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► **To cite this version:**

Sylvain Brétéché. ‘Body Ways’: The Extra-Ordinary Music Of The Deaf.: Hoppe, C., Müller, S.A. (ed.). Music in the Body - The Body in Music, Olms-Verlag, 2021, 9783487160085. halshs-03130998

HAL Id: halshs-03130998

<https://shs.hal.science/halshs-03130998>

Submitted on 14 Mar 2022

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'Body Ways': The Extra-ordinary Music of the Deaf

Sylvain Brétéché

Introduction

Music is considered according to its various (human, expressive, signifying or narrative) dimensions in contemporary Musicological Studies. However, investigations of the musical experience remain focused on the audible modalities which determine it (in part) and abandon its fundamental sensitive qualities. However, if music is addressed to the ear, it also concerns the body – and more broadly all senses. The audible is heard, the sound is embodied, and musical listening is deeply incarnated. If the study of the sensitive qualities of sounds depends commonly on the 'ear domination', deafness situations make it possible to overcome this supremacy of 'aurality' – which delimits the auditory perceptions – and open a singular way for the understanding of the musical experience. Not an opening towards the observation of the inaudible, but a real consideration of what, beyond the audible, constitutes the materiality of sound.

In common sense, the Deaf¹ live in a silent world; but fundamentally, this silence forms an integral part of the world of sounds. The Deaf relationships to music are

- 1 In accordance with the deaf cultural revendications, I write 'Deaf' with a capital D which, as specified by Charles Gaucher and Stéphane Vibert, "announces a quest for identity which falls into 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". Gaucher and Vibert, *Les Sourds*, 2010, p. 17. Original text: "annonce une quête identitaire qui s'inscrit dans une historicité bien particulière et qui s'annonce dans des termes voulant faire de la différence sourde une particularité culturelle détachée de l'incapacité physique qui la stigmatise". All translations by the author. In this way, deafness proposes itself as the foundation of a social and cultural group, where the constitutive dimensions of the community rely on deaf-specific features. In this article, I use the term Deaf to designate all the individuals who claim the deaf

often thought to be altered, deteriorated or reduced because the ordinary consideration of deafness is that of the ‘alteration’. Nevertheless, far from presenting themselves as ‘diminished beings’, the Deaf in their ability to perceive and apprehend the world and its sensitive realities look at reality in an unusual way and, more singularly, they grant it an ‘attentive ear’ in tune with its sound manifestations. Paradoxically, however, listening is very real to the Deaf and it upsets our ordinary conceptions, highlighting that if deafness is a human condition, it does not reveal an alteration but more specifically the ‘otherness’.² Perceptive otherness or representational otherness in the face of a reality that is not altered phenomenologically. Because, as the Deaf percussionist Evelyn Glennie indicates, “deafness does not mean that you cannot hear, only that there is something wrong with the ears. Even someone who is totally deaf can still hear/feel sounds”.³ The deaf listening does not concern another sound world but, quite to the contrary, takes another approach to the common world, this shared world that we define and fix from a ‘normalised’ point of view, audio-centred and, finally, limited to what our ears endeavour to say. “We are all normal, proceeding from the same humanity with functional characteristics and, thus, performances, which are different”,⁴ whereas the Deaf live the sound from a singular point of view, perceiving it in its sounding, sensitive and vibratory qualities. Indeed, the deaf musical experience leads to thinking about music beyond aurality, revealing what I call the ‘corpaurality’ – the essential embodiment of musical listening.⁵ And even more specifically, music is also an experience of the visible because, beyond sounds, it includes visual modalities in its concrete expression. Music touches the ear, the body and the eye and, therefore, musicality becomes visual reality: the ‘vusicity’.⁶ In this way, the deaf experience of music reveals, simultaneously, a denormalised perceptual and an anthropological experience, and, as the anthropologist Charles Gaucher has written: “strange and attractive, the deaf difference speaks the language of the radical

identity and specificities – cultural, sensorial, social, linguistic – but also these specificities which present themselves as particular qualities: “the attitudinal deafness”. Baker and Padden, *American Sign Language*, 1978.

2 Cf. Brétéché, “Through the Prism of Disability”, 2017.

3 Glennie, *Hearing Essay*, 2015, p. 2.

4 Hamonet, *Handicapologie et anthropologie*, 1992, p. 375. Original text: “Nous sommes tous normaux, procédant de la même humanité avec des caractéristiques fonctionnelles, et donc des performances, différentes”.

5 Cf. Brétéché, “The Deaf Listening”, 2019a; Brétéché, “L’oreille incorporée”, 2019b.

6 Cf. Brétéché, “Visual Music?”, 2019c.

otherness, that which monopolises, but for minor details, what must be thought by contemporary social sciences”.⁷

In the present contribution, I explore the extra-ordinary music of the Deaf and, more specifically present the ambitions of the research programme “Music/Deafness Interactions”, currently integrated into the activities of the transdisciplinary laboratory PRISM – Perception, Representations, Image, Sound, Music (Aix-Marseille University/CNRS), on which I have been working since the end of my Ph.D. research. Overturning a conventional musicological perspective and profoundly animated by a multidisciplinary orientation, my interest in the deaf musical experience is not based on the observation of the inconceivable or a conception of another form of music. I want to develop considerations about music itself, in its deepest form, shared by all: that of being a human activity with physical, subjective, cultural and emotional values and qualities. In this way, I want to go beyond the widely accepted paradigm which defines deafness as an impairment value. According to this paradigm, it is seen as a disability that is defined by the gaps it engages. However, “the Deaf have a vision of the world, their own vision”,⁸ the deaf historian Yann Cantin tells us and, in accordance with this, I prefer to consider deafness as a situation of otherness and focus on its performative qualities for thinking about the individual in their existential modalities. With this research stance, I try to explore the complexity of the deaf musical experience, from the set of perspectives it proposes to question music itself, from the standpoint of otherness, about its otherness.

I will give a detailed insight in this article into what my epistemological foundations are which constitute my musicological orientation. I will define what characterises the deaf musical experience and consider the plurality of scientific investigations that it provides to the overall knowledge of music. After this, I will focus on one fundamental and essential aspect of the deaf musical experience – a subject which concerns more particularly this collective publication – the body, which happens to

7 Gaucher, “L’indiscutable différence des Sourds”, 2007, p. 356. Original text: “Étrange et attirante, la différence sourde parle le langage de l’altérité radicale, celle qui monopolise, à peu de chose près, ce qui se doit d’être pensé par les sciences sociales contemporaines”.

8 Cantin, “De la réflexivité sourde...”, 2014 <<https://reflexivites.hypotheses.org/4391>>, accessed 04.10.2020. Original text: “les Sourds ont une vision du Monde, leur propre vision”.

be at the origin of the perception and production of music; of atypical music, inaudible, but sensible and visual.

Epistemological posture

Investigations concerning the relationships between the Deaf and music are currently developed mainly in neurocognitive sciences or music therapy and are concentrated primarily on the audible aspects of music and the rehabilitation of hearing capabilities. The truly musical approaches that envisage the deaf practices according to their artistic or aesthetic dimensions are rare, and the considerations of the sensitive qualities, extra-aural but fundamentally musical, which define the specificities of the deaf musical experience are even rarer.

Even though these studies demonstrate and enlighten the relevance of the subject, their musicological interest is, nevertheless, restricted because they do not really examine music and its existential conditions but rather an ‘idea of music’ to deepen knowledge about a specific human condition, the deafness, most often (but not exclusively) to transform it in order to match – as far as possible – with the ordinary hearing condition. Music here is not the main object of studies and sometimes even only a simple pretext to explore the brain’s capacities or to consider the technical and technological possibilities of hearing rehabilitation. Nevertheless, the results obtained and the experiments carried out provide particularly interesting information to consider the more specifically musical dimensions of the deaf experiences, with original prospects for music studies. Reoriented to a musicological observation focused on the “conditions of music”⁹ and associated with other approaches to the relationships between the Deaf and music that can be found in disciplines as varied as Anthropology, Sociology or Linguistics, and also from emerging and promising research fields such as Cultural Studies or Disability Studies, the deaf musical experience is proving to be an extremely broad field of study.

With this in mind, I have developed my current research programme “Music/Deafness Interactions”, by adopting a transdisciplinary posture inspired by the “inter-scientific approach” proposed by the French musicologist Bernard Vecchione,¹⁰ an

9 Cf. Souris, *Les conditions de la musique*, 1976.

10 Cf. Vecchione, “La recherche musicologique aujourd’hui”, 1992.

epistemological approach conducive to the examination of the 'complexity' (according to the Morinian meaning) of the deaf musical experience.

Music and deafness interactions: 'complexity' and 'inter-scientificity'

In order to develop all of my considerations and elaborate my plural approach to deaf music and the body experience in music, I take as a fundamental principle the epistemological opening the French philosopher Edgar Morin proposes in his work on the complexity of knowledge.¹¹

The theory of the complex thought¹² proposed by Morin is "a deep reform of our mental functioning, of our being",¹³ which allows us to get out of our local vision of music to consider the musical reality globally, in all its complexity. In this way, "complexity does not put us only in the distress of the uncertain, it allows us to see besides the probable, the possibilities of the improbable".¹⁴

The deaf musical experience is, *prima facie*, improbable and paradoxical; by shaking up the ordinary conception of music, it goes beyond the limits of understanding. It is that which interests me in my investigation of deaf music. I am seeking to observe music itself in its most varied existential forms and unsuspected dimensions. The Deaf offer us this possibility: to look at music from another perspective, with a 'new ear' detached from aural domination. It is in this sense that my ambitions are consistent with the Morinian method of complexity, which aims "to explore the field of possibilities, without restricting it with what is formally probable".¹⁵ To achieve this, I rely on the interscientific musicological methodology proposed by Vecchione.

Vecchione's approach to the musical reality joins – although he does not refer to it explicitly – the orientations of the Morinian complexity by advocating an epistemological consideration of the musicological reality, which he defines

11 Cf. Morin, *La méthode* (6 vol.), 1977–2004.

12 Cf. Morin, *Introduction à la pensée complexe*, 1990. English version (partial): *On Complexity*, 2008.

13 Morin, "Restricted Complexity, General Complexity", 2007, p. 29.

14 *Ibid.*, p. 30.

15 *Ibid.*

as a discipline concerned with all aspects of knowledge about music (intellectual, practical, sensitive), regardless of their type (scientific, technological, philosophical) and regardless of the aspects of music studied (works or practice, sound or spectrogram, existing music or music to come, in project, in progress, in process...). This definition goes in the direction of the history of the discipline and matches, if not with the classical meanings of the term, at least with the nature of the object on which musicology questions itself: the reality of music in civilizations, its nature, its function.¹⁶

The main element of this methodological approach is based on a fundamentally human consideration about the musical fact: music for Vecchione is primarily a reality of an anthropological order inscribed in a complex fabric of scientific relationships. In his words,

[a]s a subject of musicology, the musical reality is to be considered as a complex anthropological reality, made up of works and activities, all marked historically but also socially, culturally, psychologically and not only within civilizations where these activities take place, but also in regards to the social groups, and to the individuals who within these groups played a key role in the establishment of this reality: production, interpretation (realization, perennality, etc.), perception [...].¹⁷

- 16 Vecchione, “La recherche musicologique aujourd’hui”, 1992, p. 291. Original text: “Comme discipline que concerne l’ensemble de la question de l’élaboration des connaissances sur la musique, quelles que soient ces connaissances (intellectuelles, pratiques, sensibles), quelque soient leurs types (scientifiques, technologiques, philosophiques) et quels que soient les aspects de la musique étudiés (œuvres ou activités, son ou partitogrammes, musiques déjà existantes ou musiques virtuelles, en projet, en progrès, en procès, ...). Cette définition va dans le sens même de l’histoire de la discipline et se trouve tout à fait conforme, sinon aux acceptions plus classiques du terme, du moins à la nature de l’objet sur lequel la musicologie s’interroge: la réalité de la musique dans les civilisations, sa nature, sa fonction”.
- 17 Ibid. Original text: “Comme objet de la musicologie, la réalité musicale est à considérer comme une réalité complexe d’ordre anthropologique, faite d’œuvres et d’activités, toutes marquées historiquement mais aussi socialement, culturellement, psychologiquement et ce non seulement au sein des civilisations où les activités musicales s’instituent et se développent, mais relativement aussi aux groupes sociaux, et aux individus qui jouent ou ont joué au sein de ces groupes un rôle déterminant dans l’instauration de cette réalité: production, interprétation (actualisations, pérennisations...), appréhension [...]”.

This concept interests me particularly for two reasons, which at first glance seem to be separated but, nevertheless, are internally connected. Firstly, it makes an uninhibited musicological application possible because it is detached – and separable – from the 'all-powerful' historical approach, which inserts music into defined and immutable times and places – considered by many to be 'forms of truth'. De facto, and as Jean-Marc Warszawski rightly writes:

Music is not a natural object; it is not even an object. It is produced by members of humanity in progress. Everything, in music, emerges of human decisions. Today, the inventory which can be done of the diversity with which "music" is inserted into social practices, with which it is produced, broadcast, received, from the point of view of personnel and technical means, institutions, reproductions, does not determine, out of social context, a matter sufficiently homogeneous and autonomous to objectify a specific positive science, but summons many fields of knowledge [...].¹⁸

It is in this way that the interscientific proposal of Vecchione commits this re-humanisation of the 'music-object' and, in a way, updates the original musicological project of Guido Adler and the "systematic" approach integrated with his '*Musikwissenschaft*'.¹⁹ A true consideration of the musicology

as a science of functioning of an instrument of apprehension and expression of the world as specific and complete as the ear, [providing] an original contribution to sectors of activity such as the sciences and technologies of sound, knowledge, action, the semiotic, anthropo

18 Warszawski, "La musicologie et le mystère du logos", 2008, p. 129. Original text: "La musique n'est pas un objet naturel, elle n'est pas même un objet. Elle est produite par les membres d'une humanité en devenir. Tout, en musique, ressort de décisions humaines. L'inventaire qu'on peut faire aujourd'hui de la diversité avec laquelle 'la musique' s'insère dans les pratiques sociales, avec laquelle elle est produite, diffusée, reçue, tant du point de vue des personnels que des moyens techniques, des institutions, de la reproduction, ne permet pas de cerner une matière suffisamment homogène, autonome, hors contexte social, pour objectiver une science spécifique positive, mais, convoque de nombreux champs de connaissances, [...]".

19 Cf. Brétéché and Esclapez, "Music(s), Musicology and Science", 2019; Esclapez and Brétéché, "L'objet (du) musicologique", (forthcoming).

logical and historical sciences, the philosophy of meaning, understanding, argumentation, interrogativity [...].²⁰

Secondly, in addition to allowing this global consideration about music, this musicological orientation leads me to position more particularly the observation of the situation of deafness in a broader research context, based on its quality of ‘musical otherness’. However, before detailing this research context more precisely, I would like to examine one specific issue: What is the ‘deaf musical otherness’?

The ‘deaf musical otherness’? The silent music

In the first place, to speak of deaf music shakes up conventional thinking. Mainly, because music conceptualizes according to the ‘hearing norm’ that determines its ordinary delineation, 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”.²¹ Furthermore, because it seems anchored in ordinary thought that the Deaf cannot make music, that they live in the depths of silence. As Ann Darrow and Diane Loomis put it, “the idea of music and the Deaf appears to be somewhat incongruous unless it is considered to be entirely without hearing. Even individuals with profound hearing loss have some access to music”.²²

20 Vecchione, “La recherche musicologique aujourd’hui”, 1992, p. 284. Original text: “Comme science du fonctionnement d’un instrument d’appréhension et d’expression du monde aussi spécifique et complet que l’oreille, la musicologie devrait fatalement apporter une contribution originale à des secteurs d’activités comme les sciences et les technologies du son, de la connaissance, de l’action, les sciences sémiotiques, anthropologiques, historiques, la philosophie du sens, de la compréhension, de l’argumentation, de l’interrogativité [...]”.

21 Le Moël, “L’univers musical de l’enfant sourd”, 1996, p. 56. Original text: “[I] faut bien avouer que lorsque nous jouons d’un instrument ou que nous écoutons un disque, nous utilisons le sens qui, socialement, est prévu à cet effet – l’ouïe – et nous considérons la plupart du temps que seule l’oreille a un rôle à jouer dans la fonction d’écoute”.

22 Darrow and Loomis, “Music and Deaf Culture”, 1999, p. 102.

Indeed, beyond any paradox, the Deaf are making music and are far from being silent. The deaf musical experience is, therefore, not a pure projection or only a metaphor. It presents itself like a denormalised practice of music, denormalised because it does not reflect the usual standards and common ways to make music. In other words, the deaf otherness renders an experience of music detached from the ordinary conventions dependent on the ear performances and proclaims that "hearing is not prerequisite to appreciating music".²³

However, if it upsets the received ideas and causes a paradigmatic transformation of the musical existence, the deaf musical experience does not define another music that would belong to another world. On the contrary, it belongs to the known musical world but values it simply from extra-ordinary features: the ear no longer plays its central role in the understanding and practice of music, the eye and the body assert themselves as fundamental elements of the musical experience. Because, as Evelyn Glennie clarifies speaking about her own musician experience: "So far we have the hearing of sounds and the feeling of vibrations. There is one other element to the equation: sight. We can also see items move and vibrate".²⁴

We seize here the specificities of the deaf otherness, which participate to expose – a part of – the complexity of the conditions of music.

The 'deaf musical experience': an interscientific musicological field

Thus, initially *a priori* paradoxical, the musical experience of the Deaf allows us, nevertheless, to go beyond ordinary considerations of music and envisage it in its deep complexity with careful and specialised analysis. The deaf musical experience is a complex object of research for Musicological Studies, based on physical and physiological realities, which reveals cultural and social qualities and produces very singular representations and considerations of music itself. In this regard, the studies that I provide in the programme "Music/Deafness Interactions" are necessarily carried out according to various orientations: neurocognitive, psychoacoustic, psychosocial, anthropo-cultural, phenomenological or close to music analysis.

23 Loeffler, "Deaf Music", 2014, p. 441.

24 Glennie, *Hearing Essay*, 2015, p.2.

The following table shows a representation of the interscientific network I rely on for my deaf musical studies that allows the consideration of various theoretical approaches.

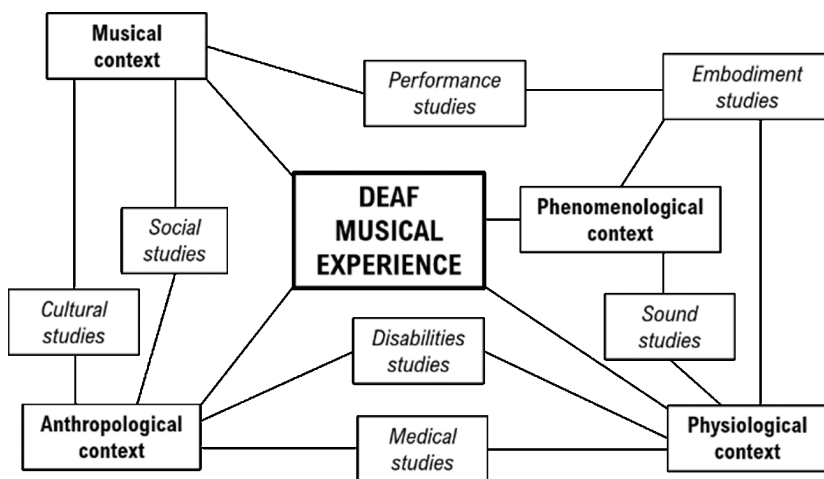


Fig.1. 'Deaf musical experience' – intersciences network²⁵

The complexity of this interscientific approach has already been the subject of thorough examination,²⁶ and in the following, I will focus on one essential aspect of the deaf musical experience which can be the subject of questions for all the orientations that constitute this intersciences network: the body.

Body ways: the embodied ear

The deaf musical otherness unveils the peculiarities of deafness as a human condition which, beyond revealing a hearing problem, suggests another modality of listening more precisely, 'denormed' (detached to the aural norms) and 'denormative' (exceeding the ordinary ideas of listening) but fundamentally based on the materiality of sound. And paradoxically, in a way, it is through deafness that it could be possible to find out the deep nature of hearing.

²⁵ Brétéché and Esclapez, "Music(s), Musicology and Science", 2019, p. 656.

²⁶ Ibid.

Therefore, the deaf musical experience seems capable of restoring a hidden but essential facet of hearing, which is, first and foremost, “a specialized form of touch”;²⁷ listening to music is feeling the mechanical vibrations of the air, which not only affect the ear but also and simultaneously the body. As the deaf percussionist Evelyn Glennie reminds us, “[f]or some reason we tend to make a distinction between hearing a sound and feeling a vibration, in reality they are the same thing”.²⁸

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. A fundamental phenomenological principle appears here that I call ‘corpaurality’.²⁹

Forming a 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 designates 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, forms part of corporeality and reveals itself in an embodied way. The ‘hearing norm’ that dictates the ordinary delineation of the musical experience focuses primarily on the aural aspect of music; however, corpaurality as an essential principle of sound perception, reveals that music listening is naturally multisensory. Relieved of the predominance of the ear, listening to music for the Deaf is largely relocated in the body, and “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”.³⁰

Thus, beyond any paradox, the deaf musical experience is conceivable and real, and even more concretely, it seems to be through deafness that it could be possible to find out the deep nature of the hearing and these physiological and cognitive aspects.

27 Glennie, *Hearing Essay*, p. 1.

28 Ibid., p. 2.

29 Brétéché, “The Deaf Musical Experience” (forthcoming).

30 Schmitt, “De la musique et des sourds”, 2012, p. 226. Original text: “pour les personnes privées d’ouïe, la discrimination sensorielle des ondes par la perception corporelle peut atteindre une subtilité que les entendants soupçonnent difficilement”.

Neurocognitive dimensions

The neurocognitive approach is the first effective way to confirm the ‘unthinkable’ by demonstrating how the Deaf, despite their hearing loss, can perceive sound and music. This research perspective considers mainly impairment and how the brain system develops adaptive strategies of perception in situations of sensory deprivation. Canadian psychologists Arla Good, Maureen Reed, and Frank Russo provide a large review of compensatory plasticity in the deaf brain and its effects on music perception in their article.³¹ They identify two specific approaches: neurodevelopmental and cognitive.

The neurodevelopmental perspective is particularly interested in the “structural reorganization of the pathways in the brain”³² and allows one to determine that “sensory deprivation leads to changes in cortical connectivity [that] may be interpreted as progressive, rather than degenerative; i. e., compensation for sensory deprivation.”³³

Indeed, studies conducted with profoundly deaf subjects demonstrate, among other things, a significant activation of the secondary auditory cortex when communicating in sign language and various studies³⁴ indicate that “in deaf people, the brain region usually reserved for hearing may be activated by other sensory modalities, providing striking evidence of neural plasticity.”³⁵ From a similar perspective, when subjects perceive visual elements in motion, “the auditory cortex in deaf subjects [is being] recruited for the processing of purely visual stimuli with no lexical component”³⁶ and during vibrotactile receptions,³⁷ “the auditory cortex of a congenitally deaf adult may process vibrotactile information.”³⁸

31 Good et al., “Compensatory Plasticity in the Deaf Brain”, 2014.

32 Ibid., p. 561.

33 Ibid.

34 Cf. Petitto et al., “Speech-like Cerebral Activity”, 2000; Zackau, *Signs in the Brain*, 2016.

35 Nishimura et al., “Sign Language ‘Heard’ in the Auditory Cortex”, 1999, p. 116.

36 Cf. Sadato et al., “Cross-modal Integration and Plastic Changes”, 2005, p. 1120.

37 Auer et al., “Vibrotactile Activation of the Auditory Cortices”, 2007.

38 Levänen et al., “Vibration-induced Auditory-cortex Activation”, 1998, p. 870.

Neurocognitive studies also show that the primary auditory cortex is also activated during visual³⁹ and somatosensory stimulation.⁴⁰ In that respect, various results of experiments “suggest that cortical reorganization in deaf perceivers is not limited to effects of visual input but also results from somatosensory stimulation.”⁴¹

These approaches to the deaf brain have not proven an increase in unimpaired abilities of deaf people. However, they lead one to think that sound perception modalities are expanded and integrate visual and bodily sensibilities in the experience of sound which usually participate in it but are concealed behind specific receptions of the ear, findings “suggesting that the auditory system is well suited for the processing of vibrotactile information as auditory and vibratory stimuli are essentially similar temporal patterns.”⁴²

From the cognitive perspective, Good and colleagues talk about behavioural compensation and specify that “complex behavioral tasks that require attention redirection consistently reveal differences between Deaf and hearing individuals.”⁴³

The studies show that the Deaf have a more developed capability for processing visual tasks and a higher speed of execution of the latter. They have generally “more efficient visual processes than normal hearing adults in the central visual field”⁴⁴ with increased visual attention and a spatial distribution more structured and more attentive to peripheral stimulations.⁴⁵ This could indicate “that deafness might lead to compensation in the mechanisms that allocate visual attention across the visual field.”⁴⁶ In addition, deaf individuals have processing advantages for supraspinal haptic and vibrotactile stimuli,⁴⁷ and the “tactile sensitivity is enhanced in the congenitally deaf”,⁴⁸ especially in musical situations. Indeed, specific studies show that the

39 Cf. Finney and Dobkins, “Visual Contrast Sensitivity”, 2001; Finney et al., “Visual Stimuli Activate Auditory Cortex in Deaf”, 2001; Fine et al., “Comparing the Effects of Auditory Deprivation”, 2005.

40 Karns et al., “Altered Cross-modal Processing in the Primary Auditory Cortex”, 2012.

41 Auer et al., “Vibrotactile Activation of the Auditory Cortices”, 2007, p. 647.

42 Levänen et al., “Vibration-induced Auditory-cortex Activation”, 1998, p. 871.

43 Good et al., “Compensatory Plasticity in the Deaf Brain”, 2014, p. 564.

44 Stivalet et al., “Differences in Visual Search Tasks”, 1998, p. 230.

45 Cf. Parasnis and Samar, “Parafoveal Attention”, 1986; Proksh and Bavelier, “Changes in the Spatial Distribution of Visual Attention”, 2006.

46 Sladen et al., “Visual Attention in Deaf and Normal Hearing Adults”, 2005, p. 1536.

47 Cf. Cranney and Ashton, “Tactile Spatial Ability”, 1982.

48 Levänen and Hamdorf, “Feeling Vibrations”, 2001, p. 76.

Deaf develop characteristic abilities “to discriminate between musical timbres based on vibrotactile stimulation alone”⁴⁹ and learn to differentiate voice colours through the somatic system, suggesting “a valuable role for vibrotactile information that may be used to supplement assistive listening devices used by deaf and hard-of-hearing individuals”⁵⁰

The neurocognitive perspectives, therefore, make it possible to justify the physiological possibilities of the deaf musical experience and overcome the paradox by reducing the supremacy of the ear in musical practice. Listening is also feeling and being touched – physically – by music, and the musical experience for the Deaf is primarily about physical contact with the vibratory materiality of sound.

Physiological dimensions⁵¹

The vibratory sensation – also called *pallesthesia* – informs about the sensory data perceived by the sense organs and concerns “the ability to perceive the presence of vibration when an oscillating tuning fork is placed over certain bony prominences”⁵²

The human body is, in its entirety, sensitive to vibration frequencies and characteristically so; effectively, “[v]ehicles (air, land and water), machinery (for example, in industry and agriculture) and human activities (e. g. people walking or dancing), expose human to mechanical vibration”⁵³ The examination of the human resonance frequencies is based on mechanical or neurological studies and concerns mainly the impact of vibrations on the human body and mind (e. g. discomfort, stress, musculo-skeletal disorders). The findings of these experiments can, nevertheless, shed light on the physiological functioning of vibratory bodily sensitivity in an acoustical situation. This falls within *somesthesia*, which designates specificities of the body which perceive sensorial stimuli. The somatosensory system concerns the sensitivity to stimuli perceived by the whole body, in association or in addition to those concerning the sense organs directly. The somato-sensitivity is based on specific sensory neurons,

49 Russo et al., “Vibrotactile Discrimination of Musical Timbre”, 2012, p. 4.

50 Ammirante et al., “Feeling Voices”, 2013, p. 5.

51 Cf. Brétéché, “The Deaf Listening”, 2019a; Brétéché, “The Deaf Musical Experience” (forthcoming).

52 Campbell and Barhon, *Dejong’s The Neurologic Examination*, 2019, p. 544.

53 Brownjohn and Zheng, “Discussion of Human Resonant Frequency”, 2001, p. 469.

the mechanoreceptors, which “respond to deformation, such as touch or pressure”⁵⁴ and perceive the stimuli ensuing from mechanical transformations of the sensitive environment. Mechanoreceptors concern more specifically – and among others – the vibratory sensations. As William Campbell and Richard J. Barohn explain:

The receptors for vibratory stimuli are primarily the very rapidly adapting mechanoreceptors such as Pacinian corpuscles, located deep in the skin, subcutaneous tissues, muscles, periosteum, and other deeper structures of the body; and Merkel disk receptors and Meissner corpuscles in the more superficial skin layers. The Merkel disk receptors and Meissner corpuscles respond best to relatively low frequencies and Pacinian corpuscles to higher frequencies.⁵⁵

According to the work of Michael J. Griffin, the whole-body human vibration exploits a frequency field that ranges from about 0.5 to 1,250 Hz.⁵⁶ Specifically and for an overall threshold of perception around 80 decibels,

Human exposure to vibration may be classified due to their peculiarities, in (1) Whole Body Vibrations (WBV): vibrations that, as the name suggests, affect the whole body, particularly in a frequency range 0.5 to 80 Hz [...]; (2) Hand-Arm vibration (HAV): vibrations that affect and are transmitted specifically to the hand-arm system, in a frequency range from 6.3 to 1,250 Hz [...].⁵⁷

We can observe that the reception spectrum is much lower than that of the human ear, which perceives frequencies between about 20 and 20,000 Hz. However, we note that the somatic system is sensitive to infrasound – sound elements below 20 Hz – not perceived by the auditory system and considered inaudible.

Indeed, “the human body, despite its higher complexity, can be considered as a biomechanical system for analysis of vibration”⁵⁸ and the modes of the bodily reception of mechanical vibrations are integrated into the somesthetic system, which can

54 Campbell and Barohn, *Dejong's The Neurologic Examination*, 2019, p. 525.

55 *Ibid.*, p. 544.

56 Griffin, *Handbook of Human Vibration*, 1990, p. 8.

57 Gomes and Savionek, “Measurement and Evaluation of Human Exposure to Vibration”, 2014, p. 292.

58 *Ibid.*

be classified in several different ways. Depending on Sherrington's distinction,⁵⁹ the sensory system can be categorized according to three distinct levels of sensitivity:

1. Firstly, the exteroceptive sensation, which refers to the external perceptions of stimuli and "provides information about the external environment".⁶⁰ The body is directly in contact with the sensitive environment through the skin, which contains many sensory receptors in charge of the vibrotactile perception and, in this way, for the Deaf, "the sensation of musical tone by the skin or the ear is generated by periodic vibration".⁶¹ The cutaneous reception is effectively presented as a fundamental sensory modality in the deaf musical experience, and "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".⁶² For the exteroceptive sensation, it is more specifically the Pacinian (in the 40 to 1,000 Hz frequency range) and Meissner corpuscles (10 to 400 Hz) which participate to receive vibrations.
2. The second level of somatic receptivity is the proprioceptive sensations, which "arise from the deeper tissues of the body, principally from the muscles, ligaments, bones, tendons, and joints",⁶³ and allow the reception and the transmission of sound vibrations through the musculoskeletal receptors. Studies have established specific resonance frequencies for several organs and parts of the body.⁶⁴ The cutaneous perceptions for the Deaf are associated with a bony reception of sound vibrations, which is based mainly on a structure-borne perception (WBV⁶⁵) of the acoustic elements. During instrumental practice, the

59 Sherrington, *The Integrative Action on the Nervous System*, 1906.

60 Campbell and Barhon, *Dejong's The Neurologic Examination*, 2019, p. 523.

61 Russo et al., "Vibrotactile Discrimination of Musical Timbre", 2012.

62 Le Moël, "L'univers musical de l'enfant sourd", 1996, p. 58. Original text: "le sens du toucher peut atteindre, par un long apprentissage et des expériences multiples, une sensibilité maximum. Il peut procurer aux êtres privés d'audition le plaisir de sentir leur peau recevoir chaque onde sonore".

63 Campbell and Barhon, *Dejong's The Neurologic Examination*, 2019, p. 541.

64 There are different specifications on human resonance frequencies that I detail in: Brétéché, "The Deaf Musical Experience" (forthcoming).

65 'Whole Body Vibrations'

body is vibrated by the instrument, primarily on the arms (HAV⁶⁶), and the bone perception of acoustic variations is also made efficient by air conduction.

3. The last level of the somatosensory system reveals the interoceptive sensitivity, which refers to general visceral sensations that arise from the internal organs⁶⁷. The organs in the thoracic and abdominal cavities also contain numerous mechanoreceptors and the transmission of vibratory waves is carried out by the soft tissues in the body. The internal sensations induced by sound vibrations are described by the Deaf⁶⁸ as 'resonances' and 'vibrations' on the torso or 'bubbling' in the stomach, indicating that the transmission of the vibratory waves is also performed via visceral conduction, which concerns mainly 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 whole body becomes 'the organ' of hearing [...]. By the vibrations that touch it, it replaces the ear"⁶⁹. Therefore, considering the deaf musical practices makes it possible to go beyond the fundamental aurality of music by revealing the primordial role of the body. In other words, the deaf otherness renders an experience of music detached from the ordinary conventions dependent on the ear and seems to be able to reveal an unknown facet of music, recentring the body as the essential organ of sound reception.

However, in addition to these physio-acoustic dimensions, the deaf experience also defines – and perhaps most importantly so – an artistic reality inscribed in a specific use of the body, 'culturally' Deaf, and concretely representing the deaf musical otherness: sign-singing.

66 'Hand-Arm Vibration'

67 Campbell and Barhon, *Dejong's The Neurologic Examination*, 2019, p. 549.

68 Cf. Brétéché, *L'incarnation musicale*, 2015.

69 Cabéro, *Différent, différence et différends*, 2009, p. 249. Original text: "le corps tout entier devient 'l'organe' de l'audition [...]. Par les vibrations qui le parcourent, il se substitue à l'oreille".

Body voice: sign-singing

Within the real musical practice of the deaf culture, sign-singing proposes a soundless expression of a verbal text in the form of a signed song, where the body carries the melodic and rhythmic values by the exploitation of a “choreographed sign language, abstract and poetic”.⁷⁰ Beyond presenting a simple translation of a vocal song into sign language, sign-singing is deeply invested with musical dimensions that transform the common practice of sign language and exceeds its strictly linguistic values.

Nowadays, sign languages are the subject of in-depth studies in the fields of Linguistics, Sociolinguistics and the History and Ethnology of Deaf Culture. More specifically, linguistic considerations are part of the origin of Deaf Studies⁷¹ and are currently developing in the fields of Gesture Studies⁷² and Cultural Studies⁷³. Like all languages, sign languages convey cultural and identity values relating to the individuals who practice them, but their visual and embodied specificities set them apart from the other languages and their specifically Deaf use transforms them into an instrument of community claim and identification.

If the linguistic studies of sign languages are currently enjoying a considerable expansion, sign-singing remains a relatively unexplored field both within linguistic considerations and musical investigations;⁷⁴ approaches to this deaf practice are often limited to its cultural and identity character⁷⁵ only, sometimes linguistic, but very few studies develop an analytical model of the musicality of the signed song. The difficulty of developing a systematic method to analyse the musical characteristics of sign-singing arises due to the non-audible expression and the bodily inscription of this sung practice. Nevertheless, analytical exploration of sign-singing presents important perspectives for the deepening of knowledge, both about linguistic functioning and musical conditions. In most studies, sign languages are considered from

70 Schmitt, “De la musique et des sourds”, 2012, p. 222. Original text: “une langue des signes chorégraphiée, abstraite et poétique”.

71 Cf. Stokoe, *Sign Language Structure*, 1960.

72 Cf. Goldin-Meadow and Brentari, “Gesture, Sign, and Language”, 2015.

73 Cf. Ladd, *Understanding Deaf Culture*, 2003; Bauman, *Open Your Eyes*, 2007.

74 Cf. Cripps et al., “A Case Study on Signed Music”, 2017; Cripps et al., “Signed Music”, 2019; Maler, “Songs for Hands”, 2013; Maler, “Musical Expression among Deaf and Hearing Song Signers”, 2015; Holmes, “Singing Beyond Hearing”, 2016; Jones, “Imagined Hearing”, 2015.

75 Cf. Darrow, “Exploring the Art of Signs and Songs”, 1987.

the perspective of the specificities of vocal languages. To observe them in their musical possibilities would lead to an enhanced understanding of their performativity and creativity criteria. In addition, thinking about sign languages from their musical qualities could lead to a specific observation of their semantic structures by detaching them from all references to the audible criteria of vocality; similarly, to separate the musical experience from the aurality by inscribing it in the body and the visual sphere participates in revealing what can be described as 'vusicity':⁷⁶ the musicality of the visible.

Sign-singing is indeed based on specific linguistic criteria: If sign language becomes musical, it is partly because the gesture takes on musical dimensions but also because the music itself becomes gesture, a product of the body, embodied expression, truly 'signed music'. Fundamentally, in this singular practice, the musical experience is consistent with deaf specificities: the melodicy takes the body as the production space of the musical expression, whereas the rhythmicity of the gesture exploits the visual space as the realisation place of the musical event.

The signed song performances synthesize the specificities of the deaf musical otherness: the visual modality and the embodied practice of the musical experience. Affirming part of their musical identity with this singular practice, the Deaf distort the ordinary codes of the singing to produce a visual music which borrows the expressive values of the vocal to develop an exclusively bodily song. The sign-singing is, in a way, a silent musical expression, the silence of the Deaf expressed through the body as musical support of expressiveness.

*

Giving itself to feeling, music imposes itself on the body; however, if "the bond between body and music is complex and indissoluble",⁷⁷ it seems that once the aural primacy is sidelined, the musical experience reveals its natural embodiment. This is how to observe the deaf musical practices which make it possible to pass beyond the *a priori* fundamental aurality of music by highlighting the primordial place of

76 Brétéché, "Visual Music?"; 2019c; Brétéché, "The Deaf Musical Experience" (forthcoming).

77 Csepregi, "La musique et le corps", 2001, p. 103. Original text: "Le lien entre le corps et la musique est complexe et indissoluble".

the body: The deaf otherness restores an extraordinary experience and reveals an unknown aspect of music, the one giving the body the primordial listening support.

As Vladimir Jankélévitch wrote, “there is an invisible and inaudible harmony, suprasensible and supra-audible, and this is the true *key to song*”,⁷⁸ and it is, in a way, to the observation of this inaudible specificity of music, to its somato-sensitive and visual qualities, and to the permutability of the senses that the deaf musical practices invite us. Repositioning the foundations of listening from hearing to feeling by detaching the sound from its aural form to affirm the corporeality as a fundamental principle of musical embodiment, the deaf musical experience leads us, by using Jankélévitch’s words again, “to decipher who-knows-what cryptic message as perceptible to place a stethoscope on a canticle and hear something else in it and behind it, to perceive an allusion to something else in every song, to interpret that which is heard as the allegory of a secret, incredible meaning [...]”⁷⁹

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78 Jankélévitch, *Music and the Ineffable*, 1961, p. 10.

79 Ibid., p. 11.

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