Self-listening

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Resumo

Este artigo analisa comportamentos de escuta que constituem ou propagam experiências subjetivas no agente do ouvir. Descritos coletivamente como auto-escuta, tais comportamentos possuem amplas dimensões abrigando desde sons concretos feitos pelo ouvinte – ele ou ela – até mais abstratas relações de escuta. Em todas as formas de auto-escuta é o ouvinte que o ocupa o centro focal. O conceito de auto-escuta advém de uma investigação que dialoga com diversas áreas em convergência: música acusmática, ecologia acústica, estudos fílmicos, fenomenologia, artes midiáticas, psicanálise, literatura e mito. Este conceito fundamental é forjado como um instrumento para tanto analisar quanto conceptualizar arte sonora a partir da unicidade da perspectiva do ouvinte.

Palavras-chave: Arte sonora. Audição. Experiência subjetiva. Arte e tecnologia. Acustemologia. Fenomelogia. Espelho acústico. Ontologia.

Abstract

This article examines listening behaviours that constitute or propagate subjective experience in the auditor. Collectively described as self-listening, the behaviours have broad scope encompassing the apprehension of concrete sounds made by the listener him- or herself, through to more abstract listening relationships. In all forms of self-listening, it is the listener that is drawn into focus. The concept of self-listening is derived from an investigation of a common thread found in diverse areas including: acousmatic music; acoustic ecology; cinema studies; phenomenology; the media arts; psychoanalysis; literature and myth. This basic concept is created as tool to both analyse and conceptualise sound art from the listener's unique perspective.

Keywords: *Sound art. Listening. Subjective experience. Art and technology. Acoustemology. Phenomenology. Acoustic mirror. Ontology.*

— Do you know the best thing I've learned? They said on Radio Clock that we should be glad to be alive. And I am. I also heard some lovely music and I almost wept.
— Was it samba?
— I believe it was. It was sung by a man called Caruso who they said died a long time ago. His voice was so gentle that it was almost painful to listen to. The music was called Una Furtiva Lacrima. I don't know why they couldn't say lágrima the way it's said in Brazil.
Una Furtiva Lacrima had been the only really beautiful thing in Macabéa's life. Drying her tears, she tried to sing what she had heard. But Macabéa's voice was as rough and tuneless as the rest of her body. When she heard her own voice she began to weep.

— Clarice Lispector

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To self-listen would seem a very simple proposition: to listen to oneself. Yet the dimensions of listening to oneself can be subtly differentiated, diverse in identity and intricately woven. As applied in this article, the term is principally used to show how the listening experience can draw attention to the self. All forms of listening have subjective dimensions, with constant potential that attention is re-directed by the listener from a source of sound, back toward him- or herself. Even when listening involves no apparent acoustic expression on the part of the listener, we might regard any inward attention as a result of audition, as self-listening. If we do, then all listening experiences will involve the potential for self-listening.

The motivation behind the following conception of self-listening has been to develop a theoretical basis for the analysis and creation of sound art. The notion of self-listening was chosen because of its resonance within the author's practice in the area of sound installation. The ideas examined each have a tacit connection with the author's work, yet are presented here in a general way in the hope they can be of use in wider contexts. In the text, a definition of self-listening emerges without emphasis on any particular art form. Initially, self-listening is discussed in the context of listening to the sounds of the body, and sounds produced as the result of human gesture. Following this, the resonance of the body and the direct transmission of vibration to the body by contact are considered. The auditory imagination is then examined. The auditory imagination presents a private manifestation of self-listening and involves what are termed as inner speech and the musical imagination. The idea of self-presence is discussed in this section and how thoughts and associations, which precipitate self-presence, are implicit in listening. Technology can also play an important role in engendering self-presence and facilitating self-listening. A number of technologies are examined, as are works of art using technology to promote new ways of self-listening. The section following this deals with emotion in listening and the signification of the listener by music; a transformation of self-presence as encoded by a composition. So-called autocentric and allocentric compositional styles are discussed, and how musical works may promote either an inward or outward focus in the listener. Phenomena associated with listening and sounding simultaneously, are discussed in a number of sections in this text. Included is Stephen Feld's idea of an acoustemology — acoustic ways of knowing. Fables and myths concerning the echo are discussed. This particular section serves to establish the notion of self-listening as mirror. The psychoanalytical concept of the acoustic mirror is examined in the final section of this article.

Self-listening and the Body

There are many concrete ways in which we can listen to ourselves. We can for example direct attention to the sounds of our own body, as John Cage was prompted (and able) to do in an anechoic chamber — a special echo-less room — in the 1950s at Harvard University. In the well-known anecdote by Cage, he asked the resident engineer, what were the two sounds he could hear, "one high and one low"; to which the engineer replied that the high sound was Cage's "nervous system in operation", the other, his "blood in circulation" (1973, p. 8). These are unintentional and unstoppable bodily sounds, and are at the far horizon of perception. Most other sounds, from or of the body, may be either intentional or unintentional. Vocal utterance for one is mostly intentional, yet if we direct our listening attention towards our own laughter for example, we find we have momentarily taken leave of language, if not conscious rationality, in a spontaneous outburst of sound. Similarly we might catch ourselves speaking, laughing, singing, screaming, crying and perhaps even whistling, in the final moments of a dream. Panic and anger too, both cause words and sounds to pour out of mouths with little or no forethought. Breathing generally goes on unnoticed, but once called to our attention, we may choose to take the reins, and using our ears as a guide, control our breath to replenish the supply of oxygen to the brain, or to restore calm and balance. Breath speaks of time passing, the smoker's breath quite pointedly of time out, and breath is loaded with sexual meaning. Other bodily sounds take on abject significance, and for the most part, can be heard by us, and can be either intentional or unintentional. For example the sound of: coughing; hiccups; digestion; snoring; wheezing; flatulence; retching; burping; expectorating; sneezing; the cracking of joints; the death-rattle; the wet sounds of the mouth; etc. These sounds are abhorrent to us because we associated them with bodily fluids, viscera and death.

People can also self-listen to the resultant sounds of their gesture and kinaesthetic action. Some of these sounds are made autonomously, as is the case with clapping or scratching, while others are made in relation to external objects or substances. Close to the body, and in some senses as an extension of the body, we have the sound of clothing and jewellery articulated by our movements (SCHAFER, 1977, p. 141). Other external sounds resulting from human actions include those pertaining to: ambulation; the use of tools, machinery or equipment; the playing of musical instruments; collisions and accidents; the handling of objects or substances; and bodily movements against supportive objects and substrates such as chairs, beds or the ground. To a similar degree to that of the voice, musical instruments produce profoundly nuanced sounds, as they are specifically designed to respond acoustically to a wide variety of gestures. Self-listening to the result of a musical gesture, is different to other forms of music listening. For one thing, there is intention to create sound on the part of the listener. For another, the musician-listener is physically and kinaesthetically connected to the source of the sound.

Yet during so-called passive listening, there may still be a relationship between the music and the body of the listener. It has been suggested that human gesture is inseparable from the act of listening or imagining music. Rolf Inge Godøy hypothesises:

> [T]hat there is a continuous process of mentally tracing sound in music perception (and in musical imagery as well), i.e. mentally tracing the onsets, contours, textures, envelopes, etc., by hands, fingers, arms, or other effectors, when we listen to, or merely imagine, music (2006, p. 149).

If this is true, our bodies are implicated during the audition of music, whether or not we are active participants in the music-making. This makes intuitive sense to anyone who has felt compelled to dance or play air-guitar while listening to music. Through gesture, or the memory of gesture, there exists a potential for a redirection of the listener's focus from the music towards his or her own body.

The self-made sounds of the body are not only heard, but are felt. The voice in particular, produces sensible vibrations in the thorax, neck, skull, sinuses and the tissues of the face. Such resonance, in addition to the muscular articulation of the voice sensed via proprioceptive mechanisms, is integral to the perception the sound's self-origin. A bodily transfer of vibration occurs when individuals play musical instruments and when there is a direct physical contact with an instrument or other vibrating surface. It also occurs as a result of high intensities of sound vibration in the air, where the body resonates in sympathy with sound. The phenomenon of the transference of vibration is cited as a form of self-listening because the body in some way becomes a secondary source of sound. Even though inaudible, the resonance of the body may itself be taken as an object of perception by the individual. The vibration is an expression of sound—a tacit shadow of sound. The transfer of vibration to the body represents an additional mode of self-listening, because it draws attention to the self as an acoustic element. The phenomenon is particularly evident in the skin and muscles, but at very high intensities, there may even be a perception of the internal organs of the body, (re)sounded with sound. Under certain conditions so-called combination tones and aural harmonics may manifest in perception (ROEDERER, 1979, pp. 33-36). These phantom tones are not present in the air as real sounds. They may appear to be located inside the head of the listener, and with this, may be considered self-sounding phenomena; and when attended to, yet another instance of self-listening.

Sound Imagination and Interior Listening

In imagining, I am able to "experience" myself.
—Don Ihde

A more abstract form of self-listening is involved when attention is consumed by the auditory imagination. This is called interior listening, inner listening or even intrapersonal listening (VOCATE, 1994; ROBERTS ET AL., 1987; SCHNAPP, 2008, pp. 135-136; AITKEN; SHEDLETSKY, 1995). The auditory imagination has broad expression, ranging "from sedimented memories to wildest fancy" (IHDE, 2007, p. 131). The auditory imagination, like other forms of inner imaginary experience, tends to mimic outer experience, or perception, yet displays itself, to use phenomenologist Don Ihde's expression, as "irreal" (2007, p. 119). This quality of irreality is sustained, no matter the clarity of the experience, and no matter the degree of training the individual has received in the particular imaginative act. Imagination like perception may undergo a process of refinement. A trained musician may imagine a performance lucidly, yet the internal acoustic representation will remain distinct from real experience; "the irreality of the imaginative contrasts with the sense of actuality and transcendence displayed by 'outer' experience" (2007, p. 119).

Speech, whether it is verbalised or sounded as an inner voice, is not a manifestation of a preconceived thought but rather an execution of thought (MERLEAU-PONTY, 2002, p. 207). When we listen to speech, Maurice Merleau-Ponty argues that we are listening directly to thought itself (2002, p. 207). Inner speech is a form of thought that operates within the bounds of language (IHDE, 2007, p. 211). It should be recognised however that not all thought finds expression in inner speech (IHDE, 2007, p. 137). Inner speech is a phenomenon that can be generally controlled by the individual but one which can reach elevated levels of activity in the case of psychosis. The inner-speaker of mind may have our own voice, the voice of another individual or multiple identities. Inner speech is easily distracted, and it may be fragmented and indistinct; the listening experience of inner speech is subject to memory, fantasy, emotion and well-being. Inner speech, unlike vocalised speech, is by definition, perfectly private. While inner speech mirrors ordinary speech, it is condensed, involving abbreviations and idiosyncrasies of the individual speaker (WILEY, 2006, p. 320). John R. Johnson noted four features of inner speech: "(a) silence, (b) syntactical ellipses or short-cuts, (c) semantic embeddedness, i.e. highly condensed word meanings and (d) egocentricity or highly personal word meanings" (WILEY, 2006, p. 320; JOHNSON, 1994, pp. 177-179). Other important features to add to this list include the predominance of so-called free association which is shared with other imaginative activities, and the rapid speed of delivery (IHDE, 2007, p. 213).

Despite attempts to study its syntax, inner speech is illusive. According to Don Ihde, even the most celebrated literary attempts to represent inner speech, such as those by James Joyce, "remain reconstructions rather than transcriptions" (2007, p. 213). Cinema has its own means of representing inner speech and thought, in something Michel Chion refers to as the I-voice (1999, 1994a, pp. 49-57). This speech is bodiless and sounds asynchronously with any on-screen character that may be present. It occurs in suspended moments in the action where a voice detaches and "someone, serene and reflective" begins telling a story (1999, p. 49). The frozen quality of such scenes shows an attempt to address the temporal disparities between spoken and inner speech noted by Ihde. For example a character staring near-motionless and directly at camera may act to disrupt the the existing time continuum of the film. Other clues are also given in the audio to suggest an inner voice, and importantly, these techniques are designed to associate the disembodied voice with the body of the viewer. They include the close-miking of the voice and a lack of reverberation (CHION, 1999, 1994a, p. 51). Both combine to give a sense of intimacy and close proximity. They suggest a co-presence of the character or voice with the viewer.

Just as we can listen to inner speech, we can also synthesise an inner music. The quality of this music is dependant on the musical knowledge of the self-listener, and is no doubt subject to the listener's musical taste. Inner-music, like inner-speech, operates within the bounds of a language, a musical language, as chosen by the listener. It may occur at will, or may act as persistent and nagging irritation. The musical imagination may also occur without any external stimulus, or it may be engaged as an interactive agent in the reception of music and sound.

Inner speech, inner music and the auditory imagination in general, interact with our listening experience of the external physical world. Sound and music can disrupt inner attention or our sense of self-presence, just as they can stimulate it (IHDE, 2007, pp. 131-133). Exterior sounds such as loud music or noises may impinge upon the listener, and Don Ihde notes the weight of truth in the well-worn complaint It's so loud I can't hear myself think (2007, p. 132). Recent news reports have revealed the use of amplified music as an instrument of torture (CAMPBELL, 2008; SWASH, 2008). One can postulate that when combined with deprivations of various kinds, disruptions to self-presence play a role in this abuse. Extreme shock caused by noise can involve interference not only to self-presence, but to perception itself (IHDE, 2007, p. 212). In contrast, Ihde also notes a more pleasant if not "seductive" variant of disruption, whereby music "may lead to temporary sense of 'dissolution' of self-presence", and in such occurrences he writes: "Music takes me 'out of myself'" (2007, p. 132).

Yet the auditory imagination and perception are not always at odds, they can coexist. Don Ihde argues that with the introduction of the imaginative mode to the mode of perception, "listening becomes polyphonic" with a resultant potential for consonances and dissonances (IHDE, 2007, p. 133).[1] This polyphony of which Ihde speaks exists between the listener's perception of external music and his or her musical imagination. The musical imagination acts upon the perceived music creating the conditions for polyphony. The interaction between modes enables the listener to direct attention inwardly from the otherwise external source of the music. This has ontological consequences, as Ihde writes: "I hear not only the voices of the World, in some sense I 'hear' myself or from myself" (2007, p. 117).

In phenomenological terms, the self "arises … strictly as a correlate to the World" and is "discovered only after discovering the World", yet "it also hides within itself and its imaginative acts (which hide themselves from others)" (IHDE, 2007, p. 118). Where sounds or music overwhelm our thoughts and private and interior manifestations of self, either by force or by seduction, our sense of self becomes momentarily untethered. Yet in moderate circumstances, self-presence is maintained and is intermingled with the mulled fragments of the exterior "in a fundamental liaison with the World" (IHDE, 2007, p. 117). The imagination is as rich in potential expression as perceptual experience, and may mirror perception by "irreal" representations that take the form of memories, recollections and fantasy (IHDE, 2007, p. 119). Such acts of imagination may occur spontaneously or voluntarily at will and contribute to self-experience:

> Imaginative acts also implicate the "self." As "my" imaginings, particularly those that I presentify to myself at will, the sense of an "inner self-presence" entices the very notion of a "self." In imagining, I am able to "experience" myself (IHDE, 2007, p. 120).

When people speak out loud, they each have simultaneous and dual roles of speaker and listener. They do not hear themselves however as others do, or as other, and this is because the focal activity[2] of the listener is speaking, which obscures the features of the voice (IHDE, 2007, p. 213).

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1. Ihde casts the *perception* and the *imagination* as phenomenologically distinct *modes*.

2. The word focus has phenomenological significance, and as a term it may be applied to fields other than the visual. Focus refers to the *noemetic* core of experience at a given moment, outside which, at the *fringe* or towards the horizon, experience becomes less distinct (IHDE, 2007, pp. 37-40).

Ihde suggests that a similar phenomenon occurs with inner speech with an even greater degree of obscurity (2007, pp. 213-214):

With the inner voice, thinking holds primacy, and implicit in that activity of thought, is the authority of the thinker (IHDE, 2007, p. 214). Because of this, inner speech, like spoken speech which also retains a primitive identification with thought, cannot be experienced as something coming from elsewhere. "[T]here is necessarily a phenomenological distinction between the representation of an imagined voice of someone else coming from somewhere" and the individuals own inner speech (2007, p. 214). Ihde comments that there is no "instrument" capable of such a ventriloquist's trick under normal circumstance, but reasons a "disruption, such as psychosis, may perform this" function (2007, p. 214).

We could however consciously, and not without some effort, imagine our own voice; its intonation for example. In doing this we may however be referencing some knowledge about our voice, acquired by listening to answering-machine recordings for example, or peoples comments. It is also clear that this constitutes an artificial or contrived exercise and something different from thinking in language. Actors, singers and politicians, may have enhanced skills, due to training, in imagining their own voices.

Self-listening as Mediated by Technology

As we have seen with the I-voice above, self-listening may be mediated by technology. This is so in the sense that the technology may fulfil an aspect integral to self-listening. For example, technology can simulate particular spatial perspective of sound, either exterior to the body, or within. An internally-located sound may emphasise the authority of the listener, particularly if juxtaposed with other sounds apparently external to the listener. Alternatively technology may act to record and replay events.

The capacity of technology to be used as means to remember sound and displace time began with the phonograph (GRIVEL, 1992) , continued with the introduction of the tape recorder, and is now facilitated by digital recording devices. The ubiquitous answering machine or voice-mail captures our voice when we call home, and we can later hear ourselves amid the messages of others. Once captured by the answering machine, our voice becomes disconnected from its temporal origins at the time of speaking. The act of recording allows us to contemplate the voice in isolation and as something separate from ourselves. As introduced above, this estrangement from the sound of our voice, is due to the preoccupation in everyday life with thought as manifest in speaking. On first listening to such a recording the listener might doubt the authority of his or her own voice. It may be that listeners learn to become accustomed with the sound of their voice through these exchanges, "in the same way that a child learns to recognize himself in the more familiar mirror" (IHDE, 2007, p. 213). Digital recording also simplifies replication and transmission, leading to further complexities. The voice may become separated not only in a temporal sense but in a spatial sense as well.

A virtual space can be superimposed upon a listener using technology. Activities performed in such spaces may involve the listener performing virtual activities, such as sitting passively, talking, riding a bicycle or playing the trumpet. These actively produced sounds may be heard in connection with the listener's gestures, as is the case in virtual environments where the listener interacts with virtual objects. Alternatively, there may be no gestural relationship as is the case with a passive listener. In these cases the virtual space may be entirely or partially synthetic, or may have been created using a recorded spatio-acoustic experience of another individual. This recorded individual may have a passive role in an environment, or may function actively.

Technologies such as the headphone, stethoscope and the audio spotlight (HOLOSONIC RESEARCH LABS, 2008) can create the sensation of in-head sounds. This phenomenon has similar properties to the bodily vibrations discussed as form of self-listening above. Like bodily vibrations, in-head sounds occupy the body. They exist however in an imaginary internal space (STANKIEVECH, 2007, p. 56) and are principally perceived as sound and not resonance. As noted with virtual audio, headphones have the capacity to position sounds external to the body when monitoring binaural recordings or signals,[3] but can also place them within the head. In-head experience is particularly evident when a monaural signal is monitored on headphones.

Headphones, particularly the closed variety, also maximise the presence of sound and music by minimising the intrusion of noise: "Ideally, if music is to reach its full presence, it must be "surrounded" or "secured" by a silence that allows the sound to sound forth musically" (IHDE, 2007, p. 111). Such amplification of presence and reduced distraction, may enhance the engagement of the auditory imagination, and in turn, notions of self-presence.

Douglas Kahn has written on a conceptual and acoustic Venus de Milo, proposed in brief notes by Marcel Duchamp early in the 20th Century (KAHN, 1990, p. 3; DUCHAMP, 1983, p. Note no. 183). In the proposal, the listener would take the centre of an "immense" sculpture built from sounds, and perceive its form with "aural training [dating] from childhood and from several generations" (Duchamp in KAHN, 1990, p. 3). According to Kahn, Duchamp's concept was ironic and "satirized the inability of vibrational space to generate objects and bodies" (KAHN, 2004, p. 44). Despite this there been a subsequent and concerted effort by composers and sound artists, to achieve much the same thing, and with a variety of technologies.

The concept of sculpting acoustic space has been explored systematically by composers and artists such as La Monte Young, Alvin Lucier, Dick Raaijmakers, Michael Brewster and Warren Burt since the 1960s, using so-called standing or stationary waves. With works such as La Monte Young's Dream House, movements of the listener through space, constitute a type of self-created composition in which "sound, space, and the individual unite" (LABELLE, 2006, p. 74). Stationary waves result where certain wavelengths of sound, reflect back on themselves against surfaces in a space, forming seemingly motionless structures. The precise location in space where a waveform reinforces itself maximally is known as an antinode. The waveform may similarly cancel itself at points where positive and negative pressure fluctuations are equally opposed. These regions form silent nodes in the space (ROEDERER, 1979, pp. 74-77). By sounding multiple pure waveforms with wavelength tuned to match the various resonant frequencies of a given space, complex networks of interacting stationary waves may be established.

In stationary wave environments, changes in listener location modulate the localised experience of the acoustic field. Such acoustic environments can be considered sculptural, and the listener's experience of the frequencies present, a function of his or her location. In ordinary acoustic environments—even those synthesised through various sophisticated spatial audio techniques such as ambisonics (ELEN, 1991; RUMSEY, 2001),—sounds propagate through the space. In stationary wave environments however, nodal and anti-nodal points remain in constant positions, seemingly frozen in time. Because of the fine articulation of space afforded in these environments, the movement of the listener is very self-apparent because of sound, and the subjective experience, amounts to an indirect form of self-listening.

In natural acoustic environments and synthetic ambisonic acoustic fields, two individual listeners at different locations, may agree by way of sound, on the approximate location of a real or virtual sound source. This agreement will be sustained, under ideal conditions, as they move independently through the space. The difference between these and stationary wave environments, is that sounds do not rapidly appear and disappear with relatively small displacements of the listener. In stationary

3. Binaural recordings, or computer generated simulations, reproduce the natural listening situation, where sounds are located in the external space through the interplay of the sound with the physical structure of the body — the so-called Head Related Transfer Functions (HRTFs).

wave environments, two individuals can have quite different experiences of the sounding content of the field. In natural and ambisonic fields however, what changes with displacement is not content, but the apparent location of sound with respect the listener. In the broad definition of self-listening emerging in this text, movement through acoustic space is included, because of the implicit self-orientation by sound, and the consequential changes in the experience of the acoustic field. This applies to movement in natural and virtual acoustic fields, as well as stationary wave environments.

The body and bodily movement may also be mapped to a sonic response using a plethora of technologies sensitive to the location, orientation and gesture of individuals. By performing such mappings, the listener's experience is inextricably linked to his or her own body, or to the particular physical or social context that the listener is in. Traditional musical instruments are at heart technologies which map gesture to sound. Since the beginning of the electronic age, inventors have built machines which create not only new sounds, but new ways of interacting with sound and music, and with a variety of controllers. The first and most celebrated electronic device for mapping unencumbered gesture to an electronic musical signal was the Theremin in 1928. This instrument has been widely used by a great many composers both as a sound generating device using its analogue oscillator, and as a controller of other electronic and digital media. Video cameras are now commonly used to map not only gesture but the movement of bodies in space. Video systems may also implement pattern recognition software, in order to identify and track bodies, limbs, hands, heads and even recognise features of the face (WILSON, 2002, pp. 758-760) .

Other mapping and information gathering systems may require the presence of personal devices, yet can operate within much larger fields than that afforded by video. For example, with the miniaturisation and cost reduction of electronic components, the development of the Global Positioning System (GPS) and mobile telephone networks, personal devices such as GPS-equipped smart-phones may fulfil locative, communicative and computational roles across vast distances. With the development of such systems there has been an accompanying emergence of the new scientific field of ubiquitous or pervasive computing; a field that focuses on the penetration of information technology into all aspects of daily life (IEEE; GREENFIELD, 2006). Artists have witnessed or even pre-empted these developments, and created works that capitalise on the new potential of the technologies. The use of GPS technology in art for example began in the 1990s. Early works of locative art using GPS include Impressing Velocity by visual artist Masaki Fujihata in 1994 (WILSON, 2002, p. 286; MEDIA ART NET), Trace by Teri Rueb in 1999 (WILSON, 2002, pp. 286-288; RUEB, 2004), the author's own Sound Mapping in 1998 (BEAN, 1999; HEMMENT, 2006, p. 353; MOTT ET AL., 1998; MOTT; SOSNIN, 1997; WILSON, 2002, pp. 283-286), and Nigel Helyer's Sonic Landscapes in 1999 (HELYER, 2005; HELYER ET AL., 2007). More recent locative music projects include Sonic City (FUTURE APPLICATIONS LAB; GAYE; HOLMQUIST) in 2002-4 and the ongoing Mobile Music Workshop ("Mobile Music Workshop") which provides a focussed academic forum for the new field.

By linking location and movement to the synthesis and deployment of electronic art, such works reverse "the trend towards the view of digital content as placeless, only encountered in the amorphous and other space of the internet" (HEMMENT, 2006, p. 349). The authorship of artworks commonly becomes blurred between the artist who often acts as an organiser, the participants and their activities, and the landscape or environment itself. Locative art practices may produce map-like artefacts of particular sites, for instance line-drawings or acoustic renderings of geographical features. Fujihata's Impressing Velocity was an example of a work producing visual artefacts. Hikers on Mount Fuji with GPS equipment, produced 3-dimensional coordinates to create drawings not simply of the mountain, but of their particular experience of the mountain. The velocity of the hikers was used to distort the imagery "in accordance with the progress of the hike" (WILSON, 2002, p. 286). In works such as this there is an emphasis on revealing something of the landscape and the activities of individuals therein. Alternatively the emphasis may be on depositing and finding digital objects in space in what is described as geo-annotation (HEMMENT, 2006, pp. 350-351). This involves a personalisation of the environment by a variety of authors. Media files of sounds, texts, images and so on, and even computer applications, may be deposited in geographical space in much the same way as graffiti. Individuals with mobile devices may retrieve these objects at a later time as they are physically encountered. For example, this may involve various individuals with mobile devices, each accessing a common networked database. Files tagged with geographical coordinates may be deposited by the individuals, or retrieved when a certain proximity to an object is reached. In this way data may be shared between individuals. Geographical space is augmented and temporally layered with digital information as individuals annotate space with time-stamped information.

What is the impact on listening to music in mobile contexts? The portable transistor radio and the car stereo were among the first electronic devices to facilitate a mobile musical experience. The car stereo can cocoon the listener in a private sound space (BULL, 2003). Whether or not the sound spills into the external environment, this personalisation of space can be seen as a form of self-expression. Since the car drives though public space, the music serves to colonise that space, if temporarily, by masking-out its acoustic features and replacing it with sounds chosen by the driver and passengers. As will be discussed ahead, music is often chosen by a listener to fulfil some personal need, for instance to feel excited or nostalgic or to feel that time is passing rapidly. The listener may thus modify or contain their state of being during transit through a variety of spaces. Earphone devices such as Walkman cassette players launched in the late 1970s and contemporary iPod and MP3 devices, similarly mask exterior sounds and facilitate personalised mobile acoustic spaces. The isolating effect of portable music devices is often held as a positive attribute by listeners, providing a form privacy by limiting acoustic interruptions from the external world and even unwanted approaches from individuals (BULL, 2001, pp. 182-183). As Michael Bull writes, the device "is perceived as a tool whereby users manage space, time and the boundaries around the self" (2001, p. 179) . Yet by excluding external sounds, we might argue that the listener has an impoverished experience of the surrounding world. R. Murray Schafer described the use of sound to "dispel distractions" as an audioanalgesia—a sound wall "to delimit physical and acoustic space" (1977, p. 96). Michel Chion wrote of the Walkman as the very "symbol of loneliness in the crowd" (1994b, p. 46). Diminished situational awareness caused by mobile music devices may certainly lead to accidents.

The uses and applications of mobile music devices by listeners are diverse however (BULL, 2001; WILLIAMS, 2006). If the devices can detach the listener from his or her physical and social context, so too they can create new types of integration. Not only can the listener control the music he or she hears, the listener may also select the environment in which it is heard. The listener holds quasi-cinematic powers over the music through their navigation in space and with an extended palette of accompanying sensation involving touch, smell, kinæsthesis and so on. The listener can for example choose pathways, direct his or her gaze, pause or move rapidly through the space. Much like sketches by Fujihata's hikers, the overarching audiovisual experience is of the listener's own making and a form of self-expression. Further, because of this creative input on the part of the listener, and the often familiar landscape through which the listener passes, we may see the mobile music experience as a form of self-listening. Through personal choice and context, the listener is implicated and somehow described in the very act of listening.

Mobile music devices thus have potential to sway the listener's attention toward daily life or to deflect it. It could be that locative technologies, may help shift the balance of listening attitudes towards situational awareness and towards integration with everyday life (REBELO ET AL., 2008, p. 16). Locative devices bring an awareness of contexts, places and even the activity of the listener—for example the device can position a listener on a map and potentially sense if this listener is stationary or travelling. As such they can produce or replay sound and music that makes reference

to those sites or situations. In this new model of musical experience the notions of authorship are challenged. The actions of the listener and his or her situation-aware device, can potentially divide authorship between the composer of the music or other audio source, the place they are in and the listener him/herself.

In a conference paper, Rebelo, Green and Hollerweger make a comparison between locative technology and a mirror "that reflects our understanding of the world" (2008, p. 15). They also allude to a necessary redefinition of the subject-object paradigm involved in traditional music presentation, concerts for example, with the introduction of locative music devices (2008, p. 16). The mirror has the interesting property that the viewer, or subject, can view him or herself as object. With traditional music presentation "the object (a sound) remains relatively unaffected by the subject (the listener)" (2008, p. 16). Standing before the mirror of locative technology, as with other interactive modes of delivery, the distinctions between subject and object become indistinct. With the capacity for networked communications in locative music devices, listening may move from being an individual experience, to one with potentially elaborate social dimensions. The practice of geo-annotation for example, as described above, has this capacity, if we imagine music can be deposited with site specificity. Text-based social networking applications with mobile functionality, such as Twitter, are already being integrated with the Google Maps API for example, and it should only be a matter of time (and bandwidth) before audio files are treated in a similar way.

Emotion and Signification

It has been shown above that the auditory imagination, expressed as either inner speech or inner music, can act upon the surrounding acoustic world. A kind of polyphony is achieved where perceived sounds are intermingled with those imagined. The listener in imagining asserts his or her self-presence. By associating the imagination with perceived elements the listener forms a personal bond with the world and reaches out toward it. The section above on the sound imagination and interior listening made a clear while abstract claim on self-listening. The listener creates sound, and while imaginary, contemplates that sound as if it were a real external source. There can however be other subjective responses sound that do not necessarily involve a synthesis of inner-sound or music. Since these responses may also engender self-presence and self-experience, they too can constitute a form of self-listening, albeit one at the extreme end of this liberal definition.

In the introduction to his book The Tuning of the World (SCHAFER, 1977), R. Murray Schafer cited two myths from Greek antiquity to describe two fundamental types of music, or at least, two motivations behind music. The first, a Dionysian myth from Pindar's twelfth Pythian Ode (BARKER, A., 1989, pp. 57-58), tells of the invention of auloi playing by Athena. After the beheading of Medusa, Athena created the art having been moved by the "heart-rending cries of Medusa's sisters". The aulos, "an instrument of exaltation and tragedy", is double-reeded like the oboe, and is the instrument of Dionysian festivals. The myth conceives music "as internal sound breaking forth from the human breast". The second myth is Apollonian and concerns another instrument, the lyre. In Apollonian tradition, music is conceived as something external, that "God sent to remind us of the harmony of the universe. … [M]usic is exact, serene, mathematical, [and,] associated with transcendental visions of Utopia and the Harmony of the Spheres" (SCHAFER, 1977, p. 6) . Schafer links the Apollonian tradition to the acoustical speculations of Pythagoras, and the pedagogical quadrivium of the medieval period, consisting of mathematical sciences including: arithmetic, geometry, astronomy, and music. Schoenberg's twelve-tone compositional method is also cited, given its systematic approach. In the Dionysian view however, music is inspired by a far more internal source than the stars and or the planets:

> [M]usic is irrational and subjective. It employs expressive devices: tempo fluctuations, dynamic shadings, tonal colorings. It is the music of the operatic stage, … its reedy voice can also be heard in Bach's Passions. Above all it is the expression of the romantic artist ... (SCHAFER, 1977, p. 6)

Denis Smalley wrote of a similar musical dichotomy in his article The Listening Imagination: Listening in the Electroacoustic Era (SMALLEY, 1992), an elaboration upon the listening theories of Pierre Schaeffer (CHION, 2008; SCHAEFFER, 1966, 1993, 2004). He distinguishes between autocentric and allocentric forms of musical perception using the terminology and theory of psychoanalyst Ernest Schachtel. In Smalley's synthesis, an autocentric listening attitude amounts to a "positive/negative emotional reaction to sounds", and has an inward, subject-centred perceptual trajectory (SMALLEY, 1992, p. 518). Smalley attributes a utilitarian dimension to autocentric attitude, where listeners commonly "seek to use music specifically to induce well-being or change a mood from negative to positive" (1992, p. 518) . Allocentric attitude is object-centred and outward looking. It is concerned with the appreciation of musical structure or signs, as well as an appreciation of sounds outside of musical contexts. Allocentric attitude "is a direct encounter with sounds, an affirmative interest separated, at least temporarily, from any desire to turn the object of perception into a need-satisfying tool" (SMALLEY, 1992, p. 519) .

It is clear from this description a close correlation exists between auto- and allocentric listening attitudes with that of Dionysian and Apollonian musical traditions respectively. Smalley does not however view the attitudes as mutually exclusive, they "exist in parallel", and the listener may vacillate between the two (1992, p. 519). Some listeners however, such as the audience for electroacoustic music, may strive to specialise in allocentric listening, and as Smalley recognises, there can exist a certain "snobbishness" by these listeners, towards autocentric response (1992, p. 519). The non-specialist listener could argue that this tension amounts to a battle between heart and head, since for many, it is the positive autocentric aspects of music that bring the greatest rewards.

We can at this point, argue that Dionysian and autocentric attitudes constitute self-listening, given their focus on self. We might also consider another instance of self-listening without the necessity of self-sounding:

Claude Lévi-Strauss wrote about self-listening in the reception of orchestral music, and did so with out levelling any slur of sentimentality or self-indulgence on the listener, or the music. Lévi-Strauss describes something different, something apart from emotion but which does not exclude it. In the following extract, he refers to an inversion of the transmission of music within the listener. He notes the similarity between music and myth, where the message becomes real in the listener, and results in his or her signification:

> Though it is equivocal in the score which delivers it to us … the composer's design assumes reality, as does myth, through the listener and by him. In both cases, we are effectively observing the same inversion of the relationship between the sender and the receiver since, in the end, the receiver reveals himself as signified by the message of the sender. The music lives out its life in me; I listen to myself through the music (1966, p. 63) .

This idea of signification, at first glance at least, seems to go deeper into experience than any reflexive emotions, or distracted daydreams or associations the listener might have. There is however no listening without thought and the imagination, and the signification of the listener might be explained in terms of self-presence. The listener's imagination, auditory or otherwise, is stimulated by music, and ideas and other thoughts are released like bees to swarm around the objects of perception. The thoughts may arise directly to music and in the mode of the auditory imagination: to novel orchestration; compelling harmonic transitions or juxtapositions of timbre. They may equally aggregate around the symbolism of certain gestures or references in the music,

and from there, depart into an infinite array of possible outcomes, manifestations. Lévi-Strauss was writing about the experience of a certain type of music, one which can inspire new ideas (be they musical or not), fresh fantasy or rare recollections. He describes an experience where the self-presence engendered by these thoughts is of an elevated stature, enabling the listener to achieve a transcendent experience of self. Signification is this transformed self-presence; its form a composite, synthesised by the composer's design, the performing musicians and the listener him- or herself. With signification, the listener embodies or fuses with the music, taking on elements of its meaning and forging a new identity. The music thus lives out its life in the listener, and shows its true purpose.

It is interesting to note that Lévi-Strauss' notion of self-listening, may apply equally to music with strong autocentric or allocentric qualities. One listener is just as likely to become signified by an allocentric piece by Warren Burt using the Fibonacci Series, as another, by an autocentric composition performed by the popular singer Roberto Carlos. Both styles of composition grant scope for this form of self-listening. Whether or not an individual is signified by music, comes down to the quality of the music, the taste and expectations of the listener, and his or her willingness and ability to be moved by the experience.

While this section on embodying sound has looked at the contribution of the non-auditory imagination towards self-listening, it is unlikely that the auditory imagination can ever fully disengage, especially during music listening. The engagement of the imagination is characteristically multidimensional. Denis Smalley, in the afore mentioned article The Listening Imagination, has described complex networks of associations experienced while listening to acousmatic music. These networks draw from prior experience of a variety of sensory fields, and consequently have the potential to implicate broad experience and synthesise rich fantasy. As already noted, recent work in the cognitive sciences led by Godøye, has indicated that listening to particular musical gestures activates the listener's memory of corresponding gestures. The body is clearly implicated in the listening experience, and the work constitutes compelling empirical evidence for Smalley's theories.

Listening and sounding in the environment

As we have already seen with the voice, listening and sounding are intimately entwined. In a desolate space, we tap, scuff our heels, whistle, vocalise, make any sound, to fill the void and summon a selfsame companion. Like radar we sound-out spaces, reaching to the far corners in search of a reflection; we fathom the depths of our surrounds, sounding the space like the blind tapping with canes. Sounds we produce travel vast distances, are swallowed-up at close range, or penetrate or scale apparent boundaries through transmission or by way of apertures. We articulate the space with sound: finding resonances; investigating the properties of surfaces by testing their reflectivity and density; finding absences. In this way we self-listen in unity with our environment. We are fused with it and incorporate it, and by means of the activity, we receive a spatial orientation in the environment with implicit information on its form and materiality.

Sounding and listening in the environment have however an importance beyond spatial orientation and the apprehension of physical features. Sounding and listening have an aesthetic role in the signification of both the individual and the environment. Steven Feld, who has conducted an anthropology of sound in the Southern Highlands Province of Papua New Guinea since the mid-1970s (1990, 2003, 1994), argues that soundscape (TRUAX, 1999), or the acoustic landscape, should be considered in relation to human habitation and action:

> Soundscapes, no less than landscapes, are not just physical exteriors, spatially surrounding or apart from human activity. Soundscapes are perceived and interpreted by human actors who attend to them as a way of making their place in and through the world. Soundscapes are invested with significance by those whose bodies and lives resonate with them in social time and space" (2003, p. 226).

Feld calls his research since the 1990s an acoustemology; a compound term he coined uniting acoustics and epistemology, and which means the study of acoustic ways of knowing. He has studied the Kaluli, one of four ethnic groups comprising the Bosavi people, and who live in dense rainforest. His work investigates "how sounding and the sensual, bodily, experiencing of sound is a special kind of knowing, or put differently, how sonic sensibility is basic to experiential truth in the Bosavi forests" (1994, p. 11).

Feld describes the interplay between certain songs of the Kaluli and their environment, as "poetic cartographies" (2003, p. 227). Songs may constitute "place-name maps", in which "vocal performance articulates their poetic and and ecological relationship to the sounds and meanings of the rainforest" (2003, 1990, p. 226). These are called path songs in Kaluli language. They comprise descriptive place-names sung sequentially with other descriptions of the environmental features of flora, sound and light. The poetic texts have cosmological meaning. The Kaluli, like other Melanesian peoples, believe that birds are the spirits of people, and bird calls and song, are the communications of the spirits. Kaluli poetry is sung in "bird sound words", and these both announce and recall spirits (FELD, 1994, p. 10): "Birds appear to one another and speak as people, and to the living their presence is a constant reminder of histories of human loss, an absence made present in sound and motion" (FELD, 2003, p. 225) .

Here we see that listening to song and the environment has a self-referential impetus and autocentric function, whereby it connects strongly and implicitly with memory and emotion; the acoustic reflexivity encoded by the Kaluli cosmology.

Acoustemological factors have an elevated importance in Kaluli culture, and this is a function of the rainforest environment in which thy live, where the visual field is compromised. In relation to this, Feld writes about the reflexivity and reciprocity of listening and voicing:

> [O]ne hears oneself in the act of voicing, and one resonates the physicality of voicing in acts of hearing. … The soundingness of hearing and voicing constitute an embodied sense of presence and of memory. Voice then authorizes identities as identities authorize voice. Voice is evidence, embodied as experiential authority, performed to the exterior or interior as subjectivity made public, mirrored in hearing as public made subjective (2003, pp. 226-227).

Two Kaluli expressions have strong acoustemological significance: lift-up-over sounding and the notion of flow (FELD, 1994, 2003, pp. 11-13) . Feld writes of these as keynotes in the acoustic environment, that is, sounds that form an ever-present and characteristic acoustical background (SCHAFER, 1977, p. 272). Lift-up-over sounding, describes not individual sound-sources, but an interplay between sound and the ambience of the forest. It describes the way man-made sounds, the sounds of animals, and other naturally occurring noises, are filtered and resonated by the landscape, and how sounds propagate spatially through the forest. Lift-up-over sounding may apply equally to the quality of sound from a falling branch, as to vocal utterance in ceremonial song. It is "the is the inspiration for many Kaluli vocal and instrumental forms" (FELD, 1994, p. 12). For example, the forest echo may be expressed in overlapping vocals, repeating the text and melody of a preceding voice (FELD, 2003, p. 231).

> "[L]ift-up-over sounding" is as potentially omnipresent in the experiences and aesthetics of Kaluli as the notion of "harmony" is in the West. "Lift-up over sounding", like "harmony", is both a grand metaphor for natural sonic relations, the ways tones combine together in time, as well as for social relations, for people doing things together in concert (FELD, 1994, p. 12).

Flow relates to the flow water in the abundant water-courses of the forest. As an acoustic metaphor it describes the way sounds trace the landscape, disappearing and reappearing like serpentine streams in the bush. Time, landscape, sound and environment are fused in the notion of flow. The idea of flow, converges with the path songs of the Kaluli: "'The flowing' nature of waters through lands, then, mirrors the 'flowing' nature of songs and places through local biographies and histories" (FELD, 2003, p. 229).

In Kaluli cultural practice, songs are often composed in the environment, and performed "with and to" the environment (FELD, 1994, p. 12). For example a song written for a waterfall, may be performed on-site ("Ulahi and Eyo:bo Sing at a Waterfall" in FELD, 2001). The metaphorical links in vocal delivery, are layered in a polyphony with the referenced environmental sounds. In such performances the self-presence engendered is inextricably bound to the environment. The subjective, inner, musical imagination duets with the external world in an interwoven partnership.

It is worth drawing a parallel with the soundwalk tradition from acoustic ecology (WRIGHTSON, 2000; HOCHMAIR, 2004; DIETZE, 2000), a movement that Steven Feld is closely associated with. Soundwalks are structured events in which groups of individuals walk through a specific environment with the focussed aim of listening. Sometimes these events involve deliberate sounding in the environment. These events promote an acoustemology which often contains a strong self-listening component. Often the walks involves specific instruction—ways of listening that direct attention towards the environment or towards the self. For example self-listening may be promoted by asking participants to concentrate on sounds they themselves are making. At other times this self-consciousness need not be explicitly requested. The leader of a walk might for example guide the group over a particular land-surface that emphasises footsteps. These soundwalks promote a sensitivity to environmental sounds and the individual's role within that soundscape.

Considering these acoustic ways of knowing, we might question if all our acoustic negotiations of presence in the environment are so harmonious or well-meaning. Does ambience always tether the individual to place? Can the echo not confuse, or alienate the individual from the environment, from him- or herself? Just as the echo is integral to Kaluli notions of lift-up-over sounding, echoes and environmental acoustics feature heavily in a familiar cultural practice, that of yodelling. Bart Plantenga writes that the yodeller is simultaneously "enlarged" and "diminished" by landscape in the act of yodelling (2001, pp. 76-77). Enlarged because of the amplification of presence in the vast ambience — an illusion of omnipresence. Diminished because of the acoustic evidence of scale of the exterior world, and because of the threat of silence; of no echo in reply.

When present, the echo shows a rambling spirit; one liberated from the body that moves effortlessly at speed — in the vicinity of 330 metres per second—in all directions about the mountains and labyrinths. When we hear echoes, off the hard walls of ridges and bluffs, we observe in hazy horizons the distances we have travelled. According to Plantenga, hearing a yodel in the mountains, is akin to synaesthesia: "when someone yodels we might feel or see the Alps" (2001, p. 79). This, as with the experience of the Kaluli, has acoustemological significance. He describes the mountain valley as an "ancient recording studio prototype"; the memory of the environment acting like tape- or digital-delay, granting self-harmony, and smearing or softening the details of voice (2001, p. 79). We hear ourselves because of this ancient technology, and our imagination may act upon this delayed voice as with any other music or sound. We forge a sense of presence in the world with such acts; and with the echo, a presence with amplified self-focus.

With amplification, there is scope for distortion or hallucination, and because of its overt self-focus, the echo has the potential to trick and mock as much as it can flatter. In fables it can play the role of an unreliable mirror, in which "[t]he vain hear the flatteries of their own imagination, and fancy them to be the voice of fame" (BEWICK, T.; BEWICK, J., 1820, p. 312). In The Owl and the Echo, tail-fragments of the owl's pontifications are echoed in the silence of the night, and convince the owl of her importance and mellifluousness:

> … "Surely the groves are hushed in expectation of my voice; and when I sing all nature listens." An Echo, resounding from an adjacent rock, replied immediately, "all nature listens." "The nightingale," resumed she, "has usurped the sovereignty by night; her note indeed is musical, but mine is sweeter far." The voice confirming her opinion, replied again, "is sweeter far." "Why then am I diffident," continued she; "why do I fear to join the tuneful choir?" The Echo still flattering her vanity, repeated "join the tuneful choir." Roused by this empty phantom of encouragement, she on the morrow mingled her hootings with the harmony of the groves. But the tuneful songsters, disgusted with her noise, and affronted by her impudence, unanimously drove her from their society, and still continue to pursue her wherever she appears (BEWICK, T.; BEWICK, J., 1820, pp. 311-312).

The echo here is a metaphor for the inner voice, made public for the reader's benefit, and bounced off rocks, to beguile the owl. The owl hears only what she wishes to believe, and in her aggrandisement, earns the ire of the tuneful songsters of the woods. A similar manifestation of inner voice occurs in the fable of The Lion and the Echo by Aesop (NORTHCOTE, 1829, pp. 57-58). While convinced and in awe of the majesty of his own voice, the lion succumbed to paranoia, thinking his echo an adversary; his power and aggression acted upon himself. In both fables, the otherness of the echo reveals itself as false-friend, or as false-foe. Either way, false. A facsimile; something not to be trusted.

The fables on echoes are derived from the Greek myth of Echo and Narcissus. While the figures of Echo and Narcissus were originally entwined, they are commonly and curiously dissociated from one another in many texts (SEGAL, 2000, p. 137). Naomi Segal suggests that the fate of Echo is often attributed to her being "a nymph who talked too much" (2000, p. 137). Yet in the telling of the story by Roman poet Ovid, the stories of Echo and Narcissus are interwoven and related, and it is clear that the downfall of Echo was linked to deception by talk. Echo, a woodland nymph, fell foul of the goddess Juno, by protecting Juno's philandering husband Jupiter and her fellow nymphs. When Juno realised what was happening, enraged, she levelled a curse upon Echo:

> "From now on, you'll be barely able to wag that tongue you tricked me with, and your voice will only work for brief periods of time!" She made good her threat, for now Echo can chime in only at the end when someone is talking, and can only repeat the last words she hears the person say (OVID, 2003, pp. 52-53).

It was in this state that Echo first encountered and fell in love with Narcissus. She pursued him obsessively. She craved to use her powers of seduction on him, yet was thwarted, able only to parrot his words:

> One day Narcissus happened to be separated from his friends in the woods and called out, "Anyone here?"
> "... here!" Echo replied.
> Amazed, he spun around and shouted, "I'm over here!"
> "... over here!" she answered.
> He looked all around, and when no one came he cried out again, "Why are you avoiding me?" And heard the same words again, after he said them. He stood still, puzzled by what seemed to be a voice answering his own
> "Come here," he called out.
> To no other words would Echo ever reply more happily. "Come here!" she repeated, and joyfully obeyed her own command and emerged from the woods and ran up to him, eager to throw her arms around his neck.
> Narcissus fled, shouting as he ran, "Keep your hands off me! I'd die before I'd give myself to you!"
> "... I'd give myself to you!" she answered only (OVID, 2003, p. 53).

Echo suffered greatly with Narcissus' rejection. She hid herself in the woods and in caves, and still in love, her body shrivelled and perished, her bones becoming stone. Ultimately, all that was

left of her was her disembodied voice. She could still be heard by everyone, "for her voice (and nothing more) lived on" (OVID, 2003, p. 53).

Rejection, was of course, something of a behaviour for the handsome Narcissus, who dismissed all such approaches. "[I]n this soft and tender beauty there was such a steely pride that no young man could touch him, and no young woman, either" (OVID, 2003, p. 52). His pride had led one spurned lover to exclaim to heaven: "Let him love as we have; let him succeed in love as we have!" And the goddess Nemesis granted his prayer, for it was surely just (OVID, 2003, p. 53).

It was following this that Narcissus fell in love with his own image. Where he could not be fooled by the acoustic mirror offered by Echo, he fell helplessly for its visual counterpart:

> For as he drank from the pool he was caught by his image in the water and fell in love and longed for something that was not real: He thought his reflection was someone real. … He wanted himself, not knowing it was himself he wanted … Naive boy, why do you try so hard to grasp a fugitive form? What you want does not exist; what you're in love with—turn away, and it's gone! It's an image, a reflection in the water that you see and nothing else. It comes when you come, it stays while you stay, and it will go away when you go away—if only you could go away! (OVID, 2003, p. 54).

It was after all the sight of Echo that drove Narcissus from her, and not the illusion in her voice. There seemed at one point the possibility of love between them, yet the heart of Narcissus was impenetrable to anyone but himself. While his echoed voice proved alluring, the beauty of Echo herself once revealed, was pale in comparison to the visual reflection that Narcissus would ultimately encounter. In Ovid's account of the story, Narcissus, to his despair, eventually realised it was he himself reflected in the pool:

> "Why, you're me! Now I see. My reflection has deceived me! I'm in love with myself! I light the fire that I feel! What am I going to do? Wait for him to make the first move? Make it myself? How can I make the first move 'now'?" (OVID, 2003, p. 55)

It is ironic that behind the acoustic reflection, was something real: a woman capable of reciprocating the love of Narcissus. Behind the visual reflection was Narcissus himself, something he could have, but not as a love—something which is intrinsically other, something apart: "What I want, I've got; what I've got, I want. Oh! If only I could leave my body! Here's a new prayer for a lover: 'Go away, my love!'" (OVID, 2003, p. 55) In this despair, Narcissus pined away and died. Echo remained a companion, albeit an angry one, until the end: "Gazing into the water, as always, he uttered these last words: 'Alas, dear boy, loved in vain!' and the place gave back the words; and when he said, 'Good-bye!' 'Good-bye!' said Echo, too" (OVID, 2003, p. 55). It would seem here that Echo, or the place, had the last word, following a feminine stereotype identified by Naomi Segal (1988, 2000) . Yet there was no rest for Narcissus, for he held fast to his strange affliction, even after death: "And when he entered the house of the dead, there, too, he would often gaze at himself in the river Styx" (OVID, 2003, p. 55).

The Voice in the Mirror

If, as Naomi Segal notes, the myths of Echo and Narcissus have become dissociated over time (2000, p. 137), the French psychoanalyst Guy Rosolato gives cause, albeit indirectly, to reconsider the relationship. In an article written in 1974 La Voix: Entre Corps et Langage (1974, 1998) he made an analysis of the operatic voice with particular emphasis on its two potentialities: that of language and communication, and its expression of the body (1998, p. 106). In the article he

coined the term the acoustic mirror in reference to Jacques Lacan's theory of the mirror stage (LACAN, 2001, pp. 1-8). It is a theme that has been further developed by feminist theorist Kaja Silverman in her book The Acoustic Mirror: The Female Voice in Psychoanalysis and Cinema (SILVERMAN, 1988). As will be shown below, both the acoustic mirror and its visual counterpart affect distinctions between the individual's sense of a subjective self and the objective exterior.

According to Rosolato the voice is something that is "produced" by the body and in early infant development is "amongst those emissions separating themselves from the body" (1998, p. 108). In the terminology of psychoanalysis the voice may be "compared to those objects referred to as 'partial'— breasts, penises, excrement" (1998, p. 108) — things at the boundaries of the self, of identity. While the child's voice may be at the margins, its presence is by no means marginal: "Because the voice can be sustained for long periods and above all its emission repeated (like breathing itself) it inspires a sense of power" (1998, p. 108).

In Rosolato's phenomenology of the infant's voice there is an underlying comparison with the operatic voice. The expression of power through sustained duration, repetition and not to mention loudness, is one perceived by both the parents (or audience) as well as by the child (or vocalist). Again alluding to similarities between the "cry" from the crib and that from the stage, he writes:

> [T]he voice is body's most powerful emanation. Very early in infancy, the child becomes aware of the extent of this power, as an irradiation of its still rather immobile mass of flesh outwards into a far vaster space, covering an area which proves to extend in all directions and to go beyond the barriers inhibiting its vision. From the very beginning, the cry is the manifestation of the excitation of living matter, in pain or in pleasure, at once autonomous and in reaction to stimuli(1998, p. 107).

A good many of the child's early vocalisations are in imitation of the mother and the familial ambience (ROSOLATO, 1998, pp. 107, 109; SILVERMAN, 1988, p. 80). Early vocalizations "relate to a culturally excluded borderzone of sounds", many of which are later abandoned in adulthood in favour of "those which most effectively enable communication" (ROSOLATO, 1998, p. 107). The poles of this maturation constitute Rosolato's two potentialities of the voice. According to Rosolato the vocal games of early childhood may be revisited in musical contexts, for example "with 'singers' who improvise amongst themselves" and "listeners who catch themselves 'accompanying' a well-known tune or adding almost mute inflections while sight-reading a musical score (1998, p. 107).

Importantly, Rosolato makes the point that the "fantasmatic" qualities of the voice — its ability to induce hallucinations or deep-seeded psychological associations — would not be possible were it not for: "the "voice's outstanding property of being at once emitted and heard, sent and received – by the subject himself, as if, in comparison with sight, an 'acoustic' mirror were always at work" (1998, p. 108). The voice is thus both subjective in the sense that it is contained by the individual and a product of the individual, and objective, because it also occupies external space, and may be taken as the object of perception by the self-listener and others. This correlates directly with an ordinary mirror, where we can see ourselves as others do. A second correlation follows with that of Lacan's mirror stage. Put briefly, the theory states that in the early stages of infant development, the child in front of a mirror — aided by the mother — begins to distinguish itself from surrounding objects, and identifies a subjective self. Or in other words, the child identifies its boundaries and develops notions of a world exterior to itself. In infant development, the mirror stage coincides with the acquisition of language and the signification of objects (LACAN, 2001, pp. 1-8). On first encounter with the reflection however there is a tension resulting from the manifest differences between the uncoordinated body of the infant and the wholeness of the image. Ultimately there is an acceptance of the image by the infant which constitutes an "identification" with the image. The underlying ambivalence held by the infant towards the image carries with it however both eroticism and aggression. This "erotic aggression" will be a constituent in all future forms of

identification and is "an essential characteristic of narcissism" (EVANS, 1996, p. 6). "Narcissism can thus easily veer from extreme self-love to the opposite extreme of 'narcissistic suicidal aggression'" (EVANS, 1996, p. 6).

It is the maternal voice that "introduces the child to its mirror reflection, 'lubricating,' as it were, the 'fit'" (SILVERMAN, 1988, p. 80). Yet the maternal voice is significant even before the mirror stage. It is acknowledged as the first object to be isolated by the infant and to be "introjected" (SILVERMAN, 1988, p. 80) Referring the visually oriented nature of the psychoanalytic research of his day, Rosolato suggested the auditory field as a primary font for introjection:

> The importance of precocious auditory and vocal introjections has also to be acknowledged; for it is only afterwards that the organization of visual space enables the perception of the object as external. In the maternal voice, the child encounters signs of accessibility, which prefigure caring, satisfaction and a climate of affection (1998, p. 109).

According to Kaja Silverman it is the maternal voice that first presents itself as a mirror. She argues that since the infant has an early focus on the activity of introjection and since it is the auditory field that is incorporated as articulated by the maternal voice: "the child could be said to hear itself initially through that voice — to first 'recognize' itself in the vocal 'mirror' supplied by the mother (1988, p. 80). Silverman notes it "has become something of theoretical commonplace to characterize the maternal voice as a blanket of sound, extending on all sides of the newborn infant" (1988, p. 72) . While warning against oversimplification, Rosolato writes:

> It could be claimed that the maternal voice is the primary model of auditory pleasure and that music has its roots and its nostalgia in an original atmosphere – which could be referred to as a sound matrix, a murmuring house – or music of the spheres (1998, p. 109).

Rosolato's acoustic mirror, unlike a real mirror, is with us always when we speak; with the voice, we cannot close are eyes or turn away to make it disappear. Further, the acoustic mirror, offers a more narrow articulation of the body's boundaries than reflective glass; the demarcation between the body's interior and the external acoustic space is less clear. Thus, the distinction between the subjective self and the objective exterior can become "confounded" and "inverted", with one prevailing "over the other" (Rosolato in SILVERMAN, 1988, p. 80; ROSOLATO, 1998, p. 108). In Rosolato's view, subjectivity can therefore be compromised and but one example of this is paranoia, where "hallucinated sounds" — distortions of inner speech — become confused with an exterior objective reality (SILVERMAN, 1988, p. 80).

Aesop's The Lion and the Echo is a case in point. So too the myth of Narcissus and Echo seems to sit comfortably within Lacan's theory of the mirror stage and the extended notion of the acoustic mirror proposed by Rosolato. An echo is but a acoustic mirror with a temporal delay, a feature that somehow amplifies its reflectivity. By combing the visual and acoustic reflections the myth points to the complexity and depth of Narcissus' condition. Confounded by auditory hallucinations (his own voice undifferentiated from that of his mother?), and towards which he directed his hostility, Narcissus became enamoured with his visual reflection. His anger soon turned towards his own image however when ultimately he identified it as his reflection: "Go away, my love!" His anger was expressed in frustration and as a destructive self-pity—a suicidal aggression from which there was no escape.

The idea of a mirror is a useful way of considering the phenomena associated with self-listening. Whether or not we take on the psychoanalytical perspective as matter of faith, the approach of Rosolato may be used towards building a structured and critical understanding of self-listening. In bringing this article to a close with acoustic mirrors, we might well consider a wider application of

the metaphor. A more general conception of mirrors can also be applied and may be said to be present in all forms of self-listening. For instance, where sounds are of self-origin, produced by the imagination, created in relation to other objects or substances, or mediated by technology, all these cases offer the self-listener a mirror relationship. The visual mirror allows us to experience ourselves by providing evidence of our existence, and more specifically, evidence of the quality of our existence. It also lets us view ourselves as others see us. Sound of course can do these things too.

In the opening epigraph to this article, an acoustic mirror brings a hapless Macabéa to tears (LISPECTOR, 1986, p. 50). This character by Clarice Lispector was a young woman whose severe impoverishment throughout her life yielded a profound ignorance. Her ignorance was such that she was unaware that she was unhappy, for she had never experienced happiness and did not know what it was. She had also very little experience of herself. In the epigraph Macabéa sings for the first time in her life and for the first time in her life she sees herself using the acoustic mirror. Macabéa could not understand why she was crying, but cry she did. Perhaps it was the first time too that she had imagined, and as Don Ihde said: In imagining, I am able to "experience" myself.

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