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The ‘Deaf listening’ Bodily qualities and modalities of musical perception for the Deaf

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Abstract. This paper focuses on ‘Deaf listening’ and more specifically on the involvement of the body in the Deaf musical experience. More precisely, it proposes to consider the sono-sensitive qualities of the body, from the Deaf experience, and by the investigation of a fundamental principle of the human experience: the ‘corpaurality’. On the other hand, they are the natural modalities of Deaf hearing that will be discussed here, modalities which, detached from the ordinary aural perceptions, position the body at the center of the musical experience.

Keywords: Deaf people; Deaf listening; Deaf perception; Deaf musical experience; corpaurality; somato-sensitivity; embodiment.

1 Introduction

The Deaf¹ relationships to music are often thought to be altered, deteriorated or reduced because the ordinary consideration of deafness is that of the ‘alteration’. Nevertheless, far from presenting only themselves as ‘impaired beings’, in their capacities of perception and representation of the world, Deaf take on this latter a singular view and, even more singular, give him an attentive ‘ear’, in tune with his sound manifestations.

¹In accordance with the Deaf revendications, I write ‘Deaf’ with a capital D which, as specified by Charles Gaucher, “announces a quest for identity which falls into a very precise historicity and is stated in terms which seek to turn the deaf difference into a cultural particularity detached from the physical incapacity which stigmatizes it” [1, p. 17]. In this way, deafness proposes itself as a social and cultural group, where the constitutive dimensions of the community rely on Deaf specific features. In this article, I use to the term Deaf for name all the individuals who claims the Deaf identity and specificities – cultural, sensorial, social, linguistic,... – but also these specificities, which present themselves like particular qualities: Deaf qualities.

For information, around 466 million people worldwide have disabling hearing loss (over 5% of the world’s population – disabling hearing loss refers to hearing loss greater than 40 decibel (World Health Organization estimations). Also, and according to the SIL International census and estimates (2019), there are 144 Sign Languages around the world. However, the number of native speakers of these Sign Languages remains difficult to establish formally, but can be estimated around 10 million (information available via www.ethnologue.com).

A priori paradoxical, the 'Deaf listening' is yet very real and upset our ordinary conceptions, highlighting that, if deafness is a human condition, it doesn't reveal 'alteration' but more especially 'otherness' [2]. Perceptive otherness or representational otherness, in the face of a reality that phenomenologically is not altered. Because the Deaf listening does not concern another sound world, but quite the contrary brings another approach of the common world, of this shared world that we define and fix from a 'normalized' point of view, audio-centered and finally limited to what our ears endeavor to say.

In this paper, I would like to focus on the Deaf listening and more specifically on the involvement of the body in the Deaf musical experience [3]. More precisely, it will be to consider the sono-sensitive qualities of the body, from the Deaf experience and by the investigation of a fundamental principle of the human experience: the 'corpaurality' [4]. On the other hand, those are the natural modalities of Deaf hearing that will be discussed here, modalities which, detached from the ordinary aural perceptions, position the body at the center of the musical experience.

2 Complexity of *corpaurality* principle

Essential base of sensoriality, the body presents itself as a sense vector and, faced with the sound reality, reveals a particular dimension, inherent in the human condition, what I call the *corpaurality*. Convergence of 'aurality' (what is perceived by the ear) and 'corporeality' (what is experienced by the body), two sensory modalities revealing the perceptible world, *corpaurality* designated the fundamental connection of the individual and the sound world: the body is anchored in the sensory world and the audible takes shape through it, form part of corporeality and reveals itself in an embodied way.

The 'hearing norm' that determines the ordinary delineation of the musical experience focuses primarily on the aural aspect of music. Indeed, "we must admit that when we play an instrument or listen to a disc, we use the sense that is socially intended for this purpose - hearing - and we consider most of the time that only the ear has a role to play in the listening function" [5, p. 54].

However, *corpaurality* as an essential principle of sound perception reveals that the music listening is naturally multi-sensory and confirms what is already known, that it is not only and exclusively located in the aural sphere of the perceptible world. As a sensory reality, the sound phenomenon fundamentally produces a material diffusion of mechanical vibrations, and for that "hearing is only one aspect of vibratory sense. The ear is not the exclusive receptor of sound vibrations, this function involves the whole body" [5, p. 56].

2.1 The vibratory sense

The vibratory sense informs about the sensory data perceived by the sense organs. The vibratory bodily sensitivity falls within *somesthesia*, that designates specificities of the body to perceive sensorial stimuli. The somatosensory system - or somesthetic system - concerns the sensitivity to stimuli perceived to whole the body, in

association or in addition to those directly in relation with the sense organs. Somatic sensations can thus give or supplement information on the environment. Unlike the sense organs, which concentrate their receptors in localized parts of the body (ears, eyes,...), the somesthetic system has receptors distributed over the entire body and positioned in the various layers that compose it: skin, bones, and musculo-tendinous or visceral levels.

The somato-sensitivity is based on specific sensory neurons - the mechanoreceptors, which perceive the stimuli and are attentive to mechanical transformations or deformations of the sensitive environment. Mechanoreceptors concern more specifically - and among others - the vibratory sensations; the human body is, in its entirety, sensitive to vibration frequencies, and this characteristically: “faced with the vibrations transmitted to the whole body, the human body behaves as a complex group [...]. At a given frequency, all or some parts of the body will react by amplifying the vibratory” [6, p. 45]. Thus, exposed to mechanical vibrations,

the human body can be considered like an adaptable mechanical system, consisting of different entities connected to each other by springs and dampers that are the ligaments, muscles, intervertebral discs.

When the body is exposed to vibrations, not all organs react in the same way. Each part of the body having its own resonant frequency. [7, p. 6]

The mechanical vibrations exploit a frequency field that ranges from about 1 to 3,000 Hz. Studies conducted on the resonance frequencies of the human body [6; 8] make it possible to determine a specific somato-sensitive organization, mainly developed at the level of the head, arms, bust, legs and spinal column. For an overall threshold of perception around 80 dB, the body naturally resonates at frequencies between 1 and 80 Hz, although the arms and hands are more sensitive - because resonating between 5 and 1,500 Hz. The reception spectrum is much lower than that of the human ear, which perceives frequencies between about 20 Hz and 20,000 Hz. However, we note that the somatic system is sensitive to infra sound - sound elements below 20 Hz - not perceived by the auditory system and considered inaudible.

The representation below shows a ‘cartography’ of the bodily resonances, on the basis of information specified by Johan Cardinaels [6]:

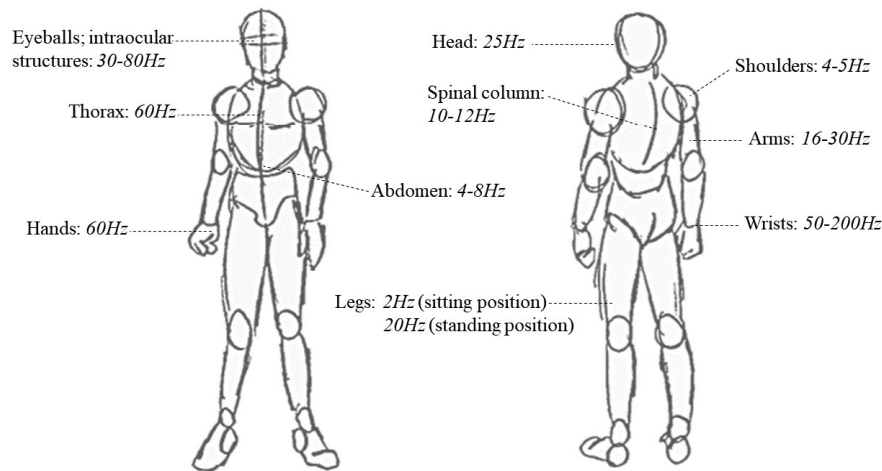


Fig. 1. 'Cartography' of bodily resonances [6; p. 44]

2.2 Modalities of the sono-sensitive body

The modes of bodily reception of mechanical vibrations are integrated into the somesthetic system, and can be categorized according to three distinct levels of sensitivity:

- 1) first, the exteroceptive sensitivity, which refers to the external perceptions, cutaneous, of mechanical variations. The body is directly in contact with the sensitive environment through the skin, which contains many sensory receptors – the exteroceptors – that react to air vibrations and are in charge of the vibrotactile perception. The cutaneous mechanoreceptors (or exteroceptors) reveal this sensitivity of the skin and are associated with three stimuli: pressure, touch, and vibration. Among the exteroceptors, two are more specifically engaged in the perception of mechanical vibrations: the Pacinian's corpuscles, which are sensitive to vibrations on a scale of 30 to 1,500 Hz - with an optimal sensitivity around 300 Hz, and Meissner's corpuscles, responsible for the 'fine touch' and particularly present in the dermis of hands, feet, lips and tongue, which are more sensitive to vibrations from 5 to 200 Hz.
- 2) The second level of somatic receptivity is the proprioceptive sensitivity, which brings together muscular, bony and tendon perceptions. Considered as the 'in-depth' reception, in opposition to the 'surface' perception represented by the exteroceptive sensitivity, the proprioceptive sensitivity allows the reception and transmission of sound vibrations through the whole body, through the musculoskeletal receptors. The bony reception of vibrations also concerns a particular aspect of the transmission of sound waves to the inner part of the

auditory system: the sound is not only transmitted by the sound waves to the middle ear, but also by bone conduction, the vibrations perceived by the body stimulating the inner ear via the cranium. Similarly, the auditory ossicles, which participate in the mechanical transformation of sound waves, can be stimulated by the cranium vibration.

- 3) The last level of the somatosensory system reveals the interoceptive sensitivity, which refers to visceral perceptions. The organs contained in the thoracic and abdominal cavities also contain numerous mechanoreceptors and the transmission of vibratory waves is carried out by the soft tissues contained in the body.

This specific organization of the somatic sensory system reveals the body's possibilities in the face of sound elements and materializes the corpaurality principle in its physiological reality. The somesthetic reception determines thus the faculty of the body to be sensitive to sound and concretizes the complexity of the corpaurality that formalizes the embodied qualities of listening.

3 The 'Deaf listening'

Corpaurality states this fundamental dimension of music reception and disrupts somehow the ordinary considerations of the musical experience. However, as the deaf percussionist Evelyn Glennie reminds us, "For some reason we tend to make a distinction between hearing a sound and feeling a vibration, in reality they are the same thing" [9]. To listen to music is feeling the mechanical vibrations of space, which concern the ear, but also and simultaneously the body. Within this context, Evelyn Glennie establishes a relevant connection with the Italian language, to highlight the fundamental link between listening and feeling:

It is interesting to note that in the Italian language this distinction does not exist. The verb *sentire* means to hear and the same verb in the reflexive form *sentirsi* means to feel. Deafness does not mean that you can't hear, only that there is something wrong with the ears. Even someone who is totally deaf can still hear/feel sounds. [9]

Fundamentally, the sound world is felt and the otherness of the Deaf musical experience thus rests on this reality of feeling. Given their specificities, deafness situations reveal a singular apprehension of music that is fundamentally related to ordinary practices, but changes and reconsiders it outside the aural sphere. To be deaf is to feel the music vibrate, and as Danièle Pistone points out, "the hearing-impaired people themselves perceive the sound vibrations" [10, p. 69].

This Deaf musical otherness unveils the peculiarities of deafness as a human condition which, beyond revealing a hearing problem, suggests more precisely another modality of listening, 'denormed' and 'denormative' because fundamentally based on the materiality of sound reality. As Evelyn Glennie once again emphasizes, "to understand the nature of deafness, first one has to understand the nature of hearing" [9], and this can be extended by saying that, in a way, it is through deafness that could be to find out the deep nature of the hearing. Because corpaurality principle

determines the sono-sensitive qualities of the body in its anatomical constitution and its sensory possibilities, even though, in the ordinary musical experience, the listening remains focused on the ear as the privileged sensory organ. The hearing experience cannot escape the aural primacy, essential and natural medium of the musical experience, and it turns out that “only the deaf know what this means not to hear” [5, p. 56]. Therefore, the Deaf musical experience seems capable to restore a hidden but essential facet of hearing, which is in the first instance and in essence “a specialized form of touch” [9]. Basically, the listening aims to be “acoustical prehension” [11, p. 236], namely the grasp of the sound materiality in its vibratory consistency, which touches the ear but also the body in its entirety. The deaf experiences of music appear able to reveal this essential nature of hearing as grasping medium of audible reality. Listening to music is thus in the Deaf musical experience relocated from the ear to the body, which presents itself as the main base for understanding and expression of musicality.

4 The Deaf’ sono-sensitivity

In the Deaf musical experience, the listening is revealed therefore primarily embodied and the modalities of the Deaf listening refer more specifically to the three levels of somato-sensitivity.

Firstly, we find a cutaneous perception, and indeed “the skin, as a sensory system, with all its aptitudes is, therefore, an essential organ for the deaf” [5, p. 58], and according to the study conducted by Maïté Le Moël, the most sensitive areas are “the fingers and the palm of the hand, the toes and the soles of the feet” [5, p. 57] - where we find, in particular, Meissner’s corpuscles. As outlined the music therapist Alain Carré, “very often, deaf people make music ‘bare ears’ and often barefoot to have a complete vibratory perception” [12, p. 15]. The sense of the vibrations transmitted by the floor passes directly “by the soles of the feet on a massive scale” [9, p. 57], and the air perception of sounds is commonly experienced naturally, without hearing aids (“bare ears”) in order to give sustained attention to the vibratory qualities of the music.

Even if elements can be perceived aurally, the Deaf prefer to listen to the music naturally, without artificial deformations. The abandonment of hearing aids during the musical practice is in line with the will of a ‘natural practice’ (the perceived sounds are not transformed) but also with the desire to avoid the amplification of sounds that are often unpleasant to the ear. Deaf people prefer to live the experience of music in the most natural manner possible, to keep a sound experience not deformed; and as pointed out Alain Carré:

For the deaf person, the most pleasant perception will often be bare ears, natural since there is no deformation or discomfort of this amplification compared to the wearing of hearing aids, even if they are the best. But in terms of music, deaf musicians often prefer to work with their natural perception, especially since they rely heavily on the processing of vibratory information in itself, even if it does not produce an aural sensation. This vibration becomes relevant for the profoundly deaf person. [12, p. 15]

It seems obvious that “the deaf are very sensitive to tactile perception” [5, p. 57] and pay specific attention to structure-borne vibrations of the objects and materials that surround them. Claire Paolacci specifies in particular that “the tactile listening is more immediate for the deaf” [13, p. 15] and that the aural perceptions are very often secondary, or less meaningful. The Deaf “know how subtle the answer given by the skin constantly caressed by the sound waves from various origins” [5, p. 57], and they are indeed able to identify a usual or everyday object from the vibrations it produces, without necessarily perceive their aural quality. As the deaf musician Maati El Hachimi explains: “the deaf person feels the vibrations in a car, knows if it is going faster or slower, if he/she is in a tractor or in a small car” [13, p. 49]. Hearing people are also endowed with this somato-sensitive capacity of identification of sound elements, but it is primarily their aural perceptions which are significant and meaning; by contrast, “for the people deprived of hearing, the sensory discrimination of the waves by the bodily perception can reach a subtlety that hearing people can hardly suspect” [14, p. 226].

In accordance with this, sono-sensitive experiences are essential in the daily life of Deaf, and as David Le Breton emphasizes,

vibration sensitivity allows deaf people to gather information about their environment: recognize the voices of relatives, detect footsteps, identify musical moments, the passage of a car, the fall of an object. [15, p. 171]

In the instrumental practice, the sonic variations of instruments are also perceived cutaneously, mainly through the hands (directly in contact with the object). This perception of sound vibrations by touch is often sought by the deaf person during the musical experience, and the use of specific objects which materially restore and amplifying the air vibrations (balloon, rigid pipe, wooden crate) is common. Similarly, the Deaf put their hands on the speakers to feel the air vibration produce the sound emission. Cutaneous reception is thus presented as a fundamental sensory modality in the Deaf musical experience,

the sense of touch can reach, through long learning and multiple experiences, a maximum sensitivity. It can give to hearing impaired people the pleasure of feeling their skin receive every sound wave. [5, p. 58]

This cutaneous perception is associated with a bony reception of sound vibrations, which is based mainly on a structure-borne perception of the acoustic elements: “the bones are actively touched and precisely vibrated by the sound waves which they receive and transmit through the limbs and the whole body” [5, p. 58]. The vibrations of the floor are perceived on the feet and “by the knees where they produce a rotational movement on the kneecaps” [5, p. 57]. Bone perception develops initially by the contact of a body part with a material element, primarily through the legs, which are in contact with the floor; and as a young deaf person reports: “*when I try to listen to music (without hearing aids) I feel by the feet the vibrations. It taps through the body*” [16, p. 44]. The structure-borne reception of the musical vibratory movement seems to begin with the feet and invests in the rest of the body, and according to Maïté Le Moël “the most sensitive bone areas are the spine, the pelvis (ilium, sacrum, coccyx), the shoulder girdle (clavicles and shoulder blades) and the thoracic cavity (sternum, ribs, vertebrae)” [5, p.58].

During the instrumental practice, the body is vibrated by the instrument, primarily on the arms, and the bone perception of acoustic variations is also efficient by air conduction because “the head is a bone region frequently vibrating with the acoustic waves and in particular the cranium, the frontal area and the lower jaw” [5, p. 58].

More complex to describe, the internal sensations induce by sound vibrations make it possible "to hypothesize that soft tissues are also good receptors of sound waves" [5, p. 58]. These contain many mechanoreceptors, and the descriptions offered by the deaf [4] of ‘resonances’ and ‘vibrations’ on the torso or ‘bubbling’ in the stomach indicate that the transmission of the vibratory waves is also performed via visceral conduction, which mainly concerns the thoracic and abdominal cavities.

This consideration of the sono-sensitivity of the Deaf musical experience confirms the reality of a specific bodily musical experience. The Deaf perceive and feel the music in and through their body, the latter receiving the sounds according to different perception modalities and develops a truly fine approach to sounds. The music therapist and anthropologist Alain Cabéro specifies in particular that the pitch is felt differently by the body:

when the sound was low, they located it in the stomach, but also on the face, when the sound was rather high-pitched, they located it along the arms and the head.
We also had as answers for the low sounds: knee and hand. The high-pitched is not always very well perceived in its delicacy, it was more by a feeling of pain, in the ears. [17, p. 67-68]

These elements show the complexity of the Deaf musical experience which, as the ordinary musical experience, reveals as many facets as it implies of individuals. Each deafness is different, and each experience of the music reports a singular lived experience, deeply embodied, but conveying different meaning values. Evelyn Glennie’s testimony shows this complexity of the relation to the sound and the possible diversity of the bodily experiences of the music that it induces:

I spent a lot of time in my youth (with the help of my school percussion teacher Ron Forbes) refining my ability to detect vibrations. I would stand with my hands against the classroom wall while Ron played notes on the timpani (timpani produce a lot of vibrations). Eventually, I managed to distinguish the rough pitch of notes by associating where on my body I felt the sound with the sense of perfect pitch I had before losing my hearing. The low sounds I feel mainly in my legs and feet and high sounds might be particular places on my face, neck and chest. [9]

to make more concrete this somatic sensitivity of the Deaf, we can see the body areas stimulated during the musical experience, areas specified by the Deaf in a survey conducted in 2015 [4] and which precisely correspond to the ‘cartography’ of the bodily resonances:

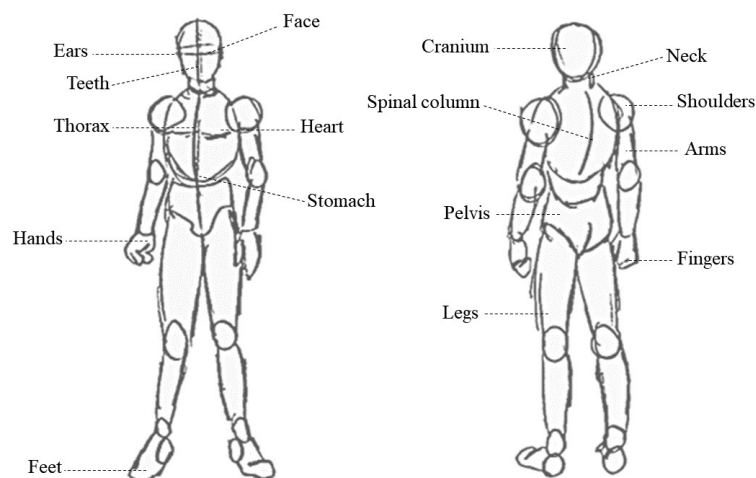


Fig. 2. Deaf's bodily perceptions [4, p. 588]

Despite the diversity of their musical experiences, we note that, for the Deaf, the body proposes itself as the privileged place of the musical realization. In this way, “regarding the direct experience of music since it is vibration, deafness, including profound, does not prevent sound contact, but displaces the privileged sense of the ear to the body” [14, p. 221]. The Deaf musical experience is fundamentally anchored in corporeality principle and thus affirms, in the words of a young deaf person, that “[we] can listen to music through the body and not through the ears. This is another way of listening. As if the body is the ear” [18, p. 247]. Music is, therefore, fundamentally lived by the body and flourishes to become a sensitive reality revealing specific aesthetic values: “the whole body becomes ‘the organ’ of hearing [...]. By the vibrations that touch it, it replaces the ear” [18, p. 249-250].

*

Insofar as it gives fundamentally to feel, music imposes itself on the body; but even if “the link between the body and the music is complex and indissoluble” [19, p. 103], when the aural primacy is overcome, the musical experience finds within the body its space of realization. In this, to consider the Deaf musical practices makes it possible to go beyond the fundamental aurality of the music, by revealing the primordial role of the body. In other words, the Deaf otherness renders an experience of the music, detached from the ordinary conventions dependent to the ear performances, and seems to be able to reveal an unknown facet of the music, which makes body the essential organ of sound reception; and thus affirms that “hearing is not prerequisite to appreciating music” [20, p. 441].

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