From Epistemology to Creativity: A Personal View
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Abstract
An epistemological model of sound is proposed involving information derived from the inner structure of sound as interpreted by the listener's contextual knowledge. In the author's soundscape compositions, the sound material is elaborated using contemporary digital signal processing techniques, while maintaining listener recognizability, and the structure of the work and its narrative are guided by the composer's contextual knowledge of the real world.

Inner and Outer Complexities of Sound
As the field of sound studies grows, there has been a great deal of interest in its epistemological basis, or what I refer to as the question "How do we know what we come to know through aural experience?" I like to begin answering that question with a simple model that can then be expanded and nuanced from a variety of perspectives. That model is based on two inter-related perceptual and cognitive processes by which sound acquires meaning and leads to communicative behaviour and social relationships, both for the individual listener and also for what I call the "acoustic community."

The first process involves the listener's progressive ability as developed since childhood to recognize pattern and structure within sounds at various time scales, from the micro level of sound pressure variation, through to the event level, and then to the scale of longer gestures and rhythmic patterns. In other words, what kinds of information do we extract as listeners from the auditory processing of the inner structure of the sounds we hear? We gain valuable insight into these complex and often subtle processes through the study of psychoacoustics, starting with basic pitch and timbral recognition (involving both temporal and spatial patterning), through to binaural localization cues, and then to higher levels of auditory stream formation and our ability to separate those streams from competing background information (an ability that is highly dependent on unimpaired hearing), just to mention a few of the main processes involved. It is also clear that the perception of acoustic space is always involved, as all sounds reach us coloured by our physical space, and provide simultaneous information about sound sources and our orientation within that space.

The second aspect of the meaning-making process is the listener's contextual knowledge that is developed through embodied experience. This process not only involves identifying sound sources and causes, but also the socially constructed meanings that derive from and are attached to such aural experiences. Long-term memory obviously plays a key role in this process, and it appears that such memories include all modes of sensory and bodily experience, not just the auditory. I use the term 'soundscape competence' to refer to the knowledge that we develop about how to recognize and interpret our sonic environment, and this is knowledge that we continue to develop throughout our lives. Some of it may be shared with others, but some will be manifest in personal expertise and experience.

I have described this aural epistemology as involving two processes, but clearly they are deeply intertwined and simultaneously interacting. They also have highly specialized domains specific to language and music, as well as to the everyday sounds of the environment, but I suspect that the processes involved in each domain have much in common. For instance, both analytical and holistic pattern recognition strategies can be identified within each domain. Furthermore, contemporary electroacoustic experience blurs these domains [when amplified music (or speech)] is embedded within a soundscape and becomes its ambience. New technologies pose conceptual challenges of how to interpret new sounds as well as new functions for them in daily life, and perhaps the most striking aspect of this process is how quickly the initial cognitive disruption is resolved for the individual, even to the point of banality, and how social norms are re-negotiated (e.g. socially acceptable uses of cellphones in public spaces).

Soundscape Compositions

My creative practice is based in electroacoustic technology which has allowed me to design sounds and soundscapes in new ways, as well as to design the process of composition itself. An interesting case in point is the "soundscape composition" which unites both the inner and outer complexity of sound and the world at large. I regard soundscape composition as part of what might be called context-based composition where knowledge [of specific contexts] shapes the composer/designer's work and invokes the listener's knowledge of those contexts. I refer to both inner and outer complexity because both of the processes I described above are involved – the perception of inner acoustic structure and its interpretation through our knowledge of the world. Perhaps the most creative aspect involved is how the two may become related.

Digital technology allows us to address the inner complexity of sound right down to the micro level of the frequency-time domain, what is essentially the quantum level of sound using techniques such as granular synthesis and convolution; it also allows us to create virtual soundscapes in three dimensions using surround sound techniques in multi-speaker environments. The "space" or volume within the sound is projected into the listener's perceived space using much the same digital technology. But it remains up to the composer's skill to reference and invoke the soundscape competence of the listener; otherwise the tendency is for the work to become abstract, in the sense of sounds related only to each other. Listeners may acquire the ability to understand abstract sound constructions, but with the soundscape composition they appear to participate more while listening because their own life experience is constantly being invoked.

A few examples may suggest some of the directions that emerge from this work. My composition *Pendlerdrøm* is loosely based on the narrative of a commuter arriving at Copenhagen train station at the end of the day, waiting for a local train, and drifting into daydreams before and after getting on that train; the hyper-realism of the busy station is contrasted with the blurred and stretched sounds suggesting the daydream, thus connecting the inner and outer worlds of perception. *Island* creates a visit to an idealized and rather magical island by combining realistic environmental sounds one might encounter with abstracted versions of the same sounds that suggest an underlying symbolic dimension. In *Basilica*, the stretched sounds of three church bells have their resonances expanded until they suggest the

interior of a large cathedral, with the structure of the piece modelled after the experience of walking through the edifice. *Prospero's Voyage* imagines what Shakespeare's magician might experience as he leaves his island, but doing so underwater in symbolic reference to the subconscious. *Aeolian Voices* places the listener in three settings (a wheatfield, a shed and in a storm) where the sounds of wind and objects activated by wind become intertwined with vocal-like transformations of those sounds. And finally, *Chalice Well* takes the listener on a journey into mythical caverns supposedly located beneath the sacred well in Glastonbury where legend claims the Grail was buried at the entrance to the underworld to protect us from its evil, thus creating a purely virtual soundscape replete with mythical symbolism. All of these works extend the everyday epistemology of sound by processing the internal qualities of environmental sounds and referencing listeners' knowledge and experience of the world, with the intent of providing not only an aesthetic experience but one which may translate into increased aural awareness of the everyday acoustic environment.

References

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