ability of transforming style conventions into the development of one's own style.

We can find differences between performing written and improvised music in Kratus's points 1 and 4 which apply directly to the immediate formation or creation of musical material (i.e. improvisational strategies), while the remaining three points are common to both activities. Even though Kratus deals with professional improvisation by adults, he nevertheless emphasises important components that have to be holistically developed from a child's first contacts with the instrument, to enable the child to integrate them deeply and permanently. A child's ability to create with the memorised – i.e. integrated experience strongly depends on their ability to imagine motor, auditory or visual experience. A new combination of the memorised experience is part of the creative process (Findlay, 1971). In his study, Hsieh (2012) concludes that development of improvisation abilities in adult musicians is closely connected with the growth of musical experience and knowledge.

One of the main goals of music education is the development of creative expression and communication in a new, aesthetically evaluated and original way, not just because today we expect from our artists important creative achievements, but also because of the importance of lifelong creativity (Williamon et al., 2006). If children are given the opportunity to discover the world in an investigative way, they will accumulate priceless creative capital which they will be able to draw from later in their lives (Gardner, 1993, as cited in Tafuri, 2006). Tafuri (2006) found out in a study that the more children are offered encouraging suggestions to express their ideas by using the learned rules, the better the development of their creative musical thinking. To boost the development of every individual's creative potential she suggests research of sound, analyses of processes and results in order to achieve greater awareness and improvisation activities. The art of improvisation lies in developing awareness of one's own individuality which is expressed through improvisation. This knowledge grows in interactive exercises with the teacher who should not offer models to imitate, but problems which trigger personal answers (Doerschuk, 1984, v Pressing, 1987). According to McMillan (1997), improvisation influences the development of musicality as well.

Bodily Movement and Musicality

We have established that creative expression represents an important component of both, performance of written musical works and improvisation, and is closely connected with expressiveness and musicality which originates in bodily experience.

The component of musical language hardest to define is “internal energy”. Many musicians may have excellent technique and completely master the creation of timbers and dynamics. However, if they lack this internal energy, their performance is emotionally unappealing. Great intellectual knowledge and skills can provoke positive reactions of the audience, due to high level mastery of the instrument, but this does not inspire or enrich the audience. True art enables us to think and feel deeper and, by touching our soul, changes our perception. This happens when the mind and soul of the performer connect with the mind and soul of the listener. Then the performance is truly artistic and inspiring (Levant, 2006).

From the point of view of neuroscience, this is confirmed by the discovery of mirror neurons which enable us to empathically experience what is going on emotionally in somebody else. Such neuron networks are created in musical interaction between the performer and the listener. Mirror neurons in the listener’s brain trigger the same processes as if the listener themselves performed the music (Molnar-Szakas, Assuied, Overy, 2012). However, the listener’s perception depends on their embodied experience. E.g. a violinist will hear violins in ways not reachable to a non-violinist (Bowman, 2004).

Levant (2006) says that a pianist, who understands micro-dynamic and energetic connections between musical tones, has to be able to translate their own intentions into the language of physical movement. The connection between one’s natural feelings for music (enthusiasm, passion) and its special requirements has to be constantly re-established. When the inner world of micro-connections is well considered and the pianist’s decisions are based on a deep understanding and sensation of the performed music, the performance gains true musicality. Therefore, careful observation, discovering of the life content encoded in intonations, rhythmic patterns, tonalities, etc., is necessary from the very beginning. Musicality in playing develops by gradually discovering the complex world of music, by understanding various elements of musical language and appropriateness of emotional reactions for each individual case.

In his synopsis of Truslit’s monograph “*Gestaltung und Bewegung in der Musik*” (“Shaping and Motion in Music”), Repp (1993) talks about “inner movement” which is “the eternal driving force of music” (ibid., p. 266) and is more or less consciously shaped; inner experience and artistic form merge into an integral process. The experience of movement provoked by music is of an inner nature and affects the whole human being. Its only outward manifestation are

subtle tensions of the muscles, which, however, easily pass unnoticed because they are overshadowed by more intense acoustic, visual and motoric sensation that accompany music. The performer “experiences” the technical movements in playing the instrument. If the execution is proper, these movements arise from inner motion in adaptation to the instrument and thus are organically integrated with musical motion. Musical motion must be distinguished from acoustic vibrations, sympathetic resonance, technical movements in playing an instrument, from the sequence of tones (which is only the outward manifestation of the inner process), and from conducting movements. Musical motion can be linked to an invisible, imaginary dance which is free from all physical constraints. Musical shaping is the shaping of movement. Therefore, all musical elements (dynamics, agogics, etc.) are the expression of the motion process. It is not sufficient to execute a *crescendo* only by increasing the intensity of the tones. The dynamic development must arise as expression of a natural movement, so that the tone sequence assumes a living, true and eloquent expression. The performer must be involved holistically, in the performance and experiencing of music; manual skills on their own does not generate living music and do not move the listener.

Repp (1993) also states Truslit’s opinion that Dalcroze’s concept is very good, but focused too much on rhythm. Motions must be primarily melodic. They are intensively guided, curve-shaped movements which magnify and bring to consciousness the subtle muscular reactions to music. The movement exercises are merely preparatory; exaggeration automatically disappears in musical performance, where the engagement of the body should be intensive but not “external” (Truslit, 1938, as cited in Repp, *ibid.*).

So, tonal shaping requires movement of the body and if the physiological mechanism is free and the micro-dynamic and agogic tonal connections and qualities are experienced and understood holistically, the performer’s sound will be as well. Through different motion experience (eurhythmic, "waving", etc.) in music, a great variety of musical nuances can be experienced and felt with the whole body, not just intellectually, which enables vivid and viable realisation of musical experience with subtle control and expressive character. At the same time, this experience helps develop auditory perception of dynamic agogic principles in music, as well as one’s own sensitivity and the power to distinguish between the finest shades and colours. This way, the creative expression is based on the existing experience which is internalised and enables the body to express subtle shades of music and to influence the audience.

Conclusion

Bodily movement is an essential part of music performance which contributes to expressive shaping of music and helps the performer communicate with the listener, enabling the latter to also visually experience the music performed. A musician's language is sensual – it is a language of an experience. It is through experience that a musician can learn to trust inner coordination and musicality, instead of forcing the body to control the instrument. A moving body, functioning as mediator between sound and thought, as the direct instrument of our feelings, can support the development of creative musical expression and communication in a new, aesthetically evaluated and original way. To achieve this, holistic approach is necessary, as founded by the embodied musical cognition paradigm.

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