Bringing Forth a World: Sound and Audiovisual Installation as a Process of Cognition

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Abstract

The motivation behind this paper stems from my practice as a composer and my research as a PhD candidate at the University of Waikato in New Zealand. The majority of artefacts that result from this research are collaborative works of sound and audiovisual installations which explore new relationships from an ecological perspective. In this context, the term ecological refers to the philosophical school of thought that believes the world to be a network of interconnected and interdependent phenomena. The work initiated by Humberto Maturana and Francisco Varela's Santiago Theory of Cognition has been a primary source in contextualizing my practice. In addition, Andrew Pickering's notion of the dance of agency, and Timothy Morton's concept of the hyperobject further this discussion. This paper presents these theories in the context of a creative practice that aims to engage with ontological considerations of interconnectedness. It investigates the interrelationships between living and non-living systems as process and structure, and their artistic potential for an empathic discourse by extending our human identity to include the larger biosphere[1].

The Santiago Theory of Cognition

Historically, the Santiago Theory of Cognition evolved from the scientific research that took place over the last decade and into the 21st century. This research reflected a paradigmatic shift away from a mechanistic, representational model, to one of an interrelated, performative network and includes emergent properties, systems thinking, cybernetics, complex systems, chaos theory, and autopoiesis.

Parallel to these noted developments in the sciences, creative arts also evolved from a static, representational model to that of a "performative" one. Advances in mechanical and computational technologies influenced this transformation and are well documented in Chris Salter's book *Entangled: Technology and the Transformation of Performance*. He writes that "technology does something in and to the world by modifying existing relations and constructing new ones between humans, tools, processes and the environment which are deeply entangled" (2010, p. xxxv).

[1] Jeremy Rifkin suggests that empathy is the "invisible hand" that allows us to stretch our sensibility to all life. He proposes that more technologically advanced cultures have evolved into that of *homo empathicus,* which is ushering in a biosphere consciousness. This evolution has occurred due to the diversity of human interaction, creating a more complex system of communication and emergence.
https://www.youtube.com/watch?v=l7AWnfFRc7g (last accessed 09/14).

The trajectory of these relations occurred across all areas of creative practice. New paradigms of expression and translation fostered the convergence and synthesis of artistic forms. Within a few decades theatre, dance, literature and music responded to the shift in ontological thinking – one away from representational models to a more performative, time-based and non-linear practice. Salter suggests that "[…] these new relationships and interactions of discrete aspects of experience [opened] deeper understandings of the nature of consciousness and the workings of the mind [...] the reorganization of human interaction and the reimagination of interrelatedness." (2010, p. xi)

To contextualise this shift away from the representational model, to one of an interrelated, performative network we need only look at a selection of fine art works throughout this time period. (*The examples quoted in the text are available on the noted websites. The reader is encouraged to use them for reference while reading this text.*)

For example, Picasso's *The Old Guitarist*[2] was completed just one year before Einstein published his special theory of relativity – a remarkable difference to his *Guitar Player*[3] of 1910. Here we can see the influence of Einstein's multiple viewpoints of space and time. "We can see the transformation of the static representational viewpoint to that of a multipositional dialect of space and time." (Welsby, 2011a, p. 277)

Kandinsky's *Composition VIII*[4] was completed three years after C.D Broad published his work *The Mind and its Place in Nature* in 1925. Here Broad first proposed his idea of emergent properties: the notion that properties emerge at higher levels of complexity due to the relationships of all parts. The more common belief of the time was a mechanistic, reductionist model which emphasized the parts rather than the whole. With this discovery, Broad put forward an ecological perspective which later became know as systems thinking.

Systems thinking found support in the research of the widely divisive and interdisciplinary field of cybernetics. Cybernetic theory "opened the door to understanding the nature of mind as a systems phenomenon and became the first successful attempt in science to overcome the Cartesian division between mind and body." (Capra, 1996, p. 55) Roy Ascott's artistic efforts were directly influenced by cybernetics[5]. Ascott pioneered the introduction of cybernetic theory in art education in Britain and widely published his concepts of a cybernetic vision in art and scientific journals of the time (1968, p. 8).

Matt Pearson's generative works such as *Twill*[6], coded in Processing, echoes Maturana's notion of autopoiesis-(auto)self (poiesis)creation. Pearson suggests that to engage in generative art processes "means we are expecting the unpredictable – it isn't an unwelcome visitor. We'll become comfortable with a lack of control over our work. We'll embrace this chaos and learn to love it." (Pearson, 2011, p. xli)

It was from Cybernetics, and in particular the work of Gregory Bateson's concept of homeostasis, that Maturana began to develop his theory of autopoiesis. He explored this while

[2] www.artic.edu/aic/collections/artwork/28067?search_no=1&index=0 (last accessed 09/14).
[3] http://thepaintednote.com/2011/02/09/pablo-picasso-three-musicians/picasso_the_guitar_player/ (last accessed 09/14).
[4] www.guggenheim.org/new-york/education/school-educator-programs/teacher-resources/arts-curriculum-online?view=item&catid=716&id=150 (last accessed 09/14).
[5] https://vimeo.com/14690122 (last accessed 09/14).
[6] https://vimeo.com/11620714 (last accessed 09/14).

researching visual perception and the organization of living systems. Here Maturana posed the question, "How do I do what I do as an observer in observing?" (Maturana, 2002, p. 5)

In reply, he proposed the new concept of circular organization claiming that "living systems are cognitive systems, and living as a process is a process of cognition." (Maturana, 1980: 162) All of his research which followed came from that basic epistemological and ontological shift of thinking, which eventuated into the Santiago Theory of Cognition. With this theory, Maturana, along with Francisco Varela, proposed that "to live is to know" and that cognition is a "continual bringing forth of a world through the process of living" (Maturana, 1987, p. 245).

This was a profoundly new view of cognition that included all processes of life such as perception, emotion, and action. It involved the concept of mind as being beyond the realm of human thinking, to that of the entire process of life. For mind to exist, a brain is not necessary, as mind is considered a process, not a thing. If the act of cognition is a process, and the brain is just one of many structures through which the process can occur, than the act of cognition extends to all of life, including organisms that do not have a brain. The Santiago Theory of Cognition provided the comprehensive scientific framework necessary to fully heal the Cartesian division between mind and body and provided a "new synthesis of mind, matter, and life" (Capra, 1996, pp. 174-175).

By suggesting that all living systems are driven by cognition and consciousness while inter-relating with others, human activity is then placed into a larger environmental context by intersecting with forces greater than those of human design – that, which in turn, provides a multi-layered point of creative enquiry from the perspective of a non-human exceptionalism.

Other Researchers

Agostino Di Scipio, Miroslav Spasov, and Chris Welsby all reference the Santiago Theory of Cognition in relation to their creative research.

Specific to Di Scipio are his interactive compositions, *Audible Ecosystemics* and *Modes of Interference n. 4*. Both works address the interaction between human agency, technologies and environment. He viewed these works as a "computation activity immersed in the real world: a computational mechanism having physical terminals reaching into the surrounding environment, constantly affecting the sonic ambience in that environment and constantly being affected by it." (Di Scipio, 2011, p. 97) Di Scipio proposed that to explore the creative possibilities in these "ecosystems" lies the potential to "bridge the creative exploration […] to questions of social, cultural, and political relevance" (2011, p. 98).

His view echoes Maturana's and Varela's notion that there is a continual process of "bringing forth a world" through the interaction of all living systems with its environment. It is of interest to note Maturana's own reflections on technology and art:

> As different technologies open and close different relational dimensions, they offer different possibilities for social and nonsocial coexistence, as well as different possibilities for the artist to create the relational experience that he or she may want to evoke. In all cases, though, whatever he or she does, the artist will be a participant creator of some virtual reality that may or not become a grounding reality in the course of human history. (1997)

In Miroslav Spasov's case, this theory is referenced in regard to his real-time interactive compositional system ENACTIV. His project investigates "structural coupling", – a phrase

coined by Maturana that indicates the spontaneous influence which occurs through recursive interactions between living systems and the environment, and then form a multidimensional network (Maturana, 2002, p. 17; Spasov, 2011, p. 69). ENACTIV is an intuitive tool for multi-modal improvisation that takes into account the unique behavioural patterns of each performer. The interaction between performer and software governs the system's behaviour which creates a continuous feedback loop during live performance (Spasov, 2011, p. 71). Spasov suggests that the intention of his research is to provide a platform for a performer to explore new thought patterns, practices, structures, and symbols, and considers the resulting outcome to be an "on the spot spontaneous activity" (Spasov, 2010, p. 2).

Chris Welsby's reference to autopoiesis and the Santiago Theory of Cognition can best be understood in his installations such as *At Sea* and *Tree Studies*[7]. Welsby's creative practice is strongly influenced by systems theory, cybernetics, and structural materialist film theory. His current installations are informed by Maturana and Varela's notion of the "bringing forth of a world through the process of living". For example, these works are assembled using live weather data and video feeds to create what he calls, an "internal topography" (Welsby, 2011b, p. 103). Referring to his work *At Sea,* Welsby states, "It is my hope that this bringing forth of an unknowable subject, in this case the incomprehensible vastness of the ocean, may be read both literally and as a metaphor for the process of cognition itself." (*Ibid*.)

Like Di Scipio, Welsby is concerned with matters beyond aesthetics. His deep love of landscape and environmental concerns inform a practice that is imbued with a sense of urgency which suggests that " the way we exist in the world [can] no longer [be] regarded as a matter of abstract speculation." (*Ibid*.)

Purpose and Motivation

The intention of my own research resonates with Di Scipio's belief that there lies the potential to "bridge the creative exploration […] to questions of social and political relevance." (2011, p. 98) And like Welsby, I agree that an ontological shift is needed in how we exist in the world. I would also include Leigh Landy's sentiments which suggest "Art for Goodness(,) Sake" can react, criticise and make proposals concerning world issues" (2011) and Margaret Schedel's view "that art is life, an endeavour of community, relationships, and interconnected ecology […]." (2005, p. 226)

The purpose of contextualising my research in sound and audiovisual installation in the Santiago Theory of Cognition, is to propose a creative practice that engages with ontological considerations of interconnectedness. What this offers is a method to promote critical discourse beyond pure aesthetic choices into observations of interconnectedness with the larger biosphere, suggesting new creative relationships and the reimagination of interrelatedness. This works towards an artistic philosophy that considers "how we imagine the world and how we act in it reciprocally inform one another" (Pickering, 2010, p. 22). As Timothy Morton has claimed "When you realize that everything is interconnected, you can't hold on to a concept of a single, solid, present-at-hand thing 'over there' called Nature." (Morton, 2014)

[7] www.sfu.ca/~welsby/Install.htm (last accessed 09/14).

Installation and the Dance of Agency

For the purpose of this paper I refer to sound and audiovisual installation works which are generated through the engagement with living and non-living systems, real-time data streaming, and what Timothy Morton has coined hyperobjects – objects so massively distributed in time and space as to transcend localization, such as global warming (Morton, 2013).

Simon Emmerson supports the idea that installation art erases the boundaries between listener, performer and composer by "encouraging contemplation and concentration […] [which is] defined by the individual listener/observer." (2001, p. 19) Chris Welsby claims installation art can give the viewer the time and space to consciously engage with the work, with its production, and with its presentation (2006, p. 35). Other practitioners such as Evelina Domnitch and Dmitry Gelfand[8] suggest that installation art can "exist as an ever-transforming phenomena [which can allow] the observer to transcend the illusory distinction between scientific discovery and perceptual expansion." (Domnitch, 2012, p. 22)

Accordingly, I purpose that sound and audiovisual installations offer an experience which embraces the notion that cognition involves the entire process of life – including perception, emotion, and behaviour. As the installation platform can eliminate the constraints of beginnings, middles, and ends, a space is created where contemplation, memory, and emotion can play a creative role in the process. The implication is that the artefact and the experience can create an autopoietic system in that what emerges results from the interactivity of all components. I would further suggest that this can position sound and audiovisual installation within what Andrew Pickering refers to as the "dance of agency," defined as "a vision of the world as a place of continuing interlinking performances" (2010, pp. 21-22).

Pickering introduces this concept in conjunction with his notion of ontological theater. Here he suggests that in exploring the performative relationship between things, including those beyond the human realm, we extend imagination of the "possibility of a nonmodern stance in the world". This is "a stance of revealing rather than enframing, that hangs together with an ontology of unknowability and becoming" (2010, pp. 32-33). Pickering's dance of agency echoes and extends Maturana's notion of autopoiesis as well as the Santiago Theory of Cognition by evoking a performative and/or cognitive quality to all living and non-living systems that is temporal, active, and emergent.

If we engage with the notion that cognition resides in all living systems and that we live in a world that is fundamentally interconnected and interdependent, where all components have agency, then the cognitive and creative process can be understood as a vital part of the cyclical process of life. It intersects with the larger cycles. In modern science this cyclical process of life is called metabolism or, the "breath of life" (Capra, 2011).

Hyperobjects

Timothy Morton's concept of the hyperobject expands upon the idea of interconnectedness, or as he calls it – "the mesh" (Morton, 2010, p. 15). Morton positions himself as an object-oriented ontologist and in his book *Hyperobject: Philosophy and Ecology After the End of the World*, puts forward a complex and compelling line of thought. Morton introduced the term

[8] www.portablepalace.com/hydrogeny.html (last accessed 09/14).

hyperobjects "to refer to things that are massively distributed in time and space relative to humans" such as nuclear materials, global warming, and black holes (Morton, 2013, p. 1). Because of their enormous properties, hyperobjects are best understood through their indexical signs, such as the increase in pine beetles that have decimated the forests of western Canada. The beetle is not the hyperobject but an indexical sign of the hyperobject, which is global warming. Morton proposes that hyperobject art makes visible, audible, and legible the indexical signs of the hyperobject, in turn, becoming a collaboration between humans and non-humans. He also suggests that art in the time of the hyperobject can function as an attunement to the reality of the coexistence of all things on Earth (Morton, 2013, p. 30). "Thus the art in the time of hyperobjects explore the uncanniness of beings, the uniqueness of beings, the irony and interrelationships between beings, and the ironic secondariness of the intermeshing between beings." (Morton, 2011)

Studio Practice

This section briefly introduces two collaborative audiovisual installations by Andrew Denton and me that engage with the theories and philosophical thoughts presented within this paper[9]: *Aspects of Trees,* and *Flight Variant.* It is important to note here that the creative practice informed the contextualization, in other words, practice before theory. Both projects seek to evoke a space of contemplation by creatively engaging with the stratified signs of our collective impressions and impacts on our environment. They aim to be a reflection of place and time and challenge our fundamental ideas of "what it means to exist, what Earth is, and what society is." (Morton, 2013, p. 15)

Aspects of Trees (2013) is a multiprojection live installation improvisation that assembles a range of moving image and sonic experiments which records and then responds to changes in the ecology[10]. The subject of this work is the escalating pine beetle epidemics that have decimated forests on the West Coast of North America.

Figure 1: Aspects of Tree – a multiprojection live installation improvisation. (Photo A. Denton 2013)

This work is the result of a two-year collection process which involved recording audio and visual material from this landscape. In part due to the increase of pine beetle activity in this location, this devastation has more of a human touch than global warming alone. Western Canadian reforestation practices during the latter half of the 20th century implemented a mono-species program, which has resulted in a pine-tree-only forest. The combination of these mono-species plantations and the increase of winter temperatures, which normally

[9] I include this section in response to questions that were posed during the paper presentation at EMS14 Berlin.
[10] A documentation video of *Aspects of Trees* can be viewed at www.divatproductions.com/aoft.html (last accessed 09/14).

reduce the population of the pine beetle, have cultivated an environment for the beetle to flourish. Currently, over 16 million hectares of British Columbia forests alone have been destroyed.

Flight Variant is the more recent audiovisual installation which responds to the Anthropocene era[11]. Constructed in MAX6, this generative installation layers a network of visual and aural content that affect each other simultaneously to produce an ever-evolving work. The assets include high-speed and HD video, field recordings from airports, data-mined radio waves, real-time convolution of acoustic instruments with field recordings, and an algorithm based on 2014 aviation statistics. The core visual elements are a series of somewhat abstracted, yet evocative filmed jet streams that cut lines across a rich blue California sky. The subject folds into itself to interrogate and reinterpret these (rather day to day) objects and spaces – and in doing so accentuate their presence. The work could be considered a fluid and flexible stepping into and out of these spaces as a method of aural and visual inquiry – an inquiry that annunciates these lines in our landscapes and in our interior considerations.

Figure 2: Flight Variant – a generative audiovisual installation. (Photo A. Denton 2014)

Conclusions

In conclusion I would suggest that the theories and philosophical thoughts presented in this paper could function as an aid to creative research. By viewing the world as a network of phenomena that are fundamentally interconnected and interdependent, the result is a performative openness to what excites in the world – the good, the bad, and the ugly. It also suggests a means by which to empathically engage, from a non-human exceptionalism perspective, with the complexities of being in, and of the world in the twenty-first century.

[11] A documentation video of *Flight Variant* can be viewed at www.divatproductions.com/fv.html (last accessed 09/14).

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