Article:
Kapsali, M (2017) Making the body all ears: Sonolope and a somatic practice of really listening. International Journal of Performance Arts and Digital Media, 13 (1). pp. 39-54. ISSN 1479-4713

https://doi.org/10.1080/14794713.2017.1300446

Making the Body all Ears: Sonolope and a somatic practice of really listening

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Abstract

Movement sonification is an ongoing area of artistic research attracting the interest of musicians, technologists and movement practitioners. Similarly, mobile phones are frequently used in artistic contexts. By discussing Sonolope, a mobile phone application that enables the production of quadrophonic sound through the user's movement in the space, this article aims to contribute to existing scholarship by examining the experience of sound and movement co-production in relation to the sensory modalities that underpin mobile phone use and through a set of philosophical accounts that focus on listening. It will be argued that Sonolope, as well as similar systems of movement sonification, can offer a third category of experience and analysis that transcends the existing binaries between external appearance and internal sensation, image and proprioception. It is thus intended to examine sound as an integral part of the user's experience within movement sonification, and position such an experience in relation to somatic practice, mobile phone use and a wider philosophical project of developing a 'sonorous subject'.

Keywords

Movement sonification, mobile phones, somatic practice, movement improvisation, otocentric accounts

I saw them from my window, six pre-schoolers accompanied by two adults. Large cardboard ears are strapped on their heads just above where their real ears are. Each is holding a flip chart with the images of sounds they have been asked to identify: planes, birds and rustling leaves, mobile phones and human voices. They are on a listening trail; the enlarged ears a *mark and a reminder of the 'stretching' of the real ones the activity aims to enable: 'what* does it mean for a being to be immersed entirely in listening, formed by listening or in *listening, listening with all his [sic] being'? (Nancy 2007, 4)*

Introduction

The co-production of sound and movement has been extensively explored through the employment of a variety of mediums, such as sensors, pressure mats and video tracking systems (Wechsler 2006; Wijnans 2008; Peters 2010; Wilson-Bocowiec 2010; Birringer 2013; Coleman 2015). An area of equal growth is the use of mobile phones in artistic production and research (Kozel 2010; Blake 2014; Farman 2015; Davidson 2016). Against this background, this article takes as its starting point Sonolope, a mobile phone application that enables the production of quadrophonic sound in response to the user's movement in the space. [1] Sonolope is similar to existing projects of movement sonification in terms of conception, design and technological infrastructure, but employs the smart phone as the main interface between the user and the system, rather than ready-made or bespoke wearable and tracking technologies.

To paraphrase Wilson-Bocowiec (2010, 48), systems of movement sonification tend to be 'described from the point of view of what the technology is doing' and/or 'what the body is experiencing'. What often escapes critical enquiry is the performer/user's relationship with the actual devices that comprise the respective systems and interfaces. This is understandable; as noted already, the majority of movement sonification systems utilise devices that fall well beyond the spectrum of daily and domestic use. In the case of Sonolope however, the choice of the smart phone as the main interface both dictates and also offers the opportunity to examine the embodied attitudes, and in particular the sensory modalities, that

are associated with the device. Tracing the intersections between contemporary mobile phone use, responsive digital technologies and movement improvisation, the aim of this article is to discuss movement sonification in relation to the use of domestic technologies and through the lens of philosophical accounts that could be broadly called otocentric.[2] These include a text by Jean-Luc Nancy (2007) as well as subsequent critical commentaries (Hickmott 2015; Janus 2011; Kane 2012); Don Ihde's (2007) [1976] phenomenological account of listening; and Steven Connor's (1997) historical examination of the 'auditory I'. As it will be discussed later on, an otocentric turn in philosophy/critical theory, exemplified by the aforementioned texts, does not simply mark a concern with the phenomenon of sound and auditory experience. As Janus (2011, 184) argues in relation to Nancy's text, such analyses aim to 'explore the ontological and epistemological possibilities of listening as a mode of thinking and as a way of being in the world'. It is also worth mentioning that although practices of movement sonification have been theorised from a number of perspectives, otocentric accounts have not been fully utilised as a lens of analysis, despite their obvious relevance to the practice.[3]

By drawing on the aforementioned texts, my own participation and observation of users in workshops with Sonolope as well as scholarly accounts of other systems of movement sonification, this article will first outline the shift in the sensory modalities that underpin the use of the mobile phone device and then discuss the creative contributions that systems of movement sonification may make to somatic practice. This discussion will be organised in two sections. The first section will concentrate on the way in which the defining characteristics of movement sonification systems can serve aspects of movement improvisation, specifically the development and stretching of habits as well as the symbiotic relationship between the mover and the system. The second section will examine how the function of movement sonification within a pedagogical/rehearsal process may be inflected

by a dialectic between the visual and the kinaesthetic, which is deeply embedded in somatic and/or somatically influenced, dance practice.[4]

Overall, this article, as well as the practice that underlies it, aspires to make two contributions. On the one hand, it hopes to contribute to an ongoing and 'broader project', envisaged by Susan Kozel (2010, 138) and others, of 'applying choreographic and performative approaches to the study of embodied expression through mobile devices with the goals of designing devices offering scope for enhanced corporeal expression and producing an embodied aesthetics'. On the other hand, an examination of sound as an integral part of the user's experience within movement sonification, aims to position such an experience in relation to a wider philosophical project of developing a 'sonorous subject'. As such, this article will conclude with some thoughts on movement sonification as a form of somatic practice and its relation to a philosophy of listening, which arguably has the potential to allow us to re-consider fundamental aspects of contemporary subjectivity.

The 'Eye-Phone' and Legacies of Visualism

With the advent of digital technologies, mobile phone use has been progressively characterised less by an auditory and more by a visual modality whereby the face and 'fingers of the hand became the dominant organs' for operating the device (Wellner 2016, 8-9). To put it simply, phones developed from devices we talk to, to devices we look at and this shift has been effected by and consequently affects the user's embodiment. Tracing the development of the mobile phone in the last twenty years, Wellner examines the interrelations between the characteristics of the hardware (its size, attributes etc), its functions, and the cultural-embodied modes of use.

> In the first variation the cell phone is held only during calls and gazed into for just a short while in order to see who is calling. In the second variation, the hold and gaze are slightly longer because there are more texts to read. The applications of the third variation require more time spent on gazing at and holding the handset, and in the fourth variation it is necessary to hold and look at the cell phone's screen most of the time […]. (Wellner 2016, 77-8).[5]

The 'victory of the visual over the auditory', as Wellner (2016, 9) puts it, is not simply functional. According to Jaime del Val (2015, 5), this can be seen as another manifestation of 'the Renaissance perspective that still governs our digital interfaces of rationalised vision and manual control'. In other words, the transformation of the phone from an auditory to a mobile, audio-visual, and now increasingly locative device, resonates with the entrenched visualism that characterises Western thought and is, according to certain arguments, inextricably related with the characteristics of Western technological advancement.[6]

Visualism – or ocularcentrism as Martin Jay would have it- is used here as a shorthand term to denote 'the whole reductionist tendency, which in seeking to purify experience, belies its richness at the source' (Ihde 2007, 13). Taking care not to institute a false dichotomy between seeing and hearing, as well as emphasising that experience is fundamentally intersensory and that any account that views senses as separate phenomena is bound to exemplify a visualist paradigm, Ihde traces the legacy of visualism from classical Greek philosophy to Enlightenment and focuses on two 'reductions'. The first is a 'reduction to vision' (Ihde, 2007, 6, emphasis in the original), whereby 'vision becomes the root metaphor to thought' (8) and knowledge becomes synonymous with seeing.[7] The second is a 'reduction of vision […] which ultimately separates sense from significance' (8-9 emphasis in

the original). Alongside the epistemological, cultural and political implications of visualism, what is also of note here is the kind of subject that emerges out of such world-view: a 'rational, self-identical subject of reflexive consciousness, a subject whose mastery and dominance over self and world involves a "vision" that objectifies all it identifies and that silences the multiple resonances of the sense and of sensual difference' (Janus 2011, 184).

As a counterweight to the dominant visualist paradigm, contemporary thinkers also examined whether philosophy and subjectivity could be –or indeed has been- conceived/experienced in relation to an alternative auditory one. By asking whether philosophy is capable of listening (Nancy 2007, 1) and calling for 'an ontology of the auditory' (Ihde 2007, 15), Nancy and Ihde respectively examined the implications of putting auditory experience at the centre of philosophical investigation. In strikingly similar ways, both Nancy and Ihde embarked on a description of the phenomenal experience of sound, such as the way it affects our sense of space and time. They also brought attention to the ability of sound to simultaneously communicate both sense and significance, which I will examine in more detail later on. Effectively what Nancy (2007, 10) proposed is a conception of subjectivity in terms of sound, rather than vision: 'in terms of the gaze, the subject is referred back to itself as object. In terms of listening, it is, in a way, to itself that the subject refers or refers back'.[8]

In a similar vein, and employing a historical perspective, Steven Connor emphasised that despite the dominance of the visualist paradigm, other sensory modalities have been influential in the experience of selfhood.[9] Specifically, Connor (1997, 204) foregrounds the way in which the acoustic technologies that emerged in the late nineteenth-early twentieth century led to the 'growing identification of the self and the ear'. An overview of Connor's account shows that the telephone was instrumental in domesticating and enhancing a

mediated auditory experience. This, as Connor argues, made possible different experiences of selfhood.

> The rationalised 'cartesian grid' of the visualist imagination, which positioned the perceiving self as a single point of view, from which the exterior world radiated in regular lines, gave way to a more fluid, mobile and voluminous conception of space, in which the observer-observed duality and distinctions between separated points and planes dissolve. […] The self defined in terms of hearing rather than sight is a self imaged not as a point, but as a membrane; not as a picture, but as a channel through which voices, noises and music travel. (1997, 206-7)

If we therefore examine the current function of mobile telephony through the historical, otocentric perspective offered by Connor, it could be argued that the smart phone reinforces visualism at an experiential level, and not only because it operates according to the logic of the Renaissance grid. The re-mediation of the tele-phonic function through the visual modalities of the smart phone significantly reduced a hitherto fundamental way of exercising our auditory sense in daily communication and has subsequently turned the human voice to text.[10] Indeed, Schroeder (2012, 26) puts it rather figuratively, when she notes, in relation to social media, that 'our mouth's "chatters" are handed down and over to the tips of our fingers'. An examination of current mobile phone use through an otocentric paradigm thus suggests that in the shift from the tele-phone to an i(eye)-phone we may have been robbed of opportunities to experience the world as 'membranes' and rather revert to an experience of the self as an external-to-the-world single point of view.[11]

It also bears noting that an analysis of the remediation of the telephone into a smart phone does not aim to lament the demise of an analogue (often posited as better, more fully embodied) past. The intention is to underline that shifts in cultures of use have profound

philosophical and experiential consequences. In this respect, Sonolope, similarly to other projects that have utilised mobile phones, has adopted a dialectical approach, whereby technology is regarded as both the 'poison' that gives rise to a set of unwanted consequences, but also the 'cure'.[12] Instead of vilifying mobile phones as another manifestation of ocularcentrism, or blaming their development for the loss of opportunities for auditory communication, a dialectic approach seeks to directly engage them within the creative context. Such an engagement is characterised not only by a conscious re-appropriation of the mobile phone and its functions, but also by the employment of a strategic distinction between the object (and the cultural and embodied set of relations it invites) and the technology that enables the object's functions. In other words, Sonolope, similarly to other mobile phone applications, is conceivable in the first place because of the device's inherent multistability. According to Wellner (2016, 12), who draws on Ihde's concept, multistability 'indicates that the same technology can be used differently by different people who assign different meanings to it'. In this respect, Sonolope not only utilises an existing object, it also utilises existing hardware devices, such as sensors, that are often part of mobile phones. It does however reconfigure the relationship between object and function and repurpose existing functionalities towards a new cultural-somatic practice.

By bringing attention back to the function of the phone as a device related to sound and by developing an interface that involves the whole body, Sonolope seeks to both extend the repertoire of functions/movements with which mobile phone use is currently associated as well as develop a somatic praxis of listening through a system of movement sonification. If, as Ihde (2007, 21) suggests, 'focus on auditory experience allows us to take note of what often goes unnoted and thus also give fresh sense of experience', how does the sonification of movement allow new things to come to the user's attention and in what ways does experience become 'fresh'? Based on a series of workshops conducted with Sonolope as well as drawing

on accounts of similar projects in movement sonification, the next section explores how inherent characteristics of the technological system relate to fundamental aspects of movement improvisation. It begins with an 'inside' description of using Sonolope within improvisation (accompanied by links to videos from practical explorations) and continues with a more 'distanced' discussion of two aspects of movement sonification that could be beneficial within somatic/improvisatory practice: the way kinetic habits can be fed back and stretched through sonification and the way the intended or unintended activity of the system may complicate the user's sense of agency.

Listening-Moving in Movement Sonification: Interactions between the user and the system

I insert the mobile phone in an arm band that has an extended belt and can be tied anywhere on my body. I select a sample of sounds from a drop down menu that appears on the screen of my phone. Each sample has a different quality, it invites different responses. Percussive sounds are to be thrown, string sounds are to be stretched. [13]

I move, from the centre, from the periphery, in the space. Sensors in the mobile phone capture the acceleration and axis of my movement, whilst a software translates the data into code. Code is mapped onto sound and the sound is emitted from speakers that stand in the four corners of the room and allow the direction of the sound to mirror the direction of my movement.

In written description these points seem fixed but during the actual experience they blend into another. Yet, the relationship is far from seamless. The system is not to be trusted. Sometimes it surprises me and talks back in ways I do not expect. After a while I find something (a movement, a step, a gesture) that is reliable. I am led by the sound to a way of movement that is reliable: I do this, you do that (Video A). [14] Awkward angles and differentiations in speed produce sounds I do not expect, I do not know they are there. I try to find them again searching with my body and my ears. My kinaesphere is filled with pockets of sound that I can only hear if I move in specific ways (Video B).[15] When I find the sound that has been hiding, I feel gratified.

As the field notes above demonstrate, one of the first, and in fact most common, responses amongst trained and non-trained movers, is to begin by trying to work out the rules of the interaction. Movers, in other words, attempt to figure out the logic that underpins the mapping of their movement into sound and it is likely that they will try to develop a form of

call and response between the two. Depending on the various mappings employed at any one time, a system could sonify different aspects of one's kinetic identity. For example, in Sonolope the mapping between the generation of sound and the data engendered by the movement is such that the direction of sound follows the direction of travel; the duration and speed of the sound reflects the speed and flow of the physical movement; and the pitch or volume of sound responds to alterations in the use of levels. On the basis of such mapping, it could be argued that movement sonification could institute an indexical relationship between movement and sound, whereby the sound is 'heard' as a particular manifestation of the movement.

In such a relationship, sound can serve as a diagnostic tool. For example, Parviainen (2011, 640) observes, with regard to the mappings employed in the Embodied Generative Music project (EGM), that 'what dancers hear is a real-time manifestation of their kinaesthetic/motor activity' and, in this manner, they could arguably gain an additional understanding/perception of their kinetic habits. This can be an important contribution that movement sonification systems make to somatic and improvisation practices, since habits pose a sort of conundrum. As Susan Leigh Foster (2003, 4) explains, movement improvisation 'encourages us or even forces us to be "taken by surprise". Yet we could never accomplish this encounter with the unknown without engaging the known'. Or as Ihde (2007, 202) puts it rather succinctly, 'improvisation is always related to patterned actions'. Within improvisation therefore kinetic and gestural habits are likely to emerge to such an extent that they become an organising force that the practitioner finds difficult to transcend, since there is no set form to offer alternative postural and spatial arrangements. The production of sound could accordingly act as an auditory document of one's preferences.

At the same time, however, the system can serve as an interlocutor that guides the movement in new directions (or not, depending on the user's choices). Deniz Peters (2010),

the project leader in EGM, brings attention to the intermedial character of the mover's experience and the development of two pathways of intentionality. Since in EGM the mapping of sound and movement operated on the basis of the dancer's location, i.e. the sounds were 'in the space' and became activated by the user's movement, Peters identifies two trajectories: one emerges from the mover's 'visually oriented and felt bodily impulses' (Peters 2010, 83 emphasis in the original), while the other is dictated by the 'sound modulations' actual spatial layout' (ibid.). The two trajectories, however, can be conflicting, since a user, for example, might wish to continue with the exploration of a particular sound but may also want to move in a different rhythm/part of the space, in which case the sound will no longer be available. A similar tension develops in Sonolope, although the sound is generated in response to the user's bodily position and not the spatial location. On the one hand, the movement serves the pragmatic function of producing sound within the established mappings; on the other, the movement, as well as the sound that it generates, develops its own sensorial reality that may produce impulses that lead the mover into new kinetic organisations and away from the generation of a specific sound. For example, in the movement exploration documented in Video B, the mapping is such that the sustained production of the sound is premised on the horizontal position of the phone. This dictated both the choice of the body part on which the phone is strapped as well as my placement in the space. As the movement-sound develops, however, and I reach an upright position, the sound I have been playing with is 'lost'. In this manner, the system features a sense of determination against or with which the user's decision-making develops.

The friction between the generation of the sound and the generation of the movement is further compounded by glitches that often occur, at least during the phase of a system's development. As indicated in the field notes, a seamless relationship between sound and movement is only transient and bound to be disturbed by unpredictable responses.[16]

However, rather than trying to iron it out, a measured amount of randomness can be productive: as Maria Coleman (2015, 170) notes in an account of the Body Response System, the slight unpredictability of the system both 'suppl[ies] a spring in the step of the mover's next move' and intensifies her listening. It both prevents the user from becoming 'amniotically immersed in sound' (Home-Cook 2015, 52) and can take the improvisation in new directions. For example, in Video A, a sound-movement phrase develops that is predictably punctuated by pauses in the movement-sound. Yet, towards the end of the video a pause in the movement does not produce a pause in the sound. As a result, a new movement is developed with the aim to explore the new-found sound. In this manner, a system of movement sonification becomes a partner that can catalyse an exploration of one's spatial, kinetic and gestural preferences and encourage a multimodal stretching: a stretching of the ears, in terms of the intentionality that underpins listening, and a stretching of the body in terms of the habits that organise movement.

Listening-Moving in Movement Sonification: Discursive assumptions

As a complement to the previous section that focused on the interaction between sound and movement/system and user, this section explores how practice of movement sonification might be influenced by the discursive assumptions that underpin somatic practice. One of the criticisms that Hickmott (2015: 490) develops against Nancy's text is that in his attempt to develop an alternative, anti-ocularcentric model of subjectivity, he 'de-historici[zes] listening in order to think of it as a "natural" phenomenon to which we can legitimately turn'.[17] In other words, it would be erroneous to assume that listening, and for that matter listening in movement sonification, automatically transcends the dominance of visualism and acculturated modes of sensory perception. This section, then, explores how movement sonification within a specific artistic context might be inflected by unquestioned

conceptions and established ways of working. It begins by discussing an example of working with imagery drawn from Parviainen's process in EGM and then proceeds with a discussion of listening as a foundational metaphor within somatic practice. The discussion is not aimed as a criticism of Parviainen's work. It is rather offered as a reminder that certain assumptions are so deeply embedded that can crop up even in the work of experienced practitioners, and as an invitation to somatic practice to take listening literally.

Working with images is one of the most pervasive aspects of contemporary performance practice, spanning the entire twentieth and twenty-first century and pertaining to systems of acting, dance, voice and somatics. In relation to movement improvisation and beyond, image is often described or articulated in terms of vision. An image is thus understood as 'a more or less coherent mental picture' (Zinder 2002, 206), a 'movie-in-the brain' (Blair 2006, 178) which either emerges during the creative process and/or the performer is invited to place 'in' or 'on' to her body. In this manner of working, an image develops from a mental construct, memory, and/or representation of an actual object to a kinaesthetic reality, and becomes 'the physical expression of a mental association' (Watson 2010, 241). In such a conceptualisation, images serve as a bridge between inner and outer and it is often the case that a feedback loop between internal image and external form is set in motion (Hulton 2010, 172). The aim of image work then is 'to have psychophysical efficacy in engaging and moving the actor and thereby the audience' (Blair, 2006, 180, emphasis in the original).

Yet, in creative processes within movement sonification, the strategy of employing imagery as a catalyst for rendering a kinaesthetic process into a visible 'presence' can be problematic. With regard to her participation as a choreographer-pedagogue in EGM, Parviainen (2011, 643) recounts that, when a dancer 'reported that a sound felt like something organic, fluid and outside her body, I asked her to move as if her body were full of heavy

liquid material. In her improvisation, she [the dancer] specified this image as "oily liquid"'. When the material was presented to the rest of the team, Parviainen (2011, 643) attests that the audience recognised the dancer's 'new expressivity of her improvisation, powerful bodily presence, and the clarity and vividness of her micro movements'. She then lists a series of somatic practices, such as idiokinesis and Butoh, which explicitly aim to generate a feedback loop between the generation of images and states of embodiment. As suggested already, Parviainen's tendency to approach the operation of image in relation to an inner sensation-outer expression dialectic, despite being in an environment that is so ostensibly sonorous, reflects a wide-spread position to treat image as a means of refining expressivity. In this way, however, a dichotomy between inner and outer, sensation and appearance becomes (re)instituted and - especially within a performance context - vision remains intact as 'an arbitrating meta-sense' (Connor, 1997, 221) that eventually validates kinaesthetic responses (in Parviainen's case the efficacy of the image is evaluated against the dancer's expressivity and the dancer's expressivity is judged against the audience's responses).

A similar attitude, but on a larger scale, is evident in Andrea Davidson's recent article on 'digital dance'. Davidson provides a wide-ranging review of important developments in the use of digital technology within contemporary dance and choreography. The aim is to claim, within dance scholarship, a unique position for the 'third wave of expression' of digital dance as well as argue that 'finer analysis [of contemporary dance production] reveals new media technologies to be operating as 'new viewing-sensing devices' (2016, 27, emphasis in the original). Yet, a number of the works under examination do involve sound, and Davidson acknowledges this (2016, 28). For example, in relation to Isabelle Choinière's Flesh Waves, Davidson (2016, 34) notes that the audience's 'proximity and immersion in sound and flesh create what amounts to a collective, or inter-corporeal sharing of an intensely sensory nature'. Even though sound is identified as an integral part of the inter-corporeal relation that

developed among the members of the audience and between performers and audience, the understanding of the technology as a 'viewing-sensing device' keeps the analysis locked within a dialectic, which on one hand singles out vision (viewing) and on the other positions together the audio, the tactile and the kinaesthetic in an undifferentiated sensory cluster (sensing). This pairing is based on a further opposition between outer and inner, whereby technology is understood as an 'exteroceptive agency' which modifies the 'individual's interoceptive, proprioceptive experience' (2016, 23). This, however, prevents Davidson from examining whether the use of sound within these artworks might be enabling the very transcendence of this opposition and the development of a new model of analysis.

Davidson's tendency to position sound as part of a generic 'sensing' could also be seen as symptomatic of the very foundation of somatic practice, and the somatic turn in dance, i.e. the argument that the living body is a source of knowledge. In an earlier article, Parviainen (2002) examines theories of epistemology and traces the thesis put forward by dance scholars that embodied perception and movement are forms of knowing. In developing an account of 'bodily knowing', Parviainen examines the process of a pianist mastering a piece of music:

> The pianist's bodily knowledge is the realisation of her or his living body's movement ability to push and release fingers on keys with a certain intensity and rhythm to produce the sound the piece demands. Bodily knowledge does not involve a mere technique or the production of skill; with the body's reflectivity it offers possibilities to choose the ways to move. (2002: 19)

Again, despite the centrality of sound in this example, bodily knowledge is identified entirely with the kinaesthetic sense and sensory-motor capacity. However, an emphasis on kinaesthesia, proprioception and motility, although it has been paramount in an attempt to challenge dominant 'visualist' models of knowledge, can also render such a project 'deaf' to

the sounds of the body and the role of the auditory sense in embodiment. This is further exemplified by a wider tendency within somatic practice to approach listening in a metaphorical manner. In Martha Eddy's comprehensive examination of the practices that belong within the wider constellation of somatics, 'listening to the body' is identified as an overarching characteristic and driving force of somatic approaches. 'How did individual experiences of, and with, the living body become a field?' Eddy asks. The answer she provides is that 'numerous men and women separately but in a common period of time, […] discover[ed] the potency of listening deeply to the body' (2009, 6, emphasis added). Listening-to-the-body becomes, in other words, the common denominator that unites a set of practices into a new field. Indeed, the phrase 'listen to the body', and variations thereof, often appear in instructions and become an actual activity of somatic practice. Yet, even if an invitation to listen may occasionally involve actual listening to the sounds generated by the body, the term is predominantly used metaphorically and rather denotes a kinaesthetic form of sensing.[18] What would happen though if we took such an instruction literally?

From Making the Body All Eyes towards Making the Body All Ears

An invitation to listen to the body presupposes that the body has/can produce a sound that can be listened to. Ihde stipulates that the entrenched habit to favour vision in the perception of the world - actualised, as we saw by the reduction of knowing to vision but also by the reduction of vision in itself - has entailed that things and bodies appear silent (2007: 49-55). It could be equally noted that an emphasis on kinaesthesia, in an attempt to destabilise an all-seeing subject, assumed a mute one. Yet, as Ihde points out, things - like bodies - can sound when they come in contact through motion with something else. Can systems of movement sonification become the sounding board that allow us to listen to the body in a literal, albeit mediated, sense? I would argue that such a possibility can be rendered

possible but it requires that we move beyond the dominant dialectical interplay between the visual and the kinaesthetic and to approach the relationship between sound and movement in a way that is more than diagnostic; like the box that makes the marble sound (Ihde, 2007: 67), the relationship between sound and movement needs to become amplificatory. So what would such a relationship amplify?

As an analysis of work with embodied imagery makes it clear, the sound produced by movement sonification can give rise to all three dimensions/definitions of sense, on which, according to Janus (2011, 183), Nancy builds his theory of listening. Drawing on my own experience with Sonolope, I would propose the following correspondences. Nancy's category of 'listening to sense as sensual or perceptual sense' (Janus 2011, 183) could be matched with the ability of sound to carry a re-sounding of fundamental aspects of the user's movement (speed, direction, flow); the category of 'listening to sense as meaning' (ibid) matches the set of representations and images that may arise in the process of sonification (the repetition of a movement that produces a percussive sound makes me think/feel/sense that I am beating an imaginary object); and the category of 'listening to sense as movement, sense of direction, impulse' (ibid) matches the possibility of the sound to carry the impulses that direct my affective responses. Within such a relationship, sound is treated as a real, albeit mediated, expression of the psychophysical experience and can thus develop an awareness of the body's sense-making in a modality other than the visual-kinaesthetic one. Most importantly, within a movement sonification environment the experiential relationship between sound and movement is on a feedback loop and, as such, the process of listening-moving as well as the sound being listened to are part and parcel of the sonorous lifeworld created by the interactions between the user and the system. In this manner, processes of movement sonification could open a space between what I do (or am seen to be doing) and what I feel, which is however other than the objectifying gaze of the mirror and the imperative placed on

the performer to produce some sort of intelligible meaning. Instead of trying to match an inner sensation to an outer reflection, whether this is the reflection of myself in the mirror, a collaborator's response, or the audience's appreciation, movement is heard in a 'mirror' of sounds.

Yet, it could be argued that even within such a formulation the body is still cast as the organ that does the listening of an extraneous sound, even if such sound carries fundamental aspects of the user's physicality. But could we envisage that the body/self not only produces but is (made of) sound? How far could we stretch Connor's (1997, 206-7) assertion that the self can be imagined as a 'membrane […] through which voices, noises and music travel'? Connor, as well as Janus (2011), refer to psychoanalyst Didier Anzieu's hypothesis of a

> 'sonorous envelope' or bath of sounds, especially those of the mother's voice that surrounds the infant soothing supporting and stabilising it. This imaginary envelope is the auditory equivalent of Lacan's mirror-stage, in that it gives the child a unity from the outside; it can be seen therefore as a 'sound mirror… or audiophonic skin'. (Connor 1997, 214)

As Connor (1997, 214) explains, sound is experienced as an outside force that permeates the infant, since the latter does not have the ability to shut it out or confine it. The audio-phonic skin develops in response as a filter that allows the subject to cope with the possible fragmentation that sound threatens to cause. Seen from this perspective, it becomes clear that an attempt to develop a paradigm of subjectivity based on the auditory is particularly challenging. Indeed, as Connor (1997, 213) argues, 'the sense of the insufficiency and insubstantiality of the hearing makes the definition of the self through it a problem. How can the modern psyche be said to be organised around an otology which is so regularly defined as the deficit of ontology?'. Yet, Connor also convincingly argues that experiences, if not conceptualisations, of selfhood based on the auditory, rather than the visual, did emerge

at specific historical moments and in response to specific acoustic technologies. Could therefore systems of movement sonification offer an auditory-somatic involvement akin to the one produced by the gramophone and the telephone and experienced by late nineteenth-early twentieth century subjects? And bearing in mind the accumulated knowledge produced respectively by philosophical accounts of listening and the somatic practices that we currently have at our disposal, could movement sonification open up the space for a conceptualisation of the body that is more sonorous? Or could we even talk about a body-sound, as a discreet sense and category of our psychophysical identity? In other words, could systems and practices of movement sonification contribute to an alternative construction of the mover's subjectivity and achieve through embodied experience what remains conceptually and theoretically slippery? Could we move from a conceptualisation of awareness that is metaphorically conceived as 'making the body all eyes' to an embodied practice of making the body all ears?[19]

Conclusion

The aim of Sonolope is to re-harness the mobile phone as a ubiquitous device in an attempt to develop the foundations of a movement practice that expands corporeality, both as a concept and a perceptual experience, through the auditory. An analysis of the moving–listening relationship within movement sonification demonstrated how a responsive system can inform processes of movement improvisation within pedagogic and/or somatic practices. It also exposed that the emphasis that somatic disciplines place on proprioception often leads to a bias towards the kinaesthetic and accordingly prevents a more thorough engagement with sound, in both practical and analytical explorations. Yet, movement sonification offers the possibility of experiencing and developing a kind of embodiment that both eschews a viewing-sensing dialectic and acknowledges the act of listening as well as the production of sound as an integral part of the body's sense making. Similarly to the impact of previous

audio technologies, the experience of such embodiment within creative and pedagogic contexts might have far reaching implications about the ways in which we experience and conceptualise subjectivity.

It goes without saying that movement sonification is only one avenue of exploration and 'making the body all ears' does not necessitate by default the use of the specific kind of technology presented here, but could be achieved by other means (I wonder if the large cardboard ears donned by the pre-schoolers we met at the beginning of this article could do the job). [20] However, within such a project different technologies as well as different ways of listening are bound to inflect the process in different ways. I would argue that an engagement with domestic technologies, such as the mobile phone, may offer an opportunity to challenge existing sensory hierarchies and thus have profound implications over the extent of agency we are able to exercise as subjects in an increasingly technologised world. Drawing on Bernard Stiegler, Neill O'Dwyer argues that 'the widening rift which has opened up between the producers of audio-visual content and the disenfranchised consumers needs to be filled by […] inventors of instruments who will re-harness and re-deploy digital technology, thus forging new circuits of thought' (2015, 49). And, I would add, new modes of experience.

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[1] Sonolope developed out of a collaboration with creative technologist Simon East through a series of workshops with performing arts students and professional theatre artists. It has been presented as an interactive installation in international conferences, the National Media Museum, and regional events, attracting over 1000 users, often including children. For more information, see the webpage: http://www.sonolope.com/ (accessed 17th February 2017).

[2] Wellner extends the concept of 'domestication' to mobile phone technologies, in order to denote a process whereby a piece of technology becomes part of the user's home (2016, 54-5). According to Wellner, mobile phones further complicate notions of domestication, since they also allow users to take their 'home' with them (2016, 79).

[3] The lenses through which movement sonification practices have been examined include techniques of mapping (Torre 2015), phenomenology (Parviainen 2011), audience participation (Coleman 2015) and theories of enactive cognition (Peters 2010).

[4] The organisation of the material in two sections –one dealing with the characteristics of the artefact and the other with the discursive 'baggage' that users are bound to bring to it, is informed by a central question in the field of philosophy of technology concerned with the 'neutrality' of the technological artefact. One side of the debate holds that technology is autonomous and imposes its own conditions, whilst the other maintains that technology is determined by socio-political interests and aims. A middle ground between these two extremes is offered by Ihde (1990) who argues that those characteristics that are inherent to the artefact are bound to inflect but not determine either its use or its function. A similar position is followed here.

[5] Wellner (2016) identifies the first three variations respectively with a particular model which arguably drove the handset forwards. In chronological order these are: Motorola's StarTAC 3000 launched in January 1996; Nokia's 5110 launched in March 1998; Apple's iPHONE launched in January 2007 (original typescript). Wellner considers the development of mobile phone applications as the fourth historical variation.

[6] Connor, for example, explains (1997, 203) that 'the rise of scientific and technological rationality […] was accomplished by a separation of the active, transforming self from a nature progressively conceived as passive, constraining and unconscious; with this separation came what Heidegger called the Gestell, or visual enframing of the world, as a separated object of knowledge'.

[7] Despite its argument, this article is still bound by a language that equates understanding/knowledge with seeing and uses audio-video material as documentation of practice. Arguably, the former is characteristic of 'academic' writing, whilst the latter is a result of the use of practice-as-research methodologies. For more information on the way language perpetuates a knowing-seeing relation, see Ihde 2007.

[8] Although Nancy's intention is to develop an alternative conceptualisation of subjectivity, Hickmott (2015) argues that his account suffers from important shortcomings: an essentialist understanding of the female body/uterus as a primordial resounding organ and a metaphysical understanding of music as otherworldly, ahistorical and pre-cultural. Janus (2011, 198-201) also locates a similar problem with Nancy's treatment of music by pointing out that the examples that Nancy gives, and are taken to exemplify music as a whole, derive from a specific high-art genre. Yet, it is debatable whether these shortcomings cancel out Nancy's project in toto. It is important to point out that Hickmott's criticism is particularly concerned with Nancy's treatment of music, and less with his account of sound and that Kane (2012), who focuses on the meaning of the French verbs that Nancy uses to distinguish between listening/hearing, is a lot more sympathetic to Nancy's overall attempt. It also bears noting that, for the purposes of this article, Ihde's phenomenological analysis and Connor's historical examination can serve as correctives to Nancy's tendency on one hand to abstract his account from any specific body and at the same time to generalise examples that are rooted in specific cultural and/or corporeal instances.

[9] In this respect, Connor (1997, 213) makes a helpful distinction between the impact that the auditory sense had on daily experiences during the late nineteenth and early twentieth century and the 'very dominance of the visual paradigm in conceptions of self'.

[10] Connor (1997, 205) for example observes that 'early commentators on the telephone were fascinated not so much by its capacity to convey messages and information as by its faithful preservation of the individuating tones and accidents of speech and even the non-verbal sounds of the body. Wellner (2016, 40) also offers a number of reasons primarily concerned with cultures of use that could explain the eventual prevalence of text messages over voice calls.

[11] This view is of course complicated by the fact that mobile phone use is also tactile and thus constitutes a multisensory experience. However, Wellner (2016, 30) argues that 'among the three senses of hearing, sight and touch, the visual eventually took over'. In specific relation to touch, he further demonstrates that the actual sensory experience is limited to the touch of the screen and involves little more than contact with the glass surface; 'the screen remains smooth and sleek, regardless of the application and the content' (Wellner 2016, 51). If we think of Connor's characterisation of the auditory self as a membrane it could be further argued that the auditory experience can be in fact a lot more haptic, than the tactile experience of using the fingers on the phone's screen. For further discussion on the relationship between touch and sound see Welton (2010).

[12] For an extensive discussion of such an approach in daily life and artistic practice respectively, see Ben Highmore 2011 and Neill O'Dwyer 2015.

[13] For a further discussion on the relationship between sounds and gestures see Peters 2010, 83.

[14] Video A is entitled 'International Metabody Forum, Brunel University, April 2016' and can be found in the Sonolope website in the videos tab: http://www.sonolope.com/videos/ as well as directly on YouTube https://www.youtube.com/watch?v=PiMl1gzfMF0 (accessed 17th February 2017).

[15] Video B is entitled 'Materiality Symposium, Leeds University, March 2016' and can be found in Sonolope website in the videos tab: http://www.sonolope.com/videos/ as well as directly on YouTube https://www.youtube.com/watch?v=B06PnD-0pr4 (accessed 17th February 2017).

[16] Cumiskey and Hjorth argue that 'seamlessness' is one of the foundational aspirations that guide technological development and identify the mobile phone as the leading interface in promoting such an experience with technology (2013, 1-4). Yet, they also problematize such as an expectation in terms of access, socio-economic standards and education.

[17] Hickmott (2015: 490) further advises to treat 'the inheritance of our ears as always already cultural'. Accordingly, an exploration of the way the user's experience within movement sonification might be informed by the ways in which cultural and socio-economic factors might have shaped her listening is an area that begs further exploration. In the literature on movement sonification I am aware of, I have not encountered such analysis and my work has not touched yet on this area.

[18] See for example, Rebecca Enghauser's article 'Developing Listening Bodies in the Dance Technique Class' (2007).

[19] Originally a metaphor that is used within South Indian systems of psychophysical education, such as Martial Art Kalarippayattu and yoga, 'making the body all eyes' has seeped into Western performer training discourse and practice, primarily through the work of Phillip Zarrilli (2009).

[20] See for example, Fabrizio Manco's recently completed PhD thesis 'Ear bodies: acoustic ecologies in site-contingent performance'. Unfortunately, I did not manage to engage with this thesis extensively since it appeared during the time of this article's re-drafting.