On Ecocomposition: An interview with Damián Keller

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Abstract

Composer and professor Damián Keller has been researching ecologically grounded sounds, which come out of a study of ecology and the everyday environment, since the late 1980s. His work has dealt with a range of issues, including naive creativity, ubiquitous music making, and ecologically-based granular synthesis. He is interviewed here on topics of ecocomposition, everyday sound, and environmental activism.

Keywords: ecocomposition, ubiquitous music, installation, environmental activism

1. Introduction

Keller earned a DMA from Stanford University in 2004 and teaches music and computing at the Federal University of Acre (UFAC), Brazil. He is a member and co-founder of the Ubiquitous Music Group (g-ubimus); his research focuses on everyday creativity, software design and ecocomposition within the context of ubiquitous music making.

During an interview with Keller via email over the course of two years starting November 2017, we examined themes such as the empowerment of the audience as co-creator and the use of everyday settings as a primary source of sonic materials and creative support. Also covered is the question of how ecologically grounded sounds (Keller and Truax 1998) relate to environmental activism, sonification, and physical modeling.

2. Interview

Over the years, you have researched and written music that deals with ecologically grounded sounds. Where does your interest in this music come from? An event from your childhood, or something that developed later in life?

My interest in everyday sound dates from my first experiences in music making. The first piece I published on CD was done in 1987 (Damián Keller 1996). It uses recorded sounds with very little processing. It was done with almost no resources: my own four-track portable cassette recorder and a fairly cheap stereo microphone. At that time, I was starting my first experiments in sound synthesis, using a Commodore 64. But it took me almost ten years to adopt computer-based techniques in my creative processes.

If I were to select two goals that have shaped my work and others' in ecologically grounded creative practice, I would pick empowerment of the audience as a co-creator and everyday settings as the main sources of sonic materials and creative support. I think the use of everyday sounds fits well within this context, but I don't think it is a prerequisite for ecocomposition. Other composers—such as Adam Basanta (2010), Rick Nance, Matthew Burtner (2011) and Agostino Di Scipio (2002)—have given

ISSN: 2184-3120

important contributions to ecologically grounded creative practice using acoustic instruments and electronic sounds. It'd be interesting to investigate how the body of work produced within the ecocompositional paradigm relates to a concrete-abstract continuum. This applies both to the materials and the methods. I suppose Agostino's music tends towards the abstract. Rick's and Matthew's works sit somewhere in middle. And my installations and Adam's artworks are closer to the mundane experience of sound.

By the way, note that I use interchangeably the terms ecocomposing, ecocomposition, sonic ecologies and ecologically grounded creative practice. I could argue that the first musical examples of eco-approaches were the works I published on the earsay label in 1998 and 1999. Though I don't see the point in trying to separate the creative ecological approaches by the names attached by each composer. Some have used ecostructuralism, others ecosystemics, others ecoacoustics and others have adopted sonic ecology. Some of us argue for a neutral and flexible term that could grasp the common methods and objectives of eco-based practices, hence the proposal "ecologically grounded."

Where does the interest in everyday sounds come from? Is it from a Cageian notion of allowing all sounds to have equal musical value? Or from somewhere else? Do you think Cage's ideas created affordances in music or sound art to address with ecocomposition?

I believe your question touches on issues that have gained weight in creative music making over the last twenty years. Despite the historical importance of the New York School, I do not see Cage's practice as a stepping stone in ecocomposition or more generally in ecologically grounded creative practice. Tracing the intellectual antecedents of musical perspectives is very hard. That's why I tend to give more value to collective contributions than to individual composers or artists. If forced to individualize, I'd say that Varèse's concept of organized sound and Satie's idea of furniture music have more weight than the performance and stage-oriented practices exemplified by Cage's work.

Readings on Satie are good examples of the Cage-centric views of many musicological discussions (to me, Satie is important because of his ideas and his work, not because he was adopted as a flag by other composers). Satie's proposal of furniture music targets musical processes tailored for everyday settings, not for the stage. The Italian composer Nicola Bernadini said that "musical sound is used nowadays as a vehicle of specific information, with the result that our soundscapes are polluted with sonic interjections of all sorts produced by the most diverse appliances" (Bernardini 2008). This utilitarian usage of sound is exactly the opposite of what Satie envisaged, music that would not demand attention, music that could be incorporated into everyday activities unobtrusively. A computational concept close to this idea is "calm technology", proposed by Jeremijenko, Weiser and Brown in the early 1990s (1995). Technology is calm when it can enhance experiences without demanding exclusive attention. Ecocompositional projects such as the Urban Corridor , the Green Canopy series (Capasso, A., Keller, D., and Tinajero, P. 2013) or Palafito/Home-on-stilts (Capasso, A., Keller, D., and Tinajero, P. 2012) provide examples of this aesthetic perspective on musical interaction.

But my answer only addressed part of your question. Why everyday sounds and not – for instance – acoustic-instrumental sources? Well, I think the choice depends on the theme of the project. Most of the artistic projects I have developed since I had my first contact with the Amazon in 2002 target aspects

of my experiences here. *Vivir sin Después* (Keller & Capasso, 2005)*, Green Canopy* (Capasso, Keller & Tinajero, 2013) and *Palafito* used biophonic sources and location recordings made in the Western Amazon. *InMesh* (Capasso, Keller & Tinajero, 2014) also used location recordings and added processed voice, though not any voice. The video *Clarita* features readings by Shuar poet Clarita Sharupi Jua. A recent collaborative work – *Atravessamentos* – with composer Luzilei Aliel and dancer Valeska Alvim incorporates synthesized orchestral sounds. The piece proposes an unusual context for the dance, the tropical rainforest. Luzilei and I explored this contrast by using a sonic palette that mixes everyday sounds with instrumental sources. So, the sonic result is a continuum, having on one end "realistic" biophonic sources that match the expected forest soundscape and on the other end the sound of unexpectedly large instrumental ensembles.

Does the use of ecologically grounded sounds in your work have any relation to environmental activism? Would you like the audience to gain an understanding of humans' connectedness to nature or are you using those sounds because they are the ones we most naturally perceive? Are you trying to say anything specific about the complexity of nature that you would want the audience to perceive?

There have been some criticisms coming from the soundscape community as to my use of the term ecology. Historically, the term adopted to identify art-based environmental activism is "acoustic ecology." We have used the term ecology as a methodological ground-truth. Ecological validity is widely accepted as the attempt to replicate everyday conditions within the context of experimental procedures. This has nothing to do with activism.

While it is true that several ecocomposers are sympathetic with the environmental cause, I do not think that ecologically grounded creative practices necessarily imply political activism. I believe that an artwork may be read as a political statement depending on its topic and on its contextual elements. Most of my production addresses social issues, including the destructive impact of mining, logging and oil extraction on the Amazonian communities and ecosystems. The video-artist Ariadna Capasso, the sculptor Patricia Tinajero and myself have produced a series of installations addressing these topics (*Vivir sin después*, *Green Canopy 1–5*, *Palafito 1* and *2*, and *InMesh 1*). These pieces invite the audience to walk within the installation space, touching, seeing and listening. We rarely use text, so the individual experience is very different from reading a political statement. The visitors have a shared responsibility to construct a positive aesthetic outcome. During the last few years we have gathered data through targeted questionnaires. While most people give positive feedback—pointing to heightened states of perception and shared community feelings—some get fixed on trivial details, like the sand on the floor or the noise of other participants. From these observations, I'd say that our artworks provide opportunities for reflection. But whether people want to share or engage in political and social issues depends on a variety of factors on which we as creators have no control whatsoever.

While replicating everyday sounds in music might not be directly seen as ecological activism do you see any truth to the idea that any art that breaks down the division between humans and nature might be considered a type of activism? I am thinking of the writings and ideas of Gregory

Bateson and Timothy Morton, who in different ways seek to use art to break down those divisions.

Yes, I agree. Unfortunately, defending the survival of all living creatures on earth has become the most radical and most urgent political statement today. This issue has implications on both art and science. Initiatives such as the Intergovernmental Panel on Climate Change are necessary to provide a bridge between scientifically reliable results and reasonable political decisions. Similarly, artistic initiatives that engage with the social and environmental problems motivated by the current political and economic systems serve to push forward a progressive agenda.

Do you see your work as related to sonification in any way? I see a similarity between attempts to model real-world phenomena with sound and your ecologically grounded synthesis techniques.

Several sonification approaches that appeared from the mid-2000s onward have adapted our ecological modeling work published between 1998 and 2001. Some researchers—such as Stephen Barrass (formerly at Canberra University)—have acknowledged the source and have applied ecologically grounded synthesis to the realm of tactile interaction (Castle, Adcock & Barrass, 2002). Stephen and his team have also given an important contribution to sonification.

Another use of sonification in ecologically grounded creative practice is the technique proposed by Tim Opie and Andrew Brown (2011). They used data from environmental sounds to control audio processing. This proposal was further extended by Álvaro Barbosa (Gomes, Barbosa & Penha, 2014) and his group based in Macau. All these techniques are closely related to the ideas laid out in the initial formulations of ecologically grounded synthesis. I hope we eventually get a chance to gather these proposals and develop a conceptual framework that can be applied to the design of digital audio processing tools. I feel they have a good potential for applications in daily settings.

In your MFA thesis, "touch'n'go: Ecological Models in Composition," (Keller, 1999) you mention "generic physical models" as one technique of ecological composition. Did you ever use actual physical modeling as a synthesis technique or only the techniques of physical modeling to inform your granular synthesis parameters? Are they implemented in the granular control functions? I am looking for some clarification on what you meant by physical models. Is this just another term for ecological models? If you do actually use physical modeling to make sounds, how do you see the technique as being related to ecologically based granular synthesis?

This is an interesting issue that needs clarification. While working on *… soretes de punta*, *touch´n´go*, and other works I did between 1997 and 2000, I was using physical modeling techniques. But I used the term "generic" because in contrast with most work on physical modeling until then, I was not interested in reproducing specific musical instruments. I worked on models of pipes and strings that resembled the sounds of objects rather than the sounds of "instruments."

In 1999, Chris Rolfe and I read a paper by Perry Cook (1997) where he discussed synthesis of percussive sounds. He said (more or less) that granular synthesis was useless for percussive sounds

because it was computationally too expensive. Chris and I had implemented MacPOD based on Barry Truax's POD system and had it running on an old Macintosh computer. So, we thought, well granular synthesis is not so expensive and percussive sounds can be done efficiently with granular synthesis. So, to answer your question, yes, some forms of physical modeling are useful for ecologically grounded synthesis. But given the multiple advances on both fronts during the last few years, I'm sure we can do much more now than what Chris and I did back in the 1990s.

In your MFA thesis, you explained three examples of ecological models: bouncing, scraping, and breaking. I'm assuming there were more examples that you didn't have the space to discuss. Which others have you discovered and used? Did you ever find a pattern from nature that you wanted to model but could not create a suitable algorithm to recreate its behavior?

Bouncing and breaking were inspired by the pioneer study by Warren and Verbrugge (1984). Bouncing was a good starting point because it was conceptually simple but presented some interesting (unintended) sonic features. That study reported fairly successful results in simulating a few examples for usage in perception studies. Of course, their cutting and pasting technique could not have worked for a large number of samples, but their preliminary results were encouraging. During my presentation at ICMC (Keller & Truax, 1998), I showed several shattered glass synthesis examples. Their overall characteristics were similar, but each example was clearly an individual specimen of a shared class. The results were so convincing that one of the members of the audience stood up and said that I was cheating (!).

I was a bit under time pressure while doing the development of the models. I had to code, produce convincing sonic results, produce a CD-length sound work, develop the multimedia elements of the piece and report the whole thing in writing in less than a year. I'm sure more could have been done and as you mentioned several models that I developed ended up not being used or documented. I did a lot of trials and variations on water sounds, such as filling and the impossible sound of emptying a jar! Drops on hard surfaces and drops on liquid. Some of that material made it into *… soretes de punta* (I recommend Basanta's 2010 analysis of that piece (2010)). I also played around with multiple variations of sounds of fire. A feature of these models that caught my attention was the possibility of creating conceptual paradoxes. One example is the piece *Action to be taken in the event of a fire* (one of the modules of *touch'n'go*). Here I used a model of fire to play a physical model of a string. In a way, it is similar to Nam June Paik's *One for Violin Solo* (1962). But since I didn't have the money to buy a violin and burn it, I did it digitally.

After reading the analysis by Basanta I was interested in his notion of 'hybridization of signs', combining micro- and meso-level events (a drop of rain or the whole rainstorm). How do you see hybridization of signs manifesting in your work? Do you see it happening in other places than what he mentions?

I agree with many proposals Adam has made in his publications and I like his musical output. His analysis of the piece is accurate and rich. Hybridization is a potentially powerful strategy that can be explored in various contexts. I have also used it in the soundtrack for the short film, *Drop* by Canadian

filmmaker Luke Carroll (1999). The script is about a guy – possibly a businessman – that runs an errand in a deserted town. For some reason (the script has no dialogues or explanations), the guy is forced to climb over a wall. When he jumps from the wall he falls into a bottomless pit filled with water, entering a dreamlike dimension. This scene was an excellent opportunity to create a huge, slow-motion splash, that turns into a shower of glass splinters. Obviously, this type of event does not happen in real life. But the scene was tailored as fantastic realism, that is, an imaginary situation that becomes feasible if we stretch the boundaries of reality.

So, hybridization has been a recurring theme in many of my works. But I am not quite convinced whether Adam's usage of signs is applicable to ecocomposing. My problem with semiotics-oriented approaches is that signs can be attached to anything. This may be the case when we deal with spoken languages, but are arbitrary relationships possible when we target sonic events? This issue, of course, demands detailed and careful studies. Some composers aligned with the acousmatic tradition argue for arbitrary bonds between sources and sonic results. This is usually enabled by the isolation of sonic units (or musical objects) from their original context. According to them, this procedure is necessary because referential sounds are less amenable to musical usage than abstract sounds. Interestingly, this polemic has spilled over to related fields such as auditory cognition and sonification. I believe this debate may be particularly relevant to ubiquitous music initiatives that target creative outcomes in contexts where it is very hard to be isolated from the local soundscape.

In the section of your MFA thesis, "Ecological Echoes," you state that "the piece requires the active participation of a conscious user." Can you explain your reasoning for designing a work in this way? Do you feel as though engaging the audience in this way might aid in their realization that they themselves are connected to these ecologically generated sounds?

This question relates back to one of the two targets for ecologically grounded creative practice that I mentioned above, the empowerment of the audience as a co-creator. I think this is a separate issue from the materials used in the artwork. There are many examples in the musical literature—even within the soundscape perspective—of works that employ environmental sounds while adopting a fully composer-centric creative process. I see the experimental works of the 1950s as interesting predecessors of an alternative aesthetic stance, particularly in the work of Morton Feldman. Despite writing completely scored instrumental music, some of the late Feldman works let the listener be free to experience sound at her own pace. The combination of a small amount of material, a very slow tempo and a narrow dynamic range, lacking any type of short-term directionality can be compared to some environmental sonic phenomena—such as a dripping faucet, a spinning wheel or the sounds of leaves blown by a soft breeze. Rather than demanding highly focused attention, these phenomena tend to trigger daydreaming, a mental state that has been recently linked to creative outcomes. While I still believe that having a conscious audience helps to achieve a participatory aesthetic experience, now I think that giving a chance to the unconscious processes might also provide a path to collective creative outcomes. The main point is that I am not THE composer of the aesthetic experience. I see myself just as a facilitator of experiences created by the audience, the materials and the settings.

This is an interesting response that I didn't expect from someone whose music, at least on *touch'n'go* cannot be described as static or minimalist, like might be attributed to Feldman or even La Monte Young. I agree that the long timespans and the indeterminacy of not really knowing what would come next allows the audience to experience and "finish" the work. How does this work with music that happens in a more condensed timespan such as your own? I know that since *touch'n'go* you have done a lot of work with installations, was this issue of time one of the reasons for that?

Exactly. I explored other formats, such as multitrack tape, film soundtrack and theater soundtrack. But the installation format seems to provide a nice context for open forms that foster social interaction. In that sense, La Monte Young's work is a good reference. *touch'n'go* was an initial exploration on how to deal with form when the materials can be freely combined by the listener or co-creator. When this problem is placed within the context of installation artwork, other dimensions come to the foreground. How are the sonic sources distributed in space? How is density handled? How are the visual events related to the sonic events? This last aspect triggered yet another strand of interesting possibilities when visual expectations are not met by the sonic outcomes.

Another avenue to be explored has recently been proposed by Luzilei Aliel. He adapted a concept coined by Heidegger for usage in ecologically grounded improvisatory works, the *Gelassenheit* (Messina & Aliel, 2019). The basic idea is that rather than targeting deterministic methods to deal with parametric control, musical interaction could embrace factors that are beyond the control of the participants. The difference from previous proposals is that rather than mapping external sources to musical parameters directly, these sources are used for aesthetic decisions that lie at the verge of the performers' possibilities.

You say that "The piece's structure (or lack of it) is centered on the idea of the forking path (Borges, 1962). In other words, the piece is designed by the listener/reader at the moment he establishes a path through the material of the piece." Is this non-deterministic method of structuring form related to your studies of ecology? I was thinking about the way that a sound is never the same in nature twice, and that things never interact the same way either, and how this could be shown in the form.

That's a sharp observation. Yes, one of the characteristics of the ecological approach is the emulation of real-world behaviors. One consequence is the avoidance of mechanistic audio-processing techniques such as looping. Another consequence is the adoption of creative procedures that take into account the randomness inherent to decision-making when biological agents are involved. This second aspect has only recently started to emerge within the context of creativity theories. Some researchers take as granted that artistic endeavors are just another form of problem solving. My collaborators and I have argued that in order to solve a problem, first you need to know what you are looking for. How many artistic projects start by defining a target without knowing the materials and their potential for exploration? Arguably, instrumental counterpoint could be taken as an example of a compositional procedure that defines the target beforehand and proceeds to unfold the materials according to preexisting rules. The label for this class of procedures is *teleological*. We have argued that a more

common procedure in artistic endeavors involves the exploration of materials and the environment in order to increase the knowledge of the creative possibilities afforded by the agents and the materials. This strategy is labeled *exploratory* and the activities that do not necessarily yield creative products are called *epistemic* (Kirsh & Maglio, 1994). My suspicion is that investment in supporting epistemic activities will have deep and long-lasting consequences for musical creativity.

Another aspect to highlight from an ecological perspective is the impact of decision-making on the material and the behavioral resources for future activities. In *touch'n'go*, I used the Borgean metaphor of the forking path because I was interested in providing the audience with the possibility of experiencing (almost) infinite versions of the piece (I say infinite because even if somebody wanted to try all the available versions of *touch´n´go*, it would be impossible to experience them in one lifetime). Another implication of the participatory approach to creative activity is the shared responsibility on the impact of our actions on the environment. The consequences of our decisions are not obvious because we do not usually measure the quantity of resources consumed and discarded during our creative acts. Should we stop to think about the investment made on each artistic endeavor and whether that endeavor produced a considerable amount of unwanted byproducts? Do the positive outcomes outweigh the social cost? Those are questions that we need to address if we want to fight for an equitable treatment of the arts when compared to the investment on scientific and educational long-term policies.

In "Compositional Processes from an Ecological Perspective," (Keller, 2000) you list four alternatives to atomistic approaches to discussing complex auditory stimuli: experimental aesthetics, acoustic communication, cognitive approaches, and ecological acoustics. Could you mention briefly how each of these has informed your work and how you viewed the perception of sound structure?

This is a subtle issue that demands a thorough review of the relevant literature. If I were to pick the two most influential perspectives, I would say ecological cognition and experimental aesthetics have kept their relevance over the years. Again, loose usage of terminology might confuse some readers. Ecological cognition is a branch of ecological psychology, firmly grounded on the experimental scientific methodology. It is not straightforward to translate experimental data and results to creative artistic practice. But I believe it is worth the effort. Particularly in the humanities, the tendency to produce a discourse completely devoid of actual field work and observations has grown enormously during the last few years. I do not say that we musicians need to adopt the scientific method and start dissecting each and every musical phenomena. What I propose is to keep our ears open to the contributions of experimental psychology.

What ideas lead you to formalize a concept of ubiquitous music (ubimus), a form based on everyday musical creativity?

Ubiquitous music is still a field of study searching for methods, definitions and conceptual boundaries. Everyday musical creativity emerged as one of the important phenomena targeted by ubimus research. It is not the only one. Another emergent issue is lay-musician interaction. A series of experiments carried out by my research group indicated that music making involving professional

musicians and casual participants is particularly attractive to non-musicians but at the same time it presents difficult methodological challenges.

An important motivation for ubimus proposals is the lack of support tailored for untrained participants in creative musical activities. This goal is an extension of ecologically grounded creative practice. Hence ubimus research receives the contributions of the eco-based approaches and fosters advances in the development of support for creative music making.

How does the opening up of music to naive musicians relate to the idea of ecologically grounded sound? Does it have something to do with showing people a connection to the natural world through sound?

A stronger awareness of our sonic reality increases the potential for meaningful interactions with our ecosystems. Sometimes this is a byproduct of musical training. But more often than not, traditional musical training works against a careful attitude toward our sonic environment. Surprisingly, an experience carried by Helena Lima—one of my permanent collaborators—showed that trained musicians were less aware of the environmental sources and had a huge difficulty when faced with the task of using everyday sounds creatively (Lima et al., 2012). If “naive” participants are better equipped than musicians to deal with everyday sound sources, we just need to provide the necessary support for them to put their creativity to full use. This is the objective of creativity-centered design, one of the methodological strategies of ubimus research.

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