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Moving together while playing music: promoting involvement through student-centred collaborative practices

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Abstract

Europe has a very strong tradition of teaching how to play a musical instrument, leading to high standards of music performance, brilliant musicians, beautiful repertoire, and outstanding instructional materials. Yet, the so-called Conservatoire tradition and especially its underlying master-apprentice model of teaching is prone to critiques in the light of recent pedagogical insights about how students learn. Studies have shown that this model is often characterized by a teacher-centred approach with a focus on technique in function of reproductive imitation, corrected mainly by verbal feedback and aural modelling, thereby neglecting important aspects of learning such as learner autonomy, self-efficacy, self- regulation, individual artistic voice. Furthermore, the one-to-one approach of this model might be questioned following current insights on effective learning and teaching pointing to the importance of collaborative learning.

In this chapter, it is argued that a viable way to address the critiques and challenges that instrumental music education faces, is bringing the body to the heart of the instrumental music learning process by promoting a bodily engagement at the intersection of personal style, instrumental gestures and bodily responses to the music through the deliberate use of expressive movement. By engaging learners in an interactive loop between music, body, instrument and co-learners, movement-based learning activities enable creating a learning environment that empowers learners and thereby fosters intrinsic motivation.

Introduction

Millions of people worldwide learn how to play a musical instrument, and many of them follow formal music training. In Europe alone, more than 4,000,000 children a week attend one of the more than 6,000 local music schools to develop the musical and instrumental skills to allow them to engage in meaningful musical experiences and to express themselves through music (European Music School Union, 2010).

Europe has a very strong tradition of teaching how to play a musical instrument which has been passed down for generations from teacher to student (Burnard, 2014). Today this so-called conservatoire tradition and its practices still prevail worldwide in many instrumental music classrooms (Jorgensen, 2011). However, despite its achievements such as high standards of musical performance, brilliant musicians, beautiful repertoire and outstanding instructional materials, this tradition and especially its underlying master-apprentice model of teaching is prone to critique in the light of recent pedagogical insights. Studies have shown that this model is often characterised by a teacher-centred approach with a focus on technique to support reproductive imitation corrected mainly by verbal feedback and aural modelling, thereby neglecting important aspects of learning such as learner autonomy, self-efficacy, self- regulation and individual artistic voice (see McPherson & Welch, 2012). Another characteristic of Western formal instrumental learning is the one-to-one approach (Creech & Gaunt, 2012). Yet, current insights on effective learning and teaching point to the importance of collaborative learning (Ferguson-Patrick & Jolliffe, 2018).

Arguably, the above-mentioned critiques call for a reconsideration and innovation of instrumental music teaching to create a space in the curriculum for activities that promote artistic creation (e.g. improvisation, composition), informal ways of learning and collaborative practices (e.g. through group assignments), student initiative (e.g. choice of repertoire) etc. Here, it is argued that one viable way of addressing the critiques and challenges that instrumental music education faces is bringing the body to the heart of the instrumental music learning process by promoting a bodily engagement at the intersection of personal style, instrumental gestures and bodily responses to the music through the deliberate use of expressive movement. This way it becomes possible to create a learning environment that empowers learners and fosters intrinsic motivation. Arguably, this may be achieved based on learning activities that engage learners in an interactive loop between body, instrument, music and co-learners by combining locomotor or non-locomotor expressive movements in relation to elements of the music and to expression.

Interestingly, according to Leman (2016), the cognitive-motivational architecture that underlies musical interaction has its roots in the biology of social interaction and the rewarding effects of such interaction. This means that the process of musical meaning formation is decisive for motivational processes.

This chapter discursively elaborates on the theoretical arguments for an approach to instrumental music education that is based on the deliberate use of expressive movement while playing your instrument, and it provides some practice-based examples of movement-based musical activities that demonstrate the theoretical elaborations. In the first section the theory of embodied music cognition and the basic mechanisms of musical interaction are explained. The next section elaborates on the importance of an optimal relationship between musician and instrument that allows these basic mechanisms to steer the spontaneous expressive interaction during performance. Then, a movement-based approach to instrumental learning is proposed as a viable way of promoting student involvement through student-centred collaborative practices. This section provides practice-based examples.

Embodied music cognition and the basic mechanisms of musical interaction

The theory of embodied music cognition offers an evidence-based view on how bodily involvement shapes the way we perceive, feel, experience and comprehend music (Lesaffre, Maes & Leman, 2017). The idea is that embodiment determines, to a large extent, why and how a stream of sounds is experienced as music and why engaging with music can be a rewarding experience.

Enactment: transforming sound into music through movement

According to the embodied music cognition view, musical meaning is not inherent to the music but rather the outcome of an embodied interaction with music, when the musician participates in a direct and engaged way in the musical environment he or she creates while playing (Dourish, 2004; Leman, 2016). The idea is that, while interacting with music a sound-movement-intention connection is established that transforms the stream of sounds into a meaningful musical experience. This transformation process, also called enactment, occurs through the association of patterns in the sounds (e.g. chord sequence or melody) with movement patterns (e.g. shape, direction, energy)

and thereby with the intentional states (e.g. emotions) that underlie these patterns. This connection is made possible because music and movement share certain features (Sievers, Polansky, Casey & Wheatley, 2013). Both modalities are time-based, and thus music can be experienced as a flow of movement, imbued with a certain quality and with an intentional direction that can evoke an emotion (Stern, 2010). From this viewpoint, understanding music can be seen as a multimodal process.

Basic mechanisms of enactment in music

The general process described above of attributing intentions to music by associating musical and movement patterns is rooted in several basic mechanisms that constitute an embodied interaction: alignment, entrainment and prediction (Leman, 2016).

Alignment with music

When moving expressively to music, physical actions are intuitively matched to the music (Eerola, Luck, & Toiviainen, 2006). Such a match is based on the ability to feel the music from within and to align one's movements accordingly in response to specific aspects of the music. Some might move to the beat, whereas others might show an emotional response or imitate the character of the music.

The ability to expressively align one's movements to certain elements or aspects of the music can be conceived from two viewpoints. The first viewpoint concerns the alignment between patterns in the music and in movement. The latter can align to the beat (e.g. nodding to the beat) or to what happens in between the beats (e.g. showing the expressive phrasing with a lateral movement of the body). Depending on which aspect of the music gets the most attention, one of the two types of alignment might be more prominent. Nevertheless, as the flow of associated bodily and musical rhythms occur within an overall discrete timing framework defined by beats, metre and tempo, it is likely that both types of alignment have mutual dependencies (Leman, 2016).

The second viewpoint concerns the conditions or 'states' that lead to patterns, and particularly the state changes that drive and support the expressive alignment of musical patterns with movement patterns. Leman (2016) distinguishes between three transition processes that contribute to state changes and, as such, to the experience of music as a pleasurable and empowering phenomenon. Firstly, the perceived ability to match music and movement leads to a sense of agency, causing feelings of satisfaction, reward and immersion (Clark, 2015). As this process also applies to the

interaction and alignment with peers, it possibly induces pro-social emotions. In this case, the individual sense of agency ('I did it!') becomes valued within the collective agency of the group ('We did it!') (Pacherie, 2014). Secondly, the physical effort it takes to align to the music can lead to an increased sense of agency and to an increase in one's arousal level. Physical activities performed to music may induce physiological and psychological states of being awake, alert and excited, thus improving executive functions (Byun et al., 2014) and facilitating higher cognitive functions (Audiffren & André, 2014). Thirdly, musical patterns can affect the energetic state of a person based on their qualitative features such as degree of variation, bass drum decibel level, length and structure of motives or timbre. For example, music can be relaxing or activating and in this way generate a transfer from sound energy to motor energy, thus affecting the way movement is aligned to the music. This leads to the attribution of affect value to music such as pleasant vs. unpleasant, happy vs. sad (Roda, Canazza & De Poli, 2014) and to a pro-social attitude.

Entrainment in music

The alignment of bodily responses to music evidently occurs within a global timing framework. Such a framework is established through the synchronisation of movements to salient time markers in the music, such as the beat. Importantly, synchronisation is a very natural human response. The process of being pulled towards synchronisation has been called entrainment (Clayton, Sager & Will, 2004). In general, the concept of entrainment refers to 'the coordination of temporally structured events through interaction' (Clayton et al., 2004, p. 3). Note that events can be interpreted broadly: from heartbeats that synchronise to moving and dancing together. Entrainment not only allows for precision and flexibility in timing between people but also for a sense of participation and emotional bonding between them (Phillips-Silver, Aktipis & Bryant, 2010).

Entrainment also happens between people and music (e.g. Ilari, 2015; Large, 2000; Phillips-Silver et al., 2010). By attracting or pulling people towards the beat, entrainment enables three sensorimotor mechanisms: finding, keeping and even being the beat, thus enabling the emergence of a person's overall timing framework (phase alignment). Finding the beat is the process of recognising the regularity in time of salient markers that allows keeping the beat and eventually being the beat. Note that between finding and being, a transition occurs in effort. Finding the beat requires effort, but once the beat has been found and prediction runs smooth, it no longer requires effort, and energy is freed up to spend on other aspects of the musical interaction.

Entrainment does not necessarily occur automatically or smoothly. One must be able to detect the salient moments in the music (e.g. the beat), to perform rhythmic patterns (e.g. the music itself), and to adapt the performance of rhythmic patterns to fit the overall timing framework (Phillips-Silver et al., 2010). Furthermore, the process of entrainment is influenced by human factors such as motor variability (Demos, Chaffin & Kant, 2014) and preferred tempo resulting from biomechanics and neuronal clocks (Styns, Van Noorden, Moelants & Leman, 2007). For example, several studies have looked at the spontaneous synchronisation of children with music which conclude that not only is synchronisation easier or better when the tempo of the music is close to the preferred tempo of the child, but the preferred tempo can also change over time (e.g. Van Noorden, De Bruyn, Van Noorden, & Leman, 2017).

Predicting music

The basic mechanisms of alignment and entrainment are closely connected to a third basic mechanism, namely prediction. Establishing a global timing framework through the mechanisms of entrainment and alignment with the music within that framework stems from the ability to sense what comes next in the music and to predict the outcome of a movement, such as hitting a drum or reaching a point in space to the beat. According to the embodied cognition approach, the combination of our biomechanical constraints (such as the length and shape of our legs and arms; e.g. Dahl, Huron, Brod & Altenmüller, 2014) and our state of arousal (feeling fatigued or being energetic) characterises the way we interact and predict music. From this perspective, prediction or anticipation of music is viewed as the expected outcome of bodily-mediated perceptions and physical actions with music rather than the expected outcome of a direct line between music and the brain.

Predictive control plays an important role in interacting with music. It induces different interaction situations. Leman (2016) distinguishes between four different interaction situations. The first, attenuation, occurs when the prediction of the unfolding music is successful. In this case, the self-generated sensory information that stems from playing or moving to the music no longer requires conscious monitoring, and attention is freed up for other elements in the musical interaction such as concentrating on the melody or the actions of others. The second, facilitation, aids the prediction of a certain channel in the music, such as timing, over other channels, such as melody or harmony, thereby facilitating the interaction with the music. For example, a stepping pattern (see Figure 1) may help to keep track of time by outsourcing the 'counting' to the repeated stepping pattern that demands a limited amount of effort due to the

entrainment mechanism. This way, cognitive resources are freed up to deal with – and predict – other aspects of the music such as the expressive phrasing.

Figure 1 - Possible examples of a stepping pattern that can be used to facilitate timing

The third, disambiguation, helps to deal with the perceptual or affective-expressive ambiguities in the music that may hinder prediction. For example, music can be interpreted in different metres (e.g. duple metre vs. triple) or in different emotions (e.g. happy vs. sad). Such ambiguity introduces uncertainty and interferes with pattern detection and with the emergence of higher level patterns that enable the enactment process. As such it becomes more difficult to couple states (e.g. sadness vs. happiness) with patterns (e.g. minor mode vs. short notes) and consequently to associate intentions with the music. Movement can reduce that uncertainty by aligning to the music in such a way that a certain content is favoured. For example, movement can be used to disambiguate metrical ambiguity such as binary versus ternary groupings of the beat (e.g. Naveda & Leman, 2010). Similarly, dancing a sad or happy choreography to ambiguous music influences the perceived expression in the music (Maes & Leman, 2013).

Finally, prediction can be linked to re-training, whereby established sensorimotor schemes are re-adjusted based on expected perceptual outcomes. Such adaptation is important. Sensorimotor schemes shape and improve cognitive processing and consequently contribute to the feeling of being in control. This makes the interaction more wanted and more liked (Leman, 2016).

The body in the enactment process

The basic mechanisms of enactment are determined by bodily processes, thereby reinforcing the body in its role as the natural mediator of the interaction with music. Prediction is embedded in sensorimotor schemes which realise tight couplings between

motor commands and expectations (Pezzulo, 2011). These sensorimotor schemes stem from a repertoire of acquired actions (e.g. through deliberate practising) and innate reflexes (e.g. postural or stretch reflexes). As such they involve kinaesthetic, tactile and haptic sensing particularities of the body related to the biomechanics of the body (e.g. the length and shape of our legs and arms; e.g. Dahl et al., 2014) and to the bodily states (e.g. feeling fatigued or being energetic) that drive the alignment. It is assumed that these particularities have an impact on the predictive processes and therefore influence anticipation of expected outcomes (Clark, 2015). The attraction dynamics of entrainment are determined by natural motor variability (shaped by prediction and adaption processes), motor resonance and preferred tempo (determined by biomechanics of the body and neuronal clocks) and body movement (e.g. by guiding attention) (Leman, 2016). Alignment is related to the music-movement correlation and, alongside the observable movement patterns, also involves bodily states related to effort and arousal and known through proprioceptive observation (Leman, 2016).

Therefore, the body cannot be conceived of as a mere vehicle for being part of and experiencing the world. Rather, it may be considered the primary sphere in which all significance is initially engendered (Merleau-Ponty, 1945). It opens a space of gestural possibilities to engage with the created musical world by shaping both the openness and responsiveness to the music. In this sense, our physiologically and culturally dependent bodily existence with its embodied skills, experience and knowledge serves as the background to the interaction with the music. It becomes possible to bodily attune to the music and to rely on this experiential basis to give meaning to the music and to develop musical understanding. Importantly, such bodily attunement can be, and usually is, pre-reflective. That is, relevant information (e.g. about the acoustics, responses from the audience) is most often perceived, selected and appropriately responded to without the musician being representationally aware of doing so (Dohn, 2002; Leman, 2016).

An essential element of the pre-reflective attunement and crucial to the possibility of freely resonating with the music is the body's ability to move spontaneously and responsively (Behnke, 1989). Such motility can be viewed from two perspectives. A first – mechanistic – perspective is related to the body as an object. Here, motility concerns the physical body and its biomechanical degrees of freedom, which can be effortlessly recruited and annihilated in a flexible and spontaneous manner according to task demands (Kelso, 1997). A second – phenomenological – perspective is related to the body as a subject. Here motility concerns the lived body and the way the body is experienced as an 'I can'. This feeling of agency is not, however, about causal control

whereby the body is merely a physical instrument that serves an interior subjectivity (e.g. predefined musical goals). Rather, it is about experiencing a horizon of possibilities to engage with the world (e.g. music) (Behnke, 1989). The pre-reflective moving body is intentional; it reaches out towards the world, and based on its motility it responds to the world (e.g. music) that questions or invites us to act (Merleau-Ponty, 1945). In other words, bodily being in the world involves a directedness that is essentially motility (Reuter, 1999). Therefore, understanding this directedness involves an analysis of movement (Merleau-Ponty, 1945). In music performance, this directedness is determined by a push and pull process through which musical intentionality is shaped on the fly, based on the enactment process (Nijs, 2017).

Musical interaction, reward and expression

Neurobiological findings indicate that music affects the human reward system, a brain structure that is key to our motivation, behaviour and psychological makeup (Zatorre & Salimpoor, 2013). According to Leman (2016), this rewarding nature stems from the expressive alignment with music, based on the use of musical patterns to enact musical expression. As such, feelings of reward through music are intrinsically related to the ability to anticipate and predict how the music unfolds (Huron, 2006; Salimpoor, Zald, Zatorre, Dagher & McIntosh, 2015). Leman's argument is that the interaction with music involves the combination of the three interaction-reward states that were described in the section on alignment: agency, arousal and valence. The three-state transition processes run parallel and, together with pattern processing, establish a cognitive-motivational loop that generates the rewarding and empowering nature of musical experiences: the mutual reinforcement of the three transition processes positively affects reward. Based on prediction, effort and expression as the major ingredients of the enactment process, the pattern processing that underlies alignment and entrainment involves the co-occurrence of arousal, positive valence and the feeling of being in control.

An interesting viewpoint is the idea that the rewarding nature of musical interaction is modulated by our innate expressive system through which the pro-social value of musical interaction is activated. Interacting with music appeals to the human urge to evoke expressive responses from others in order to establish an interaction that is mutually rewarding (Leman, 2016). This expressive system involves the sensitivity (perception) to expressive elements in the music and the ability to generate expressive responses (action) to these elements. Such responses have a biological origin, namely the reflexes as manifested in the urge to express oneself, and a cultural origin that

involves the control of these reflexes as shaped by implicit and explicit learning processes. This means that musical activities that integrate movement not only support the development of controlling reflexes; they also broaden the development of a learned repertoire of musical responses.

Embodied interaction with music and the musician-instrument relationship

Expressiveness in performing music involves listening-while-performing (Clarke, 2005). But because of the specific timeframe of musical performance, it is impossible to take every action or its result into account as if it was a perceptually distinct unit. Therefore, the musician must be able to pick up information without the need for cognitive processes and act directly in attunement with the environment. Accordingly, the flexible and spontaneous expression of musical meaning requires the musician to participate in a direct and engaged way with the music. Such interaction with music is called an embodied interaction (Dourish, 2004). Importantly, the body as a natural mediator in the enactment process is extended with an artificial mediator such as a musical instrument. The nature of this extension is vital because it may allow or hinder an embodied interaction with the music as described above. It should not interfere with a direct engagement with the music, allowing the musician to keep an open focus on the musical environment and respond in a creative and expressive way. This is only possible when the musical instrument (or any other musical tool) becomes incorporated into the natural mediator (Nijs, Lesaffre & Leman, 2013).

The incorporation of the musical instrument involves the transformation of the musical instrument from a mere artefact into a 'natural' extension of the body. The instrument's use and functioning have become so natural that it seems an organic component of the musician's body (Nijs et al., 2013). Consequently, instrumental gestures (sound-producing and sound-facilitating; Jensenius, Wanderley, Godoy and Leman, 2010) can become constituents of the dynamic structure of the body (body schema) and, as such, part of the somatic know-how of the musician (Behnke, 1989). As a part of the body as the stable background of every human experience, it is no longer an obstacle to an embodied interaction with the music. The resulting attunement of the extended body to the musical environment (e.g. music, other musicians, audience) enables the musician to engage in the enactment process and to freely and expressively communicate his artistic intentions based on the bodily articulation

of the attributed musical meaning. Engaging in the enactment process is vital for a free bodily expressive response to the musical environment in which the body is no longer a recalcitrant object that needs to be mastered in order to adequately play the instrument (Behnke, 1989). Rather, it becomes a subject, a primary source of individual musical signification processes through the articulation of the lived experience of the music through instrument-mediated body postures and body movement. Such subjectification involves a change process in which an individual expression (playing music) acquires meanings that convey a person's attitude or viewpoint. It concerns the construction of the individual subject and enables acknowledgment of 'the uniqueness of each individual human being' (Biesta, 2009).

The free bodily articulation of this lived experience is an integral part of the social interaction between musicians and between musician and audience. Such socialisation involves the use of the body as a major source of musical communication (see for example: Broughton & Davidson, 2014; Davidson, 2012). Addressing the body and body movement as mediators in the process of musical meaning formation facilitates and stimulates intersubjective interaction and participatory sense-making (Schiavio & De Jaegher, 2017). The corporeal dimension of human communication is intentionally addressed, and basic mechanisms of musicality are activated (Malloch & Trevarthen, 2009). Here, the body becomes the medium for conveying musical meaning to an audience or co-performers (Leman, 2007).

Accordingly, in this view – optimising the musician-instrument relationship and thus facilitating an embodied interaction with the music – requires the integration of three different types of bodily behaviour or movements in performance and their associated repertoire of movements. Such integration can shape the bodily engagement with the musical instrument (Nijs et al., 2013; Nijs, 2017; Ruggieri & Katnelson, 1996). The initial type of movements concerns the personal movement style. These are movement patterns and postures that are formed by genetic background, developmental patterns and habits acquired throughout life and personality (e.g. Shusterman, 2011). They are related to the idiosyncratic, distinctive nature of an individual's motor behaviour and are an essential part of expressive communication (Gallagher, 1986; Ruggieri & Katsnelson, 1996). For example, looking at fingertip kinematics of skilled pianists, Dalla Bella and Palmer (2011) were able to train a neuralnetwork classifier to successfully recognise a particular pianist just by finger velocity and acceleration patterns, a result recently confirmed with skilled flute players (Albrecht, Janssen, Quarz, Newell & Schöllhorn, 2014). A second type of movements concerns the instrumental gestures. These are the gestures that are directly (sound-producing

action) or indirectly (sound-facilitating action) involved in the sound production process in musical performance (Jensenius et al., 2010). A third type of movements concerns the expressive gestures. These are the gestures used to communicate musical meaning (communicative movements) or movements that are expressive responses to the music played (sound-accompanying movements/actions). Moreover, each of these movements is influenced by biological and cultural elements and by previously learned skills (Dreyfus, 1996).

Moving together while playing music: promoting involvement through student-centred collaborative practices

The above-mentioned processes of subjectification and socialisation, reinforced by the processes of incorporation and integration, are not only directly related to the enactment process but also to the pedagogical tenets of student-centredness and collaborative learning. While subjectification fosters autonomous musical meaning formation, socialisation embeds the individual sense-making of subjectification into participatory sense-making (De Jaegher & Di Paolo, 2007). These processes are evidently linked to the enactment process, which underlies subjectification and socialisation and is facilitated through the incorporation of the instrument and the integration of the different types of movement.

In this chapter, the use of locomotor (stepping in different ways, patterns) and non-locomotor (e.g. axial and small; Gallahue & Ozmun, 1998) expressive movements in relation to elements of the music and to expression is proposed as a viable way of promoting the processes of subjectification, socialisation, incorporation and integration. Through a variety of movement-based musical activities, learners can engage in an interactive loop between body, instrument, music and co-learners. This loop entails the exploration and exploitation of musical, bodily and instrumental possibilities and constraints and stimulates the negotiation between musical intentions, bodily responses to the music and instrumental gestures. When tailored to the basic mechanisms of enactment, such learning activities have the potential to address the empowering nature of expression. Indeed, they can intensify the transition processes, reinforcing the rewarding nature of playing music and, as such, promoting intrinsic motivation. Through the combination of (guided) exploration or discovery learning and direct

instruction, e.g. by imposing certain movement patterns, different aspects of the basic mechanisms can be supported.

According to Beegle (2010), musical collaboration supports children in expanding upon their individual musical potential through verbal and nonverbal social interaction, and children are capable of structuring creative music products in meaningful ways with minimal intervention from adults. Movement-based group activities intensify the non-verbal dimension of joint musical interaction and create a learning environment where, due to the often explorative and experimental nature of the activities, outcomes are not necessarily pre-given and unforeseen challenges emerge and can be approached in different ways. Such activities may reinforce these basic mechanisms. For example, moving together (e.g. stepping) while playing may facilitate finding, keeping or becoming the beat through the process of social entrainment, or seeing others perform certain patterns may support predictive processes.

The following paragraphs describe some practice-based examples of movement activities for group lessons in the instrumental music classroom that demonstrate the theoretical elaborations above. Note that all activities are always followed by a brief reflection with the learners.

Saying hello

An excellent activity to start a lesson with is a 'say hello' activity, based on the idea of 'shape' in Laban Movement Analysis (Bradley, 2009). Addressing the changing human form in both shape and attitude, this activity is about the how the body changes shape in relation to others (Bradley, 2009). The goal of this activity is to promote communication between learners and to connect musical motifs to a specific expressive bodily experience.

In the first part of the learning activity, learners walk around (without their instruments) in the classroom, and when passing somebody they shake hands. The way of shaking hands is changed on cue, switching between different shape qualifications, namely shape-flow (self-directed; handshake without being interested in the other), directional shape (spoke-like and arc-like movement that bridges from self to the environment, like a professional handshake), or shaping (rich mutual and sophisticated interaction supported by full-bodied interactions, very expressive and somewhat exaggerated handshake as if meeting somebody you like a lot and didn't see for long time). This might also be accompanied by music. Different variations are possible

when performing this activity to music. For example, the teacher might accompany the activity on the piano and invite learners to change the shape of the handshake according to the changes in the music. Or the teacher might vary tempo or tonality to provoke awareness of the possible influence of the music on the lived experience of shaking hands in a certain way.

In the second part of the activity, students walk around and, when passing somebody, they improvise a musical motif on their instrument in accordance with the different shape levels (uninterested, professional, expressive). This can be done using a pentatonic or any other scale or without any tonal requirement. This way, the activity can be used at different levels of instrumental skill. Again, different variations are possible. For example, learners might freely choose what to play, improvising something different for each handshake, or they might be asked to come up with a specific musical motif for each type of handshake. Another possibility is to ask the learners to invent a motif that is kept the same for each handshake but varied in the way it is interpreted according to the different types of handshake.

Warm-up and loosening the body

In this activity learners explore the joints' degrees of freedom in the interaction with the instrument and, as such, 'negotiate' with their instrument. This way, the activity helps to prepare the creative use of the body in expressively responding to music.

In a first version of this exercise, the degrees of freedom of each joint are explored by coupling each joint to a note of a scale. While playing a note, the joint is moved to explore its degrees of freedom. Again, different variations are possible, allowing for different levels of difficulty. For example, the movement in a joint might be combined while performing different musical tasks.

On the one hand, playing one note per joint raises awareness of the interface between musician and instrument and of the changes in the sound (e.g. timbre, intonation) that stem from the movement. On the other hand, performing more complicated musical tasks may address other aspects of performance such as regularity or phrasing.

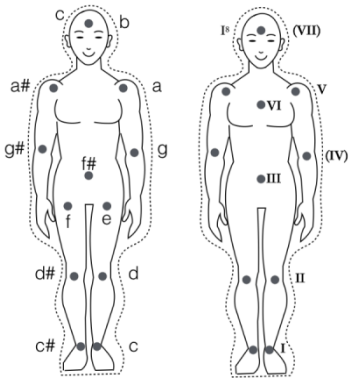

Figure 3. Connecting different joints to a scale.

In a second version of this exercise, learners pair up and in a leading-following exercise invite each other to explore bodily freedom while playing music. This is done by using two different objects: a rope and a stick. Both objects invite the learners to perform different kinds of movements, and they raise awareness of the different ways of moving while playing music. Moreover, working with objects facilitates this movement approach for students who are less inclined to move themselves. One student leads by making a movement with the object, and the other student follows by trying to imitate that movement. Roles are switched during the activity. As in the first version, this might be done while playing one note or while performing a more complicated musical task.

Stepping to the music

This activity draws on a very natural inclination to walk/step to music. In this case, the music is produced by the students themselves, possibly with some musical accompaniment (e.g. teacher at the piano, a backing track or an accompaniment generated in some dedicated software such as iReal Pro or Garage Band). The goal of this activity is to generate awareness of bodily involvement and to support the development of timing and expressive skills. The activity can be done in an external space (locomotor: walking in the classroom) or in the personal space (non-locomotor: step on the spot), thereby looking for invariants that connect the space through specific elements in the movement.

In one version learners are invited to walk around in the classroom and to switch between a mechanical and an expressive mode of walking. The mode can potentially be connected to a specific way of moving in space. For example, the mechanical mode of moving might be done while walking in a circle, while the expressive mode is done while moving freely through space, or vice versa. The musical tasks can be very varied, ranging from a scale over a simple melody to a complex rhythm. While walking the students are given a sign (musical or verbal) to switch between the two modes. Furthermore, during the expressive mode they are from time to time invited to stop walking, freezing in their position (but continuing to play the note they were playing) at the time of the stop sign, closing their eyes and turning their attention inward to feel their body and the connection with the instrument, and to listen to their own sound in relation to the body position.

In another version, the walking is done with a specific stepping pattern that is connected to a specific musical pattern (see Figure 3). First, the learners get acquainted with the different patterns, next they switch between patterns. Again, a switch between modes of moving can be introduced whereby the expressive mode of moving is connected to the expressive phrasing of the musical pattern.

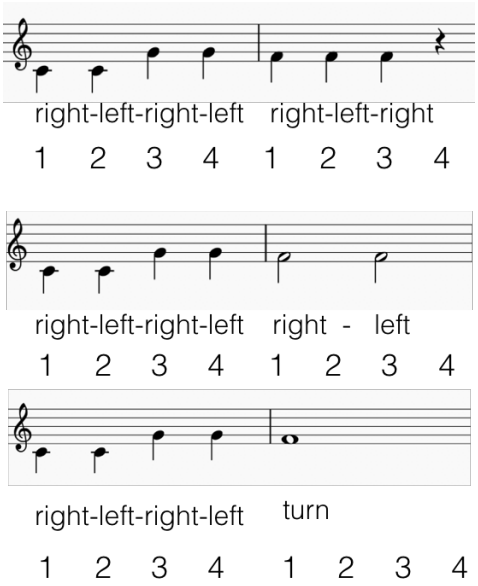

Figure 4. Stepping patterns that express different rhythms and expressive phrasing. The first measure always contains four steps forward. In the first motif, the second

measure involves three steps back. In the second motif, the second measure involves two sliding sideward steps. In the third motif, the second measure involves a turn on the spot with the whole body.

Choreo-musical motifs

In this activity learners combine improvising music with improvising movement, using movement notation based on Laban motif notation (Hutchinson Guest, 2000). The goal is to reflect in and on action about the music-movement connection.

Learners are first presented with the notation system (see Figure 4), allowing them to get acquainted with writing a score that captures their improvisation and thus allows others to repeat it.

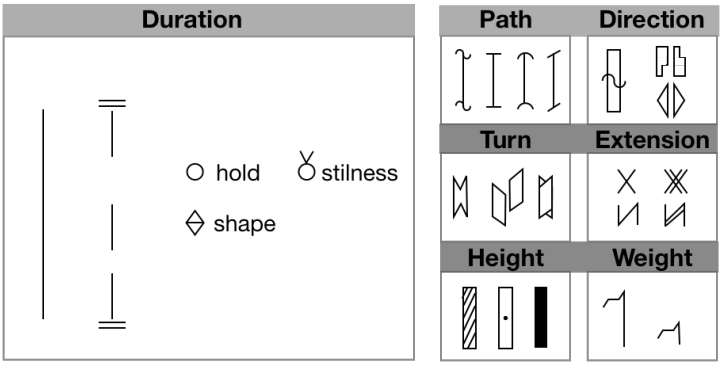

Figure 5. Example of LMA notation that can be used to design a chore-musical motif.

Next, two pathways can be followed. A first pathway goes from movement to music. In this case, learners explore combinations of movement actions, write down a sequence of actions and then try to improvise music that, according to them, fits the movement actions. A second pathway goes from music to movement. In this case, learners start from an existing melody or musical excerpt and invent a sequence of movements that, according to them, fits the music. Then they write this movement sequence down with the motif notation symbols.

After the individual explorations and creation of a personal choreo-musical motif, learners pair up. Different tasks are then possible. For example, they can perform each other's movement sequence and improvise on it, or they can start from one movement

sequence and compose a second voice to it. Another way is that one performs the movement, the other the music.

Again, this activity allows differentiation according to skill level. Both the movement and the musical tasks can be shaped according to different levels of complexity or difficulty by determining the number of possible actions, by defining the repertoire that is used, or through the introduction of degrees of freedom in the musical improvisation.

Conclusion

Movement-based approaches to instrumental music education are scarce. Yet, both theory and practice provide arguments that it might be a viable approach to shape instrumental music education. In this chapter a theoretical framework was outlined as the basis for the design of innovative learning activities with a firm pedagogical and musicological basis. Using this theoretical framework, we suggest taking the bodily experience as a starting point in the music learning process. Based on some concrete practice-based examples, the approach invites practitioners to explore this kind of movement-based practices in instrumental music teaching to promote student-centred and collaborative learning. It also invites researchers to investigate the potential benefits of learning to play a musical instrument through movement-based activities. Such investigations may shed light on the practice of instrumental teaching and learning but also on the fundamental processes that underlie musical learning. Moreover, a movement-based approach may have additional societal benefits. It may create a learning environment that lowers socio-cultural barriers (e.g. due to repertoire). Indeed, the specific context created by music and movement activities may facilitate cross-cultural communication by framing existing differences. This could support diversity, inclusion and broad access.

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