Gestures as an integral part of musical performance

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Abstract: The present paper aims to discuss pertinent analytical aspects of musical performance from the standpoint of movement and psycholinguistics. Researchers dealing with the study of human communication affirm that ignoring the physical gestures associated directly and/or indirectly with verbal utterances amounts to ignoring a significant part of the discourse. Recent studies also establish direct links between gestures, hand movements and speech thus demonstrating that physical motions carry on the intentionality of expression. Given that, this paper re-examines studies reporting on the analyses of sound manipulation and physical motion through interdisciplinary lenses seeking to add new dimensions to our future investigations.

Keywords: Ancillary gesture. Analysis of musical performance. Psycholinguistic.

Resumo: Esta comunicação tem como objetivo discutir a análise da performance musical, tomando como referência estudos na área de psicolinguística. Para esta área do conhecimento, que busca estudar a comunicação humana, os gestos físicos fazem parte do processo de expressão das ideias do falante e não considerar estes movimentos significaria ignorar parte significativa da comunicação humana. Sendo assim, iremos abordar trabalhos que analisam a performance pelo vies da investigação da manipulação sonora e gestual com o intuito de compreender o discurso musical.

Palavras-chave: Gesto auxiliar. Análise de performance musical. Psicolinguística.

1. How our hands help us think

Human expressiveness and human communication both are increasingly becoming a vital feature in the analysis of musical performance. Fast superseding a time when analysis dealt mainly with forms of notated music-the score, the focus has shifted towards the study of sound and the acoustic properties of music. Furthermore, technological advancement has enabled researchers to conduct far more sensitive and responsive studies of sound modification and manipulation while vying to understand how musicians communicate with each other and with audiences by means of sound quality control. Considering that researchers have already gained at least a provisional foothold on the understanding of the physical motions involved in the production of sound, we are therefore challenging ourselves towards a new approach to the analysis of sound and movement in musical performance as we seek to validate some of the psycholinguistics claims.

In areas such as psycholinguistics [1], the act of communicating involves not only speech but also gestures produced by speakers during a conversation. Researchers (GOLDIN-MEADOW, 2005; MCNEILL, 2005) suggest that ignoring the physical gestures during a dialogue amounts to ignoring a significant part of the communication. A recent study states that gestures and hand movements are directly tied to speech; consequently, they carry on the intentionality of expression. According to McNeill (1992), gestures and speech are tightly connected with the conversation in timing, meaning, and function.

The concept of “gesture” was defined by McNeill (1992) as a replacement to the previous term “gesticulation” used by Adam Kendon (1980). Gesticulation can be understood as a conventionalized sign, such as thumbs-up for “OK"and it occurs with or without speech. Also, co-articulation means the joining of micro-gestures into more super-ordinate gestures. Soon after Adam Kendon (1992) distinguished different kinds of gestures, McNeill (1992) rearranged them into a “Kendon’s continuum". Both authors are primarily concerned with gesticulations organized as follows: 1) ‘Gesticulation’ as motion that embodies meaning related to the accompanying speech; 2) ‘Speech-linked gestures’ as parts of sentences themselves; 3)‘Emblems’ conventionalized as signs, such as thumbs-up or the ring (first finger and thumb tips touching, other finger extended) for “OK"; 4)‘Pantomime’ as dumb show, a gesture or sequence of gestures conveying a narrative line, with a story to tell although produced without speech (MCNEILL, 2005).

Studies comparing both gestures and speech seek to establish specific relationships between the two modes of human communication. Goldin-Meadow demonstrated that gestures are produced as part of an intentional act of contact formed during speech as an inherent part of communication. The point of departure is the fact that speakers can modify the structure and content of their speech and these alterations can modulate the gestures. The author explains, “although speakers may not be completely aware of having produced hand movements, they are very aware of having spoken. Their gestures are in the service of communication and, in this sense, are deliberate"(GOLDIN-MEADOW, 2005, p.4)

2. The physical gesture and musical performance

Preliminary works in musical expressiveness has taken the focus primarily to the manipulation of sound (GABRIELSSON, 2003; JUSLIN, 1997; JUSLIN, 2000) rather than to acts related to physical movement. However, an increasing number of studies have found that the gestures produced by musicians (CADOZ; WANDERLEY, 2000; WANDERLEY et

[1]The heading of this section is a direct reference to the book *Hearing Gestures: How our hands help us think* by Susan Goldin-Meadow (2005).

al., 2005; CARAMIAUX; WANDERLEY; BEVILACQUA, 2012; TEIXEIRA et al., 2015; MASSIE-LABERGE; WANDERLEY; COSSETTE, 2018) during their performance has not only become available to investigation but also to the establishment of relationships between said gestures and the musical discourse.

According to Wanderley and Miranda (2006), the study of gesture in music is an essential new area of research promising significant gains for the understanding of perception, performance, and emotional communication. The authors point out that some of the physical movements exhibited by musicians, although inherent to performance, might not be necessary to the production of sound. These gestures have been considered essential to the instrumentalist's performance, and some of them are stable and reproducible, even after extended periods of time. Therefore, the replicable movement patterns seem to be intimately connected to the structure of the music being performed (SANTOS, 2017). It follows that these movements might also have a communicative function in enhancing the perceivers' experience of sound and phrasing (JENSENIUS et al., 2010).

Musical communication is a process that involves musicians expressing and communicating ideas to an audience as well as to other musicians. Performance planning and practicing include adjusting acoustic parameters such as note durations, intensity, pitch, timbre, and note articulation. These modifications involve strategies employed to convey musical intentions (GABRIELSSON, 2003; JUSLIN, 1997; JUSLIN, 2000). By changing parameters of sound, a performer can significantly alter the intended emotional expression of a given piece (FRIBERG; BATTEL, 2002). Also, the variety of processes and strategies employed in the communication of musical intentions is as vast as the number of performers.

A pre-existing condition to ensure a convincing musical performance tends to depart from cues extracted from the music structure (CHAFFIN, 2005; SANTOS, 2017). In his analysis of motion, Wanderley (2002) has shown evidence of a correlation among gestures at specific points in a score when comparing several performances of the same piece by one same musician. These findings suggest that ancillary gestures, that is gestures not used directly to produce sound but to ensure communication of expressive intentions, are not produced randomly as visual effects, but are instead an indispensable part of the interpretation process. According to a study involving the Laban Technique (CHAGNON; CAMPBELL; WANDERLEY, 2005), performers movements emerge from their abilities and acquired skills used to convey expressions, intentions, and emotions. Although musicians were found capable of reducing their physical motions while playing, the elimination of gestures was not a viable alternative (WANDERLEY, 2002).

Studies in musical performance offer a variety of research questions based on experience and methods from several domains. One of the strategies consists in the investigation of the various aspects of artistic planning and performance by musicians with different skill levels and with different cognitive resources beyond the analysis of movements. The body movements executed by the performers while playing have been gained attention, and their findings indicate that physical gestures are an integral part of a musical performance.

In 1988, François Delalande studied Glenn Gould's performances and the specific order of his musical and physical gestures. The instrumental gestures themselves were analyzed and categorized according to in three levels ranging from the purely functional to the purely symbolic. 1) 'Effective gestures' are those that mechanically produce the sound. 2) 'Accompanist gestures' are those that musicians associate with essential movements (instrumental gestures) but are less obvious, such as movements of the shoulders or knees, and/or breathing. Finally, 3) 'figurative gestures' are those recognized by the audience. Delalande (1988) argues that the accompanist gestures are probably as helpful to the mind as to the actual production of sound.

Cadoz and Wanderley (2000) compared several definitions and pointed out the specificity of the concept gesture in the musical field as related to communication. They also lead to different representations of gestures performed by musicians while playing and proposed a classification, such as instrumental gestures and ancillary gestures. Instrumental gestures are produced during a physical interaction and present a mode of communication similar to empty hand gestures. The authors suggested three types of hand actions or hand gesture functions: ergotic (1), involving the energy's transfer between the hand and the object; epistemic (2), including of the capacity of muscle and touch; semiotic (3), affecting the meaning or communicative intent. On the other hand, ancillary gestures, although not produced intentionally to generate or modulate sound, are present and part of expert performances. The terms "accompanist gestures"and "ancillary gestures"have been used to classify the actions produced by musicians during a musical performance but that is not producing sound.

While Jane Davidson (1994) used the designation "expressive movements", Sofia Dahl and Anders Friberg (2004) considered the expression "body language"more appropriate to denote the same idea. It is interesting to note that the ancillary gestures are usually present in professional performers (WANDERLEY; DEPALLE; WARUSFEL, 1999), and these gestures appear as part of a set of non-lexical elements of communication during speech (MCNEILL, 2005). By asking listeners to respond to relationships between physical

movements and sound manipulations during musical performances, Jane Davidson (1994) was able to point out that audiences can recognize the musician's expressiveness in both modalities: acoustical and visual. In addition the researcher also found out that participants considered the visual aspect as important as the sound results.

The term "communication"is useful as a linguistic means and for the purposes of this text, we assume that speech and music share many components and properties. According to Dahl and co-author (2007), it is feasible to map out this idea into musical communication as well. So, their approach to the study of gestures is of particular interest to us, given the fact that that during a musical performance instrumentalists produce motions as an integral part of a communicative act.

Some studies have shown that ancillary gestures have a relationship with the metrical structure, groupings and configurations (WANDERLEY et al., 2005; SANTOS, 2017), helping clarify musical events (TEIXEIRA et al., 2015). Although gestures appear to serve an essential function in the process of communicating, the mechanisms by which this communication is activated does not necessarily involve communication with the listener. Susan Goldin-Meadow (2005) points out that people provide gestures independently of any listener's presence, similarly to speakers gesturing while on the telephone with no visual contact with the hearer. Likewise, instrumentalists still move while practicing in their practice rooms. According to this researcher, it stands to reason that gestures are an integral part of the process of thinking.

Marc Leman (2008) explains the concept of music "embodiment" in which the human body is a mediator between the musical mind and the physical environment. It follows that gestures can be understood as the physical body stretching itself in space and time. According to Leman (2008), the gestures are part and parcel of the processes of synchronization and entrainment of the body, that is, gestures are intrinsically related to the meaning of the emotional engagement as well as to deliberating of actions.

Comparing the artistic research and studies that involve gestures and speech, we perceive a similarity between both modes, mainly how gestures embody discourse information. Researchers (MAES et al., 2014) proposed a theoretical frame mirroring the forms of the human motor practice and how its effects can reciprocally affect the perception of music. The authors explained that it is not about how the body resonates with the music, but how predicted sensory outcomes of planned or performed actions can be projected onto the learned music. The integration of action and perception in this internal pattern is defined as a result of associative learning processes.

3. Ancillary Gestures as a part of musical performance

While the above mentioned researchers continue to provide us with provocative studies on gestures as part of the musical performance, musicians, themselves may be lacking a solid understanding of gestures as a complement of musical discourse and how these gestures may impact both co-performers and audiences. Although Chia-Jung Tsay (2013) has conducted one study confirming the primacy of the visual modality as an integral part of our cognitive processes in the music domain, auditory information defines the field. The author discusses the fact that hiring committees continue adopting “blind"performance not only as a way of assuring fairness, “but also in response to critics who disparage those who prioritize visually stimulating choreography over the composer’s intended sound"(TSAY, 2013, p.1).

Tsay argues that performers consistently relate to sound as the most relevant information for the evaluation of music. Moreover, musical upbringing and musical education gravitate around a qualified sound production. Musicians not only learn an instrument but also train the ear. While ear training is an indispensable component of the learning process of professional musician classes on movement are not. Last but not least, performances are judged during auditions. Using real competition outcomes, Tsay employed a series of experiments in order to empirically test the impact of visual information on expert judgment. The study shows that 96.3% of domain-expert participants reported that the sound mattered more for their evaluations although, only 20.5% of experts identified the winners when they heard sound-only versions of the recordings. However, 46.6% did so upon viewing silent video clips. Those with video-only stimuli performed significantly better, compared with those who heard sound-only stimuli.

In her analysis, Tsay indicates that the visual effect held across all ten competitions. The most remarkable result to emerge from Tsay’s data is that ignoring the physical gestures during a performance amounts to ignoring a significant part of the musical communication.

Previous works corroborate with this discussion and point out that the amplitude and quantity of motion present significant differences highly dependent on the choice of excerpts. Also, repetitive movements were observed when musicians performed specifics musical excerpts (MASSIE-LABERGE; WANDERLEY; COSSETTE, 2018; MASSIE-LABERGE; COSSETTE; WANDERLEY, 2019). Furthermore, some studies have shown that the ancillary gestures have a relationship with the metrical structure, grouping of phrasing (WANDERLEY et al., 2005; SANTOS, 2017), as well as with defining musical moments (TEIXEIRA et al., 2015; SANTOS, 2017).

On previous works (SANTOS, 2017) discussing the relationship between physical

gestures and musical phrase organization we have suggested that, in addition to being stable and not at all random, gestures are able to express both a significant level of artistic interpretation and high degree of individual artistry.

4. Conclusion

It has been our aim to enhance the understanding of physical gestures employed by musicians during a musical performance, that is the investigation of motion produced by musicians as well as the relationships established between gestures and intentional communication of musical phrasings through the use literature obtained from musical studies and from the psycholinguistic field. It is fair to state that this interdisciplinary search has added new dimensions to our future investigations.

By the same line of reasoning, recent results have encouraged us to further pursue our studies of these relationships, as we believe that these findings may strengthen our knowledge of music as a powerful means of communication. We conclude by stating that the study of gestures seen through the lenses of psycholinguistics affords enticing possibilities for the analysis of musical performance. Further studies include investigations of possible links between sound, motion and the boundaries of musical phrases.

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