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HEARING BEHAVIOUR: SOCIAL INTERACTION
AS A MEANS OF CREATING EMERGENT
SITUATIONS IN/AS/THROUGH MUSIC

TOM HOLMAN-SHEARD

Commentary to accompany a portfolio of compositions submitted to the University of Huddersfield in partial fulfillment of the requirements for the degree of Masters by Research.

August, 2014

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List of Supporting Media

The following list of media (which are referred to in this thesis) can be found on the memory stick provided or streamed from Vimeo at this address: <https://vimeo.com/user19593745> (alternatively, type Tom Holman-Sheard into the Vimeo search field).

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Abstract

This body of writing serves as accompaniment to a portfolio of musical compositions and visual media composed between September 2013 and August 2014. The work is in three parts. Part one sets the context of the compositions with reference to numerous other artists, explaining the political need for compositions of this kind and how these relate to the topic of emergence in relation to group performance and social enrichment. This part also makes reference to the philosophical influence behind the works and how these ideas might be relevant to wider society. Part two offers a commentary on the works themselves, explaining the thinking that brought them about, and a narrative of the development from one composition to the next. Part three offers a reflection of how well these works relate to the originally stated political agenda, as well as outlining my plans for future artistic direction.

Introduction

With the aim of setting the context for this body of work, it seems necessary to begin with an exposition of my aims as a composer and furthermore what it means to create scores for performance. First of all therefore, I propose we consider what it actually means to be a composer. There are many ways in which to define the role of a composer. Michael Pisaro (Youtube, 2014) defines the composer as “someone who changes the sonic situation”. He further explains that the need to instigate change comes about through the will to indicate the presence of music in the infinite acoustic environment (perhaps with the aim of unveiling or transmitting something of the nature and existence of beauty). This understanding of the role of a composer can be viewed in part as stemming from the philosophy of John Cage. Pisaro himself writes:

If I dare, I would wager that the “truth” of the Cagean event [4’33”] (if it is that) is the “opening” of the world of music to the world of all sound (Pisaro, 2006, p.6).

Cage’s composition 4’33” (1952) could be looked upon by composers as a symbolic starting point, or position from which to proceed artistically. It is a reminder of the fundamental nature of the art of making music, and furthermore it provides the foundation for the acknowledgement that reality is sought through each individual perception rather than something transmitted by the composer him/herself, and to this end, and in the words of Ananda Coomeraswamy (1994, p.64), it can be said that “[t]he artist is not a special kind of man [human], but every man is a special kind of artist.”

It might be said that music serves as a mediator to the timeless presence of the live environment, and in this sense it has a transformative quality, as Gernot Böhme (2010, p.33) writes, “beauty is that which mediates to us the joy of being here”. With regards to the conscious observer, the experience of beauty arises from the subtle field of awareness that in relation to music we call listening. In the listening state there is no distinction between composer, performer and audience, there is only awareness of the presence of Self (or the presence of *consciousness* itself). This is why much of the music in this portfolio emphasises the importance of mediation through repeated use of

the sentence “the group achieve a comfortable presence and hold it for a while in stillness”. This is an attempt to create the right listening context for the consequent ‘performance’ of the specific pieces in question.

Continuing with the notion of the creativity of the individual, I am concerned about how this unified field of awareness can be utilized amongst a group of people in order to trigger collective and spontaneous action emergent from the specific actions of any one individual. This type of coordination in a group could be seen as the essence of what we call ‘ritual’. To this end I see the composer as having a social responsibility to provide a sense of ritual connectedness through the activities he or she creates.

Further more, this humanistic quality – the desire to connect with others on a creative level is something I deem to be of highest importance in the challenge to engage and connect on an intimate level as a global society. Because of this, these compositions are a manifestation of a wider political concern or agenda, which first stemmed from reading Christopher Small’s *Music – Society – Education*, in which he describes the music from such societies as the Chopi tribe in Mozambique and the gamelan music of Bali. Small (1996, p. 38) describes how their music would arise as a phenomenon of wider fundamental social interaction and ritual.

It could be seen that if a society is functioning in a harmonious way, music would perhaps manifest unencumbered by social hierarchy, and would be integral to the heart and understanding of that society. Such societies might also not possess the desire to preserve or turn their music into a commodity by means of recording – there would only be the interaction of members of the societies and the emergence and then eventual subsidence of music. In other words their music would be an outward manifestation of a deeper social need that is all the time rooted in an understanding of the need for harmony and balance on the level of human relationships, and to the wider environment.

We can compare this with the way that music functions generally in an industrial capitalist society and conclude that more often than not music is exchanged as a commodity with an equivalent monetary value, as Edwin

Prévost (1995, p.68) writes “[t]he general substitution for this absence of music as an expression of life itself is music to be consumed”. This disconnection with the source of music creation ‘as an expression of life itself’ as is apparent in our current consumerist society is perhaps a symptom of a broader dysfunction, and we therefore have to ask ourselves, why is it that we do not experience music in the way that these rare societies do, and how can we change ourselves in order to reconnect with such a precious form of experience?

Small also posits in his book *Musicking* that this broader dysfunction comes from the way in which Western ways of thinking have developed since Plato:

There is no such thing as music.

Music is not a thing at all but an activity, something that people do. The apparent thing “music” is a figment, an abstraction of the action, whose reality vanishes as soon as we examine it at all closely. This habit of thinking in abstractions, of taking from an action what appears to be its essence and of giving that essence a name, is probably as old as language; it is useful in the conceptualizing of the world but it has its dangers. It is very easy to come to think of the abstraction as more real than the reality it represents, to think for example of those abstractions which we call love, hate, good and evil as having an existence apart from the acts of loving, hating, or performing good and evil deeds and even to think of them as being in some way more real than the acts themselves, a kind of universal or ideal lying behind and suffusing the actions. This is the trap of reification, and it has been a besetting fault of western thinking ever since Plato, who was one of its earliest perpetrators (Small, 1998, p.2).

The debilitating process of mistaking abstracted thoughts for actual things further relates back to the importance of meditation as a way of reconnecting to the infinite source of life within, which can be seen as being pure consciousness or pure creativity. Only from this point does there manifest true change.

So this focus on cooperation between people in my own work is demonstrative of this value system, one that places the conscious action of people above the sonic results that those actions yield. In other words,

through the act of making music together, social enrichment is achieved and can be valued beyond any sonic outcome. To this end, this body of compositions represents a rejection of the idea of composition as having to do with sound, or even silence. I prefer to view composition as co-creation or co-perception in ongoing activity or inactivity through the necessity to explore what it means to be human within a group of other humans (or even further, what it means to be conscious...). Again in relation to Smalls notion of *musicking*, this perspective also makes redundant the dualistic concept of performer and audience. When music is seen as an activity, it becomes harder to conceive of music as a commodity – everyone becomes involved in the active creation of a single music.

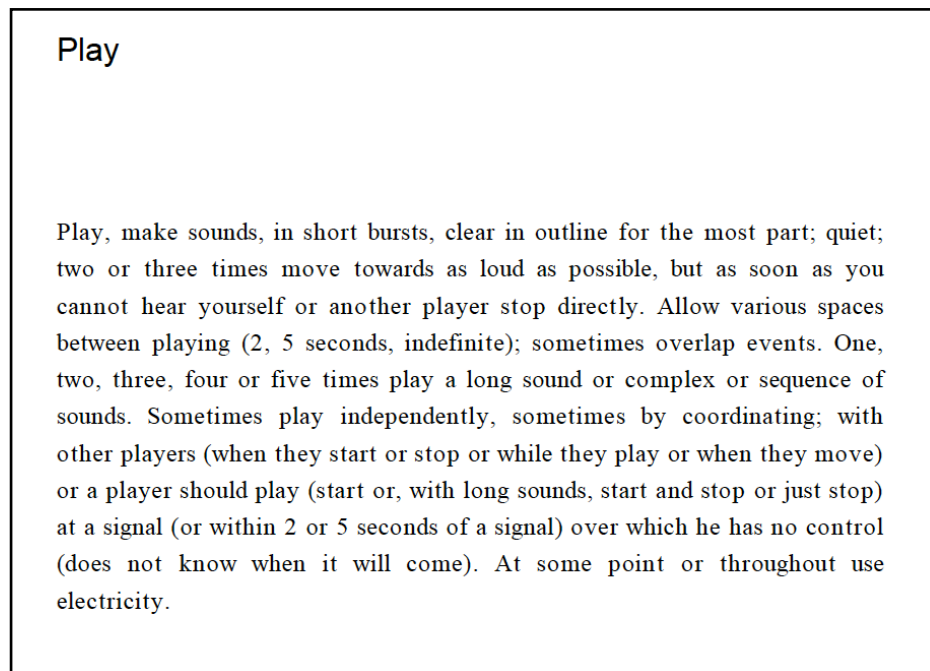
A further political influence for this body of work (outside of a musical context) was the writing of John Berger, who in the following passage, and in response to the question ‘where are we?’ describes his views on what we are experiencing as a global society:

Might it not be better to see and declare that we are living through the most tyrannical – because the most pervasive – chaos that has ever existed? It’s not easy to grasp the nature of the tyranny, for its power structure (ranging from the 200 largest multinational corporations to the pentagon) is interlocking yet diffuse, dictatorial yet anonymous, ubiquitous yet placeless. It tyrannizes from offshore – not only in terms of fiscal law, but in terms of any political control beyond its own. Its aim is to delocalize the entire world. Its ideological strategy – besides which Bin Laden’s is a fairy tale – is to undermine the existent so that everything collapses into its special version of the virtual, from the realm of which – and this is the tyranny’s credo – there will be a never-ending source of profit. It sounds stupid. Tyrannies are stupid. This one is destroying at every level the life of the planet on which it operates (Berger, 2008, pp. 36-7).

I see music as a way of working towards a solution to this sense of isolation that the ‘tyranny’ causes. This can be achieved by using the score as a way of teaching a kind of ecology of musical material where the activity of a piece emerges from the engagement with a system, much like the rules of a game. The resultant enrichment could be considered as play.

Christian Wolff's composition *Play* (fig. 1) from his *prose collection* (1969-1985) is imbued with the same ethos, and his compositions provided both the name (from Wolff's piece *Edges* (1968)) and the æsthetic context for Huddersfield University's Edges Ensemble for whom the majority of this body of work is intended, and whom will be discussed in further detail later.

fig. 1



In continuation of the discussion of the political concern of this portfolio, I also deem the topic of ecology to be of utmost importance in providing an understanding of the solution to the global tyranny. The economist E. F. Schumacher explains how an ecological understanding of the way that we relate to one another in society is imperative.

[...] people can be themselves only in small comprehensible groups. Therefore we must learn to think in terms of an articulated structure that can cope with a multiplicity of small-scale units. If economic thinking cannot grasp this it is useless (Schumacher, 1973, p.62).

This kind of ecological thinking in relation to human societies can also relate to movements such as anarcho-syndicalism where local activities and local governments determine the wider structure of society, rather than structure being dictated globally and enforced locally. These pieces are a manifestation

of these principals and ideals just as music of any time is imbued with the personal, cultural, and political histories that brought it into existence. To this end my compositions use this principal of people as small-scale units as a means of conveying an ideal, that of the desire for self-organisational structures in wider society.

Emergence

So seeing as self-organisation relates with the issue of emergence or emergent structure, when beginning this body of work the notion of emergence naturally became the main focus. My composition process became about finding ways in which performers could interact or communicate through sound, or more broadly, how they could respond to each other's activity or inactivity, which may or may not impact on any sonic outcome. As a compositional approach, this involves the creation of systems and rules which, when carried out by the performers, yield 'indeterminate' results. In the context of the experimental music tradition, indeterminacy has been accepted as a legitimate compositional tool to be utilized. This is distinct from more fully 'determined' work where indeterminacy manifests only as the assumed knowledge and awareness of any given music tradition, and through the expressive content of live performance.

The experimental music aesthetic can itself be characterized by an attitudinal adoption of "openness to any contingency" as outlined by Pisaro (www.wandelweiser.de 2004, 2014), which further relates back to his views on acceptance of the live environment. Experimental music can from this perspective be seen as dealing explicitly with the ideas of indeterminacy and emergence. Whether it's the emergence of the inner timbre of harmony by means of persistent repetition in Erik Satie's *Vexations* (1893); the emergence of the scores themselves in Cage's *Variations* series (1958-1978), or of the emergence of rhythm in the phase shifting works of Steve Reich, or the emergence of acoustic phenomena in the music of Alvin Lucier – all work within the experimental music tradition demonstrates the will to bring something into being, to make something known that was previously

unknown. My aim is to proceed the same way by making social enrichment the subject for emergence.

We could ask what benefit this type of composition has over free improvisation in a political sense, and my opinion is that, while free improvisation offers complete liberty, it is difficult to engage through absolute freedom. This type of indeterminate composition however, offers a framework that allows a kind of pragmatism and conscientiousness to the activity at hand; everyone is aware of the rules of the composition, but there is infinite freedom within the confines of those rules, providing that respect is showed to the rules themselves. I am interested in the idea of freedom through constraint and what the implications are for creativity. I think absolute freedom is almost impossible, and if people had it they would be more paralyzed than liberated. Furthermore there is a large part of human nature that likes to be told what to do. To surmise, I believe there does exist true freedom but only when considered paradoxically in relation to constraint, and this exists as a personal life struggle in the background consciousness of every individual.

So, once I have identified an interesting way in which people can interact, the compositional process becomes about fine-tuning that interaction and working out the best way of instructing the performers so that the piece's resultant behaviour can be clearly realized or heard. The strength of such compositions can therefore be measured in three ways:

1. by the uniqueness of the type of behaviour they produced
2. their ability to create an engaging and enjoyable experience for the performers involved
3. the degree of freedom and voluntary participation they offer to the performers whilst still maintaining a clear emergent behaviour

A fantastic example of this, and one that greatly inspired this body of work, is Braxton Shrouse's *splatter study (on social networking)* (2013) (fig. 2), a composition that involves very simple rules of engagement through open participation, yet creates highly complex rhythmic and textural structures without extended effort from any one group member. This composition is a prime example of an open game-like framework where the rules of the game

determine the type of behaviour, but the behaviour itself can manifest through infinite permutations. It is this 'confined behaviour' that I consider the essence of such compositions.

fig. 2

splatter study (on social networking)

form a circle of eight or more friends. the more the merrier!

independently pick:

- a short sound, ideally just an attack
- a long sound
- a length of time, less than two seconds
- a person in the circle, your "buddy"

whenever your buddy makes their short sound, wait the duration you've picked, then make your short sound. also feel free to make your short sound whenever the moment is right.

if you get bored with your contribution, or want to get out of a loop, you may:

- ignore your buddy's next sound, then rejoin with a different short sound, or
- pick a new buddy and a new short sound, or
- make your long sound, then exit the circle.

if your buddy exits the circle, inwardly mourn their loss, then pick a new one.

Pieces

#1

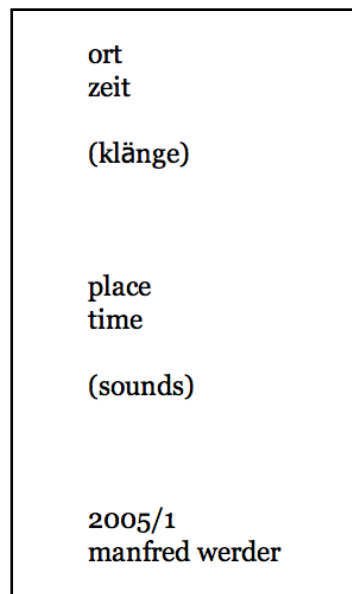
In the first composition however (#1), the aim was first to explore the fundamental nature of emergence and what this would mean within the context of a group of people. At the time it was composed I had not arrived at working by the three criterion detailed above as a basis for a successful composition on the grounds of the given thesis. Instead influence came from ontological concerns also explored by the Wandelweiser composers, particularly Manfred Werder's composition *2005/1* (fig. 3), in relation to which he writes:

A beginning of music as beginning which is not yet music.

When I'm hearing the sounding of the world, I sense a beginning of music touching me, transparently, without imposition on, but immersion in the world.

Inclusion. Cheerfulness. By sensing and experiencing the vertiginous infinity of mere *occurrence*, something like dignity in relation to the world would appear (Cited in Lely & Saunders, 2012, p.379).

fig. 3



With the single statement “we are experiencing an emergency” I wished to draw attention to the fact that in any society of any time, there has always been the need for questioning and reassessing the way in which we choose to live. If history could be so bluntly defined as the study of the action and reaction of former societies and their constituents, then the statement is quite relevant to any society of any time. Moreover, I intended for there to be a play on the word ‘emergency’ in reference to the nature of ‘emergence’ (or the state of being ‘emergent’), The New Oxford Dictionary’s definition of which are as follows:

Emergent

“[a]n effect produced by a combination of several causes, but not capable of being regarded as the sum of their individual effects.”

[In other words, the opposite of 'resultant' – something that has clear traceable causes]

Emergency

“A juncture that arises or ‘turns up’; *esp.* a state of things unexpectedly arising, and urgently demanding immediate action.”

or

“as a political term, to describe a condition approximating to that of war; also *state of emergency*, wherein the normal constitution is suspended.”

(Weiner & Simpson, 1989, Vol. V, p.176)

We can make the connection therefore, that what we experience is emergent from the present moment, but at the same time, in reference to the definition of 'emergency', what we experience demands 'immediate action' due to the human need to take responsibility. The second sentence in composition #1 “(the group achieve a comfortable presence and hold it for a while in stillness)”, is presented as a solution to this declaration of emergency, however, the brackets encapsulating the sentence provide the sense that the solution is taken as granted, the solution being that change starts within, that each must access the state of consciousness that is required for change, seeing as the outer reality is always a reflection of the inner. I consider this piece to be a meditation on the dilemma of that paradox.

In relation to the nature of emergence however, it has been argued that “emergence is simply a sign of our ignorance” (Humphreys, 2008, p.6), and this comes further to light when considered in relation to *Gestalt* theory (from the German word for 'form' or 'shape'), which describes how we perceive the world in terms of shapes, configurations or structures that “form a specific whole or unity incapable of expression simply in terms of [their] parts (e.g. a melody in distinction from the notes that make it up[.]” (Weiner & Simpson, 1989, Vol. VI, p.474). In effect, *Gestalt* theory teaches us that what we experience is illusory – and music is arguably the most illusive of all the arts. Moreover, because music's temporal, ephemeral nature, it is the most

capable of reminding us of the human condition, that is, that we misperceive reality as being fixed and material, rather than as infinite and fluid.

The teachings of Buddhism attempt to go beyond this paradox. The *Prajna Paramita* Sutra contains the paradoxical statement “form is emptiness and emptiness is form” (Suzuki, 1970, p. 41), leading on to assert – “form is form and emptiness is emptiness” (ibid). This was perhaps written to provide a way of pulling the mind out of the trap of dualistic thought and into the realm of experiential reality – bringing thought into alignment with a deeper sense of connectedness. It is this sense of connectedness which composition #1 aims at highlighting. The piece therefore has a metaphysical concern and can be seen as relating to the aims of the composers of the *Wandelweiser* collective, who, it could be argued have a shared metaphysical (sometimes even *religious*) interest, as manifested through their ongoing pursuit of ‘silence’.

emergent environment #1

Continuing from #1, I wanted to explore the idea of sound as emergent from or existing within the physical conditions of a location. *emergent environment #1* is a description of a location, and further still the time of year and the weather conditions required for that location. I wanted to provide the sense of the sounding environment for the mind of the reader, purely through description. In a sense the performance of the composition is in the reading of it, and is emergent in the imagination of the reader. The main point of interest when choosing to write down this experience was the fact that the wind coincided with the position of the underpass in order to create this trail of dry leaves, and in this sense the sound of the leaves themselves were emergent from the rare conditions physical conditions of the situation.

Although there is a contradiction here between my aims for the creation of action through composition, and the fact that this piece is entirely conceptual based with regards to its so called ‘performance’, nonetheless I wanted to illustrate an emergent sonic experience, if only for the purposes of the documentation of a time spent listening...

Edges ensemble

Given that the compositions in this portfolio that are for ensemble were written with Edges Ensemble in mind, an understanding of the ethos of such a group, its origin, the cultural demographic of its member, and the performance history of the group since it was established in 2006 is necessary in order to understand the recordings made of the rehearsals of these pieces. In relation to the topic of 'hearing behaviour', a background awareness of the ensemble will be useful in understanding how these works were approached by this group, and why they were performed in one way rather than another.

Moreover, seeing as behaviour itself connects with ritual, routine, cultural experience and understanding, the type of behaviour that emerges could be analyzed purely on sociological grounds. An example could be the behaviour of a group of school children towards performing an 'open framework' piece in comparison to a group of non musically trained adults, and further with an ensemble of trained musicians who do not perhaps have an awareness of the *Experimental* music tradition, and again with Edges Ensemble who do possess an awareness of such a tradition. The point being that these pieces have been created with the aim of being 'empty containers', yet the resultant behaviour will be as much determined by the players' histories than by the system that the composition in question advocates.

Edges ensemble was established as an open platform environment for composers and performers to explore issues of improvisation. Lead by Doctor Philip Thomas, the group worked with artist and musicians such as Fred Frith, Sol LeWitt, Alvin Curran, Joëlle Léandre, Antoine Beuger, Malcolm Goldstein, Philip Corner, James Saunders, Tim Parkinson, Jürg Frey, Joseph Kudirka, Nick Williams, Michael Parsons and many more. Their concerts have mainly taken place through collaboration with Huddersfield contemporary music festival, or with the *music we'd like to hear* program in London.

Philip Thomas explains that his intention was to create a group with the following principles:

- Members should only attend if they want to be there

- To be more flexible than New Music Ensemble (the precedent ensemble to Edges based at Huddersfield University)
- Concerts must develop out of the activities of the group
- Must be able to accommodate those unable to read traditional notation
- Open to anyone willing to make a sound
- Would be stopped if there ceased to be any female members.

(In personal communication with Philip Thomas)

Although Edges Ensemble has never committed its ethos to writing until now, several principles are evident within the group such as persistence, conscientiousness, and open-mindedness when approaching any new score. It is often discussed that a general principal should be, when you feel that you are playing too much, you should stop what you are doing, and whenever you can no longer hear what others are doing you should stop what you are doing.

Ritual

So this piece was a way of trying to encapsulate the overall principals of Edges ensemble (although admittedly it is a lot more prescriptive in its structure to pieces we would normally play). This piece contains an implied sense of humor that manifests through several aspects, firstly, the imposed equality of everyone having to play the set motive (or at least take center position should they choose the option in the score not to actually play), secondly that the motive is intentionally banal with the aim of making each person's contrasting sounds seem ridiculous, and thirdly, the 'pantomime' nature of the stage direction that indicate everyone must take center stage facing either the rest of the group, or an audience if present. The humor is further heightened by the fact that the person can choose not to play if they so wish. After making themselves comfortable, composing themselves, and perhaps after going through difficulty to bring their sounds to center stage "however heavy or inconvenient", they could choose not to play. This would greatly add to the sense of expectation, and consequently heighten the potential for humor.

The reason that I think this piece is particularly illustrative of the Edges ensemble aesthetic is that it is intended as a way for Edges to laugh at itself. Everybody in Edges is aware of the principals of their performance practice, such as inclusiveness and conscientiousness, and therefore it would be played in a way that is both a celebration *and* a mockery of those principals. For this reason, this composition draws on the theatrical as much as on the musical.

So how does this composition relate to the issue of social interaction as means of creating emergent relationships through music? First of all in its structure, which itself is emergent from the social dynamics of the group. Each individual has a choice to play or not to play, and therefore each person's choice (other than perhaps the first person) will be dependant on the previous person's choice, as the group engages with the joke of the ritual at hand. Furthermore, the piece is also about each person being given the choice to share his or her sounds with everyone else. In all the pieces of this portfolio, the sounds are unspecified, and I see this as a way to create performances that are emergent from the decisions of the performers through engagement with the system.

Finally, the tutti that brings this piece to an end will be the resultant combination of all sounds that had come before, which, although 'resultant' is considered to be the opposite of 'emergent', in this context the tutti will be emergent from the moment to moment choices of the performers as they participate with the ritual's process. This emergence of form is especially true when considering that in the solo sections the performers have the choice to play or not to play, which creates an indeterminacy with regards to the continuity of the piece's form.

#2

Composition #2 was intended as a way of exploring power dynamics within a small group of people, and in a way it acts as a kind of social experiment presented in the form of a game. It took several rehearsals with Edges to refine the rules because the first draft of the composition presented a dilemma in terms of how the role of leader should be passed on. As seen in video #2

rehearsal 1, originally it was for the group to make a collective and spontaneous decision of who qualifies as the new leader, and this made the performance impossible to complete because we could never reach a unanimous decision about who should become the new successor. We subsequently tried a version (shown in video #2 *rehearsal 2*) where the current leader passed on the role by themselves by choosing who they personally thought was quickest to respond. This created a much more flowing and interactive element to the process. However what was lost then was that kind of heated social discussion and confusion created in the first approach, and in the video #2 *rehearsal 1*, at around 31'50" it can be seen that we resorted to pointing at each other in order to elect a new person to lead, which is fascinating behaviour to watch in its own right.

Because of this I considered writing two versions, one which involved an 'election' process and another that involved a 'passing on of power' process. However I later decided that the composition as it is contains a logical process and that the problem is not in what the composition dictates should happen, but in the practicalities of human perception and social organization within the group itself. The subsequent social dilemma created around how to determine the 'winner' and 'loser' of each attack, seems to correspond with the whole concept of the composition being about power dynamics. For this reason I decided to leave the composition as it is and offer this dilemma as something to be resolved by the performers.

What is more, the piece is rather Darwinian in its nature. It is a competitive system, and those who do not engage with it become 'excommunicated' – condemned to playing a "very quiet sustaining sound until the piece's end". Some people chose to default to this option from the start of the performance, as they did not like the aggressive nature of the piece, and preferred to engage with those instructions instead. I think the piece's capacity to bring out this side of human nature is interesting nonetheless, and relates to what John Zorn (1992) describes in about his own piece *Cobra* (1984):

Every society has rules that people deal with in different ways. What I basically create is a small society, and everybody kind of finds their own position in that society. It

really becomes like a psychodrama. It's like scream therapy or primal therapy. People are given power, and it's very interesting to see which people like to run with that power, which people like to run away from it, who are very docile and just do what they're told, and who try very hard to get more control, and more power (Youtube, 2014).

In relation to the issue of emergence, composition #2 creates a completely live, 'open ended' environment, where the piece emerges out of the spontaneous interaction of the performers. There is also the inevitable emergence of the overarching form with regards to the texture of the piece, moving from sporadic, loud clusters of events, and gradually evolving into a quiet, thick sustaining blanket of sound as more and more people exit from the competitive element and enter into the passive element.

#3

With composition #3 I wanted to progress with the idea of an active community, and create a framework that would allow for the cooperation of individuals in order to build a 'sonic sculpture' rather than framework that creates competition like in composition #2. Inspiration came from the quote present at the top of the score in relation to the term 'stigmergy', and this corresponded well with the previously mentioned notion of dealing with small, easily manageable amounts of information communicated by each performer.

This piece requires much more listening and concentration than the previous piece, for it can only work by listening to, and correctly translating the behavior of someone else in the group. What is more, everyone is reacting to someone else, and the goal of the piece is to become aware as a group of an overall emergent pattern over time. This emergence is determined by the choices that the people who are being followed have made – their sound 'type' (high/low-pitched or noise), and after which trigger in the cycle of three that sound type is placed.

In video #3 *rehearsal 1*, we hear the type of patterns that this framework produces – brief clusters of sustained sounds, uneven in relation to each other but symmetrical in terms of the sound to silence durational values of each individual sound proceeding each trigger. Furthermore, with the

inclusion of the instruction that each performer must maintain their own durational value (the length of time they wait after their chosen trigger, and the duration for which they sustain their sound) the arrangement of sound events within each new cluster should be identical, with only the sound types themselves changing. What will be heard in that case is the correlation over time between who is following whom.

As a mathematical principal, the slightest change in numerical factors, say with the number of performers involved, the range of different people being followed by others in the group, the amount of people playing after each trigger, all have dramatically different outcomes in terms of how long a pattern takes to emerge over time, and furthermore whether or not this pattern becomes stagnant or whether it settles into a complex oscillating cycle. It is for this reason that I have included the instruction in the 'notes' section of the score:

“Feel free to change at any time whom you are observing”

and

“If you know that another performer is observing you, feel free to place a sound independently of anyone else using the same confines, and changing to a different trigger if one or more have become redundant.”

but only under the condition that they are able to perceive the consequences of any other previous change made throughout the group. This was in order to provide the group with a means, outside the bare mechanism of the framework, to be able to shape the nature of the emergent patterns should it arise that the initial conditions produce a pattern that is stagnant or uneventful. It followed naturally then, that the end of the piece is determined by the satisfaction of the group as a whole that they have reached a level of fluency with the process as to have produced an interesting pattern over a prolonged period of time. Figure 4 represents one pattern that could emerge based on arbitrarily chosen starting conditions, and figure 5 shows what could be defined as an uninteresting 'stagnant' pattern.

In order to understand figures 4 and 5, I will provide an example: in figure 4, person one is following person eight, and the subsequent numbers '1, 1'

under person one, cycle one, means, sound one played after trigger one, which we can see is replicated by person eight in cycle two. The block of four cycles highlighted in yellow indicate the first time a repetition (of the previous four cycles) becomes apparent, and this repetition is of quite complex information, which would perhaps be very difficult to perceive.

fig. 4

Cycle→	Person	Following																
	↓	↓	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	1	3	1,1	1,3	1,1	3,2	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3
	2	11	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3
	3	7	1,3	1,1	3,2	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2
	4	2	3,1	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2
	5	2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2
	6	11	3,2	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3
	7	6	1,1	3,2	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2
	8	1	3,2	1,1	1,3	1,1	3,2	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3
	9	5	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2
	10	7	1,1	1,1	3,2	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2
	11	9	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3	2,2	2,2	2,3	1,3

fig. 5

Cycle→	Person	Following									
	↓	↓	1	2	3	4	5	6	7	8	9
	1	10	1.2	2.3	1.3	3.1	1.3	3.1	1.3	3.1	1.3
	2	6	1.1	3.1	1.3	3.1	1.3	3.1	1.3	3.1	1.3
	3	6	1.3	3.1	1.3	3.1	1.3	3.1	1.3	3.1	1.3
	4	1	3.3	1.2	2.3	1.3	3.1	1.3	3.1	1.3	3.1
	5	9	1.1	2.3	1.3	3.1	1.3	3.1	1.3	3.1	1.3
	6	7	3.1	1.3	3.1	1.3	3.1	1.3	3.1	1.3	3.1
	7	6	1.3	3.1	1.3	3.1	1.3	3.1	1.3	3.1	1.3
	8	6	3.3	3.1	1.3	3.1	1.3	3.1	1.3	3.1	1.3
	9	7	2.3	1.3	3.1	1.3	3.1	1.3	3.1	1.3	3.1
	10	3	2.3	1.3	3.1	1.3	3.1	1.3	3.1	1.3	3.1

#4

This composition was a continuation of the idea explored in composition #3. In this one however, I tried to create a system for the exponential propagation of sound events over a long period of time, rather than a propagation of the type and placement of sound between people.

The composition relies on video #4 as a score to follow in performance. This was developed long after the composition was initially written in order to allow the time brackets in the piece to be represented in a purely spatial way – a necessary solution to the need for the alteration of the time brackets based on the relative size of the ensemble playing the piece, which would have otherwise meant awkward divisions of clock time. The development of the idea of using dials to represent time will be discussed later.

Inspiration for this piece came from performing Antoine Beuger's *en una noche oscura* (2004) for solo singer and seven instruments at Huddersfield's 2013 contemporary music festival. I was interested in the way that Beuger stretched out time events, specifying several tones per instrumentalist to be equally placed over a period of 25 minutes. Eight of these sections occur over a period of four hours, while the soloist sings one stanza from the Spanish poem per half an hour, always starting several minutes after the instrumentalists, and continuing unaccompanied for the last five minutes of each half an hour section. The effect that this way of arranging had on the perception of time was profound. It created this constant murmuring and blending of barely perceptible tones, which after disappearing created a vast emptiness in the composition.

In the pre-concert talk, Beuger (2013) spoke about ways in which music can allow us to come to terms with loss, and how that has come to be his main compositional focus. His piece *one tone. rather short. very soft.* (1998) (figure 6) a beautiful example of how a piece of music can encapsulate a sense of loss. What was fascinating for me however, aside from Beuger's intentions for the piece, was the way in which he set the context for intimate communication between two people, and how an integral part of this communication is due to the freedom afforded by the time brackets, and the choice for the performers to exercise their judgment in deciding when to drop out of the composition.

fig. 6

one tone.
rather short.
very soft.

once in the first half of each minute: one performer

once in the second half of each minute: the other performer

at some time one performer plays the tone no more and remains still until the end of the piece.

at some time the other performer plays the tone no more and remains still until the end of the piece.

duration of the piece: at least 30 minutes.

In composition #8, I therefore used this idea of framing a duration of time in which events can occur, and by using extended duration with long sustained sounds, I created an environment where performers could easily acknowledge each other's sounds, without the confusion that a busier composition could create. The mechanism of this composition works by each performer reflecting on what they heard in each section of the cycle and having time to calculate where and what they will play in the next cycle whilst at the same time repeating the events of all previous cycles. This is therefore a composition about the gradual addition of sound unlike Beuger's music, which focuses on the gradual subtraction of sound (or at least of compositional material).

The process through which this composition operates is more or less imperceptible due to the fact that it operates across lengthy periods of time and by abstract criteria. It does however provide a way of propagating sound events that become distributed in accordance with an ongoing analysis of its own structure. This allows for the evening out the amount of sound events and sound types across all sections, and is therefore emergent from what each person chooses to do initially. This is in turn dependant on the moment-to-moment engagement of each performer who has to be aware of what every other performer is doing in order to succeed at the composition. This factor alone is illustrative of quite complex social interaction due to the sense of responsibility that these conditions create.

#5

#5 was written in response to the challenge of having to design a framework that would produce an emergent structure for a soloist to interact with rather than writing for a group to interact with each other. I developed the idea of the performer reacting to replays of previous material, and this developed into an exploration of the performer's ability to incrementally reduce the lengths of sounds through each replay, as well as being able to respond to the unexpected cues for action – the random playback of the sounds themselves. I subsequently learned how to program using Max MSP software, and built a patch that would enable this form of interaction.

Once built I began rehearsals with singer Peyee Chen, the performances proved to be fully organic in the sense that every new sound set the way for what came next, and the duration of the performance was completely dependent on the performer's ability to engage with whatever degree of competence with the system and the task at hand. Moreover, because of the randomization in the playback of each sound within the confines of the duration of each preceding sound, this allowed for the creation of dramatically different and unexpected landscapes and textures as the performance progressed – sometimes in monophonic or homophonic strings, other times in thick chords all at once.

Figure 7 is a graph derived from the sound timings of Chen’s final performance of #5. These are based on a print screen (figure 8) taken of the Max patch immediately after the performance. The video *Peyee Chen #5* also shows the performance in full. We can see from the graph that her process of reducing the lengths of each new sound was far from consistent. From this I became interested in how aspects of human error could themselves be utilized for the creation of emergent structures, and this will be discussed in further detail later.

fig. 7

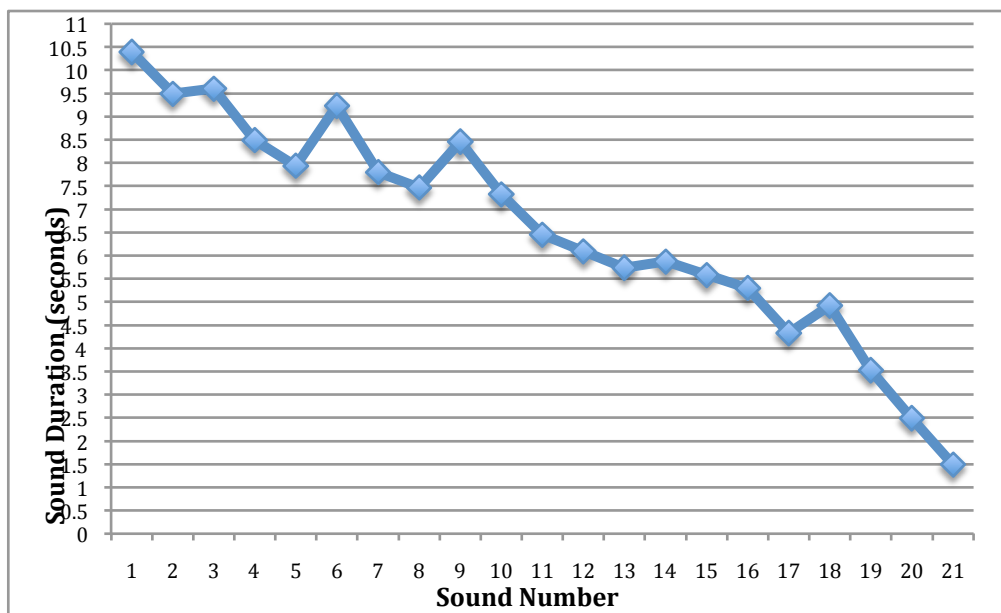
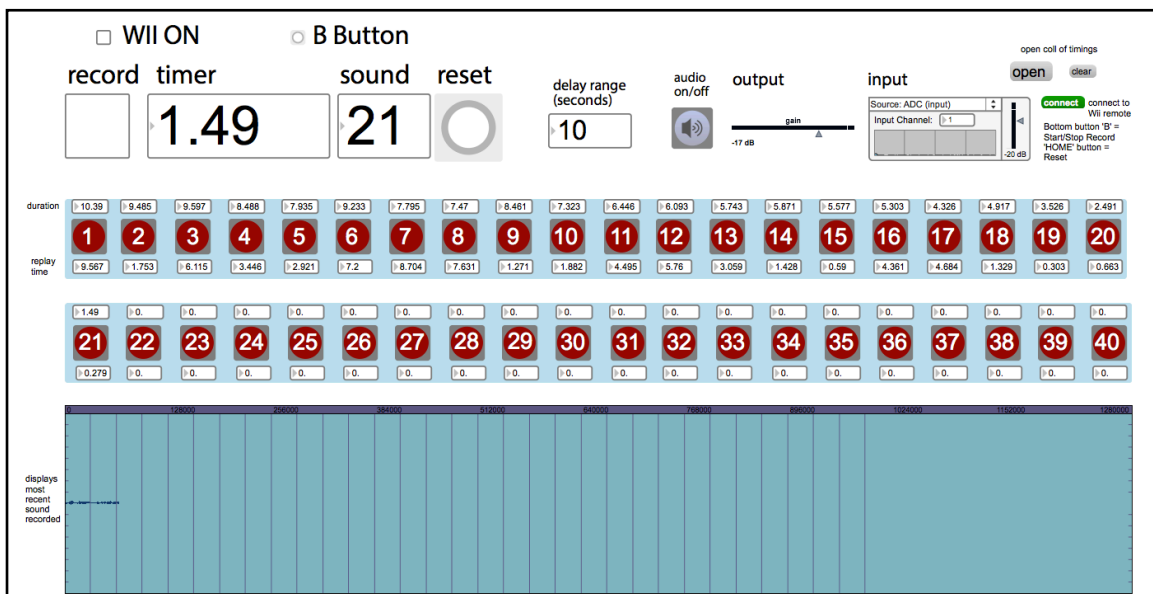


fig. 8



Returning to criticisms of this piece, another weakness was that I intended for the interest to be in the challenge of having to respond to the randomization of the playbacks of previous sound. However, the fact that I wanted the performer to play a shorter sound than the one that was playing back meant that the sense of surprise was diminished – The fact of not being able to play immediately with the replayed sound, due to the reaction/processing time of the performer, fulfilled the other instruction of having to reducing the length of the new sound in response to the previous. For this reason the score contained somewhat contradictory aims. I think this is partly the reason why the results of Chen’s performance were so inconsistent. Nonetheless, on a purely sonic level the piece worked well in that there was an audible process apparent to the audience (which they were informed about in the program notes (figure 9)).

fig. 9

<p>#5</p> <p>for solo performer</p> <p>A piece of indeterminate length, which presents a challenge to the performer to try to incrementally reduce the length of each new sound performed in comparison to the previous sound, whilst at the same time responding to a random playback of all preceding sounds in sporadically arranged chains.</p> <p>The piece is part of a series, which explores different ways of creating sonic emergence by exploiting aspects of human behaviour and cognition.</p> <p>Tom Holman-Sheard</p>

Furthermore, in relation to improvements that could be made to this composition, the system could be adapted in a way that would be more stimulating for the performer, and allow them to shape the relationship between the actual replays of the sounds themselves in a more creative way. I therefore composed *for harriet* which can be viewed as an adaptation and extension of this idea.

for harriet

The main difference with this composition is that the replay of recordings occurs as one single ongoing sonic sculpture due to the fact that each time the recording button itself is pressed, this also automatically replays all previous recordings at the same time. As a system, this allows the performer to play with the rhythmic relationship between the attacks of each new sound. This can be seen as a type of evolving block form where everything happens within the same duration or 'block' (the duration of the initial breath), and each time the block is reactivated (at the performers leisure), the performer follows the consequent created rhythm, adding one more step each time, as though creating a jagged pathway through that block of time. What emerges then is a thickening of texture as the piece progresses, and a contrast is created between the sustaining tones and the surface detail of the attacks.

What is more, the performer is free to explore any sounds, although I thought it necessary to instruct that the performer explore "one specific sonic parameter in depth", in order for there to be a degree of focus in the sonic outcome, otherwise the unrelated nature of one sound to the another might distract the listener from the piece's objective, which is to cause the emergence of an interconnected 'organism' of sound.

Although these solo pieces do not coincide with the purpose of this thesis in terms of creating ways in which to heighten *social* interaction between people, they do however provide a means by which an individual can engage creatively in a performance. Also, given that they can appeal to amateur performers I see this as a continuation of the political aims of this thesis, as it does not comply with elitist ideas about music performance being only for those who possess some in depth technical capability. Furthermore these two pieces present systems of engagement that could be easily adapted into an ensemble context, thus making them suitable to pursue the given social agenda.

#6

This following group of compositions began with the desire to explore what would happen to peoples' behaviour when given a window of time in which to carry out a simple task, and what would happen if that time was repeated and changed in duration. They are a continuation of my inquiry into the use of open time brackets, originally inspired by reading Beuger's *one tone. rather short. very soft.* as previously mentioned.

The video *How Huddersfield Moves (on a Wednesday morning)*, served as an meditation on, and example of possible patterns in behaviour that could emerge in day to day living (to which composition #6 could also be something representational of). What becomes apparent in this footage is how rhythms are created in the flow of people and cars, and these rhythms are dictated primarily by the confinements of physical space such as the pedestrian crossings, roads, and pavements, and by confinements of time such as the rhythm of the traffic lights and security gates. What is more, when someone deviates from those confinements, such as moments when people cut across the round about rather than sticking to the standard crossing path, or cross at the pedestrian crossing when the light is at red, this is representative of a kind of creativity, and this acted as a further source of inspiration for composition #6.

To reiterate, for composition #6, I was interested in how people would adapt to a shifting cycle of time when given the freedom to do something very simple at any point within that time. This is when I leaned how to make the dial used in video #6 *steady speed*. Would this freedom within constraint inspire any kind of interaction or communication between people? And if so, could this be developed or encouraged further? Could this be expanded in order to layer periods of time and divide people into groups in order to create a kind of game? At this point I decided to apply some simple rules on top of this idea in order to further encourage interaction. These were (as listed under the 'condition' at the bottom of the score for #6):

- "make sure someone plays at the beginning and end of each sounding section, but don't preplan"

- “readjust your playing point within each new sounding section”
- “try to play your sound at a point when no one else is playing”

#6 *steady speed* shows the first rehearsal with edges of this idea. At this point I had not worked out how to program the dial to increase and decrease in speed, so the video shows only people’s responses to an alternating cycle of time repeating at a *constant* rate (an oscillation of a sounding section followed by a silent section of equal duration). Nevertheless a kind of behaviour is still apparent, due to the effect of the imposed rules, and you can hear people playing around with the sense of space-time that the moving needle conveys. This was something I found interesting about this method, in that the needle allows a spatial representation of time, and people respond differently to this than how they might when using a stopwatch for example, which can be seen as a more linear way of representing time.

Four-dial-phase

With these two videos *four-phase rehearsal 1*, and *four-phase rehearsal 2*, I wanted to explore the possible improvisational and creative outcomes of multiplying the dials and dividing the ensemble into different groups. The videos show the results of two different approaches tried out in rehearsal with Edges. In the first rehearsal each performer was restricted to playing the same single sound event per revolution of their assigned dial (at any point within the sounding section). If they chose to sustain, they could begin their sustain sound at any time within the sounding section, but always sustain it until the end of that section. The outcome resembled that of a gently revolving distorted sonic kaleidoscope.

In the second rehearsal I arbitrarily chose the rule of having half the ensemble continue in the same manner with playing the sustaining sounds, and have the other half of the ensemble choose three short sounds which they could play in any order (once) in each new sounding section. I was curious to find out how this simple development of rules would impact on creativity. Would the fact of being given slightly more freedom to construct basic motives necessarily result in better communication and a more creative performance? I concluded that the greater the restriction in material, the more focus this

affords for the performer, and the more space this creates in the composition. If people are given more material to play with on the other hand, they can 'speak' more, but might end up 'saying' less because of the resultant lack of space necessary for reflection that is necessary in improvisation.

Dial Phase Continued

From this idea of dials phasing in and out with each other, I decided to develop a video that expressed in as much detail as possible the relationship between two dials. This resulted in the video *dial phase continued*.

The top left and top right dials (the two that are divided into 'sound' and 'silence') are in close phase with one another (one is moving slightly faster than the other). The other four dials represent the different aspects of the emergent discrepancy between these two dials (red indicating to the performers to play, and blue indicating not to play):

- The top middle dial displays red when the top right dial is in sound while the top left dial is not.
- The bottom middle dial displays red when the top left dial is in sound while the top right dial is not.
- The bottom left dial displays red when both the top left and top right dials are in sound.
- The bottom right dial displays red when both the top right and top left dials are in silence.

What this creates is four gradually expanding and contracting windows of time in which to play sound. I presented this video in a rehearsal with Edges ensemble, and divided the group up as follows:

- One person played a sustain tone whenever the top left dial was in sound.
- Another person played a sustain tone whenever the top right dial was in sound.
- The rest of the group was divided in to four sections, and asked to play anything they liked when their assigned dial was displaying red.

The video *dial phase continued* is the result of that experiment. Several things became apparent from this:

- Firstly, some of the group felt uncomfortable about being asked to do anything they wanted as there was nothing empirical in the instruction to go on and therefore they felt they could not do a good job, although maybe I did not explain my intentions clearly enough in giving them these instructions (this is why it can be heard, in relation to the bottom middle dial, someone chose to play an attack sound only at the very beginning and end of the playing section because this was the only information they thought they could respond to).
- Secondly, the mechanistic nature of the dials meant that people started to play in a gestural way as the dial moved towards the cut off point between sound and silence.
- Thirdly, people commented after this rehearsal that there was something imprisoning about the fact that they had to play something in the sounding sections even if they did not want to, and in particular because of the relentless nature of the dials.
- And finally that a communication between the four groups did emerge, and the activity developed a voice of its own through the content that the performers chose to fill the spaces with. I would comment though that the type of improvisation that emerged was moving towards the theatrical, and I cannot recall Edges ensemble having ever improvised in this way before. This might say something of the nature of the dials, having inspired that kind of improvisational response.

Furthermore, in relation to the earlier discussion of Edges ensemble and what their experience has been in terms of performing different repertoire. In the case of the two people assigned to play the sustained tones with the two phasing dials, both performers played very softly, which I did not actually instruct but they automatically chose to play in a 'wandelweiser-esque' manner due to the fact that Edges has played a lot of quiet music from repertoire coming from or influenced by the Wandelweiser collective. That is why this aspect of the performance is not too audible on the recording that accompanies the video. This was a shame because the four improvisatory

groups would be placed in better context if these two parts were more prominent in the performance (perhaps more people should have been assigned to those parts).

#7

Composition #7 was written in response to Edges' feedback of the Dial Phase experiments. I tried to incorporate into the score the sense that the video is merely a prompt for improvisation, and that the participation for this is voluntary and at will. This text was written specifically to correspond to video #7, but it could equally apply to the dial phase videos. With video #7 however I created it using an algorithm that allows for all the possible permutations of all eight colours in combination across all six dials moving at different speeds, and this process takes a little over one hour and a half to run its course. The process is as follows:

The slowest dial is top left. Each subsequent dial from the top left is moving faster at a ratio of eight divisions of that slowest dial, so the top middle dial is moving one-eighth faster, the top right dial is moving two-eighths faster, all the way to the bottom right, which is moving five-eighths faster (than the top left dial). I then calculated the lowest common multiple of the numbers 3, 4, 5, 6, 7 and 8 (the ratio divisions of the original speed). This came to 840, which meant that I had to repeat the *original* cycle of eight colours (the top left dial) 105 times, the next dial 120 times, the next 140 times, all the way to the last which is repeated 280 times in order for all six colour cycles to realign as they are at the beginning. If you fast-forward the video to the end, you will see that all the dials realign, and the video could be looped back to the beginning. This mathematical arrangement creates a tempo in the image, and through this tempo, visual patterns emerge as colours coincide across dials. The emergence of colours coinciding creates rhythmic patterns between colours in the image, and each pattern is unique.

There is perhaps a contradiction in the accompanying text #7, and that is that the element of voluntary participation prevents the emergent structure becoming apparent. We would hear the sound of the performers only when they want to play, which would prevent the consistency needed to articulate

the actual structure of the video as it is objectively, in a mathematical sense. However, I have tried to emphasize the need to “be consistent in the association/representation” they do make. I see the activity of the group for this composition as a subjective filtration of an objective pattern. So we hear the (perhaps flawed and warped) traces of a complex structure but we rarely ever hear the structure in its entirety.

Though the structure of the video is unfathomable on a moment-to-moment level when you try to comprehend it in its totality, if you focus in one single aspect of its behaviour (perhaps the tempo of one particular dial against another), it soon becomes comprehensible. So even the simplest of associations is bound to create something of sonic interest when placed in context with the association that another performer might be making. Furthermore the algorithm never creates exactly the same permutation over the course of the duration of the video, so in this sense there needs to be an element of submission from each individual in order to engage with the mathematical nature of the video, otherwise they are bound to become overwhelmed.

Emergent patterns in video

In order to further explore the potential for the creation of these emergent patterns in video, I went on to make the video *colours original 21x11*. I began with expanding the video for #7, speeding it up and extending the mathematical formula to include smaller ratios. This created the central strip of dials. I then took this strip and speeded it up two, three, four times and so on, each new strip of dials moving outward to create one quarter of the image. This quarter is in turn partially mirrored vertically and horizontally from the center of the image. I chose to mirror the image in order to create a better context for the pattern, which would be easier to spot if seen as coming from a central point rather than from the bottom left corner of the image for example (as it would have existed un-mirrored). Also the symmetry of the image means that the patterns seem to literally emerge from the centre, and this creates a rather hypnotic effect.

Reflecting on this colour video I decided to abstract it by removing the colour, altering the contrast so that the previous darker colours turned to black disappearing, while the lighter colours became white dots. I also slowed the footage down considerably. This resulted in the video *black & white more contrast original*, which is easier on the eye, allowing the patterns to be more fully appreciated. The video *black & white original 44x21* is a further expansion on this work and explores how the original '21x11' version might relate to itself when multiplied fourfold, with two of them reversed, and two of them beginning from their halfway points. This created the effect of movement across the four 'panels' as though all four were interconnected.

I also created a similar video by using dials that change speed progressively like the one used for #6, and by using the same mathematical formula to multiply the dials, this resulted in the video *black & white exponential rhythm*. Due to the changing speed of each single dial, an unfathomable rhythm is created in the image that is erratic and jolty, creating ripples of exponentially expanding and contraction movement through the image.

These videos are too fast moving and complicated to be used as a source of inspiration for a group to improvise, due to the patterns being too fleeting. However, subsequent to creating them I came across the work of contemporary artist such as Leo Villareal and Tim head, both of whom work with emergent light sculptures. Villareal comments on his work:

My pieces are very open ended. I don't know what they're going to be when I'm making them. Like, I have a general sense, but then my goal is to create the conditions for something to happen, and I'm very much interested in emergent behaviour and complexity and all these things, and the idea with that is that you create the parameters but then let it happen, and you're there to kind of capture that moment of, you know, discovery when something does happen, and kind of bring that moment back. [...] The epiphany for me was that you can create a very potent work of art with a small amount of information (Youtube, 2014).

Making these videos provided me with the same experience because I had to focus on what kind of mathematical relationships I would use, and how complex these could be whilst at the same time still running their course

within a comprehensible time scale. Once I press play at the end, the result is there empirically to be analyzed, so that I can adapt the algorithm to create a different sort of emergence. The immediacy of this medium, in comparison to that of working with an ensemble, means that the creative process has a more powerful charge to it. The routine of making, analyzing, reflecting and adapting becomes a major part of the enrichment. We could say it is an emergent working process in itself, in the way that you follow a line of inquiry without knowing where it might lead. With the text scores, on the other hand, the primary enrichment is through trying the scores out themselves with an ensemble, while the compositional process of writing the text can be a bit more problematic and inconsistent in terms of providing creative stimulation.

With regards to social interaction though, these videos do not qualify as relevant, unless they were adapted into public installations and made into live frameworks capable of responding to the interaction of the public. They have however served as a means of sketching and working out the consequences of mathematical relationships in time. They can also be adapted, abstracted, or slowed down in order to create something more digestible as a means of inspiring a way of playing music interactively, and this will provide the continuation for part of my ongoing inquiry.

Further considerations

How does this body of compositions compare or 'live up to' the stated political ideal of creating work that can bring about social change towards a more connected society?

Firstly, these scores could be viewed as a fusion of two approaches, the one being of the kind of spontaneous improvisation that is necessary for such societies to function musically, and the other being the approach of an 'experimental art tradition' where a relationship with extra material such as a score are often required to serve the specific artistic enquiry. The later pieces where I began to incorporate dials, were the beginning of this fusion, composition #7 being a lot freer than that of the earlier strictly rule-based compositions for ensemble such as #2, 3 and 4.

I see no contradiction between 'rule-based scores' verses 'spontaneously improvised' activity because the scores can act as a necessary tool to communicate a diplomacy or ethos for group understanding, which in turn allows a group to move towards freer aspects of creative music performance.

A further challenge for musical groups, and for day-to-day living in general, is to embrace technology as a means of aiding and enriching our lives. This is something that I have come to realize through the incorporation of programs like Max MSP and video within performance. I believe in the development of technology as an integral part of the solution to the political concerns discussed in this thesis. However, technology can only be of true benefit if we are capable of adopting the correct ethical relationship with it. With regards to musical performance, it could be argued that technology is only useful when it acts as a facilitator for group activity to become possible that would otherwise be impossible. It could also be the case that technology is only useful if it provides more convenience for a given activity, or as used to express something beyond the realms of possibility of a group, as it exists on its own.

For the future, I wish to progress by exploring further how technology can be utilized for open-framework compositions for ensemble. This will require developing my understanding of computer programming languages and software, and studying in more depth the mathematical principals behind emergent structures, as well as experimenting with different ways in which these principals can be utilized within the context of group performance.

Reference List

- Berger, J. (2008). *Hold everything dear* (2nd ed.). London: Verso.
- Beuger, A. (2013). *antoine beuger the wandelweiser group* [spoken lecture], Huddersfield University.
- Coomaraswamy, A. (1994). *The transformation of nature in art* (1st ed.). New Delhi: Munshiram Manoharlal Publishers.
- Prévost, E. (1995). *No sound is innocent* (1st ed.). Matching Tye, near Harlow, Essex, UK: Copula.
- Pisaro, M. (2006). *Eleven Theses on the State of New Music*. Retrieved 20 June 2014, from <http://www.timescraper.de/pisaro/mp11theses.pdf>
- Schumacher, E. (1973). *Small is beautiful* (1st ed.). London: Blond and Briggs.
- Small, C. (1996). *Music, society, education*. Hanover, NH: University Press of New England.
- Small, C. (1998). *Musicking* (1st ed.). Hanover: University Press of New England.
- Suzuki, S., & Dixon, T. (1970). *Zen mind* (1st ed.). New York: Walker/Weatherhill.
- Weiner, E., & Simpson, J. (1989). *The Oxford English dictionary* (1st ed.). Oxford: Clarendon Press.
- YouTube,. (2014). John Zorn - Cobra - On Improvisation (1992). Retrieved 20 June 2014, from <http://www.youtube.com/watch?v=yp-oZbmsQVw>
- YouTube,. (2014). Leo Villareal. Retrieved 20 June 2014, from <http://www.youtube.com/watch?v=ML88Lf6D0PE>
- YouTube,. (2014). Michael Pisaro: Co-Chair of the Composition & Experimental Sound Practices Dept. Cal Arts. Retrieved 20 June 2014, from <http://www.youtube.com/watch?v=jsLbz4lyK0c>

Bibliography

- Bailey, D. (1993). *Improvisation*. New York: Da Capo Press.
- Berger, J. (2008). *Hold everything dear* (2nd ed.). London: Verso.
- Blackwell, T. & Young, M. (2004). Self-organised Music. *Organised Sound*, 9, 123-136. doi: 10.1017/S1355771804000214.
- Böhme, G. (2010). 'On Beauty'. *The Nordic Journal of Aesthetics*, 39, 22–33.
- Cage, J. (2009). *Silence*. London: Marion Boyars.
- Cardew, C., Parsons, M. and Prévost, E. (2006). *A reader*. Essex: Copula.
- Coomaraswamy, A. (1994). *The transformation of nature in art* (1st ed.). New Delhi: Munshiram Manoharlal Publishers.
- Cox, C., & Warner, D. (2004). *Audio culture* (1st ed.). New York: Continuum.
- Eno, B. (1996). *A year with swollen appendices* (1st ed.). London: Faber and Faber.
- Glover, R. and Harrison, B. (2013). *Overcoming form: reflections on immersive listening*. Huddersfield: University of Huddersfield Press.
- Google.co.uk,. (2014). define: stigmergy - Google Search. Retrieved 20 June 2014, from https://www.google.co.uk/search?q=define:+stigmergy&ie=utf-8&oe=utf-8&rls=org.mozilla:en-US:official&client=firefox-a&channel=sb&gws_rd=cr&ei=2WCkU5fyDOmf7AaW8YCgAw
- Kudirka, J. K. (2012). *Extending the Invitation: Composing Notated Experimental Music for Performance*. Unpublished PhD Thesis. University of Huddersfield.
- Lely, J. (2008). *Commentary on Portfolio of Compositions*. Unpublished PhD Thesis. Goldsmiths College.
- Lely, J., & Saunders, J. (2012). *Word events: perspectives on verbal notation*. London, Continuum.

- Lucier, A., Gronemeyer, G., Oehlschlägel, R., Simon, D., Duckworth, W., & Tenney, J. et al. (2005). *Reflections* (1st ed.). Köln: MusikTexte.
- Martin, A., & Schwarz, D. (1991). *Writings* = (1st ed.). Ostfildern: Cantz Verlag.
- Melia, N. (2011). 'Stille Musik – Wandelweiser and the Voices of Ontological Silence'. *Contemporary Music Review*. 30 (6), 471-495.
- Nachmanovitch, S. (1990). *Free play* (1st ed.). Los Angeles: J.P. Tarcher, Inc.
- Nyman, M. (1974). *Experimental music* (1st ed.). New York: Schirmer Books.
- Perkis, T. (2003). Complexity and emergence in the american experimental music tradition. In Casti, J., & Karlqvist, A. (Eds), *Art and complexity* (pp. 75-84). Amsterdam: Elsevier.
- Pisaro, M. (2006). *Eleven Theses on the State of New Music*. Retrieved 20 June 2014, from <http://www.timescraper.de/pisaro/mp11theses.pdf>
- Prévost, E. (1995). *No sound is innocent* (1st ed.). Matching Tye, near Harlow, Essex, UK: Copula.
- Saunders, J. (2009). *The Ashgate research companion to experimental music* (1st ed.). Farnham, England: Ashgate.
- Saunders, J. (2011) 'Testing the Consequences – Multipart Series in the Work of the Wandelweiser Composers'. *Contemporary Music Review*. 30 (6), pp. 497-524.
- Schumacher, E. (1973). *Small is beautiful* (1st ed.). London: Blond and Briggs.
- Small, C. (1996). *Music, society, education*. Hanover, NH: University Press of New England.
- Small, C. (1998). *Musicking* (1st ed.). Hanover: University Press of New England.
- Steiner, R., & Wilkinson, R. (1993). *Rudolf Steiner on education* (1st ed.). Stroud, Gloucestershire, U.K.: Hawthorn Press.
- Suzuki, D., & Humphreys, C. (2000). *The awakening of Zen* (1st ed.). Boston: Shambhala.

Suzuki, S., & Dixon, T. (1970). *Zen mind* (1st ed.). New York: Walker/Weatherhill.

Weiner, E., & Simpson, J. (1989). *The Oxford English dictionary* (1st ed.). Oxford: Clarendon Press.

Wolff, C. (1998). *Cues* =. Köln: MusikTexte.

www.wandelweiser.de 2004, r. (2014). wandelweiser - Michal Pisaro. *Timescraper.de*. Retrieved 20 June 2014, from http://www.timescraper.de/_michael-pisaro/texts.html

List of cited works

Beuger, Antoine, *en una noche oscura*, Wandelweiser (2004)

_____, *one tone. rather short. very soft*. Wandelweiser (1998)

Cage, John, *Variations I-VIII*, C.F. Peters (1958-1978)

_____, *4'33"*, Edition Peters (1960); composed in 1952

Satie, Eric, *Vexations*, unpublished, (1893)

Sherouse, Braxton, *splatter study (on social networking)*, unpublished (2013)

Werder, Manfred, *2005/1*, Wandelweiser (2005)

Wolff, Christian, *Edges*, C.F. Peters (1968)

_____, *Play*, from *Prose Collection*, Frog Peak Music (1969-1985)

Zorn, John, *Cobra*, unpublished (1984)

List of influential compositions

Ablinger, Peter, *places*, Zeitvertrieb (2001 -)

Akama, Ryoko, *koso koso*, self-published (2013)

Allison, Pat, *Cha-Cha (anoga)*, unpublished (2011)

Barrett, G. Douglas, *A Few Silence*, self-published (2008)

Feldman, Morton, *Crippled Symmetry*, Universal Edition (1983)

Kudirka, Joseph K., *Beauty and Industry*, self-published (2007)
_____, *british creepy crawlies*, self-published (2007)

Lely, John, *Second Symphony*, self-published (2006)

Parkinson, Tim, *song for many*, self-published (2011)

Pisaro, Michael, *harmony series*, Wandelweiser (2004 - 2005)
_____, *fields have ears (4)*, Wandelweiser (2009)

Reich, Steve, *Piano Phase*, Universal Edition (1967)

Susam, Taylan, *for maaïke schoorel*, Wandelweiser (2009)

Sfirri, Sam, *the undulating land*, Wandelweiser (2009)

Shim, Kunsu, *happy for no reason*, EarPort (2000)

Tenney, James, *Postal Pieces*, self-published (1965-1971)