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# Separation anxiety: metaphoric transmutations from a paradoxical biological instrument, or: What is a cactus doing in our concert hall?

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**In its original rendition, *Degrees of Separation: "Grandchild of Tree"* (1998) is performed with cactus, outboard digital effects, and CD playback, with simple lighting. The work is a metaphor which portrays subtle transformations (or transmutations) in human existence precipitated by pervasive new technology. A new version consists of a performance with a video component and all electronics fully automated in MAX/MSP on a Macintosh Powerbook. Development of this work, and subsequent versions, have proven invaluable for my own approach to the music I compose, and for the understanding of my position in the contemporary world of computers, technology and art. This paper attempts to describe these discoveries through outlining the levels of symbolism and metaphor in the work as realised through source abstraction (both visually and aurally), *spatialisation* and (re-)contextualisation. It begins with the question: What is a cactus doing in the concert hall?**

} **Biological Instruments** = (improvisation – performer ego) + chance discovery {

One person's solution to an aesthetic problem in art often precipitates another's challenge. In 1975, John Cage wrote *Child of Tree* for percussion solo (choreographed by Merce Cunningham). In the score, Cage calls for the performer to find instruments from various plant materials. Two of these instruments he specifies as the pod rattle from the Mexican poinciana tree, and various cacti. This work, along with two others from 1975 and 1976 (*Branches* and *Inlets*) marked a change in Cage's output in two significant ways: (i) the scores were non-notated, and (ii) he required the performer to improvise. Cage's prior objection to improvisation was its basis in the confines of a performer's memory and taste which directly contradicted his dada influences. Improvisation with plant material (cactus and seed pods in *Child of Tree*, and conch shell in *Inlets*) solved this dilemma through removing the familiarity of previously learned (and practised) patterns, by introducing a completely unpredictable instrument into the performance (Revill 1992: 251). Cage's challenge to me is: What is a cactus when it is removed from its natural environment, placed in a pot and brought into the concert hall?

} **Paradox** = structure / (biological instruments – natural environment) {

Paradoxes abound in modern existence. Through technology, the world is shrinking, yet isolation grows as this very technology which seems to bring humans closer, often eliminates the option of personal contact: touch, vision and smell. Technology is also an insidious thing. One day we hear about an amazing new invention called the computer, and the next, we cannot imagine our lives without it. Most of us cannot probably say the exact day, month or even year that we became dependent on the computer for work or play. I remember when I did not have a computer, and somewhere between now and then, it has become the one thing with which I spend most of my time. I communicate with more people each day via the computer than with the telephone (or even face-to-face some days). The disembodied voice of the telephone is taken one step further to the disembodied mind of the computer as it passes our thoughts throughout the world with a click of the 'send' button.

I visited a local high school with a guest composer last year, who spoke to forty-five orchestra students about electroacoustic music. He began with the question, 'If a tree falls in the forest, does it make sound?' The students enthusiastically debated this for a while, never reaching an agreement. Some said yes, others no. He then followed up with the question, 'If a tree falls in the forest, is it music?' Without discussion, they unanimously said YES! This experience shows how Cage's philosophy that anything, and everything is music, has permeated our culture, at the most basic level of assumptions. I think the ability to make anything into an instrument through sampling technology has made this philosophy into a reality.

The first time I heard *Child of Tree* performed, I was immediately taken with the sound of the cactus. The instrument produces an amazing variety of intricacies from the plucked and scraped spines with definite, but unpredictable pitch, and each timbre subtly varied. These unpredictable complexities, which force the performer on a journey of exploration and discovery, not only allowed Cage to remove the performer's musical memory from improvisational performance (while necessitating chance discovery), but also allowed him to focus on beautiful sounds found in nature. Through Cage's ideology (and beautiful music) I began discovering not only the sounds, but structural analogues of music in nature as well.

Visual micro-counterpoint is everywhere in nature, from a multifaceted cascading waterfall, to distinct layers of clouds moving at different speeds in the sky. These have become visual analogues to musical structures in my own works. There are, however, drastic differences between mapping visual and conceptual phenomena from nature onto music, and using natural objects to produce sounds in a musical context. The former is contained completely in the symbolic or metaphorical psychological and intellectual realm of perception (i.e. supplied by the mind of the listener), while the latter prescribes specific reference from the physicality of the real thing. Beethoven can only suggest a rainstorm in the *Sixth Symphony* while Antheil actually specifies ‘motor’ (and hence ‘mechanical’) with an airplane engine in *Ballet mécanique*. Technology, and specifically recording, has extended these prescribed associations to include anything that makes sound. In his work *Etcetera*, Cage played an ambient recording made at Stony Point (where the work was composed) during the instrumental performance, which transferred the audience to Stony Point, or perhaps more significantly, transferred Stony Point into the concert hall! Indeed, Cage’s ideas to use cacti and water filled conch shells in the concert hall would not have been possible without technology (specifically: amplification).

While Cage sought to remove the performer’s ego and experience from the performance, Pierre Schaeffer sought (through recording) to remove the [contextual] identification of the sound from its sonic quality. Schaeffer suggested that we ignore any meaning from the recorded sounds we hear in *musique concrète*, and listen just to the beauty of the sound itself (the value is in the sound, not the source, or even context, of the sound). These two views, while bearing some similarity on one important level (the musical possibility and beauty of ANY sound), are remarkably opposed on another level. Cage revelled in the novelty of the listener ‘knowing’ the cactus sound source, while Schaeffer would rather we NOT think about the cactus in performance. The drastic difference here is in the performance medium: in Cage, the medium is the cactus (it is visible on stage, and we see the performer plucking it), while in Schaeffer’s *concrète*, we do not see the sound source because of the veil of recording. Unfortunately (or perhaps fortunately depending on your view), I am hardwired to associate sounds with visual images from my own experience (perhaps by having grown up with cinema): I simply cannot divorce a [recognisable] sound from its source (nor would I want to even if I could).

My goal in *Degrees of Separation*, as a result of my hardwired biases, is to combine these two views: to see the sound source initially, and to abstract the sounds into the metaphorical and symbolic realm. I unabashedly revel in the sound of the cactus, knowing that the source is the cactus, while abstracting that source to suggest levels of thought and symbol that go beyond its mere

novelty, but are precipitated by the sound source itself. In *Degrees of Separation*, I rely heavily on the listener associating the sounds they hear with a cactus and its re-contextualisation in the concert hall, as an analogy to the real-to-abstract sound progression.

The paradox that Cage has confronted me with is: What is a cactus when uprooted from the desert (or grown in a greenhouse) and brought into the concert hall, fitted with contact microphones (or phonograph cartridges in Cage’s case), and plucked or scraped? What we tend to forget, is that to actually hear a cactus (before amplification), we would have to lie on our bellies in the hot desert. Without technology, the sounds would go largely unnoticed. Having heard an amplified cactus, however, I now know that the world would be a poorer place, if I could not hear the plucked spines: this is the gift of Cage to the world. There are, however, numerous degrees of technological separation in this scenario: the cactus taken from the desert (its natural home), placed in a pot (synthetic environment), brought into the concert hall (artificial context), and fitted with technology (unnatural extension). With the cactus in the concert hall, I find an analogue for the gradual (and often imperceptible) separation of humans from their natural environment through technology: having heard the cactus in the concert hall, there is no need to go into the desert. Herein lies the structural concept behind, and title of, my work *Degrees of Separation*, in homage to Cage.

} **Metaphor** = (cactus technique + technology) / context {

In the first version of *Degrees of Separation*, sound is the vessel through which the cactus is transformed (in its already dislocated position in the concert hall) from ‘natural’ to completely artificial (through computer processing of sounds). The work begins with cactus plucks that slowly become amplified. Gradually, the taped and processed sounds emerge out of the cactus, and continuously morph into deeper abstractions. In the end, long sustained drones (made from single cactus plucks and scrapes) dominate the soundscape until the original source itself is no longer present. Mediating the live cactus and preprocessed, recorded portion is a digital multi-tap delay and reverberation which smoothes the transition from short to long sounds. This constant and gradual morph from unaltered cactus to transformed electroacoustic sounds is the metaphor for the insidious nature in which technology creeps into our lives.

We tend to embrace new technology, because of the possibilities it unleashes in our imagination, and ask questions later about how it affects our lives. After the turn of the twentieth century, the advantages of the automobile took hold (not without resistance) on a large scale, and now motorised transportation is an integral part of our lives. Driving a car was much more convenient, cleaner, and quicker than saddled horses or buggies, which led people eventually to embrace it. Did Henry Ford (and all those who purchased the first automobiles)

consider the smog problems of the twenty-first century? I doubt it. By small, imperceptible increments, new technologies have given us expanded possibilities in life while creating new unforeseen problems rarely considered while adopting new technology.

Found in an ever-increasing physical, mental and emotional sterility, the individual in microscopic steps has transformed from self-sufficient, to totally dependent on others (or 'the system') for survival, while at the same time, becoming more removed from others outside of the 'virtual microcosm' of media such as televisions and computers. Freed from the acts of daily survival, our lives can focus around intellectual pursuits and the 'virtual' understanding of life, which often, ironically, helps us understand the physical nature of it. I wish to make it very clear that *Degrees of Separation* is not intended to be an indictment of this technological advancement, but rather, to question what is (or has already been) lost in the transition, and to portray the un-definable (and un-measurable) nature of this human progression. The abstractions of the cactus sounds by the end of the work, after all, are quite inviting and nurturing, rather than cold and alienating.

Theatrical lighting is intended to reinforce this aural metaphor and transition as well. The work begins with a single light illuminating only the cactus. The intended effect is to focus attention on the cactus, and its sound, and not the performer. After a short while the light begins to fade, and for the last two minutes of the work, the audience is in the dark, listening to the aforementioned drones, far removed from the original cactus source. A new version adds a video component which, along with the audio components, are automated in MAX/MSP (one more degree of separation – although indistinguishable by the audience). Like the sound, the video imagery begins with a focus on the cactus, and gradually progresses to total abstractions of colour, shape and gesture, all based on, but far removed from images of the original source. All of the sound and visual components sum to reinforce the idea of moving farther and farther from what is natural.

The score follows the same text format as Cage's, with a couple of important differences: the score is laid out graphically, and the structure is more clearly specified (figure 1). Cage's score is four pages of scribbled text in which the structure is predetermined by the roll of dice in conjunction with the I-Ching. In both cases, the performer is given general instructions (or descriptions) meant as a guide, not a strict set of rules. In my experience, each performer that attempts either work discovers something unique, which adds to the repertoire of gestures and techniques for approaching cactus performance. Wire snare brushes, sheets of paper, paper clips, pencils, and serrated spines scraping spines, all add new and unique sounds to the work, and each was discovered by a different performer. In addition to

applying objects to the cactus, there are many hand techniques which have been discovered along the way as well. Plucking with rubber finger protectors gives a harder, biting sound. Rubbing both hands over the spines gently causes a rain-like sound, and rapidly 'walking' over the top spines with multiple fingers yields a delicate contrapuntal texture. Depending on the specific cactus, traditional pitched motives can be produced as well.

Another important difference between Cage's work and my own is that Cage often used portions of the cactus (for example, lobes from a prickly pear cactus) that were removed from the plant which therefore eventually dried (and died!). My work, while not directly specified in the score, is generally performed on whole, live cacti. *Echinocactus grussoni*, or *golden ball cactus* is my preferred species, although any cactus with long spines will work. Using a live cactus points to another important difference between the two works: Cage's dead material required frequent replacement (it would simply disintegrate over time and use), and thus, new plant material would necessitate new exploration. With a live cactus, the instrument must be initially explored (and the performer is asked to do this for the audience at the beginning of the work), but can also be rehearsed, again, bringing in composer control, and performer memory and taste, both of which Cage sought to eliminate. The important thing here is that the performer is encouraged to rely on memory and taste without either of these becoming the focus (as it is in jazz improvisation).

**Paradigm** = (techniques \* technology) + (discovery \* environment) / (context \* structure) {

The visual and aural techniques extended, enhanced, and transformed by technology; the psychology of discovery extended by the environment, compared to the context transformed by the structure; all work together to create a new paradigm. All of the visual and aural elements initially rely on the traditional setting of performance with the audience as observer. The cactus on stage, and even the video projection orient the listener forward as if they are watching (and hearing) the work unfold from the outside (not unlike watching a string quartet performance). With spatialisation, the final layer of the work seeks to move the audience from this external observer position, to a fictional location inside the cactus. The sound is gradually moved from the front (pan centre) position, to surrounding the audience in at least four speakers with a stereo image. Occasionally I have used four contact microphones so the performer can spatialise the sound in real time by moving around the cactus: literally placing the audience in the middle. In addition to engulfing the audience with sound, the types of sounds themselves often elicit the fluidity of the liquid inside, as well as the incredibly slow growth cycle of the cactus. Like Cage, I attempt to immerse the audience in a new location. This new location, however, is not the 'real location' of Stony Point as in *Etcetera*



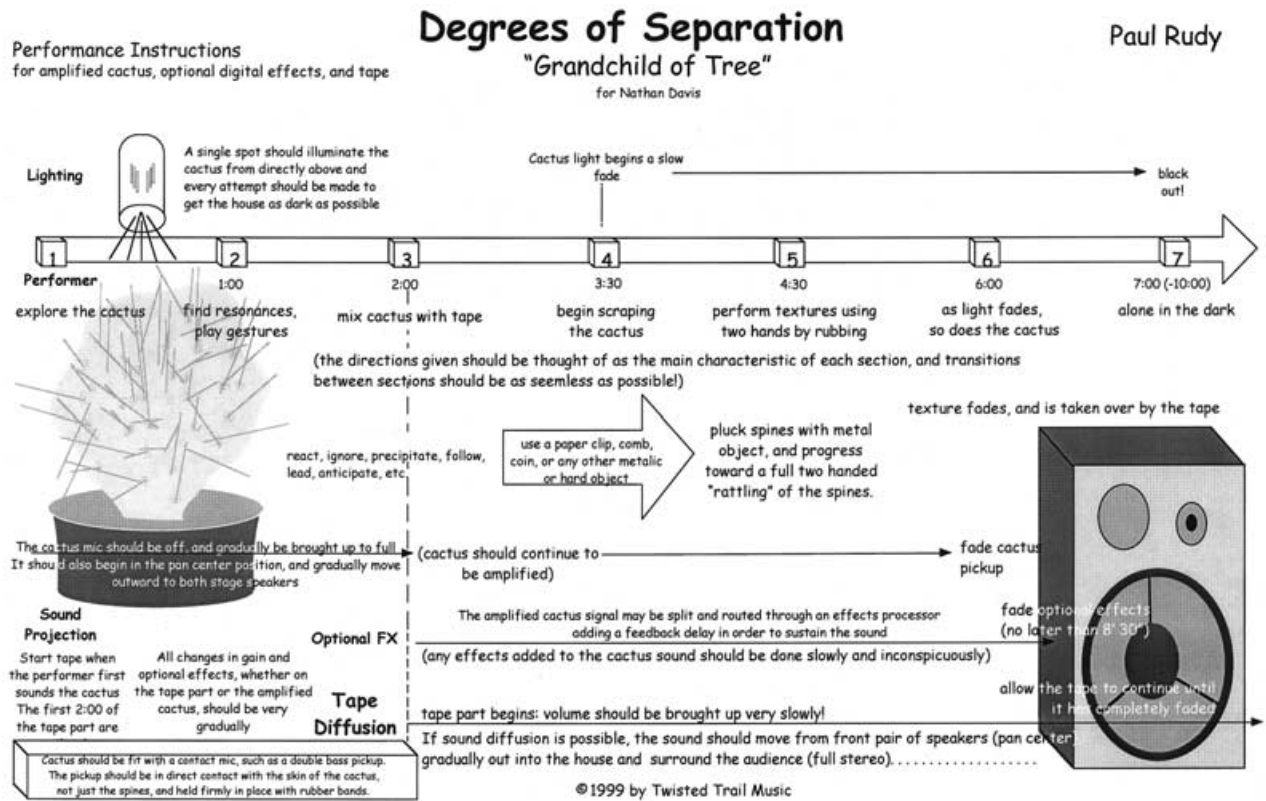


Figure. *Degrees of Separation*: "Grandchild of Tree" score (© Twisted Trail Music).

(where an audience member could go if they so desired), but rather a fictional, imagined location inside the cactus, and even inside the sounds themselves. Cage's use of aural relocation in *Etcetera*, carries the meaning of 'this is where I composed the work,' while also allowing the listener to supply the visual image of their own specific outside location (inevitably queued by specific sounds which they relate to their own experience).

In my experience, aural relocation is one of the strengths of both acousmatic and soundscape music (also 'cinema for the ear'). Sounds from the real world can portray very specific concepts (and relationships) in a work of music. These specific sounds also invite (indeed require) the listener to supply the specific image associated with the sound, thus giving each person a unique experience with the work. An analogy would be that of a good novel in which the author spends pages describing a character. After reading the description we know a certain number of general characteristics of the subject, but our imagination (and **NOT** the author) supplies the actual image of the character (and context), based on people with similar features that we know from our past, or that we simply make up. In sound, a ten-page literary description can be expressed in a few seconds, but still, the listener must supply the specific image they visualise in their mind.

To use Beethoven's *Sixth Symphony* again, we can

imagine the storm, but only if we know (through programme note or subtitle) that is what Beethoven was trying to portray. Even so, the context is within the symphonic structure, which makes the 'rainstorm' a mere novelty. Specific emotional reaction to the storm is accessed through intellectual processing of abstract musical gestures based on prior knowledge of a musical system (i.e. tonality, sonata form and orchestration techniques). On the other hand, in Jonty Harrison's *Unsound Objects* (1996), we actually hear the storm, and further, in the context of other 'real world' sounds, we envision a specific storm based on our own experience of storms. This personal experience allows us to formulate a narrative through the work based on imagined scenes precipitated by the composer's juxtaposition of 'real-world' contexts. In this case, my emotional reaction is accessed directly through the sound (i.e. having been nearly struck by lightning three times, while not eliciting the fear of the real situation, the sound does produce the same adrenaline rush), even without understanding anything about the organisational system the composer has used. Recorded sounds from acousmatic works, in my experience, can be very specific in eliciting responses such as the previous example. It can also be specifically descriptive: In *Unsound Objects*, it is not just a storm, but a country storm because of sounds making up the surrounding context.

In Beethoven's *Sixth Symphony* the 'storm' is originating from the two-dimensional space of the stage which subtracts from its specificity while adding to its novelty. With proper speaker configuration, spatialisation in electroacoustic music brings the most effective imprint of these real-world sounds into compositional syntax by placing them outside of the artificial nature of the traditional concert hall (even when performed in such a space), and back into real sonic space of three-dimensionality. We experience the storm happening around us because we have all been caught in rainstorms (rather than in front of us with double basses and tremolo strings merely imitating thunder). At the same time we can formulate structural relationships with the other sounds in the proximity of a composition, into one personally tailored narrative. The irony is that the more specific (and literal) the sound material, the more suggestive and interpretable that material can become within a sonic context at the hands of a master composer.

Traditionally, acousmatic music requires the listener to ignore the identifiability of a sound, as well as its context. Rather, all sounds should be listened to in a reduced fashion, which means listening only to the qualities of a sound and how those qualities are used in a composition. Soundscape music, on the opposite side of the spectrum, revels in the recognisability of sounds and their contexts. The very quality that draws me to acousmatic music (juxtaposition of recognisable and unrecognisable sounds) is also that which renders it, by strict definition, soundscape music. And conversely, the very thing that draws me to soundscape music renders it acousmatic. The idea that there is a right and wrong way to listen to sounds in music is an academic restriction which I find highly counter-productive to perception. How can I possibly ignore source recognition in acousmatic music, and likewise, how can I disregard the sound qualities of an environment in soundscape music?

In *Degrees of Separation*, the idea is to present the listener with this slippery nature of abstraction. Throughout the work, the more the material is abstracted, the more the context becomes real. The artificial nature of the concert context of the opening (two-dimensional traditional performance paradigm) is in direct contradiction to the realness of the cactus sound source (back to the original question: What is a cactus in the concert hall?). As the piece progresses, the cactus sound source gradually loses its tangibility through increasing artificiality, while the context becomes more based in reality (three-dimensional sound space). The tension of this paradox becomes the new modality (replacing pitch and rhythm) which gives the work shape and structure, while propelling the listener from beginning to end. This separation paradigm relies heavily on the tension between context (concert hall versus real or imagined space) and source (natural versus artificial sound).

} **Redefinition** = (sound + associations) – class structure  
\* (content + context) / personal experience {

In the early 1970s, Cage expressed the conviction that technology would solve the problems of the world (Revill 1992: 237); this, from the same period when he rediscovered (or better, reconnected with) nature through the writings of Thoreau (Pritchett 1993: 194). This paradox, faith in technology, while at the same time embracing (yet growing farther from) nature, has been a theme throughout my artistic life, and the cactus in the concert hall is the perfect symbol of tension between contradictory notions. A growing dependence on technology leads to a separation: distance from the activities and requirements of sustaining life. Yet, this new technology has opened up whole new worlds of exploration and expression for artists and scientists alike.

The separation paradigm operates on numerous levels. Technology enhances our lives in many ways while at the same time removing us from our origins and life functions: we no longer grow the food we eat (nor even prepare it on many occasions), make the clothes we wear, or participate in direct life-sustaining activities. This separation paradigm often leads us into the feeling of 'being acted upon,' rather than 'acting in' life. David Gelerntner (1997) calls this the crime scene of the twentieth century that results in a growing feeling of victimisation, and in my view, the separation paradigm.

In many ways, using recorded sounds (in acousmatic and soundscape music) from the real world is the antidote for the separation paradigm in music. Identifiable sounds invite any listener back into participation in music through imagination, much like the beat of dance music motivates people to move. And, the listener's imaginative interaction requires no prior knowledge of a specific musical language or system, only their willingness to accept sounds that they recognise, or do not, as part of a musical discourse, the specifics of which they themselves supply through their own experience and association. Unfortunately, this flies in the face of the musical establishment, who would rather maintain the class system of initiates (those who really understand a system like tonality, or dodecaphony), and the masses: this music is not for everyone, only those who understand it!

Cage made it possible for any sound to become a part of musical discourse, while removing the composer's persona from the equation. Schaeffer made it possible to organise real-world sounds into a musical context, but chose to remove the specific source identification from the sounds to focus on their beauty. Whether someone chooses to listen in a reduced fashion only to the qualities of a sound, or enjoy the imagination of association, music that uses sounds from the real world has opened up a whole new level of compositional possibilities. I am interested in combining the potency of all these

options, and, rather than limiting alternatives, this new direction has dramatically expanded the field of musical discourse. What is a cactus doing in the concert hall? What a fabulous question!

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