The effect of electronically mediated sound on group musical interaction: A case study of the practice and development of the Automatic Writing Circle

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Declaration

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Thomas Gardner
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Abstract

The effect of electronically mediated sound on group musical interaction: A case study of the practice and development of the Automatic Writing Circle

The interaction between musicians has been one of the traditional strengths of music: it stretches to include an audience and ritual participants but has its origins in group activity, the interpersonal responses of one musician to another. This thesis examines the way that electronic media have transformed the interactions between musicians, particularly in the context of live performance. A central theme is the way in which mediatisation creates new splits within previously integrated musical situations and also merges differences usually defined by physical boundaries.

The theories of Gregory Bateson on schizophrenia and Irving Goffman on Situationism are brought together to create a new understanding of the term 'schizophonia'. This rehabilitated concept is proposed as the key to a creative exploration of new situations and discontinuities which make up group performance in a mediatised environment.

In practical terms the exploration of new musical situations is documented in the following projects: the material created for the group 'Automatic Writing Circle' during its evolution over a period of six years (compositions, software, instruments), development of the Ouija Board (see below) and accompanying software, composition of the piece Lipsync (see below) and the earlier piece *I slept by numbers* for flute and live electronics.

The Ouija board

This is a new form of group musical instrument. Based on the real-time video analysis of shadows cast by the hands of performers, it reframes many of the conventions of traditional, tactile instrumental engagement.

It allows the relationship between sound material from loudspeakers (location recordings, processed live sound, synthesised sounds, acousmatic pieces) and the embodied act of performance to be investigated more deeply. The tactile quality of traditional acoustic instruments is in contrast to this remote, shadowy form of engagement. It is a negative instrument, between two worlds, casting a human shadow on the acousmatic curtain.

The developmental stages of the Ouija board and its relationship to the performers, computer programs and compositional structures were marked by a

series of works, some of which are discussed in detail in the following thesis.

Phase one: Networked ensemble**.** This resulted in two pieces, "*North South East West*" and "*St Pancras Sound*" (2005), in which sound and gesture information are shared amongst a group of musicians using networking protocols.

Phase two: The design of the first group interactive instrument (called the 'Ouija') produced the work "*Mary Ward in October*" (2006). The initial principles for this instrument were arrived at by replacing Schaeffer's notion of the 'objet sonore' with that of a 'relation sociale'.

Phase three: Initial research into links between acoustic instrumental performance and the electronically mediated Ouija board focussed on ideas of entrainment. This lead to further refinements of the Ouija instrument, to the work "*Thames Wire*" (2007) and to collaboration with the instrumental group 'Ecosonic Ensemble'.

Phase four: A breakthrough in the design of the Ouija board (the use of shadow and its link to the dynamic contours of entrainment) lead to further changes in the relationship between performers, programming structures and performance, and resulted in the works '*I see an A*' and '*City Environment'* (2008).

Phase five: Charts the latest period of the Automatic Writing Circle (a merging of the Ecosonic ensemble and Ouija board players). The two works in this period," *Extended Silence*" and "*Die Alte Schmiede*" (2009), demonstrate many of the changes in the relationships between players that stemmed from the breakthrough above. These include changes in the use of discourse within the group, changes in the relationship between rehearsal and performance, changes in the concept of improvisation and further changes in the instrument itself.

Compositions:

Lipsync: Piece for cellist, lips, and 6 channel live electronics. 14'00

Heine's poem "Der Tod, das ist die kühle Nacht," is spoken by the cellist while he/she plays. The divided body of the performer, one part speaking the other part playing, is the starting image. Various levels of synchronisation are explored: between action and speech, poetic idea and sonic image, acousmatic sound and live processing. These elements are linked by the romantic conceit that death is a heightened and transcendent state.

I slept by numbers: for flute and gestural performer (using touch sensors). 15'00

The piece employs two human performers (a flautist and a gestural performer) and a series of algorithms that interpret the data from these performers.

A variety of different techniques are used to reprocess the sound of the flautist. These include granular synthesis, additive resysnthesis, ring modulation, the creation of spatial trajectories and the segmentation and recombination of flute phrases. The gestural performer is able to exercise fine control over these techniques, aided by the rapid contextual readjustments of the algorithms.

Introduction

An exploration of the ways in which relationships between musicians are changed by electroacoustic media

John Cage proposed a relationship between the sounds from new media and the sounds coming from earlier forms of music making:

> As I see it, tape has brought about, in a very tangible way, a profound alteration of musical action, the consequences of which are not limited alone to tape but will affect all music, no matter how traditional the instrumentation. (Kostelanetz 1974:129)

Cage suggests that in some subtle but pervasive way our sense of all musical acts has undergone a sea change, brought about by the introduction of tape. Cage's comment has a McLuhan-like ring to it. The sense of global change in musical action is a mirror of McLuhan's sense of the global change in society brought about by the new media. As McLuhan suggested, it is not the content of the message that is most significant but the medium itself—'The Medium is the Message' (McLuhan, 2008, pp. 5).

My own particular interest has been in the way that new media have transformed the interactions of musicians, particularly in the context of live performance. These interactions include those which occur between acoustic musicians as well as those that occur between musicians using electronic sound. They include changes in the communicational environment which may be systemic, at an almost environmental level, as well as changes which are much more specific and can be utilised in a deliberate way.

It is this second area, of specific changes to the relationship between musicians, which has been a special focus. As a practising cellist, and also as an erstwhile professional computer programmer, I have been keen to explore the ways that these two forms of activity affect each other, and to develop an informed and emotionally and intellectually satisfying relationships between them.

To some extent I could trace in myself the changes about which Cage and McLuhan were speaking, exploring the difference between performing the cello and programming code for making sound. But to really come to grips with the changes I felt that the exploration needed to occur in a group, since it is the

patterns of connection between people (not between aspects of one person) that are the principal area of change.

The exploration of this area has been conducted in two related ways. The first is practice-based, working intensely with a group of musicians over a period of years, the 'automatic writing circle', and designing a new instrument, the 'Ouija Board' which integrates acoustic and electroacoustic performance. The second kind of exploration has been through the critical appraisal of various theoretical frameworks in which this work can be situated.

The practice based part of the work brings to the foreground the detailed experience of the contact between musicians using traditional instruments and the mediatised Ouija board. These experiences and their qualities can be overflowing and multidimensional, and therefore hard to analyse. However, the physicality and relative permanence of the Ouija instrument acts to underpin many of the evanescent experiences, and give the associated ideas resolution and direction. As a consequence, this dissertation is able to chart the evolution of ideas associated with the instrument, and discuss the way in which changes impacted on the musical relationships between the performers. Four phases in the evolution of the instrument are examined, showing the breakthroughs and realisations that helped move the project from one phase to the next.

The second, more theoretical, strand elaborates a framework for analysing the way in which musical relationships are changed by electronic media. It draws first on the work of Gregory Bateson (2000), showing the way that our understanding of a situation is influenced by the communicational context, involving the interpretation and resolution of the clashes between different levels of communication such as iconic (embodied, gestural) and symbolic (linguistic, textual). The initial study of Bateson's ideas is then expanded to include mediatised communication, referencing work by Goffman (1974, 1981), and Meyrowitz (1986) and includes a broad consideration of the discontinuities introduced by sound recording. This has a clear significance for the kind of musical performance that I am considering, as the social space of live interaction (the actual spaces and relationships in the room, hall) is transformed by the mediatised connections which are woven into it.

The theoretical and practical approaches come together in numerous ways. One category of mutual influence can be seen in the evolution of the Ouija Board, where it has been necessary to consider its areas of overlap with other specific sonic practices. These have resulted in the practical application of ideas, enabling decisions to be made and allowing the preferential choice of one direction over

another.

Another category of mutual influence can be seen in the relation between verbal discussion and sonic improvisation in the workings of the Automatic Writing Circle (AWC)[1]. The dialogue in the AWC includes a meta-discourse about the relationship of theoretical propositions to the actual embodied practice of making sound together. The group becomes a place in which the relevance or significance of theories (or theory in general) can be tested.

Also, in reverse, the musical improvisations of the AWC lead almost inevitably to discussion, often manifested as discussions about what was significant or interesting in an improvisation. Awareness of the use and function of individual judgement, verbalised or not, has presented itself as a powerful tool in shaping our improvisational experience.

Between the theoretical and the practical there is also a huge conflict. The details of practice cry out to be theorised in different ways, and not to be cajoled and moulded into certain patterns. The practical experience can overwhelm and change the direction of any theoretical construct, and the rich anecdotal quality of experience demonstrates how many potentially important avenues are untapped.

I have attempted to give both the practical and theoretical sides of this equation adequate room in this dissertation, allowing phases of description and practical observation to have space, without the insistence that every observation should be recuperated into theory. Sometimes this observational narrative, tracing the evolution of the work, will show the intuitive connection between different areas even where this has not been explicitly drawn attention to. However, alongside this practical narrative is a theoretical framework, and the theoretical structure provides a way of highlighting those issues in the practical work which I consider to be most significant.

The layout of the thesis is as follows:

Section 1 – definition of the main theories

The first section examines the work of Bateson, particularly his theories on schizophrenia and the Double Bind. It also discusses the work of Goffman, and shows how Meyrowitz's inclusion of medium theory gives a framework for understanding some of the transformations in the situation of live performers with

[1] This is the group to which the author belongs and which explores musical interaction using traditional acoustic and electronic instruments.

electronics.

Section 2 – overview of the main areas of investigation

Five chapters set out the more detailed terrain in which the research occurred—instrumental performance, live electronics, soundscape and musique concrète. They relate these areas to the theory of schizophrenia outlined by Bateson and provide a mid-range mapping between the many particular details of practice-based work and the more abstract implications of theory.

Chapter one looks at ways in which acoustic instrumental performers exploit the difference between the sound produced directly by their instrument and the sound as it is modified by the surrounding acoustic space. Chapters two and three investigate the types of merging and splitting that occur in instrumental identity when mediated by live electronics, whilst chapter four traces the changing identity of a notional 'sound recordist' incarnated first as Pierre Schaeffer then as Murray Schafer. The final chapter proposes a rehabilitation of schizophonia.

Section 3 – Practice-based research

Six chapters give a detailed account of the evolution of the Automatic Writing Circle, the Ouija board and its relationship to performers.

The first chapter places the contagious and unstable qualities identified in schizophonia at the heart of the processes animating the group. The following chapters chart the history of the resulting changes, examining the successive reformations of the group and discussing the evolution of the Ouija board. The final chapter gives a detailed account of a performance given by the group at the end of the period covered by this thesis.

Section One

1. Definition of the main theories: Patterns which Connect and Patterns of Access.

In this chapter I will outline two related areas of theory which provide a framework for considering the complex interactions that occur in live electronic music. These can best be described as 'patterns which connect' and 'patterns of access'. The two areas can be considered as complementary, one dealing with the extension of communicative interaction and the other with its necessary constraints.

The first, which concerns the extended interrelationship of communicative patterns, is derived from the work of Gregory Bateson. It focuses on the study of the richly interrelated levels of communication which exist in any living environment, for example in an ecology, a society, or in a family. The second, derived principally from the work of Irving Goffman and Joshua Meyrowitz, focuses on the significance of the separation which exists between different communicative environments, which is conceived initially in terms of the physical barriers to perception that exist between one social situation and another.

Of particular importance in both areas is the way in which they suggest a link between the perceptions of the individual and the communicational environment of the group. The negotiations of difference, both in terms of the medium of communication and the politics of social interaction is central to the later description of processes which have occurred in the Automatic Writing Circle and to an analysis of the effects of electroacoustic sound on group interaction.

1.1 Bateson and the analysis of communicational frames.

Historically located in the 1960s and 70s, Gregory Bateson's theories represent a high point in the critical integration of research into perception and communication. His distinctive way of thinking about the relationship between them led to the formation of a well articulated epistemology.

He became a guru of the alternative culture of the 60s, but the analytical and intellectual vitality of his work resists facile interpretation. His work withstood the passage of time and has become a stimulus for further exploration, as can be seen from its presence in fields as diverse as continental philosophy (Deleuze and Guattari 1987, Foucault 1988), family therapy (MRI Interactional school of

Weakland, Jackson, and Watzlawick, the Milan school of Palazzoli) and in artificial intelligence (Maturana 1987). In musical research his work is reflected most directly in the new fields of bio-musicology (Cross 2003) and evolutionary musicology. Chris Small's influential book 'Musicking' (1998) uses some of his ideas as a base.

This thesis will itself draw on and extend certain lines of his work. Of particular relevance is Bateson's notion of framing, and the description of the kinds of frame within which communication takes place. Bateson's external 'frame' has a clear connection with Wittgenstein and his proposition that language creates the limit and frame for knowledge. But Bateson's theory has a more biological basis, in that communication is not formed out of language games alone, but develops from biological and social relationships. [2] A deepening of Bateson's theory occurred in the analysis of schizophrenic communication in the 'Double Bind', and this will be discussed shortly. However, before this, a more detailed description of the origin of his theories of communication will be in order.

1.1.1 The immanent frame of 'evolution plus environment'

The primary scientific place in which this biological frame is articulated is the theory of evolution, which Bateson reinterpreted as the survival of the individual plus the environment. It is not necessary to explore this in depth, only to suggest that the theory of evolution provides a rich environment in which to discuss theories of mind and of interpersonal interaction.

Bateson cites Lamarck (Bateson 1973: 403), a pre Darwinian theorist of evolution, as the first to devote an entire work of evolutionary theory to ideas about the evolution of mind. Bateson considered this valuable because it reversed the hierarchy in which mind had been seen, no longer placed on a ladder that descended from the supreme mind of God down to man and onward down to the smallest creatures. Lamarck, and later Darwin, suggesting instead that the biological world may be the explanation of mind, rather than the product of it. In short, mind can be seen as a product of the evolutionary plus environmental system, and not a separate transcendental entity.

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[2] The famous article co-authored by Maturana "What the frogs eye tells the frogs brain" (McCulloch 1965), was a ground-breaking piece of research which decoded the information passing from a frog's eye into the brain. It was discovered that the brain receives pre-filtered data from the eyes which privilege fast-moving small objects, ie the frog's inner world is already geared towards the noticing of bugs. It set in motion a train of artificial intelligence research based on the notion of autopoesis, the means by which a system generates its own perceptual schema.

In a similar way Bateson's theory of communication begins by examining the types of message that animals can exchange based on their mutual context in the environment, and works up through higher levels which exist by virtue of learned but changeable social and linguistic frames.

1.1.2 Iconic Communication

The essay "Redundancy and Coding" (Bateson 1973) is a discussion of evolutionary and other relations between the communication systems of man and other animals. It begins by observing that there is a distinction between the kinesic and paralinguistic form of communication used by animals (and humans), and the verbal language used by humans alone. The difference consists particularly in the nature of the 'frame' which makes the communications intelligible.

The way in which animals communicate with each other is through an 'embodied metaphor'. A dog threatens you with its bare fangs, which would be the objects used in a real attack. A cat wishing to be fed acts out its dependency on you, meowing and twisting around your feet. A bird indicating that there is a general threat acts as if it was personal, making angry and attacking gestures. These kinds of communication can be called iconic, in that the message material stands as an icon for the thing that it refers to. They work in a 'part for whole' way, in which a part of the phenomenon or sequence is used and taken as an icon for the whole. Thus, exposed fang stands for attack, dependency stands for 'feed me', 'I am angry' stands for 'look out there is a threat around'.

Several things can be said about this state of communication:

- The individual giving the message is always part of it, is always a subject in the message.
- The message always refers to the relationship between the giver and the receiver. There is no possibility of referring to relationships of which the subject is not a part.
- Intensities and magnitudes in the action relate to intensities and magnitudes in the thing referred to.
- The communication is a proposition not an assertion, and it always refers to the here and now, not something far away in place or time.

Iconic or part-for-whole communication persists in humans in many forms and can be experienced in dreams and in the type of 'primary process' thinking

revealed in slips of the tongue or unconscious, inadvertent actions. The communications which come from paralinguistic or kinesic actions are hard to falsify. If you love, hate, or respect someone it will be most quickly revealed in this kind of communication, and conscious goals will not easily distort it. The fact that verbal language has not made paralinguistic and kinesic communication obsolete in human communication can be seen as an indication of the fact that they serve complementary purposes. The kind of here-and-now communication of relationship enabled by use of the body (founded on the shared evolution in a common environment) saves linguistic communication from having to take on that burden.

1.1.3 Linguistic communication

Linguistic communication suggests that a message can be placed in something other than the 'I – you' interactional pattern, and in order to do this there needs to be a way of framing the context of the communication so that it can be understood. Because the communication no longer derives meaning from the embodiment of the individual emitter, there needs to be a way of creating a 'virtual context', something that says 'this is a map' and 'this is the way that the elements on it are to be related to a territory'.

One could say that language allows communication to occupy a mobile, displaceable context. Linguistic communication can detach itself from its grounding in iconic, self-referencing contexts, and move into a world of symbolic reference. A shift has occurred in which 'self-reference' no longer refers to an individual biologically-embodied speaker referring to herself[3] in her environment, but to the language system referring back into itself. The system of signs which make up language becomes the 'self' to which reference has to be made. This leads to the distinct features of linguistic expression which differentiate it from iconic communication. Some of these features are listed below:

- The ability to refer to events and places which are remote in time or in place.
- The ability to refer to situations which are not centred on the self.

[3] In order to avoid singular/plural mismatches of the type 'the speaker referring to themselves in their environment' I shall use the singular form, and assign an arbitrary gender to it, sometimes using the masculine and sometimes the feminine.

- The ability to make indicative assertions (statements which assert their own truth).

- The 'digital' nature of the word symbol, which needs no proportional or qualitative relation to the object it refers to i.e. the word 'loud' does not need to be spoken loudly, the word 'hot' has no need to radiate more heat than the word 'cold'.

Whilst it is easy to give a list of features of linguistic communication, and to distinguish them from the features of iconic communication, there exist very deep questions about the actual way language achieves this separation, and the way language succeeds in pointing to or referring to things.

1.1.4 Self as icon and linguistic self

Particularly paradoxical is the status of the 'icon' in language. In the embodied communication that we have been calling 'iconic', the actual bodily self of the organism is presented as part of the communication. In evolving the ability to use language there is the suggestion of some kind of transformation of this 'self' icon, a suggestion that linguistic competence evolves out of a re-framing of the self.

Lacan (1993) has famously proposed a theory of how children move to embrace the 'symbolic order' of language. He suggests that a child facing the Oedipal conflict (the impossibility of possessing the parent of the opposite sex) engages with the symbolic order of language as a way of resolving the conflict, of incorporating the 'other' in a symbolic sense. The symbolic order allows the desired parent to feature in a symbolic form alongside the symbolic representation of the self. Thus the relationship can be internalised and the loss overcome.

In another theory Pines (1995) describes the process by which the child and mother construct a pseudo-conversation. From the start, mother and child participate in social interaction and use turn-taking dyadic exchanges to pattern their communication. The rhythm of these pre-verbal exchanges is shaped by sensitivity and reciprocal awareness. (It has been noted that depressed or insecure mothers tend to impose a false rhythm on the exchanges.) They form a basis from which the child can build a concept of self inside a proto-linguistic exchange. The acknowledgement of the self by the other in conversation allows the basic building blocks of self-representation, object representation and a linking effect to be established.

The two theories of Lacan and Pines propose different ways of negotiating the separation between the body used as an icon in communication, and the symbolic icon used in language. The dimensions of this separation can be seen in many other ways too: it is, for example, an area of critical interest in the analysis of the separation between a musician and the sound produced, which is the subject of the later part of this thesis. Bateson proposed a distinction based on the meta-linguistic hierarchy of language and the meta-communicational hierarchy of iconic communication.

1.1.5 The meta-communicational hierarchy and the meta-linguistic hierarchy

The methods by which a sentence points to a subject are always affected by a process of remote reference, relying on a meta-linguistic structure.

> A message, of whatever kind, does not consist of those objects which it denotes. ('The word 'cat' cannot scratch us'). Rather, language bears to the objects which it denotes a relationship comparable to that which a map bears to a territory. Denotative communication as it occurs at the human level is only possible after the evolution of a complex set of metalinguistic (but not verbalised) rules which govern how words and sentences shall be related to objects and events. (Bateson 1973 :153)

Certain kinds of meta-linguistic code may be picked apart in semiotic (Nattiez 1990) or structural (Chomsky 1988) analysis, but these analyses themselves depend on unspoken codes of how they relate to the territory, adding a further level. This spiral can go on forever. The separation of the 'deep rules' from the surface structure which Chomsky aimed for in structural linguistics is an attempt to avoid this paradox and to reserve a place for the 'deep rules' in a universal space.

Another version of this recursive experience can be encountered in any conversation since there will always be a *meta-communicational* dimension to it. Thus, whatever the supposed subject of a conversation, it may also be considered to be about the actual relationship between the people. An apparently simple statement such as "Those bunches of flowers look nice" could, because of its timing and context, be interpreted by the other person as suggesting the start of courtship, or as a reproach for not bringing flowers.

Any particular act of communication will consist of multiple layers, including the iconic, which may act to 're-frame' a message. This can be seen, for

example, in the way that one statement can frame and contextualise another ("we love each other"… "said Bush to Bin Laden"…"in the film I saw last night"…"or wished I had"). But they exist equally in the non-linguistic aspects of a communication. For example, in conversation, if somebody changes the subject, pauses, interrupts, leans forward, talks faster – these changes in the pattern of the conversation all act to create contexts for what is being communicated, and to modify the meaning of the communication.

The rupture between iconic and linguistic communication can be seen as the first in a series of separations that can occur in language, each one representing a context that supplements the other. An essential quality of this is that one message can be changed in its meaning by placing it inside a new context.

A comparatively surprising consequence is that this state of affairs defies the usual presumptions of objective enquiry. To study an object or process it is necessary for the object to be separated from its larger environment. However, it appears that in the world of communication, the larger environment will always be available to transform the meaning of the smaller one – the part is always defined in relation to the whole.

Some of the particular consequences of this for the experience of the individual were studied by Bateson in his work on the Double Bind (Bateson 1973). Later, this study was elaborated in a far-reaching thesis on the nature of communication.

1.1.6 The Double Bind

The Double Bind (Bateson 1973) is the study of schizophrenia in a family. In particular, it marks the way that stark conflicts between levels of communication employed by the parents can create mental illness in the children. Bateson proposed that, in the case of a schizophrenic, the communication patterns of the family can be seen to have created the schizophrenia; that the mental illness of the individual was placed in the individual by the communicational environment that they are in, and by their inability to question, change or frame the context.

He looks at the situation from two viewpoints, that of the individual schizophrenic patient, and that of the relationship between the patient and their family. From the point of view of the patient, the problem can be described as the lack of a strong sense of self or ego:

(a) He has difficulty in assigning the correct

> communicational mode to the messages he receives from other persons. (b) He has difficulty in assigning the correct communicational mode to those messages which he himself utters or emits non-verbally. (c) He has difficulty in assigning the correct communication mode to his own thoughts, sensations and percepts. (Bateson 1973 – Towards a Theory of Schizophrenia p.173)

The particular kind of communication featured in schizophrenia is the use of unlabeled metaphors. A speaker will avoid referring to any relationship, implicit or explicit, between himself and the person he is addressing, and he will avoid indicating whether the message is intended ironically, literally, as a joke or as a metaphor.

Bateson proposed that this manner of structuring dialogue came about as the result of a particular learning process which occurred within the family and which he labelled the 'double bind': a situation in which the patient or 'victim' is forced to misunderstand or ignore those aspects of a communication which serve as markers of context. Symptoms are caused by 'the experience of being punished precisely for being right in one's own view of a context' (Bateson 1973 : 206). Bateson gives many examples, and they usually concern the mother of the patient, although he stresses that the events occur in conjunction with other members of the family.

He gives the example of a mother who is, for whatever reasons, unable to tolerate intimacy with her child and is, in addition, unwilling or unable to acknowledge this feeling. The child is lonely and desires affection, and approaches the mother. The mother, wishing to avoid intimacy, suggests in a caring way that the child is tired and should go for a nap, even though the child is not tired. If the child follows her instructions and goes for a nap this will have the double advantage for the mother of firstly making the child go away, and secondly satisfying her own need to feel that she had been caring.

If the child does not accept this categorisation of his state and does not go away, the mother will use other tactics to avoid intimacy, which may become increasingly hostile. If the child does accept that he is tired, even though he is not, it is because he wishes to preserve the illusion proposed by the mother that she is acting out of love, even though this creates a misrecognition of his own state. The end result is that the child has to sacrifice his correct identification of the meaning of 'you are tired' in order to preserve the illusion of closeness to the parent.

> To be close to the parent, he must sacrifice his right to indicate that he sees any meta-communicative incongruencies, even where his perception of these incongruencies is correct… The patient may know but must not tell, and thereby enables the parent to not know what he or she is doing. The patient is an accomplice in the parent's unconscious hypocrisy. (Bateson 1973 :208)

The analysis of the Double Bind, and the many situations in which it occurs, gave Bateson a very clear picture of the mechanisms which are at work in the communicative relations between people. Particularly important was his recognition of the way that the larger family system works to create the state of the individual within it. This observation lead Bateson and his co-workers Jackson, Haley and Weakland to develop the school of family therapy in which therapists engage with the communication systems in the family. The therapist acts to facilitate the discovery of new patterns of communication which restore the potential for individual growth and learning.

1.1.7 Summary

Thus far, this chapter has given an overview of Bateson's theories of communication, showing the importance of the frame in which the communication is judged to have taken place. In complex human interactions the frame includes elements of both iconic and linguistic communication. Becoming adept in the interpretation of communicational frames is a social skill of considerable complexity, and one which begins in the earliest stages of childhood. The earliest learning about communicational frames begins in the family, and is powerfully influenced by systemic qualities of the communications within the family.

Bateson's analysis of schizophrenia is particularly interesting because it allows a shift in perspective from the state of the individual to the state to the communicational environment of the group. Bateson argued that the patient's inability to judge the context of communications is a consequence of the family's deliberate and repeated misalignment of communicational levels, with the verbal level being used to subvert the message of the iconic level.

For my own work, it is important to find ways to move between descriptions of individual perception and descriptions of the communications in a group, and I will be drawing on Bateson's linking of iconic and linguistic communication in the coming chapters. As will be discussed in chapter 3.3, my own research points to entrainment (the reciprocal following of one musician by another) as a major

feature shaping the inner quality of musical experience, both at an individual and a group level.

1.2 Extensions to Bateson's analysis

Bateson's analysis of communicative levels provides a good starting point from which to consider the functioning of musical entrainment, and the links between physical and verbal communication. However, for my own work there is a limitation in that Bateson does not suggest any explicit ways in which the use of mediatised communication changes the quality or framework of entrainment.

For a useful and provocative extension of Bateson's ideas into this realm, I will refer briefly to the work of Joshua Meyrowitz, particularly the arguments expressed in his book 'No Sense of Place' (1986) which offers an enlargement of Bateson's ideas. In this book he gives an analysis of the ways in which the place-bound definition of a social situation is changed by the presence of mediatised environment. His analysis takes place in three major leaps.

The first is in the use of Erving Goffman's situationist theories, which develop Bateson's concepts of social framing (exhibited in the Double Bind theory and in his work with Systemic Family Therapy) into the analysis of 'every-day' social situations. Thus, rather than focussing on the pathology of misaligned communications (although he was a leader in the anti-psychiatry movement) Goffman looks at the complexities which occur in familiar social situations, and the ways in which the definition of a particular situation maintains itself.

The second leap involves a reworking of Goffman's concepts so that the scene of these every-day encounters is no longer defined by the physical location of the encounter but by the social information that is available, thus making it possible to include electronically mediated communication.

The third leap looks at the way that the social information provided through electronic media redefines situations and leads to new kinds of behaviour. It draws on the media theories of Marshall McLuhan and applies these to the detailed analysis of situations.

The principal theme of the Meyrowitz's work is that electronic media move and even remove some of the barriers that allow social spaces to be kept separate from each other, with the consequence that new kinds of social space and new kinds of behaviour are created. He emphasises the importance of access, and barriers to access, in defining social situations.

For the remainder of this chapter I shall spell out more explicitly the way in which Meyrowitz takes up the work of Goffman and McLuhan.

1.2.1 Goffman : Situations containing Front and Back regions.

Like Bateson, Goffman makes great use of the distinction between iconic and linguistic communication. This is extrapolated in several ways, one of the most important of which is the distinction between information which is an intended part of a communication and information which is hidden or inadvertent. This distinction is characteristic of the social performance of both individuals and of groups[4]. At the group level Goffman introduces some new terms to describe the difference between intended and hidden information, and it is these that Meyrowitz makes great use of, in particular, the distinction between Front and Back regions.

In his analysis of group identity Goffman describes the separation between consciously expressed and hidden information in terms of a front and back region, two distinct and separate physical places. Front regions are those places in which a social group is exposed to a public, and back regions are those in which the group is sheltered from the gaze or overhearing of an audience.

The 'front' is where the publically defined activities take place – i.e. classrooms for teaching, operating theatres and wards in hospitals, stages in theatres, court rooms in law etc. But these regions are complemented by regions with restricted access in which those whose performance is central to the situation are able to segregate themselves from their audience. Behaviour in the front and back regions will be different, precisely because in the back region there is freedom from the scrutiny of an audience.

Goffman describes a region as

> any place that is bounded to some degree by barriers to perception. Regions vary, of course, in the degree to which they are bounded and according to the media of communication in which the barriers to perception occur. Thus, thick glass panels, such as are found in broadcasting control rooms, can isolate a

4 For example, when discussing personal communication Goffman makes the distinction between information which is 'given' and information which is 'given off'. The expressions which the performer 'gives' are the intentional, primarily verbal symbols concerned with the communication of a narrow set of information. The expressions which the performer 'gives off' are primarily non-verbal, contextual and apparently unintentional (even though such communication can be purposely engineered).

> region aurally but not visually, while an office bounded by beaverboard partitions is closed off in the opposite way. (1959: 109)

For Goffman, the front region was an area in which the group would maintain certain standards, defined as politeness and decorum, which suggest how an audience is handled and a sense of what is morally approved of. These standards will be different in different situations, for example in a factory or office it is considered important to make a display of continuous alertness and work, whilst in a church, where the standards may be expected to be more severe, it is quite acceptable to daydream.

The back region Goffman defines as "a place, relative to a given performance, where the impression fostered by the performance is knowingly contradicted as a matter of course" (ibid:114). The general sense of the back region is that it is an area in which the techniques, tricks and accessories of the performance may be openly revealed, and that it allows a regression from the standards of the front region. It also allows the group to display a less united front and discuss the shortcomings of members of the group, for example, how the 'expressively inept can be schooled or dropped from the performance' (ibid: 115).

Because people in a back region are able to depart from their public character and also because secrets which sustain the performance are hidden there, it is particularly important for the back region to be kept separate from the audience. The access to this region, treated as a physically separate space, is constrained by walls doors and corridors.

Goffman was interested in the some of the difficulties of protecting and defining this boundary, looking at various places in which the boundary is ill-defined. Most of the examples are of finely observed social discomfort caused by a permeability between the regions, for example in the front rooms of Scottish Crofters when welcoming strangers, or the forecourt of a petrol station which also has a garage for repairs, in bedrooms sharing thin party walls with neighbouring flats, or in the movements between kitchen and restaurant performed by waiters. Amongst these he also mentions the particular case of radio and television broadcasting

> in these situations, back region tends to be defined as all places where the camera is not focused at the moment or all places out of range of 'live' microphones ... Professionals, of course, tell many exemplary tales of how persons who thought they were backstage were in fact on the air and how this backstage conduct discredited the definition of the situation

> being maintained on the air. For technical reasons, then, the walls that broadcasters have to hide behind can be very treacherous, tending to fall at the flick of a switch or a turn of the camera. Broadcasting artists must live with this staging contingency (ibid :121)

These examples give a picture of the importance which the segregation of regions has in presenting a particular situation. The ability to restrict access to a back region is instrumental in allowing the front region to retain its prime role in defining the situation. As the example above shows, if a microphone is inadvertently left live, if walls are too thin, if the 'barriers to perception' are not sufficiently strong, then back region behaviours may become public and undermine the intended definition of the situation.

Whilst most of Goffman's examples discuss the separation between regions as physical separations, based on place, this last example makes it clear that the separation does not have to be a physical one, but can be concerned with the pattern of information flow in more general sense. It is this aspect which is central to Meyrowitz's thesis.

1.2.2 Patterns of Access – Mediatised communication

Meyrowitz's argument is that one may substitute the place-based definition of a social situation with one that instead treats it as a pattern of 'social information'[5]. Since electronic media have the capacity to present much of this social information, via sound and image, without the need for direct physical presence, this allows one to consider mediatised situations as an extension of place-based ones. The essence of both is that the regions in any situation are defined by 'barriers to perception', whether this is maintained by a physical barrier like a wall, or by an electronic barrier like a routing or a switch.

The diagram below offers a convenient way of visualising the overall relationship of elements in Meyrowitz's argument (although it should be noted that Meyrowitz does not use such a diagram himself). The horizontal axis, illustrating changes brought about by the movement from print based to electronic communication, is derived from the media theories of Marshal McLuhan, whilst

[5] Social information is understood as the kind of information available when in the presence of another person, such as the sight of gestures or hearing of a voice, as well as the clothing, furniture and accessories in the space.

the vertical axis is concerned with the more stable features of social organisation, and has a theoretical basis in Goffman's sociological work. The contents of each box describe the effect of electronic media on patterns of social organisation.

McLuhan → / Goffman ↓	**Change from print to electronic media:**	Merging of public spheres	Disruption of public / private boundaries	Separation of physical and social definition of place
Significant social structures which are affected				
Group identity How groups maintain their special identity.		Changes in group identity caused by general accessibility of information about other groups. The sense of the 'otherness' of outside groups is altered.	Changes in group identity caused by easier outsider access to hidden, backstage, group behaviour.	Changes to group identity caused by wider access to locations: the sharing of special information in a group is no longer tied to place, people can make more numerous and fleeting allegiances.
Socialisation The stages by which someone gains entry to a group.		Stages of socialisation into a group (e.g. child to adult, student to teacher) more visible.	The sequenced initiation of outsiders into insider knowledge is undermined by the visibility of insider, backstage, behaviour. Consequent reduction and blurring of stages.	Stages of socialisation no longer supported by separation of locations. Electronic Media's lack of restrictive boundaries undermines the staging of entry into a group.
Authority Hierarchical structures within group through which authority is performed.		Ability to communicate /access information widely is no longer dependent on social status. Information flow less controllable.	Visibility of backstage behaviours undermine the mystery of authority.	Territory and Status no longer tied. People with authority lose the place-based power to limit access to themselves. Control of physical territory is disassociated from control of information.

Table 1 showing a summary of Meyrowitz's principal arguments

Meyrowitz draws on McLuhan's earlier work to examine the shift from printed to electronic media. By comparing the characteristics of these two generations of media McLuhan created a position from which to observe contemporary social conditions. He believed that the change from one medium to the other resulted in a fundamental alteration in our perceptual habits; a consequence of a decline, after many hundreds of years, in the dominance of printed media. The sense of rapid change in human perception is in contrast with the much longer evolutionary timescale which underpins the social situations explored by Goffman. As with Bateson, with whom he worked and exchanged many ideas, Goffman was interested in the relationships between people expressed primarily through their spoken and physical behaviours, a focus in which mediatised interaction is secondary.

Understanding the difference between these two viewpoints is critical in my own research. The question of how electronically mediated sound impacts on historically, even biologically, determined musical experience is a profound one[6], sharing many underlying conditions with the views described above. The way in which Meyrowitz constructs a framework for integrating these perspectives is of significance here, providing a useful initial model for the interactions of the Automatic Writing Circle. The following section explores the discourse as it relates to the relationship between the sound making of traditional acoustic musicians and electronic mediation.

[6] Some recent strands of musicology, (evolutionary musicology and biomusicology), give prominence to the search for the evolutionary roots of music. The research sees music as an innate and universal genetic gift with a deep evolutionary basis, equivalent in significance to the evolution of language. (Cross 2001, Wallin et al 2000, Mithen 2006)

Section Two

Effects of mediatisation on sonic experience: theories of merging and splitting.

The chapters in this section follow a trajectory which begins with acoustic instrumental performance and ends with a discussion of electronic sound-making. The object of this journey is firstly to explore potential relationships between acoustic and electronic sound, and secondly to discuss the kinds of creative split that already exist within these areas. My argument is not for a single theme of unification: rather, it is to show that the negotiation of splits and separations is an important part of the way that identity is constructed. Thus the analysis follows the main ideas of the previous section, which examined schizophrenic splitting in Bateson's double bind theory, and the everyday splitting of Goffman's situationist model.

An exploration of the themes of splitting and exposure are brought into play in several different areas; instrumental performance, amplified performance, live electronics, acousmatic composition, soundscape composition and sound installations.

2.1 Performance: Intimate and Distant simultaneously.

We begin the movement between the genres mentioned above with an examination of the way that a performing musician is placed within sound, both as producer and listener. The reflexive relationship created by the acoustic performer between the production of sound and its return from the environment provides the starting point for an examination of some of the changes that occur when electronic mediation is brought into the process.

The potential for seeing the performing musician in a central position, recovering a balance distorted by electronic production, has been articulated by Murray Schafer in evangelical terms. In *The Soundscape* (1994) Schafer suggests that the highly immersive experience of listening with headphones may direct the listener towards a new integrity with himself, but "only when he releases the experience by pronouncing the sacred *Om* or singing the Hallelujah Chorus or even the "Star Spangled Banner" does he take his place again with humanity" (Schafer 1994: 119).

The changes of sound between its source production and its reverberant reflection can be seen as a unique feature of sonic experience. Compared to sight,

for example, sound offers a more immediate experience of multiple perspectives. Barry Blesser describes the activity of sound making as a kind of aural illumination of the space and compares this relationship to the space with one based on vision, where

> … because human beings do not possess an intrinsic means for generating light, a space does not react to our visual presence, which manifests itself there only through interrupted or reflected light – as shadows or mirror images. (Blesser 2007 : 16)

Blesser makes the point that humans do not create the light with which they see, but they can create the sound by which they hear. The person making sound is "immersed in the space's aural response. By responding to human presence, aural architecture is dynamic, reactive, and enveloping ". (ibid)

I believe that acoustic musicians develop ways of dealing with the most extreme version of this simultaneous experience: the immediate source of the sound is within the body (generated by muscular action and, in the case of singing, interior vibration), but this is heard at the same time as the return from the outside environment, conditioned by the physical space and stylistic norms. The way that these two types of experience are combined into the semblance of a coherent whole is a complex process, dependent on multiple social and psychological factors as well as physical criteria.

In his analysis of the cognitive and social aspects of our sonic perception Blesser identifies one of the sources of complexity as the mix between an allocentric and an egocentric way of perceiving space:

> Because an allocentric framework situates you within a fixed external environment, philosophically, it implies that reality exists apart from your self. In contrast, an egocentric framework situates your self at the center of an experiential universe where everything is interpreted relative to you. A cognitive map of space can be egocentric, allocentric, or some combination of both. The choice of framework modifies the experience of space. (ibid: 50).

The extent to which the egocentric and allocentric are interlinked can be seen very clearly in music therapy, where the unconscious inner state of the client is presented to the outside world via sound making, and the state is acknowledged and responded to by the therapist in a way that is analogous to an external reflection. This reflection from the therapist back to the client, modified by the therapist's own internal process, encourages a therapeutic deepening of the

relationship

> More sophisticated procedures include those developed by Nordoff and Robbins (summarized in Rider and Eagle 1986:231-2) and involve the therapist mimicking the spontaneous musical behaviors of autistic children in synchrony with them. In their experience, once a child realized his behavior was being mirrored by the therapist, "there was almost universally a laugh, a smile, or some observed affective change which seemed to indicate the children were willing to enter into a more therapeutic relationship. (Clayton et al. 2004: 230)

The psychoanalyst and music therapist Edith Lecourt has discussed the psychodynamic aspect of this balance in her article "Le sonore et les limites de soi" (Lecourt 1983), and employs a particularly direct term for it: the 'self-sound interval'. This symbolises the way in which the distance between the inner sounding self and the outer sounding self is in constant fluctuation[7], partly related to environmental context, but more deeply related to a sense of sonic self acquired over time, and particularly within the social circle of early childhood.

In the context of music therapy the analysis of the acoustic space passes from an experimental or positivist position to a qualitative and humanistic one. Perhaps more than any other field, music therapy brings situational factors of musical experience into the frame. The focus is less on music as an object and more about a reflexive understanding of the situation in which the music making occurs. (Ruud 2008).

2.1.1 Vibrato: An example of culturally constructed difference between close and distant listening.

Having thus made some general observations illustrating the interrelation between an intimate and distant experience of sound, I would like to provide a more detailed example of one way in which an aspect of musical performance, vibrato, can create a culturally determined relationship between them.

The nuances of vibrato form part of the code musicians use to distinguish

7 While writing this part of the thesis I suffered from a blocked right ear, leading to an extraordinary amplification of the interior sound of my voice and a reduction in reflections from the exterior. This upset in balance is disorientating, and leads to a strange feeling of being inaudible in the outside world. Being cut off from the audio image of oneself in the outside world makes the feeling of existing in a common space with others less tangible.

between different stylistically framed gestures, for example between Baroque and Romantic performance practice. Use of vibrato in this context is partly based on differences between the sound as it is at the point of performance (close or inside the performers body) and the way that it behaves in the room, thus becoming a significant tool for marking the social distance that exists between a performer and audience in the wider acoustic field. (Leech-Wilkinson 2009)

Vibrato is produced by an oscillating pitch, the physical consequences of which are felt particularly in two areas – the resonating body of the instrument and the reverberation of the enclosing space (hall, room etc).

In the resonating body of the instrument the oscillation can excite and vary some of the upper partials of the tone, while keeping other parts of the timbre stable. The result depends on the size and rate of the vibrato, on the base pitch to which it descends and on the intensity of the energy put into the instrument. Vibrato can be used to relieve or spread the intensity of a forced and bright sound and to add shimmering and colourful layers to the upper partials of the timbre.

The effect in the surrounding space is equally important. In a certain resonant acoustic the diffused sound will come to resemble a noise band, with the varying pitch material sounding simultaneously. As the reverberations arrive at slightly different times, it becomes impossible to track the oscillating pitch in its moment by moment position, and the overall range of positions are heard simultaneously.

Between these two places, the close and the far, will be a number of intermediate points, where the reverberation of the room will emphasise different aspects of the spectrum. The key is that both these attributes of the sound, the close and the distant, are audible simultaneously by the performer, and by most of the audience[8]. The sound that the musicians produce is not just created with close proximity in mind, but also with its distant effect. Particularly, it is about the kind of meaning that is carried by the difference between these two positions. The significance of this can be deduced from changes in the use of vibrato in Baroque and Romantic performance practice.

In Baroque styles there is a greater use of lifted notes (notes where there is a silence after them), in which the resonance of the room can be heard, and much less use of vibrato. When the performer plays a sustained tone without vibrato

[8] The only audience members who will be unable to hear the direct sound along with the reverberation are those who are so far from the performers that the direct sound has become week enough to be masked by the reverberation. It is also the case that the proximity of the performer to the production of sound can mask acoustic response from the room.

there is a higher degree of fusion between the direct sound of the player and the reverberation. The lifting of the tone, or the addition of a moment of vibrato then becomes a way of clarifying the separation of the performer from the enclosing acoustic.

In Romantic performance practice there is much greater use of vibrato. The performer can maintain a continuous production of vibrated sound and still remain separated acoustically from its effect in the performance space. The performer is able to saturate the space more completely, whilst still having a way of coding the difference between himself and the enclosing environment.

Murray Schafer has suggested that the "desire to dislocate sounds in time and space" has been part of a historical trend in Western music:

> the introduction of dynamics, echo effects, the splitting of resources, the separation of soloist from the ensemble and the incorporation of instruments with specific referential qualities (horn, anvil, bells, etc.) were all attempts to create virtual spaces which were larger or different from natural room acoustics (Schafer 1994: 91)

The use of vibrato in Romantic performance practice can be seen to participate in a similar trend, creating a human acoustic presence which saturates yet remains distinct from the room in which it occurs.

My own experiences of baroque and romantic performance practice make it clear that musicians are able to conceptualise differences between close and distant sound and hold these as elements in a culturally constructed relationship between an interior self and an exterior reflection. This relationship is not simply a matter of physics, or a subsidiary hurdle in learning to play an instrument, it is fundamental: one is learning to play the room and the space as well as the instrument, learning a culturally significant way of hearing oneself from a distance whilst monitoring what occurs within.

The important point here is that the listening of the musician to the return of the sound from the outside is directed by culturally defined priorities – it is not the reverberation per se that the musician is listening to, but those aspects of the sound in which a deliberately created relationship between sound made and sound returned can be discerned. Sounds that are heard may include many 'objective' aspects which are unclassified or ignored, but will also include certain key elements which form the basis for a way of structuring the relation between inner sound making and the space that encloses the maker. In most group musical situations a further and even more compelling form of feedback occurs, centred

around qualities of attunement and processes of mutual engagement.

2.2 Merging and Splitting – A consequence of Electronic sound Mediation

If one of the cultural complexities for a performing musician is the simultaneous interpretation of the inner and outer forms of experience, then this is increased dramatically by the use of electronic media. The far reaching effects can be difficult to describe. However, an initial analysis in terms of Goffman's frontstage and backtage and Meyrowitz's extension of this into processes of splitting and merging is helpful.

In the case of merging, electronic media breach the barriers between front and backstage areas, creating new social situations with new interpretations of behaviour. I wish to emphasise the idea that 'front and backstage' behaviours are in a mutually interlinked collaboration, co-defining each other. The regions are separate, and have well-defined barriers to perception between them (the backstage is partially hidden and usually has restricted access) but this is a necessary condition for their mutual functioning.

In Goffman's book *The Presentation of Self in Everyday Life* (1959) he somewhat playfully analyses a number of group social situations in terms of their front and backstage behaviours, identifying the role played by the backstage in supporting the performance presented in the front. Although front and back stage are physically separated from each other with walls or other barriers to perception, they are interdependent, working together to create the environment in which 'front' behaviour can take place.

Meyrowitz discusses what happens when electronic media are introduced and backstage areas become opened to the public by microphones, loudspeakers, cameras, television, internet and other media. In this case he suggests that new staging areas appear. One of these is a new 'merged' position, where audiences are able to see the backstage and the front stage simultaneously, observing previously hidden kinds of behaviour and transitions that occur when performers move between them. This draws the backstage into the front stage, with versions of backstage behaviour being sanctioned and made visible in the front, as if the standards of decorum had been loosened. [9]

Two other new areas occur as a result of processes of 'splitting': in which the

[9] A straightforward example given by Meyrowitz is the case of the news presenter—backstage banter, joking and chatter between presenters has become part of the performance. It is a blend of fake and real behaviour, but has become an established part of the televised performance. (Meyrwowitz 1986: 63)

front and back stage become even more separate, partly to compensate for the blurring influence of mediatised incursions into the traditionally interlocked front and back stage. The extreme front stage is an area for highly formalised performance in which there is no apparent need for privacy or reference to a backstage, whilst extreme backstage is somewhere in which the individual is protected from all external observation and in which public presentation of a personal or group front is not necessary.

2.2.1 Merging – the blurring of individual and group identities

The mediatised creation of new social situations through the removal or shifting of barriers between front and backstage regions is described by Meyrowitz as *Merging*, and I shall elaborate some of its consequences for the acoustic performer.

Merging describes what happens when two areas which were held in a frontstage/backstage distinction from each other lose their secure boundaries. Frontstage/backstage distinctions have been described primarily in terms of their manifestations in groups, but they can be applied in a similar way to the patterning of individual identity. Indeed, it is one of the consequences of mediatisation that some of the distinctions between individual and group identity become blurred. In what follows I shall chart the mediatised process of merging from the individual through to the group.

Goffman describes the relationship between individual identity and the group by saying that individuals are defined by the actions and local events which 'render them interpretable by witnesses':

> In analyzing the self then we are drawn from its possessor, from the person who will profit or lose most by it, for he and his body merely provide the peg on which something of collaborative manufacture will be hung for a time. And the means for producing and maintaining selves do not reside inside the peg; in fact these means are often bolted down in social establishments. There will be a back region with its tools for shaping the body, and a front region with its fixed props. There will be a team of persons whose activity on stage in conjunction with available props will constitute the scene from which the performed character's self will emerge, and another team, the audience, whose interpretive activity will be necessary for this emergence. The self is a product of all of these arrangements, and in all of its parts bears the marks of this genesis. (Goffman 1959: 254)

In establishing the personal ground on which the performance of self is based there is an important place for signs which are presented as unconscious, but which are in fact under control. Theatre actors develop skills to bring the more unconscious nuances of body and vocal inflection under conscious control, and musicians do it no less.

The performing actions of the acoustic musician contain carefully cultivated displays of what appear to be personal and private material. Thus, when executing the movements required to make the 'official' notated sounds of a piece there will be many other sounds produced. These sounds include those of breathing, shifting strings, tapping fingers, the sounds of the tongue and lips, the roughness which emanates from certain parts of the instrument . On the cello, for example, these sounds occur during string crossing, or when releasing a finger from the string and sliding then re-attaching. They are caused by a hidden hierarchy of movements, which give the appearance of sleights of hand when they are well controlled, or of mistakes if they are inadvertently revealed. The choices of what to demonstrate or keep hidden is largely cultural: for example in the earlier 20th century there was much greater use of audible glissando to move from note to note. Discovering this underhand language, and becoming more familiar with its cultural connotations is one of the pleasures of learning an instrument.[10] (Though it can also be one of the pains, as the movements are so fought over and upheld by conservative tradition, taste masquerading as rules).

Mediatisation can change the basis on which such personal separations between public and private are made. By using microphones and loudspeakers the carefully staged relationship of a performer to the nearness or distance of sounds can be eroded, merging previously distinct areas. Amplification can mean that sound produced by the performer is equalised through the space. For example, the dual function of vibrato (close and distant effect) can be negated (Katz 2010), the backstage 'unconscious' sounds of the performer can be broadcast voluminously through the space, and equally, the performer may feel detached from what the audience is hearing (the sound of the loudspeaker system in the auditorium being inaudible to the performer (cf – my own hearing problems)). It can also mean that there is genuine loss of the ability to construct the appearance of unconscious or

[10] In 'The Grain of the Voice' Roland Barthes makes a distinction in a similar vein concerning the difference between the singers Panzera and Fischer-Dieskau (Barthes 1997). For him Fischer-Dieskau has turned the breathing and lungs of the singer into a controlled object for cultural consumption, removing it from the backstage privacy of the body, whilst Panzera, focussing on the language-based articulation of vowels and consonants, leaves breathing officially inaudible and hence more tantalising.

private material, with the resulting potential exposure of something inappropriate or unwished for.

By bracketing out segments of the mechanical propagation of sound and replacing it with circuits linking microphone and speaker, aspects of the musicians self/sound identity are disturbed, and the musician is moved out of culturally stable ways of staging the self.[11]

The mediatised merging of distant sound and close sound in the individual performer is echoed at another level by the merging of individual and group. In choirs, orchestras, string quartets and other ensembles there are varying degrees of blending of individual voices into those of the group, but in principle the acoustic contribution of each person to the sound can be identified[12]. Electronic mediation can merge the activities and sounds of individuals so that individual sounds cease to be meaningfully related to individual people, or it can expose details of unique individual activity: a complex re-assignment of identity ensues, in which the central definition of performer identity becomes unstable.

Even in the simple case of an acoustic musician with microphone and a sound director who controls the diffusion of the amplified sound there are profound problems in interpreting the nature of the identities created. Either player can stop participating in the mediatised sound space (the instrumentalist by moving away from the microphone or stopping playing, the sound director by turning down the gain), but what happens when they both agree to occupy it?

In her analysis of flautist/sound director interactions in the works of Saariaho, Riikonen (2005) discusses differences in the way that performers construct identities. One flautist interviewed described her responsibilities as directed towards the flute, continuing the 'self-flute' paradigm that comes with many years of training, whilst the sound director spoke about his responsibility to the audience in managing the final diffusion of the sounds from the loudspeakers. They spoke about their relationship to each other in terms of a negotiation of power, with mutually supporting and regulating roles.

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[11] Examples abound of the incursions that electronics have made into the body. Performances have been made by swallowing a probe and transmitting data, Attau Tanaka of sensorband performs using sensors which respond directly to muscle contractions, and others have embedded electrodes into their face, so that the facial muscles can be made to contract under the control of a midi keyboard or generative algorithm (Elsenaar & Scha 2002).

[12] One of the striking effects of listening to a choir or orchestra is that individual performers, for various reasons, blend with each other. It would be possible at any point for an individual to be recognised as separate, by playing out of time or a wrong note, so the exhibition of control in maintaining the merged state is a powerful component message in the experience.

However, the description of this power was inconsistent and led to contradictory constructions of identity. One flautist spoke of her discomfort at the amplification of certain in-breaths (those needed for the sake of air, while performing otherwise sanctioned notated sounds), as if this invaded a certain privacy or passed the threshold between flautist identity and personal, bodily identity. Another flautist interviewed by Riikonen spoke of his ability to disregard the sound coming from the loudspeakers, saying that it was the responsibility of the sound director to deal with it. But as Riikonen says

> Alanko [the flautist] retains the authorship of the playing activity entirely with himself in a quite contradictory way; the activity of the field is acknowledged by arguing that it is not necessary to hear one's 'own' sound. (Riikonen 2005)

Thus, the modality of sharing constructed between the flautist and the sound director has, for the flautist, the potential to veer between a sense of intimate exposure, or, alternatively, a sense of disconnection from an essential essence. In one case the flautist wishes to retain an instrumental identity which reaches the whole diffused space (and hence is sensitive to disruptions of the flautist identity) whilst in the other the flautist defines identity in the comparatively narrow sense of performing flute-playing actions without really hearing the sound. These responses of the flautist represent one side of a fluctuating equation which also includes the sound director and the audience.

Riikonen's analysis focuses on the flautist identities in interpreting Saariaho's pieces, but even in this relatively constrained environment we see some of the unstable consequences of the 'merging' of individual identities through electronic media. The situation develops a much wider range of possible mutations and directions when the roles of sound directors and acoustic performers are less constrained.

2.3 Splitting: Introduction.

We have discussed the way in which the instrumental identity of the individual performer can be destabilised by the electroacoustic merging of previously separate areas. In the section that follows we will discuss the beginnings of a new kinds of split that occur, first with the introduction of electronics in live performance, and secondly with the introduction of the tape recorder.

2.3.1 Splitting 1: In amplified performance

The acoustic musician has been presented quite fully so far, but we shall now

turn our attention to the role of the sound director. [13]

In the professional discipline of live sound mixing there is often a division between monitor engineer, who mixes signals for the performers on stage, and the front of house engineer who mixes a signal for the audience. This suggests a dual responsibility, firstly to comprehend the nature of the sound that the performers habitually make, and secondly to amplify it with as much vividness and plausibility as possible for the audience. We shall examine these two responsibilities in more detail.

Attending to the performer. In attending to the performer, and thinking of how to relay a sense of an individual's performance to the audience, the sound director is presented with a particular paradoxical problem. Since the instrumental identity adopted by the performer already contains a sense of the image presented to the audience, created through the coupling between room acoustic and instrumental sound, how does the sound director recreate an image of the 'performer' and present it in the wider space?

To ignore the coupling of the instrumental identity to the actual room acoustic is to fail at some level to transmit the nature of the performer to the audience. However, to succeed is equally difficult, since the act of amplification changes the nature of the sound in the space and thus a good portion of the symbolic and real relationship between it and the performer's actions.

One solution is for the performer and sound director to base their respective actions on a stereotyped or shared fiction of the sound. The performer focuses on her pre-existing sense of instrumental identity, imagining a generic space in which she is playing whilst in fact ignoring parts of the actual environment (as if the sound coming from loudspeakers was actually inaudible to her) [14]. The sound director deals with the qualities of the sound received from the microphone (whilst ignoring some of the live sound coming from the instrumentalist), adjusting the sounds so that they represent an adequate version of the performer playing in a space which resembles the one which the performer is imagining, possibly by

[13] This title has some every day connotations which will provide an initial point of departure, but these will be opened out to include more diverse definitions. In the final part of this thesis the label 'sound director' will give way to the term 'Ouija player', giving some of the roles attributed to the sound director a place and a context in the Automatic Writing Circle.

[14] She will be helped in this process by the nature of the music that she is playing. Traditional musical structures encode relationships between performed space and between performers. For example, echo effects are the crudest of a vast spectrum of musical techniques which refer to external spatial phenomena, and which can be used within musical structure to make symbolic connections between the space and the performer.

adding a small amount of reverberation and adjusting the dynamics. The director will in a sense be compensating for the deficiencies and peculiarities of the actual space, no doubt concerned with its increased size, in so far as it fails to represent the ideal space in which a performer might be playing. This version of events can bring a wider public into the audible range of a live performance, but it depends on the existence of a stereotyped instrumental identity and an acceptable way of rendering this in the loudspeaker space.

Attending to the audience

By being placed with the audience, usually in the middle or in the last few rows (in a traditional performance layout), the sound director will have a different perception of the sound from that of the performer. From this perspective it will be possible for the sound director to gain an impression of the volume level and spatial distribution of the sound as heard by the audience, and be able to modify sonic attributes to change this impression.

As suggested above, the sound director's intent will be to produce a sound which represents the instrumental performer, but his focus will also be on the qualities of the sound diffused to the audience listening space by the loudspeakers. These sounds will have many differences from those produced directly by the instrument, having been transformed by the qualities and positions of the microphones, the amplification system, the types and positions of loudspeakers and any other intermediate electronic processes such as equalisation or reverb.

The sound director may wish to compensate for the audience's distance from the performer by emphasising the usually somewhat hidden articulations of the performer, those heard close up, by using a microphone placed near a flautist's lips, for example, or by filtering out lower frequencies, or by exaggerating dynamic contrasts. Depending on the intent of the sound director the sound heard by the audience may become increasingly divergent from the activities of the acoustic performer.

Summary.

These two perspectives, the close acoustic events on the stage and the distant acoustic events in the room, can be seen to mirror those being negotiated by the acoustic musician in unamplified performance. In the unamplified situation the musician structures his actions in order to create symbolic and actual connection between these two areas. However, with amplification these two areas can become less connected, and the perception of the sound director and acoustic musician may well be that the stage and auditorium have become two separate areas.

Francisco Lopez has described this situation in the following way

> The electronic amplification of instruments in rock / pop (and also jazz) has naturally created two strangely separated areas of sonic experience and control in the space where the live music takes place. What the musicians on stage hear, through the monitors, and what the audience hears, through the main PA, are two different things; quite different things. Not only in terms of volume (the musicians can be unknowingly blasting the audience, or the contrary, which in most cases they would consider even worse), but also with regards to any other imaginable property of the sonic matter in the audience area. It is the sound technician in the back of the room who is really creating that (by mixing, EQ-ing, panning, routing, balancing of speakers, etc.). In a way, from the position of the audience, the musicians have control over the generative part of the process, but the sound technician has the control over the final phenomenological part of it, with all its consequences. Of course the bands take pains at hiring good, akin sound technicians but, because of the stage, they have to keep this sonic splitting anyway. (Lopez 2004)

Despite clarity in describing the splits in the amplified contexts, however, I believe that Lopez is incorrect in ascribing a similar situation to the unamplified musician: "Because the sound radiates from his / her position, the player of an acoustic instrument cannot be the generative actor and the receptor-as-audience at the same time." (ibid) It seems misleading to suggest that because sound 'radiates out' from the performer, they are unable to attend to their own sound; sound also radiates back in. The listening position of the acoustic performer can be thought of as somewhat different from that of the audience, but not completely dissimilar. To suggest that because the performer is not in exactly the same place as the audience they will be disassociated from the sonic material by which instrumental identity is constructed is to miss the point. Instrumental identity is not constructed out of a straightforward 'whole' which is simply projected out into the audience space. At a fundamental level it already contains differences and splits (between personal and public identity, close sound and distant sound etc). Differences between the perspective of the audience and that of the musician are part of the semiotic potential of the situation: they create difference but not a complete schism. The acoustic space which audience and performer occupy is common to them both, but is one in which articulations of difference can occur.

Lopez portrays one of the advantages of electronic music as its ability to reunify the split between sonic spaces and the personas that occupy them (ibid).

However, my own argument is that the exploration of difference in the shared acoustic space of the performance is a principal constituent of the meanings which are constructed in the performance. Without this difference, represented in the admittedly unstable symbols of the sounds and actions, there would be no point of contact or mutual interest in the event between audience and performers. This is not to say that electronic music does not have numerous marks of difference on which to draw, but to question Lopez's inference that the reunification of splits is the quality that makes electroacoustic music desirable.

2.3.2 Reflexive relations 1: Sound director and performer identities in live performance

One of the potential outcomes of amplified performance is the creation of spaces which are experienced as separate. A second, more experimental option exists, in which the acoustic musician and sound director explore the construction of new identities by investigating the way that they can shape each other's acoustic representation. The performer relinquishes some of his pre-established ways of engaging with the instrument, and the sound director takes on a more prominent role in the generation a sonic identity, not just, to use Lopez's term, the phenomenology of it.

This demands that both sound director and performer attend to a shared acoustic presence and that they also develop a reflexive awareness of their effects on each other. The interest in the mental state of another person, discussed as theory of mind (Cross 2007), is seen as a core element of responsive processes in music, such as entrainment. In the reflexive situation described above, the sound created in the space becomes an indicator of the kinds of relationship being explored between the acoustic musician and sound director. Thus, as well as any traditional ways of coding the space which may exist for the instrumental performer, there will exist a new range of sonic material, having as its source a reference to the evolving relationship between the performers (a feedback loop with infinite regress).

2.4 Sound-recording and split roles

I have discussed the way in which amplification has the potential to undermine the instrumental identity of the performer by blurring the distinction between private and public sound. We have also seen how amplification can be

the source of a new level of split between the acoustic space of the performer and the acoustic space of the audience.

These changes in the space are consistent with the description of the effects of media, proposed by Meyrowitz, in the merging of regions and also in the creation of extreme front stage and hyper backstage regions (deeper splitting of audience and performer). Following Goffman and Meyrowitz, we have discussed the importance of the separation of public and private, and the way in which identities are created with the underpinning of these semi-permeable barriers. The difficulty created by electronic media is that the barriers used to articulate and manage difference are much more mobile, and introduce such movement into the sign system that many of the culturally stable ways of understanding what is being referred to, or how it links to a wider network of meanings, can be undermined, either through processes of merging, by the substitution of a complexly reflexive and rapidly changing notion of identity, or by the emergence of split positions which offer the potential for stability whilst limiting the interaction with wider areas.

These three outcomes – merging, complex and rapid fluctuation of identity, or more stable but split positions – can be taken to an even greater extreme when sound-recording, in any of its technological forms,[15] is used. The sound director becomes freed both of the direct, here and now, obligation to a performer or an audience and of his position placed directly between them. The tape recorder becomes a virtual placeholder for the sound director – fixed between the sound event as it happened and the sound object as it is reproduced through loudspeakers – and the actual sound director is able to take up positions elsewhere along the axis of technological mediation.

In exploring these new situations, we shall initially assume that they occur at different times: that while making a recording the sound director is not simultaneously diffusing the recording into the environment, or that while playing back recordings they are not simultaneously re-recording and manipulating them. The separation of these activities is the starting point behind a more detailed exploration of potential differences between the acts of recording and playing back. By temporarily abandoning the idea of feedback between loudspeaker and microphone (between a sound and its reproduction) we are able to explore more divergent contexts in which the microphone and loudspeaker operate. The idea of a separation between the experience of the sonic event in situ, and its experience at

[15] Part three discusses issues connected with digital code in more depth, and the ways in which this generates new ideas connected with embodiment and symbolic structures.

a later stage in a technologically mediated form, is at the crux of a split in the experience of sound.

The unified term 'sound director' that we have been using to describe the person who was placed between the performer and audience will also be temporarily split, and incarnated as the two personas of R Murray Schafer and Pierre Schaeffer, representing the views as seen from the perspective of the microphone and loudspeaker. These terms are used advisedly, and will shortly be contextualised more fully. The incarnations are set in a particular historical period, in the decades immediately following the Second World War. As such, their approach to issues of modernity, and to issues of musical meaning, are marked by the catastrophic undermining of trust in existing cultural values. The desire and hope for a firm basis on which to re-establish viable human communication is thus entirely comprehensible. In the light of this, it may seem regrettable that the positions adopted by these two protagonists were defined as mutually exclusive. However, in the analysis that follows, rather than treating these two personas as completely separate, we will examine their connection to each other through the prism of 'schizophonia'.

2.4.1 Splitting 2: schizophonia as creator of acoustic ecology.

Schafer's term 'schizophonia' , first used in his book 'The New Soundscape' (1969: 43, is a label for a problematic split in signification arising from electroacoustic reproduction. It

> …refers to the split between an original sound and its electroacoustic transmission or reproduction... Originally all sounds were originals. They occurred at one time in one place only. Sounds were then indissolubly tied to the mechanisms that produced them. The human voice traveled only as far as one could shout. Every sound was uncounterfeitable, unique. […] Since the invention of electroacoustical equipment for the transmission and storage of sound, any sound, no matter how tiny, can be blown up and shot around the world, or packaged on tape or record for the generations of the future. We have split the sound from the maker of the sound. Vocal sound, for instance, is no longer tied to a hole in the head but is free to issue from anywhere in the landscape. (Schafer 1977: 90)

Schafer's intention in labelling a split in this way is clear: it is both a pointer towards a less alienated relationship of man to nature and a pejorative label for the presence of amplified sound in culture. We shall look at these two aspects of the

term separately, beginning first with Schafer's concerns for a reunification with the natural environment.

Along with the critique of electroacoustic transmission, the idea of 'schizophonia' contains an implied critique of modernity and the changes arising from the industrial revolution. Schafer suggests that these are responsible for a break in the continuum between nature and mankind, and that the original hi-fi soundscape of rural life is being replaced by the lo-fi soundscape of the urban dweller. The description of the richness and interdependent relationship between humans and nature in a pre-industrial society is contrasted with the depletion and social and acoustic poverty of life in an urban setting. There is the suggestion that in overcoming the acoustic split of schizophonia one may also be overcoming a split between man and the environment.

Schafer's identification of the split between the sound and its reproduction with a split between man and nature is a problematic on several levels. Firstly, by giving philosophical weight to the existence of a split in sound, between an original and its reproduction, he is affirming the essentialist notion that the reproduced sound does indeed have an objective presence separate from its complex social meaning. By saying "we have split the sound from the maker of the sound" he suggests that the sound has indeed been radically severed, and that it contains the seed of a new ontological reality. The implication is that the split between a sound and its reproduction is as extreme as a wall between the natural state of man and an alien other. This fuels the notion that on either side of the wall there lies a condition of wholeness, with the wholeness on the side of nature (deemed historically prior) being considered, in Schafer's case, preferable.

Secondly, the argument for the appreciation of an earlier state of integration, prior to the effects of industrialisation, suggests that we can have an unbiased perception of this state and that we can evaluate its true significance. However, if we are indeed in a state of schizophonia (and since most of Schafer's readers are urban dwellers, immersed in the effects of modernity, this is likely) how could our already split minds begin to reconstruct the authentic experience of the state prior to the split. Put another way, as Auslander does in a different context in his book *Liveness* (1999: 51), before the introduction of recording there was no distinction between live and reproduced. The very notion of a unity between the maker of the sound and the sound itself depends for its conception on the idea of its opposite. The kind of thought which would see the maker and sound as fully united is inconceivable prior to the conditions of modernity in which its opposite appears to

exist. [16]

One of the solutions that Schafer proposes to this split is the use of exercises (called ear cleaning) that will purge the listener of the confusion of the schizophonic listening state. The creation of a new listening mode, specifically segregated from the normal one, mirrors the role played by Pierre Schaeffer's reduced listening (which will be discussed shortly) in proposing not only a definition of a new conception of the place in which sounds are made, but a parallel new mode in which those sounds can be heard.

The relationship between the schizophonic listening state and this new 'clairaudience' can be detected in the frequent use of microphones and tape recordings as the tools by which the new listening is achieved. Pauline Oliveros describes the way in which the childhood gift of a tape recorder opened her ears to a new way of hearing the world, one which then could begin to operate almost independently of the machine itself.

> I have been training myself to listen with a very simple meditation since 1953 when my mother gave me a tape recorder for my twenty first birthday. The tape recorder had just become available on the home market and was not so ubiquitous as it is today. I immediately began to record from my apartment window whatever was happening. I noticed that the microphone was picking up sounds that I had not heard while the recording was in progress. I said to myself then and there: "Listen to everything all the time and remind yourself when you are not listening".
>
> I have been practicing this meditation ever since with more or less success. I still get the reminders after forty-six years. My listening continues to evolve as a life long practice. (Oliveros 1999)

Extending this metaphor in a more politically motivated direction, Westerkamp makes a didactic use of recording to explore issues of ecological and social unity in the soundscape. This potential for unity is revealed in an oppositional sense through the use of the schizophonic medium.

> Rather than lulling us into false comfort, it [soundscape composition] can make use of the schizophonic medium to

[16] Schafer's concept of a schizophonia to be overcome is also akin to the argument put forward by Lopez, suggesting that acoustic musicians are split from the acoustic space of their audience. The notion of a split comes concurrently with the presence of mediatisation, and is a product of it, hence the idea of a resolution by moving into the unity of a purely electronic music is taking reification a step further.

> awaken our curiosity and to create a desire for deeper knowledge and information about our own as well as other places and cultures… Rather than disorienting us, such work potentially creates a clearer sense of place and belonging for both composer and listener. (Westerkamp 2002)

Thus Westerkamp is able to say that soundscape composition can be used as part of a conscious effort to heal a rift which has opened up with the natural world. The technology of the microphone and recorder are used almost as in a guerrilla war, like weapons seized from the enemy and used against them. [17]

The anxiety about a deficient human perception of the damage being done to the environment, and to the distress caused by changes in our relationship to physical places, is linked explicitly to the notion of a split in the signs at the centre of contemporary acoustic communication. The former anxiety leads to a potentially overcompensating wish for the signs used in human musical communication to rid themselves of their inherent splits, wishing them instead to become more direct conduits of an ecologically aware attitude.

The difficulty, as I see it, with the label schizophonia, and the idealisation of one side of the split as if it were an original whole, is that it places the notion of difference in a problematic light. As has been discussed earlier, the 'instrumental identity' of the performer is constructed around a series of differences, and not by reference to a unified whole which is then radiated out, to be received by the audience. However, before discussing the distinction between a split and a difference, I would like momentarily to return to the scene of schizophonia, and look more closely at the other side of the split identified by the term.

2.4.2 Split 3. Schizophonia as creator of Musique Concrète

In Murray Schafer's vision the path to restoration from the schizophonic split lay in the recovery of the relationships existing in an idealised past, undoing some of the effects of modernity. An equivalent but opposite version of wholeness was explored by Pierre Schaefer. In this version the restoration of unity lay in the

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[17] There are many composers, phonographers and sound artists who do not share Westerkamp's didactic use of sound recordings. For example, Michael Rüsenberg has said that

> Any soundscape composer wishing to champion the cause of acoustic ecology is entitled to do so. However to place his role as composer within this context is to make a purely personal choice which is neither inherent to nor demanded by soundscape composition, be it historically contemporaneous with acoustic ecology or not. (Rüsenberg 2003)

future, in the fuller realisation of the sonic phenomena which the tape recorder enabled.

Schaeffer was acutely conscious of the complexity of the semiotic processes of reference into which recorded sound was placed. He discussed the meaning of music, the systems of referentiality which support it, the status of music as a language, along with the idea of sound in itself. His work may be seen as an initial attempt to create a map in which the new kinds of sound and signs available from recorded material could be placed back in the cultural domain.

> Nous recherchons les eléments préexistants à tout système musical possible, et prétendons qu'ils serviront alors à réexpliquer aussi bien le nôtre que d'autres systèmes possibles ...
>
> [We are looking for the elements which preexist all possible musical systems, and suppose that they will serve to re-explain our own system as well as any other possible one…] (Schaeffer 1973: 38)
>
> Tout l'effort est de généraliser en se contentant de définir, avant les valeurs musicales, la nature des ces valeurs.
>
> [All the effort is to generalise – whilst remaining content, before defining musical values, to define the nature of these musical values.] (ibid: 40)[18]

The next step in the Schaefferian project was to have shown that these hearings of a sound in itself, first encountered in the detachment of écoute réduite[19], could be the basis for a reengagement with the musical and cultural universe, a literal recreation of musical signification from square one.

However, the process by which this might take place encountered problems. Kim-Cohen has suggested that the basic underpinning of Schaeffer's ideal is the essentialist proposition that the sound signifier refers only to itself, and not to any

[18] All translations of Scheaffer's French are my own.

[19] The fulcrum around which the theory of *musique concrète* rotates is the moment of *écoute réduite*. This is the moment of transformation where pertinent features of sounds are separated from their embodiment. By studying their morphology and spectral content in and for themselves, without any preconceptions, new 'musical' values may be uncovered. Schaeffer pays tribute to the closed loop recordings (sillons fermés) which allowed the breakthrough of repeated listening to occur. He felt that this enabled *musique concrète* to advance from the shock state of inconceivable sounds and into the development of sonic typologies. Sonic typologies allow sound to move from the unusable of the specific to the musically useful of the generalisable.

further symbol or external context.

> "Schaeffer's dream for musique concrète is this: the sound signifier signifies only itself; it does not point to some other signified that is meant to be brought forth by the signifying relation. Strictly speaking, Schaeffer's method, his aesthetic, relies on a disarming or suspending of semiotic activity in the listening experience" (Kim-Cohen 2009: 12)

Thus, the re-connection and re-referencing of the sound object with the symbolic activity of an existing world is problematic. The phenomenological sleight of hand by which all the contingencies of our material embodiment are bracketed out, only to be later restructured according to the discoveries made in this deliberately naïve state, is awkward to defend. By proposing a prior state of purity of the musical sign and suggesting that this can become the essence of a new semiotic system, Schaefer makes contamination a serious issue.

> Par l'invention de nouveax objets, on accède à l'inoui. Mais cet inoui en tant que tel n'a pas d'intérêt musical autre que potentiel. Il doit être récupéré, conquis, assimilé par une oreille qui s'éduque tout en le découvrant. Parmi les objets sonores, ainsi écoutés musicalement, apparaîtront peu à pue les <<objects convenable>> (au musical).

> [By the invention of new objects one creates a shock. But this shock has in itself nothing but potential musical interest. It needs to be recovered, conquered and assimilated by an ear which educates itself whilst discovering. Amongst the objets sonores, thus listened to in a musical way, there will be the gradual appearance of objects which 'lend themselves' to music.] (Schaeffer 1973 :41)

In this case Schaeffer suggests that the musical ear becomes a gate keeper, conquering and assimilating some sounds and rejecting others as unusable, performing a process of selection to move from the objet sonore to the objet musical.

Whilst working on the definition of such a system Schaeffer remained aware of the paradoxical nature of any bracketing out, maintaining that even when sounds are heard as bracketed out they are at the same time always 'determined by the structures to which they belonged'. Part of the resolution of this duality came

through the creation of a new kind of listening, one which arose through the practice of reduced listening. Thus, not only are the sounds new, but the mode of listening is new too, "The tape recorder has the virtue of Pythagoras' curtain: if it creates new phenomena to observe, it creates above all new conditions of observation." (Schaeffer 2004: 81).

Schaeffer's argument was that the perceptions afforded by the technology of the tape recorder should not be regarded as linked to the media, but rather, should be considered as having a metaphysical value, with an ontological status equivalent to that of acoustic sounds. The soundwaves produced by the loudspeakers are the physical entities on which this ontology is based. By giving these ephemeral and unknowable representations an ontological status he also suggests that the process of judgement by which the human subject arrives at the assignation is transparent and clear, that somehow they have been able to resolve the problems of representation inherent in language or in the construction of a stable subject able to make such judgements. It would suggest that the contingencies of culture or of habit can be bypassed, and also that the contingencies of the technology, such as distortion and obsolescence are not relevant. One may define the starting position of the Schaefferian listener as one in which the self is treated 'as if' it were an autonomous and fully integrated whole, rather than a self which is partially constructed by the social context in which it finds itself. Such a fully and independently constituted self would be able to explore sounds coming from unlabeled sources in an objective manner.

2.4.3 Rehabilitating schizophonia

The separation between the moment of recording and the moment of playing back is one that we have volunteered in advance, in the section leading to the discussion of the schizophonia. As suggested at that point, it is quite possible to combine the roles of sound director in a live situation with the split roles of recording and playing back, by doing both simultaneously, by pressing record on one machine and play on another, or by using technology which allows manipulation of live samples, or uses delays and feedback. This is a moment that we have deferred, and will continue to defer for a little longer.

Before re-entering this world of simultaneity a further and more explicit rehabilitation of schizophonia is required. It is not simply by having live feedback that the issues posed by Schafer and Schaeffer are brought into a new light.

The discussion about acoustic ecology and musique concrète highlighted the different focus on time which underlies the ideals of both, with acoustic ecology

referring to a previous unity in the past and musique concrète referring to one in the future. But, amongst many other symmetrical differences, there is another that I would like to bring to attention, concerning differences in the way that the physical presence of the sound director within the frame is understood. This difference can be described as context-embedded or context-free. The sound director incarnated as R Murray Schafer takes the social and physical scene in which they are making the recordings as the primary source of structures in which they are interested, whilst the sound director as Pierre Schaeffer takes the abstract symbols derived from the sound as the source of significance.

The divide between iconic communication and symbolic communication was discussed in part one, when looking at the theories of Gregory Bateson and Irving Goffman. Bateson's argument began by examining the differences between the iconic communication of animals and the linguistic communication of people, noting that linguistic communication had not replaced iconic communication but was a supplement to it. The theories of Lacan were briefly discussed, in which he suggests that language plays a dual role in the development of childhood identity, both compensating for the Oedipal loss of the desired parent and presenting the inscription into the symbolic social order 'in the name of the father'.

Problems in framing and holding identity, balanced between an iconic and linguistic representation were further examined in the case of Schizophrenia, which was seen as a state of mind placed in the individual by the family group's deliberately misaligned communications. The consistent repetition of communications in the form of a 'double bind' resulted in the situation in which, in order to protect themselves from overwhelming anxiety and direct threat, the schizophrenic is forced to misrecognise his own communications and those of others. As Bateson wrote, 'he must sacrifice his right to indicate that he sees any meta-communicative incongruencies, even where his perception of these incongruencies is correct' (Bateson 1973 :208).

Returning briefly to Schafer's term 'schizophonia', one can see that, unlike the extremes of actual schizophrenia, the ability of the victims of schizophonia to think about the frame of their communications is not impaired. They are, on the contrary, intensely interested in labelling and identifying the frame in which communication can occur. The kind of anxiety or concern which may impair articulation on the part of the schizophrenic is not disempowering in the case of the schizophonic.

However, as Bateson's later research, and that of Goffman's research into situationism makes clear, the process of identifying the context successfully is by

no means easy. It depends on both a gestalt view of the situation and on the perception of individual details within it. Goffman refers to the seminal moment when he joined Bateson at Fleishacker's zoo in San Francisco to watch otters playing, (though Bateson in his later article describes watching monkeys). The question that pre-occupied them both was how the otters could distinguish between play fighting and actual fighting. Otters do not have placards to announce that they are playing: they have no direct means of indicating that a particular communication is to be considered a 'meta-communication' about the frame of reference and not as a normal communication. Because the iconic signs of fighting (teeth barred, jumping, wrestling, clawing etc) are equally present in both the fighting and play-fighting, there remains a question mark over the way in which otters succeed in signifying their playful intentions to each other. The theories of Bateson and Goffman analyse the complex interrelations between the semiotic and the corporeal in this situation. Goffman's development of situational theories and Bateson's own work on metaphor and embodiment both elaborate on this moment.

My intention here is, thus, to make a partial rehabilitation of schizophonia, by suggesting that the state of not knowing, of having an inherent instability in the constitution of identity, is a characteristic of our being. To wish to rule this out, by turning to a phenomenological unity or to a pre-modern idea of natural cohesion, is fully comprehensible in the face of the schisms and threats of splitting, but is also counter productive. The wish for a stable and unified central subject can itself be the cause of further schism as it leaves no space for regimes of difference operating within the construction of identity.

The post war, post-modern reappraisal of the relations between language and culture proposed by intellectuals such as Derrida, Foucault and Deleuze can be seen as the rehabilitation of this indeterminacy at the heart of signification, and one which allows one to observe and respond to perceptions of difference working within one's own psyche as well as in group behaviour. Thus the threat of schism and the projection of hate in the second world war, the exclusions from human identity that created the holocaust, could be seen not as a consequence of the failure to establish a single just centre for human perception, but, on the contrary, as the inability to tolerate the discomfort of differences working within the generation of identity.

The shifts in perspective away from those initially proposed by Murray Schafer and Pierre Schaeffer can be seen to follow the critique of master narratives. The focus was no longer on the establishment of claims of metaphysical unity, but on exploring relationships between the subject and its

constituting environment.

For example, Luke Windsor, in his article 'Through and around the Acousmatic', describes Gibson's view of perception as based on 'affordance' and links this biological and evolutionary referential frame with the perception of sonic structures in Acousmatic work:

> Perception is seen as the result of a dynamic relationship between organism and environment... The dynamic relationship between a perceiving, acting organism and its environment is seen to provide the grounds for a direct perception of meaning. Objects and events are related to a perceiving organism by structured information, and they 'afford' certain possibilities for action relative to an organism. For example, a cup affords drinking, the ground walking... (Windsor 2000:11)

For Windsor, part of the listener's response to sounds in the acousmatic situation comes from the evolutionary sensitivity to structural invariants in sounds, directly linked to structural invariants in the environment in which they have evolved. Because this form of perception has developed over an evolutionary time span it is an innate part of our response to sound at a pre-conscious level; it is a 'direct perception of meaning' which informs our other responses to sound and cannot be switched off. The appearance of sounds in acousmatic pieces which accord with any of these lawful invariant structures will allow a range of direct perceptions to emerge in the listener, regardless of whether they were intended by the composer or not. This suggests a diversity of auditory perceptual mechanisms, in which the ground of the response is not based in a new metaphysics of the sound object but arises partly out of the evolutionary history of the listener, co-evolving with the environment.

Zanpronha, in an article written in 2004, discusses the potential of 'gesture' to act as an intermediary between the phenomenological materiality of sound and musical signification. Gesture is seen as a valuable resource because in instrumental performance it links the materiality of the body with the materiality of the sound, and this creates a recognisable unit for the listener. These recognisable units can then be used within pieces as a structural resource, in much the way that the harmonic series was previously used. In purely electroacoustic music the significations of gesture can be used to link the listener to certain perceptions of time, akin to Delalande's Temporal Semiotic Unities (Delalande 1996). Zanpronha refers to the further potential for gestures made during live diffusion of an acousmatic work to take up some of the gestures implied in the electroacoustic material.

He contrasts this exploitation of the signification of gesture with the Schaefferian sense of the sound object

> In this sense the use of gesture in music post-1980 is clearly different from the search for a neutral sound materiality in the 1950s, which aimed to eliminate significations and references from it. In music post-1980 gestures are important exactly due to the references they accomplish, due to the significations they introduce into the work, significations and references that can be used in a creative way inside composition. (Zanprohna 2004)

2.5 Pressing play and record at the same time.

Having explored the rehabilitation of the schizophonic it is finally possible to discuss the much postponed relinking of the activities of recording and the activities of playing back. This now no longer needs to be seen as the reunification of a ruptured identity, but can be thought of as a situation in which a particularly wide range of culturally significant regimes of difference can be encountered.

At the outset of this chapter we discussed the way in which the acoustic instrumentalist employs a series of references, which relate an exterior image (which contains consciously exposed references to private material), to a more interior construction (the instrumental persona to the self-sound interval). It is possible to trace a similar movement between the identity of the sound director as phonographer and the sound director as acousmatic listener.

The example of Alvin Lucier's 'I am sitting in a room' is one of many in which the process of pressing play and record is not used as a simple erasure of difference, but as a way of exploring some of the complex ways in which identity is constructed through difference.

In this piece the voice of the performer is recorded, then played back and a recording taken of this playback, complete with the acoustic colouration added by the room. This process is repeated many times over until the voice of the performer and the text they are speaking is no longer recognisable in the bath of reinforced resonant frequencies from the room. Each recording in the series is spliced onto the previous one, making a sequence which moves in focus from the qualities of the individual speaking voice to the qualities of the acoustics of the room in which the speech occurred.

The particular marks of personal identity heard both as the sound of an

individual voice and in the reference to an "I" in the spoken text, are progressively less clear. As the reverberation becomes louder, and the room tone becomes more present, the question arises about how the "I" was signified. Was it by the separation of the performer from their enclosing space, or on the contrary, because the performer was linked to the reverberation of the spaces of mouth, chest, and room, and to the symbolic chain of references which situate the 'I' inside language. The gradual movement along the scale of differences, between the interior and exterior, points to the inherent impossibility of locating a single place as the source of an identity: it is a complex interrelationship, as Bateson and Goffman's otters would show.

A second example of research demonstrating a similar interest in the social differences to be detected in the propagation of sound comes from the world of architecture. There is a long established interest in the quality of the acoustic space created by buildings and in the social and political role that they also play. This dual view, of seeing space both as a physical acoustic and as a social context helps architects place sonic experience within a wide disciplinary field.

The book *Sonic Experience* by Augoyard and Torgue (2005) emanates from the Grenoble school of architecture. It is a lexicon of new sonic terms related to the 'sonic effect'. This initially innocuous term comes to carry a very pointed significance, as the sonic effect is treated not as a secondary consequence of a sound made, but as a new and complex point of reference, lying somewhere "between the cause and the event" (p6, ibid). This term has a double-edged meaning, as the sonic effect is as much about its effect on us as about its effect in an environment. In the introduction to the book Augoyard describes this as an 'instrumental dimension' to urban space which requires further examination and reflection:

> Firstly, no sound event, musical or otherwise, can be isolated from the spatial and temporal condition of its physical signal propogation. Secondly, sound is also shaped subjectively, depending on the auditory capacity, the attitude, and the psychology and culture of the listener. There is no universal approach to listening: every individual, every group, every culture listens in its own way. (Augoyard 2005 : 4)

In cataloguing a list of sonic effects there is a raucous and extraordinary blending of terms, which come from various domains such as the musical, urban planning, musique concrète. One can move from a definition of crescendo to

crossfade. The complex interfacing between different categories of listening, sound making and psychoacoustics, (social sciences, urban studies and applied acoustics) emphasises the almost playful nature of the new terms (example: Sharwadji, Tartini effect). It seems that along with a consciousness of sound effect comes a consciousness of a new approach to the language in which it is described. The whole structure of the book is quite novel, in that it is an alphabetical list of terms, each of which is subdivided to discuss the effect from various disciplinary points of view—disciplines which go from the hard sciences to the soft ones, using both quantitative and qualitative methods, and thus embrace a variety of positions along the axis of subjectivity. Some of the effects are most strongly sourced from within one disciplinary field, for example the description of Synecdoche (selective listening) begins with psychology and physiology of perception, whilst Mask (the presence of a sound that masks another) begins with physical and applied acoustics.

There is a deliberate tolerance of ambiguity, and a sense that the description and classification of the sonic effect can never be finished, but draws the reader in from various fields.

2.6 Conclusion

The chapter began with a description of the instrumental identity of the performer, and ended with a discussion of the different constructions of identity which can occur when the shifting barriers of electronic media are introduced.

Seven different situations were discussed, each with a different emphasis in terms of differences which predominate to create the context in which the sounds are interpreted.

1. **Non amplified**. Traditional instrumental identity, as learned in conservatoires and through the interpretation of the musical canon.

2. **Live amplification** – split 1. The perception of the space around the performer,

3. **Live amplification** – split 2. The perception of the space around the audience

4. **Live amplification** – Reflexive interaction. The interaction between the instrumentalist and the sound director, mutual reinterpretation of space and instrumental identity

5. **Tape recorder** Split 1 recording. The situation of R Murray Schafer and the phonographer.

6. **Tape recorder** Split 2 playing back. The situation of Pierre Schaeffer and Musique Concrète.

7. **Tape recorder.** Recording and playing back.

These situations coalesce around certain pivotal problems or instabilities, and two were addressed in particular. The first is the potential split between the performer and audience that occurs when electronics are used in live performance. This can be seen as the appearance of spaces which are sufficiently different for them to seem disconnected (stage, auditorium).

The second is the potential split introduced by recording, between the sounds occurring in a world that can be considered as real (context embedded), and a sounds that occur in a virtual environment created by loudspeakers (context free).

One way of pursuing the argument was to say that these splits are problems to be resolved, and that the satisfactory outcome would be for a merging or reunification of the identities created. For example, Lopez (2002) argues that electronic music creates a happy fusion of the split state of live amplified performance.

My argument is different, in that it takes the existence of splits and differences as an essential component of any symbolic system.

It takes the idea that a 'sign' is not a self-constituting whole but is a way of organising concepts of difference, deeply linked to cultural and social identity. The workings of the social group were seen as implicit for an understanding of the formation and reformation of both signs and identities.

The placing of a 'split' in identity, and at the heart of the sign, can be seen as problematic, as it places a doubt and instability into the system. However, the exploration of this inherent instability is also the agent of change, allowing the symbols, individuals and groups to evolve and establish new networks of meaning. The ontology of the sign (or of the individual) cannot be reduced to a single observable source, but is already inherently made of multiple threads.

The areas suggested above, with splits between stage and auditorium, environmental sound and reproduced sound, are hence areas in which the cultural symbols through which we construct experience are in particularly wide flux, and

to which we will naturally be drawn.

Engagement with these questions, in sonic and linguistic form, is a significant part of the ongoing activity that takes place in the Automatic Writing Circle. An examination of the ways in which this particular social group evolved, its development of instruments, movements of exclusion and inclusion, and sensitivities to differences in sound make up the next chapter.

Section Three

Introduction

3.1.1 Borderlines and Touch

There has been considerable change in the work of the group, the Automatic Writing Circle (AWC), over the last six years. The agent of this change can be traced to a certain contagious quality which was there at the beginning and which has reached out and expanded its range.

The nature of this contagion is connected to borderlines, and the ambiguous way in which a borderline contributes to definitions of what lies within it whilst at the same time preserving categorical differences from the interior. My most direct experience of the unsettling quality of borderline positions has been in the explorations of contact within the AWC group, in which a performer can shift the nature of their relationship to the group, sometimes positioning himself or herself as an insider and sometimes as an outsider. The changing relationship is articulated through many modalities, including speech, writing, sound, and gesture.

Like Bateson's schizophrenic, the ultimate stability of any position cannot be secured, and there is always the potential for misunderstanding. One of the ways in which these borderline positions are taken out of the realm of schizophrenia is through the integrating perspectives of 'touch', taking touch to extend beyond the physical contact of skin to include more diverse uses of the word, such as to be 'touched' by another, or by an experience. Thus, as we move closer to the qualities of the interactions between members of the group (plus those at its borders), there will be a heightened examination of the different kinds of touch— from the physical touch of body on instrument, to the visual touch of the shadow of a hand, to the variety of ways in which sounds can be considered to have touched us or we have touched others through sound.

The animation of the notion of touch, and its relation to the political negotiations of boundaries, is discussed in Derrida's work *On Touching – Jean-Luc Nancy* (Derrida 2005) in which he explores the diverse and paradoxical nature of touch. Chapters include those on 'Spacings' (with a section on words beginning with 'ex-'), on 'the Untouchable, or the Vow of Abstinence' (with sections on tact

beyond the possible). Thus, at the opening, when discussing the nature of the look that occurs between two lovers, Derrida ponders the phrase "when our eyes touch, is it day or is it night?" (ibid: 3). Rather than proceeding by clear and visible operations this consideration involves a descent from clarity. The two lovers "blind themselves so as to see a gaze; they avoid seeing the visibility of the other's eyes so as to address themselves only to his or her gaze." (Ibid, 4). The means by which the benediction of togetherness is derived is never fully assured, never finally separated from individual differences or endings.

Derrida's deconstruction of touch can be understood as the correlate of the multiple, schizophrenic borderlines discussed above. Although touch provides a way of stabilising and linking these atomised experiences, one of the qualities of touch is its inherent division—touch is not a starting point for the expansion of a cohesive presence. Themes of darkness and obscurity are described as operating alongside and enriching those of light and clarity, and are also significant metaphors in the work of the AWC. The contamination across boundaries and the simultaneous activation of the pregnant possibilities of touch thus go hand in hand whilst bearing in mind, as Derrida suggests, the centrality of a sense of 'tact', of the appropriateness, justness and acceptability of the form of touch.

Associated with a sense of tact is the notion that there are certain boundaries which one cannot cross. One of Derrida's recurrent themes is that of loss, and the presence of traces or residues of that which has been or will be lost, and which cannot be touched directly. He sees this 'untouchable' side of touch as an essential component of the experience of touch, something which in a sense accompanies any sensory or phenomenological essence. The boundary through which touch occurs includes a sense of the paradoxical boundary between presence and absence.

The negotiation with the presence of this untouchability at the heart of any contact has been a significant background sensibility in my own work, and will be returned to at the end of the chapter. The name of the group 'Automatic Writing Circle', and the choice of the name Ouija board for the group electronic instrument, allude, in a somewhat populist way, to some of the links between touch and the untouchable. But it is in the details of the work on sound, and on the nature of the contact between instrumentalists and electronic sounds that the issues have been most fully explored. In this area, along with the acousmatic curtain and its reference to a listening to that which cannot be seen, the wider theme is of the presence of that which cannot be touched.

3.1.2 The politics of community

The question of the 'group', bringing with it the tantalizing boundary or circle which demarcates the inside of the group from the outside, and the relation of the individual to the group, is a fundamental disturbance animating the current discussion.

In thinking of the power of the group, the multiple levels in which being in common with others provides the essential motor for experience, and for the exploration of sound, I do not mean to suggest that the group is the source of permanently stable meanings. Rather, it is to resurrect the idea that community is desirable, and to emphasise the potency of notions of community. The processes of authorisation and legitimisation that occur in community, and the struggle to participate in them and to play with them, have a reverberation through all areas of experience and knowledge.

Jean-Luc Nancy, in the *Inoperative Community* (1991), discusses the impossibility of pure individual being and describes the way in which community cuts into the absoluteness of any individual subject.

> A simple and redoubtable logic will always imply that within its very separation the absolutely separate encloses, if we can say this, more than what is simply separated. Which is to say that the separation itself must be enclosed, that the closure must not only close around a territory (while still remaining exposed, at its outer edge, to another territory, with which it thereby communicates), but also, in order to complete the absoluteness of its separation, around the enclosure itself… The logic of the absolute sets it in relation: but this, obviously, cannot make for a relation between two or several absolutes, no more than it can make an absolute of the relation. It undoes the absoluteness of the absolute. The relation (the community) is, if it is, nothing other than what it undoes, in its very principle – and at its closure or on its limit – the autarchy of absolute immanence. (Nancy 1991, 4)

Nancy's notion of community is seen as a constant work, a politics beyond politics, of cutting into the absoluteness of the individual subject, whilst being simultaneously a retreat from any notion of group which finally arrives at agreement about its identity.

Referring this to sound, the central divide which interests me, implicit in the analysis of splits in the previous section, is that which tantalisingly exists between sound making as a collective activity, as in much traditional music, and sound

experienced as a sensorial relationship to the individual, as in much electronically mediated sound.

Approaches to sound art which follow a phenomenological path tend to foreground the relationship of an individual listener to sound, and place the community or group at a distance. For example, Salome Voegelin in her recent book *Listening to Noise and Silence* (2010), describes the sonic in the following terms

> …whereas the modernist framework lives with universality and postmodernism considers us and others, **the sonic understands there only to be engaged, but absolute, others.** A philosophy of sound art consequently must follow the idea that any identification of groupings, however well intended, is sonically impossible, since it supports the principle of a priori sameness and difference, that legitimizes hierarchies, exclusion and discrimination, the very things its material dispels. (Voegelin 2010, 64. My highlight)

Following Nancy's understanding of community, however, one can offer an alternative version of the relationship of individual to group: it is through the exposure to community that the creative processes of political authorisation can be unleashed, and through which the gaps in the individual experience of sensory plenitude can be brought into play.

3.1.3 Boundaries under consideration

In working with the group, and exploring the interactions between acoustic instrumental performance and electronic sound, many different types of boundary are in play. As well as the broader categories which arise through the group exploration of sonic identity, which may be discussed in terms similar to group music therapy, more specific technical and historical factors are introduced by the instrumental / electronic focus. The nature of these influences, and the aesthetic and philosophical character that they bring to the group, are discussed in section two. The current section confronts these with the material processes of the group itself.

One of the tools that played a significant role in reshaping boundaries is the computer and associated software, which allows a high degree of malleability in the circuits that connect microphones, loudspeakers, recordings, video cameras and touch interfaces. An appendix is given to the description of some of the underlying software and techniques that I have developed to support our work.

The programming is used to act on the field of possibilities that exist at any

given moment of performance, and to shape the more permanent infrastructure supporting our work. Some of the variables include the ways in which timbres, textures and spatial attributes are linked to performers and the way in which gestures are linked to instrumental performance, whilst others refer to the way in which the actual performance space is linked to features of the environment beyond it. As will be seen, the kind of linkage made between these different features has a profound effect on the way in which an individual performance evolves, and on the kinds of togetherness, exposure and critique which the performers are able to engage in.

In the following chapters I document the exercises, instrument designs, techniques and moments of insight which have allowed us to refine the processes of authorisation and touch that occur within the group, and which also chart my response to the contagion of working in the group environment and my exposure to the inoperative community which is at the heart of the AWC.

3.2 An outline history of the group

It is possible to break the history of the group into 3 main segments, which coincide with changes in the project at various levels. On a simple grid, the 3 phases are given a character by the place in which meetings took place, first the Mary Ward Centre, then a nomadic period, and finally a base at the London College of Communication. These changes in location were also accompanied by changes in the concept of the instrument and the kinds of issue that dominated our discourse. The changes of place helped an overview, summary and change of direction to take place, placing the achievements and ongoing problems in a useful frame.

The diagram below summarises these phases:

	Instrument	People	Concept
1 2002 to 2005 Mary Ward Centre	Various multi-user instruments. Ecosonic improvisations. (see Chapter 3.3)	Adult learners and instrumentalists	Explore Social relationship before sound object. Use structured exercises in sonic interaction.
2 2005 to 2007 Nomadic	Colour-detecting ouija board. Working with paired acoustic instruments.	Ecosonic group + Ouija players	Developing structure from exercises. Planned interactive sequences for performance
3 2007 to 2010 London College of Communication	Shadow controlled ouija -board With variety of acoustic instruments	Dedicated group – Automatic Writing Circle	Developing competence in negotiating difference

Table 2 The three phases of the group

A brief description of the principal subjects covered in each phase is as follows:

1. The opening phase was motivated by an explicit agenda, to explore the reverse side of Pierre Schaeffer's theory of the sound object, and uncover the potentials of a 'relation sociale' which might open the objet sonore to the politics of community.

The work began in a series of classes that I conducted at the Mary Ward

Centre in London between 2004 and 2006. The class was for adult learners, and we used group improvisation and structured exercises (using networked and self-made instruments) to explore the group performance of electronic sound. The classes became increasingly focused on the specific problems of the relationship between the instrumental interface, the aesthetic motives behind the sounds being produced and the social interaction of the performers. It culminated in the creation of the first version of the Ouija board.

Simultaneously, I had begun working with Stephen Preston in the Ecosonic ensemble, which was devoted to the expansion of the performance possibilities of traditional acoustic instruments through a focus on dialogic and interpersonal interaction. We both felt that our physical capacities in instrumental performance (Baroque flute in Dr Preston's, cello in my case) could be extended by being placed directly in the service of mutual responsiveness.

These two projects informed each other, and were motivated by very similar ideals—namely that the interpersonal responses of one musician to another could form the basis for a new relationship to sound and to instruments.

2. The second phase involved a deeper examination of the implications of the work in the first phase. Various questions peripheral to the first phase became central in this one. For example, the two following interlinked questions began to assume increasing importance:

- To what extent are the goals and ideals of the group linked to an external theory or manifesto, and to what extent are they created out of the interactions of the past and current members of the group?
- To what extent does the use of exercises to explore the territory of our interaction become an unconscious constraint, suggesting that all territory can be defined by exercises?

This phase of the work also consisted of an explicit joining of the two groups, the Ecosonic and Ouija, in a series of performances. These maintained the focus on interpersonal response whilst including both electroacoustic sound-making and acoustic instrumental performance. It led to considerable modification in our understanding of the interrelation between the two types of performers.

3. The third phase of the work, which leads up to the latest period covered by this thesis, involved a succession of breakthroughs. These included changes in many areas: the form of the Ouija board, the design of the software, the relationships between performers, and the conception of structure which guided

our performances. Our increasing recognition of the ideological background of many of our judgements led to a greater competence in dealing with and hearing often deeply held differences, not only in an intellectual and verbalised way, but also in the improvisations.

The discussion of these changes, and the details of their sonic outcome, is the substance of the remaining chapters of this section.

3.3 Two early histories—Entrainment and 'the other'

The following two chapters cover the first phase of research, and detail the work with two different groups, the acoustic musicians of the 'Ecosonic' group, and the adult learners at the Mary Ward centre. I present two initially separate histories, one involving the movement outwards from 'entrainment' between musicians into areas outside the immediate dialogue, the second involving a movement from the electroacoustic experience of sound as 'other' into the politics of entrainment.

3.3.1 Ecosonic exercises and entrainment.

The ecosonic ensemble grew out of initial research conducted by Dr Stephen Preston into birdsong, (Preston 2004) which had been motivated by the wish to discover ways of performing which matched the freedom and sonic breadth found in bird song. This resulted in the development of the Ecosonic playing technique in which the hexagrams of the I-Ching are mapped to finger patterns on the Baroque flute. Because they resulted in finger combinations that are not part of traditional scale-based patterns they produce a wide range of unusual timbre, pitch and volume. These can be produced with great fluency and with a stimulating level of unpredictability as some of the combinations place the instrument in an unstable mode of vibration.

At the time that I joined Dr Preston he was working with his pupil, Amara Guitry, on aspects of duetting, inspired by the variety of temporal organisation and synchronisation to be found in the duets of different species of bird.

The tight co-ordination between Guitry and Preston impressed me: it allowed the possibility of listening to their improvisations either as the sound of a single instrument, or as the production of two separate people. My own presence, as a cellist, in the sound-making of these two Baroque flautists, raised obvious questions about the differences between us and the extent to which I could be integrated into their pre-existing and sonically cohesive world. My partially alien presence was an early instance of the contaminating impetus provided by borderline positions, which provided a driving force for many of the changes to come. My effect on the group was partly the consequence of the boost in number of participants from two to three, thus allowing the possibility for somebody to be on the outside, and partly because of the different acoustic and gestural potentials of the cello.

The presence of someone on the borderline, paradoxically in and out of the

group, coincided with an increasing focus on what it is to be mutually engaged with another performer, the sense of what it is to be on the 'inside' of a group. The creation of an instrumental technique which allowed fluency and rapidity of response began to be seen as a consequence of this need for mutual engagement, rather than as a goal in its own right.

The improvisations were not in an entirely free form, but were designed as exercises intended to explore particular ways of being together. They focused on a variety of different structural elements, centred principally on simultaneity, turn taking, and the gestural and timbral component of an exchange. Two principal themes co-existed: one in which players recognise and authorise each other's sound making acts through mutual reciprocation, the other in which the presence of an outside or alternate performer disrupts the basis of entrainment. Many exercises were explored, and I shall describe two in particular, which show the diversity of ways in which the influence of an outside or perimeter became recognised in the internal forms of entrainment.

The work of the infant psychologist Daniel Stern has been of particular value in thinking about the nature of these interactions. His book, *The First Relationship* (1977), is a description of the growing social skills of an infant, from birth up to the age of one year, by which time the baby has learned how to form an enduring internal representation of mother as the cornerstone of a relationship. The internal representation is not made up of a single image but can be understood as a learned sense of what it is like to be with mother, built up from many sessions of play in which there are repeated chunks or packages of interactions. Through the mutual management and structuring of these packages of interaction the baby learns how to regulate their relationship with mother, manage their own levels of affect and emotion within it, and also learns the basis for wider social relationships.

In Stern's detailed exploration of the interactions between mother and child there are two aspects which stand out as having particular significance for the work that occurred in the Ecosonic ensemble and later with the AWC. The first is that in trying to find the minimum unit or segment which made up an interaction Stern always refers to curves of intensity and direction, not simply to separate symbolic chunks. For him, the basic process unit of an interaction

> is not necessarily the smallest unit of perception in any modality, but rather is the smallest unit in which a temporally dynamic interactive event with a beginning, middle, and end can occur. Such a process unit is like the briefest incident or vignette that can contain a sensory, motor, and affective element of experience and accordingly have signal value as an

interpersonal event.

> A vocal utterance, or the formation-maintenance-decomposition of a facial expression, could define the boundaries of an interpersonal process unit (Stern 1977:122).

Thus the unfolding over time and the intensity of a behaviour, for example a smile, is as significant as any discreet 'content' of the action. The boundaries of an event are defined as much by these contours of intensity as by any solid substance. For the work with the acoustic musicians in the Ecosonic ensemble, and later in the work with the group using both acoustic and electroacoustic resources, the awareness of the communicative impact of temporal curves of intensity was central. In changing or modulating the terms on which our mutual engagement occurred the subtle elements of rates of increase and decrease and proportion were as important as any striated structural differentiation. This became particularly relevant when thinking about the relationships between electroacoustically produced sound and that from acoustic instruments.

Stern also gives a detailed analysis of the way that the boundaries of an interaction are maintained through mutual feedback systems. The mutual provision of stimulus is kept within an optimal range, but this optimal range is fluid and flexible. Unlike the feedback system of a thermostat, which has a fixed cut off point, the mother and child negotiate a system that allows them to change the agreed-upon range of stimulation—the optimal range is a moving target.

This is a good description of the processes of interaction which occurred within the ecosonic ensemble and AWC. The tensions within our performances were often generated by the changes in the boundaries within which a sanctioned or authorised regime of entrainment was conducted. Like the mutually regulated interaction between mother and child, our improvisations could be seen as processes of extension to include others within regimes of authorisation which were themselves subject to change.

In the following description of exercises, I detail the way in which the curves of intensity of an outside agent are incorporated in the mutual regulation of the entrainment of an inner group.

3.3.2 Ambient

In this exercise players took turns, one by one, to play a phrase or a single note in response to the sounds around them in the environment. Each player's turn would begin with silence and end with silence. The initial silence would be a period in which the player could be immersed by the acoustic environment,

enabling her to detect sounds beyond the immediate social distance of the group. These sounds might be the activities of other people in the building or of the clicking of light bulbs or external environmental sound like wind or birds. Like a dissolving lump of sugar, the attention of the listener could spread out and notice how all these distant sounds were present at the edge of the performance space, in a sense dissolving the boundaries of performance space as well.

In attempting to reverse this process of dissolution, and reproduce the sonic environment in some instrumental form, the player would pay attention to the relative scale and intensity of the sounds around them. They needed to find ways of articulating the dimensions and multiplicity of the external environment in their physical response and exploitation of the micro-ecology of the instrument.

For example, on the baroque flute there could be a sense in which the slow release of breath provided a background noise easily related to the continuous roar of traffic, whilst the tongue could be acting to produce a secondary and changing white noise within the mouth cavity, perhaps linked to the sighing of wind. The body of the flute, with varied fingerings, could be producing whistle tones (depending on the embouchure of the lips), the fingers could be producing light or darker clicks and taps.

The point was not to produce sounds which, if recorded and played back, would be indistinguishable from the acoustic environment. Rather, it was for the player to internalise the sense of scale and relative agitation and movement of these external sounds, and use them as an inspiration to release new complexes of activity and technique.

As a consequence of the musician's response there was a second, equally important component to the exercise. The awaiting players, the people whose turn would be coming next, would not only be listening to the space around them, but they would also be appreciating the response of the performing musician. Often, whilst awaiting my turn, I would not have a clue about how my body would find a way of performing on my instrument. Then, hearing and seeing somebody else's approach, I would feel the sympathetic stirrings of imagination and could suddenly imagine how the shaking of an arm at one speed combined with a slackened lower string and taps with the left hand (one finger using a nail and the other the soft pad of the finger tip) would create a similar sonic environment, even if the technique were quite different from the currently playing musician.

Thus, my own response, when it came, would be a stimulating and engaging response to the other musician, as well as a response to our situation in the

environment. I could not only use my body to relate to the external environment, but use it as a way of indicating appreciation and echoing another person's performance.

This exercise allowed a multiple focus to develop, shifting between different kinds of entrainment. One was an attention outwards, into the environmental space, another was a focusing inwards, into the multiplexed activities of bodily/instrumental sound making, and a third was towards a mutually engaging, provocative and stimulating response between musicians. Although not every sound-making act by a musician was novel, the sense of a changed listening relationship with the environment and with each other often was.

A fourth form of entrainment could also be detected, which was the interaction with our classically trained instrumental gestures and habits. The spontaneous responses to each other and to the environment were in negotiation with these learned responses and the sonic values that they related to: we were not forgetting our instrumental training, but engaging with it through other contexts.

3.3.3 Entrained pair and 'Outsider'

This exercise developed as a consequence of the presence of a third person on the periphery of the closely entrained interchanges of a dyad.

The mutual focus of the dyad was strong, and consisted of rapid matching and small divergences in the way that the sound was being produced. Unlike the ambient exercise described above, the entrained pair responded at high speed, almost without pre-emptive thought (examples 2 and 3 on Disc 6).

As a third player, listening to the dyad, I became interested in the way that an awareness of the 'outsider' could be brought into the situation. The entrainment of the dyad was obviously compelling and demanded attention but there remained a presence on the periphery of this mutual engagement.

We developed a variety of exercises, for example:

1. Having the entraining pair close together and the outsider physically distant.
2. Allowing the outsider to destabilise the entrained pair, and then to bring about some kind of re-negotiation (an audio example can be found on disc 6, example 1).
3. The entrained pair to ignore the outsider, and the outsider to make

sounds without intending to disrupt the pair.

4. The outsider as a silent listener: an audience.
5. The outsider to pay attention to the pair (the insiders) and remember their activities, paraphrasing or diarising in some way for the benefit of an audience, or to comment back to the insiders.

These exercises involved a conscious manipulation of focus, both for the people in the dyad and for the person on the periphery. This became particularly evident when everybody had played the part of the outsider. Once having been on the outside and returning to the role of insider it was strangely easy to give the appearance of entraining with the other in the pair whilst also being very aware of the actions and state of the person on the 'outside'.

The strange mental categories created by this divided attention are worth noting: as an insider one was supposed to give full attention to the other person in the dyad. However, this conscious play at ignoring the person on the periphery seemed to create a second mind that was actually listening to and participating with the outsider, even while exhibiting no obvious sign of this secondary attention. So one became aware of the existence of several frames of reference, even within one's own attention. For example, it became apparent that the official outsider mirrors a part of one's own consciousness that is already outside the interaction, but a part that is not fully under our conscious control.

3.3.4 Summary

The exercises conducted with the Ecosonic group of musicians demonstrated the variety of ways in which the focus of entrainment could be shifted. These consisted of movements outwards beyond the immediate relationship between mutually engaged musicians towards environmental sound (or a peripheral musician), and inwards towards a redefinition of the content of the group entrainment, bringing in new ways of being together.

In Stern's analysis of entrainment there is a description of the way in which Mother-child interactions develop a structure and focus. This first relationship is the learning ground in which we discover ways of making associative patterns which have a social basis, and in which we learn how to form mutually constructed frames around an interaction. It was suggested that, as musicians, we are dealing with more diverse and politically unstable elements of the same framing process, allowing an expanded awareness to come in and reshape the

details of our relating.

In this complex process of alignment between performers there is an attention given to the 'place' in which these mutual engagements occur—not a fixed location i.e. 'in me' (or even which part of a divided mind) or 'over there', but a movement of displacement, the interior of the body placed into an exterior space, or the exterior space represented in the micro-ecology of instrumental performance. This creates a paradoxical image of being together, constructed always with something that is not fully present, a trace or a residue of presence.

The exercises provided a pre-defined frame, allowing various aspects of content and behaviour to be explored, but also acted as a potential conceptual block—for in the end entrainment between people is not conducted in the form of exercises or pre-agreed rules. The politics of individual authorities in proposing or analysing an exercise came under increasing scrutiny. We also became more conscious of the fact that language was used to formulate the boundaries and contents of the exercises, and was thus directly implicated in our construction of sonic experiences. In the same way that the presence of an acoustic outsider (as musician or external environment) began to change the mutual engagement of the insiders, so the role of language, as an apparent outsider to our sonic interactions, began to make its presence felt more strongly, and we began to adopt a more flexible and deconstructive approach to its use in our interactions. Some of the ensuing changes are discussed in 3.6.1, detailing the changed role of exercises in our work and a more extensive engagement with writing from an ethnomusicological perspective.

Chapter 3.4 Mary Ward Group

3.4.1 Initial group instrument

Whilst the main focus of the work with the ecosonic group was on the expansion of the range of material that could be included in the entrained relationship among musicians, the work of the Mary Ward group went in the reverse direction, focusing on the way in which the expanded field of electronically-produced sound could become part of an entrained interaction. A principal area of research concerned new concepts of instruments, with a particular examination of the link between an individual's performing body and the sound produced by the group.

An essential difference between the Ecosonic group and the Mary Ward group lay in the role played by the physical instrument: the Ecosonic group played acoustic instruments with a long cultural history, whilst the Mary Ward group had

the task of evolving a group instrument that had the dual function of providing ways to articulate particular sounds and also of distinguishing one person from another (and hence allowing processes of entrainment to occur).

Acoustic instruments have always created a tight link between an individual and the sounds produced, furnished by the individual's unique contact with the instrument. Electronic sounds uncouple this one-to-one relationship: the sounds may have an ambiguous link to a single performer or none at all. This in turn makes the politics of performance more complex because the separate acts of individuals may have no discernable link to the sound emanating from the group.

One of the paradoxes of community is that it is indelibly linked to the notion of separateness: there can be no notion of separateness without one of community. The individuality of separate people needs exposure before ideas of co-regulation, mutuality or reciprocity can have significance. If bodies are merged, or are indistinguishable then this constrains the processes of reciprocation and the exploration of ways of being together.

Nancy uses the example of a face to illustrate the way in which individual exposure plays an explicit part in being together:

> "my" face always exposed to others, always turned toward an other and faced by him or her, never facing myself. This is the archi-original impossibility of Narcissus that opens straight away onto the possibility of the political. (Nancy 1991, xxxviii)

Thus, in terms of the sound-making of a group, the instrument provides the face which may be turned to an other, and through which an individual may become present in the political process of being together. The visibility of a performer's gestures and the link between the gesture and sound produced is the basic ground from which reciprocal sound-making can occur.

However, rather then suggesting that electronic sound should be returned immediately to the orbit of individual instrumental control in order to re-establish the familiar politics of instrumental streaming[20], the work carried out at the Mary Ward classes explored a more graded approach. The objective was to find the minimum set of differences that would allow individuals to present themselves to each other, and to engage in processes of exposure and difference within the group. These minimum differences would be concerned with perceptual attributes of the sound (for example aspects of volume, spatial location and timbre) as well

[20] For further discussion of instrumental streaming, composition on the lattice, and electroacoustic music's development of territories beyond these see Wishart 1996.

as with the kinds of contact that could occur between an individual and the instrument as a consequence of these attributes.

This reductive social strategy is the reverse of the normally imagined sequence of events, in which instruments are designed for maximum individual expressivity. Thus, rather than looking for a restoration of the individual/instrument coupling, I was looking for the first shading or colouration of electronic sound which could indicate mutual engagement in its production. After experiments with diverse networked instruments (see example 4 on disc 6 – 'Early networked instruments') I took the decision that this would be best explored within the conceptual framework offered by a single group instrument which would be unlike existing acoustic instruments, in the sense that the collaborative environment and the individual instrument are merged into one artefact.

Electronic control systems allow the splitting and merging of functions through a network of multiple devices, chips or circuits and create a diverse range of resources for any causative action. At a superficial level this is analogous to the multiplicity of potential auditory sources in electroacoustic sound. The 'instrument' that I was thinking of would exploit the same mobility of suggestive intent, and would allow the multiple control actions of the individual performers to be re-attached to the electronic sound, and to each other, in a diversity of ways.

The exploration of minimum sets of difference, and the way that they allow for distinctions to appear in the group, allowed for a rapid way of reducing the number of options that were being explored. The main criterion for any instrument or sound-making method was firstly that it should address the relationships among people. No matter how fascinating or engaging the process appeared in its own right, it would only be explored further if it was helping to articulate the relationships among people.

3.4.2 Precursors and preparatory work for the first Mary Ward Classes

Before beginning the first project with the Mary Ward class, I explored a variety of other group-instruments with a particular focus on those that achieved a balance of complexity between individual, interpersonal and group identities. Insight came from the comparison of two in particular, Soundnet and Daisyphone.

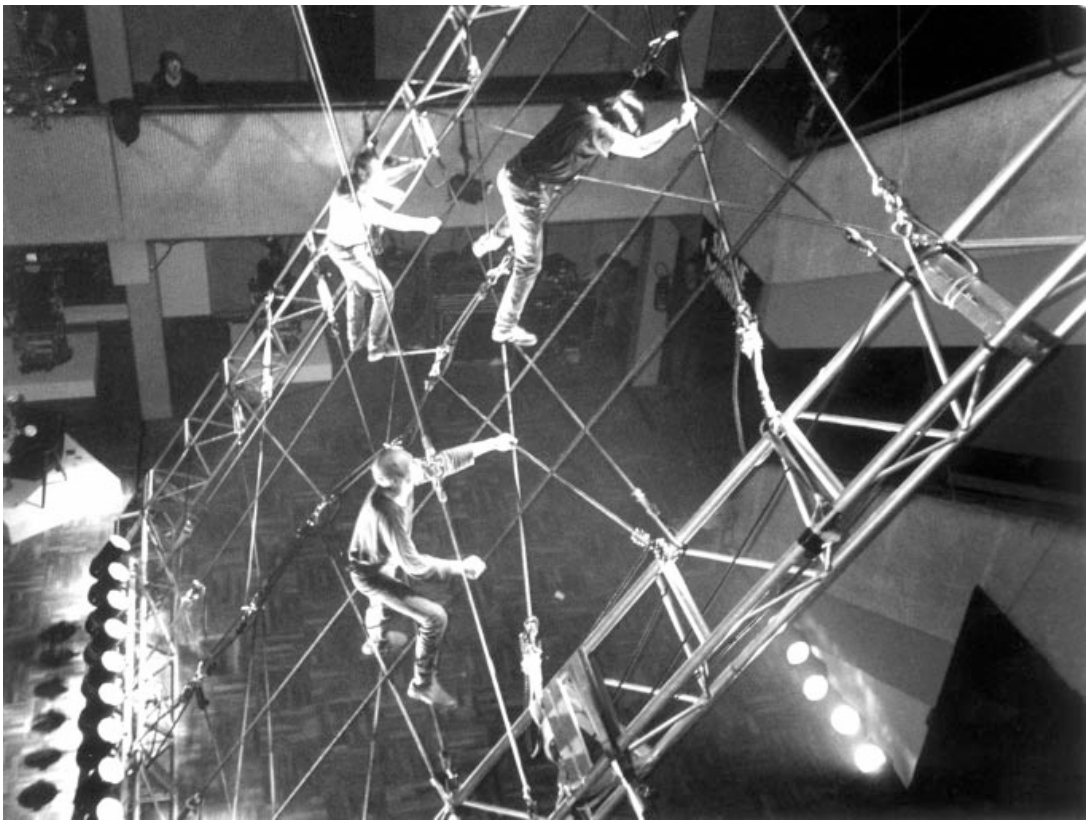

Figure 1 Soundnet

Soundnet is an instrument performed by members of the group Sensorband: Edwin van der Heide, Zbigniew Karkowski, and Atau Tanaka.[21] It is a monumental architectural object consisting of a physical network of ropes fixed together by interdependent connections. The performers move through the net using extreme climbing techniques and body gestures that affect the tensions on the ropes. However, no individual performer has exclusive control of the tension sensors attached to the ends of the ropes, and the sounds produced are always a consequence of unpredictable semi-collective activity.

The sonic aspect of the performance emerges from a position somewhere between individual and collective control, and this is emphasised by the use of sounds which avoid individual instrumental connotations, combining recordings of natural sources with DSP processing such as filtering, convolution and waveshaping.

[21] Formed in 1993, the group disbanded in 2003. The group of three musicians joined together to explore ensemble performance and developed a variety of instruments which map the body to sound, such as the Midiconductor, which measures the rotational position and relative distance of the hands, and the Biomuse, which tracks neural signals (EMG) to create sonic data. (Tanaka 2004)

Bongers describes the resulting effect in the following way:

> Sensorband has chosen to work with digital recordings of natural sounds. Natural, organic elements are thus put in direct confrontation with technology. The physical nature of movement meeting the virtual nature of the signal processing creates a dynamic situation that directly addresses sound as the fundamental musical material. Through gesture and pure exertion, the performers sculpt raw samples to create sonorities emanating from the huge net. (Bongers 1998)

There is an important element of showmanship to the performance and in these statements, which hold out the promise of a raw, cheek-to-cheek contact between elementary materials. However, one can experience a contrasting effect, one of diminution, in which the physical scale of the installation and the monumental effort and wide suggestive scope of the sounds in fact highlight the lack of complexity in the relationships among the performers. Each performer is constrained in his ability to articulate a unique position in the net by the presence of other performers, and group interaction is given only limited potential for development.

A contrasting approach is taken by Nick Bryan-Kinns in the Daisyphone (Bryan-Kinns 2004) which is an experiment in the creation of a single web-based instrument designed to support group improvisation.

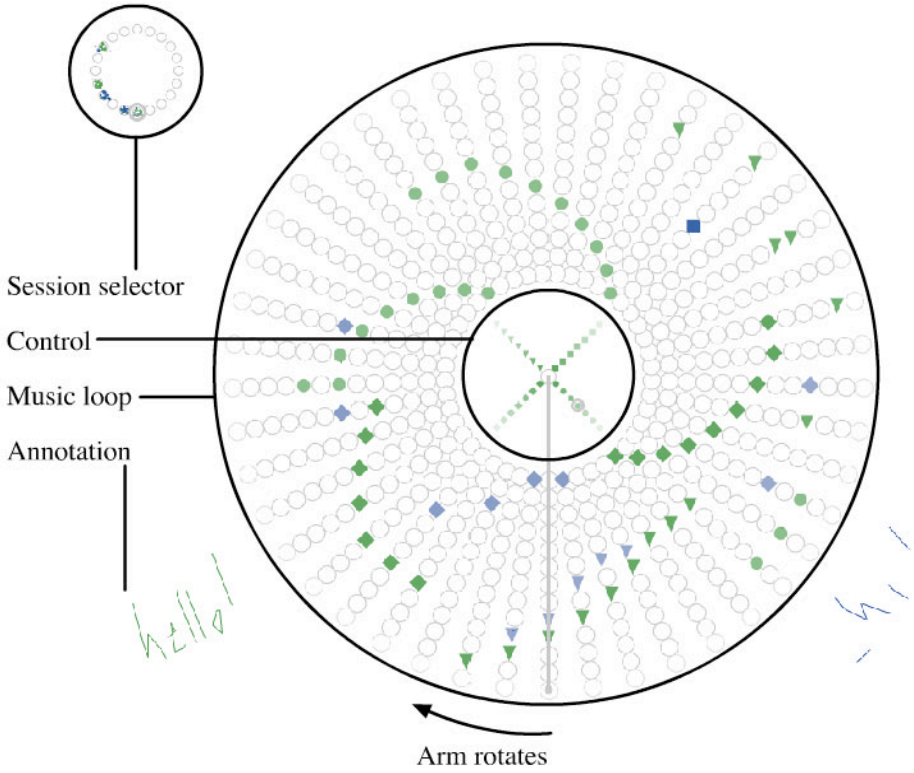

Figure 2 Daisyphone user interface

The daisy represents both the instrument and the shared mutual environment. Performers create sounds by filling the head of the daisy with symbols, and an arm sweeps round the daisy activating the sounds in a continuous cycle.

Bryan-Kinns identifies four features of human interaction which make collaboration more efficient and free flowing (Bryan-Kinns 2004). These consist of identity (which establishes who is present in the space), mutual awareness of actions (how the actions of each contributor can be identified), mutual modifiability (each person can modify the contributions of others), and localisation (the ability to reference parts of the joint product).

Soundnet and Daisyphone environments treat the exposure of the individual to others in the group in different ways, with the overall form of the instrument playing a crucial part in providing the context in which these relationships can be articulated. Thus, Soundnet indicates a tension between the individual as potent, muscular, physical presence, and the dwarfing and erosion of individual identity by the uncontrollable sounds emanating from the instrument.

In contrast, the Daisyphone suggests a bucolic space in which limited physical exposure is compensated for by the fullness of its collaborative environment. I was struck by the attempt in Daisyphone to place a high value on

mutual engagement, and to make any other complexity subservient to this. This can be seen not as a loss of complexity, but as a gain in terms of diversity. There is the possibility of relatively rich individual action, but there is also the multiple interaction between individuals, which can be mutually enhancing.

The culture represented by each instrument includes all the associations and metaphors set in motion by its presence, including the way that it looks and feels, and the relations of this to the specific interpersonal and individual sound-making actions that it enabled.

Making each of the instruments involved decisions about many contentious details which required resolution or a conscious decision. Examples include the way that microphones and loudspeakers are placed in performance (connected to individual performers or in a more communal position), the role of improvisation or composition in the work, the degree of constraint or control that one player can place on the actions of another, the sound types and sources that would be used (synthesized, location recording, instrumental…).

3.4.3 Moving between hierarchies in the emerging prototypes

I had in mind the large differences between these two group instrumental environments when I began my own explorations with the Mary Ward group, and was aware of the potential need for rapid reshaping of the inner connections and overall ethos of the instrument. The decision that, above all, the instrument should enable mutual engagement between the performers imposed limits and began to create a network of hierarchies through which other, finer details could be viewed. The plural, "hierarchies", is used deliberately, as there were many different interpretative orders that could be brought to bear and there needed to be speedy ways of initiating movement between one perspective and another.

A crucial factor in maintaining the mobility of the hierarchical structures was through computer programs. My approach to software design builds on the relationship between signal networks and hierarchical text-structures and is discussed, with examples, in appendix 1. The main point is that the programs allow for the rapid evolution of different groups of connections between elements in a signal network, and they do this through the use of a name-space[22]. Thus the flexibility of text-based, semiotic principles of reference is combined with the physical infrastructure of a signal network. The flexibility and rapidity with which

[22] A namespace is a directory like structure in which logically related identifiers can be grouped together. It is a central aspect of the Open Sound Control protocol, which I use to organise and create networks between different areas of the software. (Schmeder 2008)

new interconnections could be prototyped, allowing new sonifying potentials to be drawn from any physical, sensor-enabled device, was essential throughout the work. It was significant in the first Mary Ward classes because it allowed the simplest physical materials, such as string and paper, to be used in complex different ways to explore mutual engagement in sound-making.

3.4.4 The first instrument

My work at the Mary Ward centre consisted of a six-week course. The plan was to build an initial group-instrument with the sole intention of understanding its limitations and gaining critical feedback. From this a second, more evolved instrument would be created.

The first instrument was deliberately simple and was designed to be played by four people. It consisted of 4 pieces of string, one USB joystick, a selection of easily modifiable ways of mapping the actions to sounds diffused over four loudspeakers. The four pieces of string were tied to the joystick and each performer could pull on it to change its position.

The first six hour session provided valuable insights:

1. A 'whole' sound consists of a unification of many elements, which can be arbitrarily parameterised. There was a need to find a way of allying a 'whole person' with a 'whole sound', and not with an arbitrary parameterisation of a sound. In one instance we had divided the joystick into separate axes, one representing pitch, and another volume. However, the distribution of these different parameters among people led to difficulty in identifying the author of the resulting sounds, and mutual awareness of actions was reduced.

2. The sharing of a single joystick among four people (each controlling part of the axis) also created a co-dependency which was hard to negotiate. For example, two people pulling in opposite directions on the same axis would cancel each other out, or, on independent axes, one group keeping an amplitude at 0 could prevent anyone else from hearing his output.

We felt that the sense of 'group' should not be at the expense of individual action and that there was a need to have autonomy as well as a group reflection of synchrony or difference. A simple example of a system giving more freedom used two joysticks, one for each performer. Each performer could move the joystick freely, but an additional stream of comparative data was generated showing how similar the movements were to each other i.e. how coordinated or identical in terms of direction and speed.

3. The most important insight was that the notion of 'instrument' and 'individual' seemed to be fused, and that this created problems in sharing an instrument. When thinking about a group instrument a visual/spatial metaphor suggested itself as more appropriate. With a visual field the whole space can represent the whole group, but it is also a space that can be variously subdivided: it can be segmented and interpreted to allow individual representation and interaction in a very fluid and non-intrusive way.

Soundnet (discussed above) was an example of deliberate sonic co-dependency combined with a high level of individual physical exposure. The Daisyphone, on the other hand, was a joint space which allowed considerable individual sonic freedom, but where the bodies of the performers were reduced, virtual entities. For the second phase of the Mary Ward project I wished to create an instrument which combined clear physical presence of one performer to another, whilst also allowing a clear sense of authorship and of individual localisation within a group artefact.

I decided that the group instrument would be designed as a simple surface, such as a table, monitored by a camera, and digitised for analysis. Any changes within the space, created by the bodies or actions of the performers, could be mapped in the software to control the sounds produced. The communal visual field thus creates a metaphoric and practical connection with the electroacoustic field, in which the presence of performers or of individual striated or segmented sonic hierarchies can be variably manifested.

Having arrived at this image of the instrument as a visual field which the performers occupy I read Jolanda Harris's description of her work with video cameras. The article, *inside/out instrument* (Harris 2006), describes the distributed nature of a new visual instrumental space, using the word 'exocentric' to highlight its difference compared with traditional instrumental contact.

> In an exocentric idea of the body/instrument relationship, the instrument is diffused, away from the body but surrounding it and in constant interaction with it. This is conceptually a very different position from the exoskeleton, where the technology meets the body at the skin, sometimes even below the skin, but keeping the body in the focal point. The distributed character of developing technologies, primarily due to their miniaturization, wireless portability and the network infrastructures that have allowed the computer itself to be de- centralized, is directly reflected in the exocentric work. (Harris 2006)

My own preoccupation differed from Harris's in that I was primarily

concerned with the ways in which performers could entrain with each other inside a collective space, but the sense of a distributed visual space which reverses the musician-instrument focus was very similar.

These thoughts led to the construction of the second environment.

3.4.5 The first Ouija board

The performers sit round a table, and can see each other. A camera is suspended above the table, and relays an image of the surface of the table to a computer for analysis. Hand movements trigger and control the sound, whilst four loudspeakers, one at each corner of the table (sometimes extended out to the corners of the performance space), create a localised stereo image behind each performer.

Figure 3 The First Ouija board in use

The instrument allowed connections to be made between the gestural, sonic and social space, all three acting together in a cohesive way. From a sonic point of view a structured repertoire of sampled sounds was available to each performer, consisting of a five pairs of sounds, each pair of sounds representing a simple opposition (short long, loud soft). In addition, the five pairs were linked in a continuum, thus representing a more gradual set of changes.

Setting up the points on the table

This abstract sonic structure was made available to the performer by creating a mapping in the space on the surface of the table.

1. In front of each player 5 points were marked, forming a triangle.
2. These points were coded into the computer so that changes of colour that occurred at those points could be used to send messages inside the computer system.
3. The system was set up to recognise two kinds of colour, a blue one (from a vivid piece of paper) and a hand colour.
4. In order to choose which pair of sounds to make available the performer held a green piece of paper over one of the 5 points. The player then put the green paper away and could use his own hands to trigger the samples in the pair.

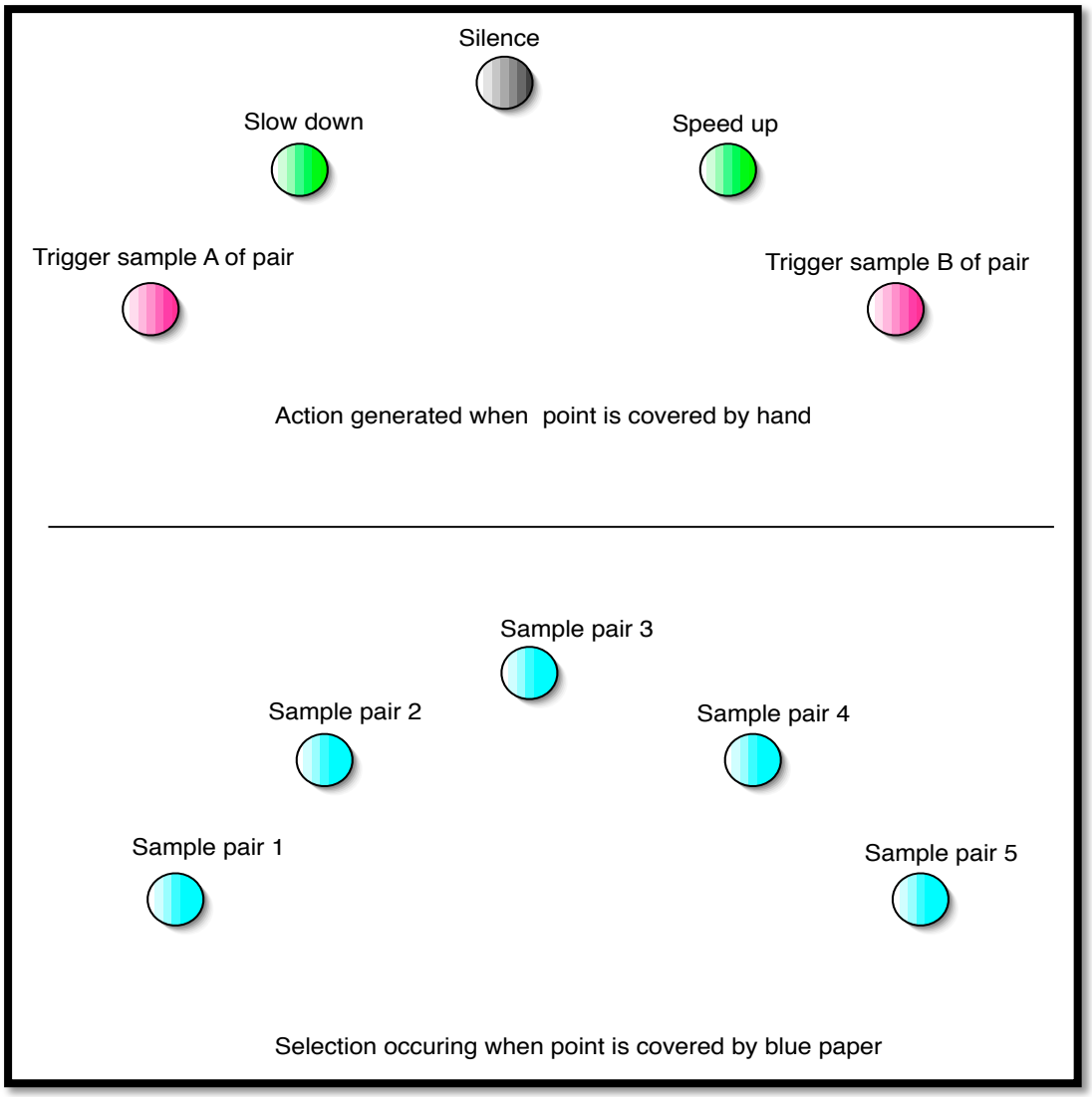

Figure 4 The Ouija points of an individual performer: a detailed view of the two functions of the points in front of each player.

Performing

From the gestural point of view, the binary pair could be triggered together or apart, with the right hand triggering one sound and the left hand the other. For the whole group round the table, right-handed gestures were linked to one sonic extreme and left-handed to another, and this created an easy gestural repertoire around which communicative situations could evolve. The use of the central silence point could be part of an elaborate display of approach. Part of the advantage was that the arm gesture could be seen approaching the moment of triggering, and this approach, through delay, acceleration, and postponement, created the kinds of gradations in expectation which enrich the communicative experience (Stern 1977)

Individual performers had a repertoire of movements which were easy to follow, mimic or contrast by other Ouija players: for example the emphasis of left- and right-handedness, the movements from edge to centre (triggering to silence), and the amount of time dwelling on pitch shifting. The social and sonic significance of 'invading' another's territory was a source of some amusement. Since the points all looked the same and had the same layout the idea of moving your hand over someone's else's spots did not carry the same connotations as picking up someone's instrument, particularly since this incursion did not prevent continued access.

Performances consisted of two sections linked together—the first section involved the creation of original sounds from acoustic sources (assorted percussion instruments, voice, objects in the room, Instruments brought in specially, Piano) which were recorded and split into separate samples according to the syntagmatic and binary pairings chosen by the group in advance.[23]

The second section consisted of the performance of these sounds on the Ouija board. There was a certain pleasure in seeing how the initial linear performance, with the sounds created and performed in sequence one after the other, was reoriented into the gestural and temporal space of the Ouija board. All sounds could be played together and all players could play together.

For a fuller sense of the qualities of these performances I refer the reader to the set of videos on disc 6, examples 5 to 8.

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[23] I had set up a simple system of paired sounds, which allowed a movement through a continuum as well as having opposite pairs.
Each group had the task of constructing a table like the one below before each performance. They would use it to generate the series of sounds which were recorded in the first part of each performance.

An example would be

1. Low pitch	a **Short** - Spoken word	b **Long** - Spoken word
2. Mid-low pitch	a **Short** - single note	b **Long** - single note
3. Medium pith	a **Short** - Close Note cluster	b **Long** - Close note cluster
4. Medium-high pitch	a **Short** - Wide chord	b **Long** - Wide chord
5. High pitch	a **Short** - 9th chord	b **Long** - 9th chord

3.4.6 Reflections on the first Ouija board

Judged in the light of the long-term development of the project, this early version of the Ouija board provided breakthroughs on several levels. I would like to focus on a selection of these, and relate the work with the Mary Ward group to the work with the Ecosonic group.

In the Ecosonic exercises discussed in 3.3.2, Ambient and Outsider, the sonic 'other' took two particular forms, the first being that of an external sounding environment and the second that of a musician playing the role of outsider. There is a clear difference between the two: the outside environmental sound does not respond to you, whilst the outside musician clearly could. To put it another way, the process of entrainment and assimilation taking place among the musicians inside the group could extend to include an outside musician, but not the whole environment.

Electroacoustically-generated sound treads a curious intermediate path between these two genres of 'other'. The sounds can be environmental in the sense that they are generated with no reference to the entrainment of musicians, but they can also be nuanced and steered so as to have a more reciprocal engagement with the inner politics of the group. The diversity of constructs into which electroacoustically-generated sound can be placed is a virtue to be maintained, but is hard to encapsulate in an instrumental form. This is because in crossing between individual instrumental sound and environmental sound there is an ambiguity about the relationship of instruments to human bodies, and sounds to resonating space.

I particularly wished to maintain a sense in which the 'other' of electroacoustically-generated sound could be the product of one, several or no people. The evolution of the 'Ouija board' instrument, whose existence provided both the group environment and the location for individual action, was a breakthrough since it opened up a way of linking the performance of sound, through the exposure of one person to another, with its manifestation as an electroacoustic other.

Despite the satisfaction of this initial development, the nature of the Ouija as it stood had limitations and problems. Some of these were technological or aesthetic and some were more deeply rooted. In the technological category I would highlight the absence of any direct means by which performers could

introduce smooth dynamic contours into the production of sound[24], which limited the ability of the performers to entrain with each other. As Stern observed (1977), subtle temporal dynamics are an important part of the flow of reciprocal interaction.

From a visual point of view it should be noted that the instrument looked rather like a card table and made it seem as if the players were playing a game of bridge or poker more than an instrument. As discussed in the analysis of the Soundnet and Daisyphone, the complete range of metaphors or associations brought about by the instrument/environment were an important part of its meaning, and I was keen to unchain a different set of metaphors for the Ouija instrument.

3.4.7 Linking the Ecosonic and Mary Ward groups

A deeper critique of the instrument, similar in nature to the criticism of Ecosonic exercises, was that the reductive strategy guiding its creation was itself the source of limitations. The motivating idea that entrainment among musicians could account for the full experience of a musical situation was brought into question. In both the Ecosonic group and the Mary Ward group the objective had been to expand the range of what could be included in the entrained relationships. My understanding of the Ecosonic group was that the 'other' of an outside musician or of an external environment could be appropriated to broaden entrainment, whilst the idea with the Mary Ward group was that the otherness of electroacoustic sound could be brought into group performance.

However, both these constructs underestimate the extent to which musical experience refers to 'others' who are beyond entrainment or encapsulation. The community which may exist within a group is under constant fabrication and, as discussed in section two, the otherness of electroacoustic sound is not that of a single autonomous entity.

The three years following the initial work with the Mary Ward and Ecosonic groups were devoted to a further understanding of these 'others' which resist incorporation. The principal approach was through joint work and performances with the 'Ecosonic Ensemble + Ouija', which brought the otherness of the opposing group into a working proximity.

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[24] I had thought about ways of introducing something like a pressure sensor or sliding scale, but in for the first instrument I did not find an efficient and intuitive way of introducing it. The use of samples as a means of generating sound was partly a response to this, as they contain their own pre-defined contours and do not have an immediate requirement for extra shaping.

The Ouija board group had an odd place inside the wider group, sometimes feeling like a separate group and sometimes like a supplement extending the work of the instrumentalists. The ambiguity of the name reflected this: the Ouija board may include the musicians who were playing it, or the Ecosonic group could consist of all musicians and simply refer to the Ouija as another additional instrument. The research was accompanied by changes in the conception of the Ouija board and of our notions of being together, and this was reflected eventually in a change of name; from 'Ecosonic Ensemble + Ouija' to the Automatic Writing Circle

Chapter 3.5 Middle period – principal events. Negative instruments

The idea that the Ouija board should be an autonomous group electroacoustic instrument able to perform by itself was altered by its continued presence amongst the acoustic instruments of the Ecosonic ensemble. It became more productive to think of its definition as being constructed through a process of exchange with the resonating bodies of instruments in an actual acoustic space, as well as by the diffused, mediatised performing presence originally indicated by the Ouija board.

Paradoxically, the presence of the two types of performer in the same space allowed them to release each other, as they no longer needed to attempt to include in themselves that which could be represented by the other. Thus the Ouija board players could relinquish the tactile detail associated with acoustic instruments, whilst the presence of the Ouija board allowed the instrumentalists to abandon direct access to the diffuse otherness of environmental sound[25]. As each group began to appreciate the space that was being relinquished, they also began to create a gap which invited occupation by the other- something which creates the possibilities of difference, and a more evolved politics.

It took several years of further work to establish an understanding of the space offered by each type of performer to the other. A key moment came after two years of research and performance, and consisted of a major change in the way that the Ouija board worked, and in its relationship to the acoustic musicians.

In the initial stages of creating the Ouija instrument I had been influenced in a subliminal way by notions of traditional instrumental contact, which occurs through tactile, bodily pressure between performer and instrument, powered by

25 I use the word "environmental" to refer to the sonic environment as found in location recordings, which may or may not be made up of the interactions of individual musicians.

breath or movement. The other side of this contact, the hollowness of the instrument, the empty space of the auditorium, or the counterbalancing forces inside the performers body, are less visible. I had carried this analogy through in my initial approach to the electronic instrument, unconsciously presuming that it was through some transposition of direct contact that the performers would engage with the sound. Even though I was using a camera and its electronically reproduced visual field, the detection of the performer's hands was the central focus. For the performers this meant that they would be aware of their hands as the icons of instrumental action.

As indicated earlier, I had been struggling to find an intuitive way of allowing the performers to scale their gestures and create dynamic contours in the sounds. I had also wished to bring a different set of associations, not linked to card tables, to the overall appearance of the Ouija.

The moment of serendipity came when, during a rehearsal in which there was a portable theatrical spotlight, I realised that the existing relationship between camera, light and body could be changed. Rather than the camera focusing on the illuminated hand itself, it could focus on the shadow cast by the hand. The focus of the performer is then split between the image of the hand as it appears before him, connected to the body, and the shadow of the hand as it appears on the sheet. Through this one extra step of indirection, a set of oppositions was set in motion which would have extended consequences.

Figure 5 The Latest Ouija board showing the shadows of the performer's hands.

Like a guiding metaphor, but in a physical rather than a verbal sense, its interpretation remains open-ended. This is particularly so as the central image is one of displacement: the shadow image of the performer both represents the self and creates a distance from it. Bateson's description of schizophrenia as a condition in which communication takes on the quality of an ungrounded metaphor is useful here. The physical metaphor of the Ouija board does not give rise to a finished context, but opens out a situation in which fusion and separation are both possible. For example, by touching your hand on the sheet the shadow and body are fused, whilst by putting your hand over the light, the whole area, including your body, is put in darkness. Thus the scaling of the shadow moves from a one-to-one relationship with its cause, to a position in which it is able to obscure not only its cause but everything else around it.

In the image of the hand and its shadow I had found a physical metaphor for schizophonia, a coherent and usable image of disjunction. However, since any such image is bound to split itself, exceed itself, or break its own boundaries, the object engenders numerous new interpretative contexts. In what follows I introduce some of the ways in which the physical metaphors expanded to encompass wider territory.

3.5.1 Extending the Shadow metaphor

- Body posture

  The posture adopted in order to play the instrument involves standing with the arms held out in front of the body. This is a primary position adopted in the standing meditation practice of qigong (chi kung), designed to develop the flow and discipline of internal energies. Unlike traditional physical instruments in which the body receives haptic feedback from the instrument, the Ouija player is focussed on proprioceptive relationships between different parts of the body. Slight movements of the hand result in internal changes of balance and this is as much a focus than any external measure of movement.

- Anticipatory touch

  Although haptic feedback (the contact between body and physical instrument) has been removed, the link between touch and sound remains in an imaginative sense. This can be seen as an advantage, as the haptic feedback from a hardware controller is often at odds with the qualities of the sounds being produced electronically.
  Faders, joysticks, mice or other touchable control surfaces contradict the sensory qualities invoked by sounds produced from loudspeakers. For example, the sound of water, rain, wind, or other environmental sources would be countered by the actual sensation provided by a controller. The process of imagined contact suggested by the shadow, linked to the proprioceptive relationships in the performers body, allows a freer interpretative link between body and sound.

- Linking vision and hearing

  Postmodern theory points to differences between an ocular regime and an audio one. In an ocular regime the observer is outside the frame looking in, introducing notions of control, surveillance and domination (Foucault 1975). This contrasts with an audio regime, which contains the listener inside the context—the multiple reflections of sound in the acoustic space illustrating the reflexive feedback between source and reflection, placing the observer in the context (LaBelle 2006 : 14).
  The image of self as a shadow in the communal space of the Ouija board acts as a bridge between these two modes of perception: by presenting a shadow image of the observer in the external space under

observation, positioning the subject inside the context, an analogy of sound's reflection is brought into the visual domain, and the visual externality of the observer is rendered less absolute.

Trope 1: Ouija as instrument of enlightenment.

The Ouija board, having no pre-determined sonic identity, appears to offer itself as an empty space categorically different from the historically and culturally-determined usages of the other instruments in the group (the Baroque flute, the middle Eastern Ney and Daf, and the cello). However, this very sense of the instrument as a tabula rasa, able to offer equal and democratic access, is representative of a particularly Western principle.

Examples of the principal in music can be seen in the spread of an equal-tempered tuning system, in the adoption of an increasingly standardised concert pitch between orchestras, in the developing role of notation (with its implication of a neutral layer), in the claims made for the piano as a universal instrument (able to 'sing', as well as replicate orchestral parts) and in the development of the generalised sound-making capacities of the electronic studio.

In responding to the cultural undercurrents revealed by this list the Ouija has a particular place. It can be seen as further example of the ideals of generality and equality, and also as a deliberate critique. The 'blank' space of the sheet, bereft of inner detail, can be seen as an area ready to be colonised by structures. But the sheet also summons up images of a hospital sheet, or a shroud. The original sheet was from a bed, and the latest is made by a theatrical costumier with links to the undertaking profession. There is thus a reference to an impure or already tainted past.

In addition to the questions hanging over the purity of the surface, there is a question over the performers themselves. Human presence is projected onto the surface of this sheet by casting shadows, not by direct touch—preserving a distance from the ideal upon which we are unable to make a permanent mark. The only way that the performer can act on the sheet is by blocking the flow of light, and the body is used to create that blockage. This links the body, in its opacity and intractability, to images of impurity and darkness: sometimes the light cannot shine into the darker recesses of private experience, and sometimes the spotlight of publicity illuminates prurient detail. Thus, the blank space of the instrument, illuminated from above, creates performers who are present by virtue of their obscurity.

Adorno examines the complex dialectic within Enlightenment between the

banished world of shadows and the publicly illuminated surface:

> In the enlightened world, mythology has entered into the profane. In its blank purity, the reality which has been cleansed of demons and their conceptual descendants assumes the numinous character which the ancient world attributed to demons. (Adorno 1997: 28)

This passage points out the troubling re-inscription of myth and sacrifice into an enlightenment rationality avowedly dedicated to its banishment. A self-reflexive spiral is described, in which the character of a previous avoidance becomes inscribed in the system at an even higher level—and excludes stabilising self-reflection or outer references.

However, unlike the solipsistic feedback described by Adorno, the Ouija board operates by the exposure of its schizophonic metaphor—and thus opens up the possibility of redemptive reflection and critique. Its usage thus represents both an image of an ideal and a reference to the undercurrents of that ideal. It is both an instrument of enlightenment, and the undoing of it. In this sense the Ouija board has a direct connection with the figure of the spectre in Derrida's hauntology (Derrida 1994), in which the spectre represents an impossible blending of exteriority and interiority, incapable of assimilation yet always present on the borders – it becomes a vehicle for deconstructing philosophical categories.

Figure 6 A photo showing the Ouija players Kirsten Edwards and Peter Coyte

3.5.2 An instrument for reframing sound relationships

The metaphors instantiated by the Ouija board enabled a new thinking about the workings of the group. The initial manifestation of this was in changes to the sonic relationships between the Ouija players and the instrumental players.

The set of performances that took place after the initial Mary Ward class (see Trinity, Bath, City video and scores –appendices 4 and 5) were designed as a series of improvisations in carefully ordered sections, each linked to the next in a pre-determined way. There was detailed preparation of the environment for each section, included the writing of specific software, the composition of electroacoustic material (some performances had 30 separate small pieces created for them), and the rehearsal of specific forms of entrainment between the performers.

However, amongst these more pre-meditated structures was one which differed significantly, being less specific in the kind of interaction that it specified. In it, a single Ouija player and a single acoustic instrumentalist performed a 'duet'. The essence of the new duet section was that, rather then thinking of the Ouija and the acoustic instruments as equivalent, each producing sound directly (with the Ouija functioning like an electric guitar or midi piano) the Ouija was instead considered to act by reframing the sound of others. It could still be played in a manner akin to an individual 'instrument', but its identity had become caught up in the notion that it was remediating sounds rather than being the cause of them.

Figure 6 Ouija Players Kirsten Edwards and Peter Coyte with the author in the foreground.

In the performance at the Union Chapel on the 16th December 2007 there were two separate sections in which an acoustic performer and Ouija player played in a duet. One of these was between Stephen Preston, Baroque Flute, and Peter Coyte, Ouija board (see video on disc 6, example 12). Rather than maintain a focus imposed by the use of a specific exercise, such as the ambient or outsider, the objective was to explore the ways in which feedback between the musicians could evolve using the simple displacements offered by the Ouija player

The following three types of mapping were available to the Ouija board player:

1. Delay lines. Two microphones were placed at different positions on the flute, one near the lips and the other near the fingers. The amplitude of each delay line was controlled by the Ouija player.
2. The Ouija player could diffuse a scalable noise source, choosing between pink, white or recordings of distant rushing water.
3. The Ouija player could diffuse a scalable set of recordings from earlier performances.

Both players could break out of co-dependent sound production, the Ouija player by using source sounds not originated by the flute player, and the flute player by making sounds away from the microphone, directly into the ambient acoustic. However, in the improvisation both players spent more time exploring the landscape of direct interchange.

In this context a wide variety of feedbacks and reciprocal gestures became possible. The Ouija player could reinforce one aspect of the flautists playing and ignore another,[26] and the flautist could respond or counter this focus by extending or breaking the boundaries of the reciprocal interaction[27]. This allowed multiple dialogues to appear, in which one player would offer material to the other whilst simultaneously developing other avenues.

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[26] This could be achieved by amplifying the delay line from the microphone close to the flautist's fingers and or the one close to their lips, or by amplifying delay lines only when the flautist made particular sounds (such as percussive sounds or sustained sounds). The Ouija player could introduce pre-recorded or noise based sounds, which, because of their internal morphology or because of morphologies introduced by the Ouija player's gestures, could supplement or create a counterpoint to the flautist.

[27] The options included making polyphonic sounds, singing or speaking while playing, speeding up or slowing down of the pace of interaction, creating new micro-gestures supplementing or disrupting the joint material.

Unlike the exercise-based improvisations which defined the work with two acoustic instrumentalists, the Union Chapel duets made certain category distinctions more fluid. A particular feature was that a shared construction, loosely connected to the 'flautist identity', was able to float, schizophonically untethered from the actual flautist. This 'other' sonic identity came both from the displacing activities of the shadow Ouija player, and from the exploration by the flautist of the sonic dislocations offered by the Ouija player.

I save a fuller analysis of the changes in perspective to the next chapter, which describes the situation in the group after the expansion of the Ouija metaphor into a much wider territory.

3.5.3 Summary

The principal change in the way that the Ecosonic and Ouija groups collaborated can be summarised as follows. Individual acoustic instruments were no longer the sole face through which one performer could be exposed to another. The collaborative deconstruction and exposure of instrumental identity itself, using the shadow metaphors of the Ouija board, provided an additional arena in which we could embody our ways of being together.

There was no merging or blurring of the identities of individuals in the group, or loss of the specific potentials of the different instruments. Rather, we became aware of an additional set of differences and relations between performers, and the range of sonic relationships and hierarchies within which we could construct ourselves became more diverse.

The specificity of physical acoustic instruments, in terms of timbre, spatial position and one-to-one contact with the performer, permits the linking of an instrument with a performer. Electronic sound has no specific identity of its own, and the Ouija instrument makes a virtue of this, exposing the lack of physical substance in the instrument by reducing it to a sheet and shadows, and by allowing the projection of other identities on its surface. The relation of the specific face of acoustic instrumental identity and the shadow projection of identity in the Ouija board is like the relation between a positive and a negative photographic image. The tactile quality of traditional acoustic instruments is in contrast to this remote, shadowy form of engagement. It is a negative instrument, between two worlds, casting a human shadow on the acousmatic curtain.

3.6 Final performances.

3.6.1 Seven further changes

The process of change set in motion by the new relationship between Instrumental group and Ouija board group took many further steps over the course of the following two years, and resulted in radical changes in the nature of the performances which took place in Vienna and Helsinki in 2009.

In this final chapter I will first outline the principal areas of change, and then provide a more detailed examination of a performance that took place in Helsinki.

Changes leading up to the performances included those in the following 7 areas:

1. An increased awareness of the function of dialogue in the group.

The group often engaged in discussion about the success or failure of different aspects of our work, and at a meta-level, we also discussed the relationship between our verbal discourse and the sound-making itself, seeking to unpick the ways in which they might influence each other.

The stakes were raised in this area, with consequent useful changes, through our collaboration with the ethnomusicologist Taina Riikonen who began a period of study of our group in March 2009. As an ethnomusicologist, defined by her profession as a producer of text, Taina was positioned as an outsider to our sound making, whilst being an inside participant in our discussions and writing. She thus represented a powerful extension of the peripheral position that had been so important in the previous work of the group. The position involved a balance between her role as an embodied researcher, creating knowledge through her work with the group, and her simultaneous role as a producer of text, something that indicates a separation from the embodied processes it was describing.

One of the first revelations of the complexity of our interrelationship came at a public seminar at LCC on March 25th 2009 (see transcript in data portion of Disc 6). The seminar, which also constituted our first formal encounter, highlighted issues which had been obscured in our private inside-group discussion.

The first of these was that our conversations were themselves a genre of performance. The category distinctions which occurred within the group, allowing sound-making to be labelled 'performance', whilst conversation is treated as a 'non-performance' adjunct to this, dissolved in the public conversation of the seminar. Language was used not simply as a static or external framing mechanism but in a way that was deeply implicated in our negotiations of authority with each

other. We were clearly performing political functions, as well as more apparently abstract ones. In listening back to the flow of the discussions, it was found that our breaks, hesitations, denials or moments of mutual support had an uncanny resemblance to our sonic performances. For the group, the exposure of our internal material to public scrutiny risked breeching codes of privacy or tact, but also opened the way for an engagement with multiple spheres of discourse, not limited to sound making alone.

An exploration of the relationship between ethnomusicology as performance and the performances of the group itself are beyond the scope of this dissertation, but will be explored in joint texts being written by Taina Riikonen and members of the AWC, linking to work developed by theorists such as Della Pollock (1998) and Victor Turner (1988).

2. We abandoned exercises, the definition of sections and any pre-planned orders in the improvisations.

We were subsequently able to abandon the use of exercises as an external frame for our work. There was no longer a set way of bringing about a solo, duet, instrumental, instrumental/ouija combination, or any pre-planned ordering of software programs to be used by the Ouija players. Rather, all material and combinations were to be available at all times, with the considerable likelihood that certain rich combinations would not arise in a given performance.

Our decision to abandon pre-planned orderings had several causes:

- We now had the confidence and techniques to release ourselves from the safety of an established framework and explore the flexibility of an unplanned environment.
- The realisation of the political nature of our linguistic framing created an additional incentive. We let go of the strategic separation between verbally framed exercises and the exploration of mutual sound-making, and this helped us to adopt a more flexible approach to the structuring of the performance.
- During a performance at Café OTO in October 2008 one of the noise generators on the Ouija board failed to terminate properly, and the rest of the performance was accompanied by loud white noise, as well as by a loud earth loop hum from the loudspeakers which had not been there in rehearsal. The collapse of our pre-planned sequence (the white noise was supposed to die away leaving the possibility of listening to

the ambient acoustics and creating material from that) left us stranded, and more to the point, our commitment to a pre-planned structure left us unable to explore what could potentially have been an interesting dilemma (working around the thresholds of the white noise for a long duration).

3. A Ouija supplement.

As a consequence of the removal of the pre-planed order of software settings, the Ouija instrument needed some physical adaptations and further adjustments to the software. The physical supplement consisted of a touchable control surface (the Lemur), hidden from the audience but visible and touchable by the Ouija performers. This control surface introduced a further level of representation to the instrument, and was programmed to show all the configurations potentially available to the Ouija as well as to reflect aspects of the system's current state (Disc 6 Example). By touching different elements on the Lemur, the individual processes that made up a Ouija setting could be changed.

Whilst the intensities of expression remained with the main Ouija instrument, (the dynamics of gesture over a space, each containing a selection of different interconnections) the synchronic view of the complete range of options could be placed into this 'supplementary' instrument, and no longer needed to be kept as a pre-planned diachronic sequence which controlled the changes to the Ouija board.

From the software point of view, this also entailed a re-making of the representational hierarchy. Rather than being centred on sound-making processes, to which Ouija shadow points would be attached, the Ouija shadow points became the focus, and these could be attached to any particular process (Discussed further in Appendix 1).

4. Two new Ouija sound-making processes were introduced

These consisted of sine tone extraction, a form of analysis-resynthesis which rendered as a group of 16 sine tones the partials of any live sound selected by the Ouija player, and a new and more flexible way of selecting Location Recordings. (see Appendix 1 for further details)

5. Seth Ayyez joined the group, and we began a collaboration with Taina Riikonen.

Both these new people brought further power to 'outside' positions. This was not only by virtue of their newness, but also because of their previous grounding in practices related to other forms of improvisation. Seth has been a member of several noise music and free improvisation groups, whilst Taina has worked as an independent ethnomusicologist, particularly examining issues concerned with embodiment and live electronics

6. The change of Name, from the Ecosonic Ensemble, to the Automatic Writing Circle.

A mark of the coming together of the Ecosonic group and the Ouija board players was in a new name , the 'Automatic Writing Circle'. The name mixes various metaphors – circle in the name represents an aspiration towards community, and to the circle of light which surrounds the performers of the Ouija board, whilst Automatic Writing refers, amongst other things, to the way in which 'outside' voices influence us during performance, as well as to the different kinds of writing that occur in the group (writing software, recording sounds, discussing our work…). The name brings into being something which is on the edge of what is possible. The name marked a turning point in the work of the group, encapsulating a change we had been struggling with for several years.

7. Change in relation between rehearsal and performance.

We no longer thought of our preparations for performance as exercises or rehearsals but as performances in themselves: the presence of an audience was not the fundamental criterion distinguishing a 'rehearsal' from a 'performance'. The difficulty of finding a name for our meetings led to a variety of labels being used including rehearsals, meetings and séances.

The social aspect of these occasions was an important component. Our meetings were social events which then moved into sound making in a variety of ways, the earlier conversation often acting to seed the initial character of the sonic interactions. The same was true of our performances before a public; the themes in the immediate build-up to the performance became part of the initial material in the sound-making, as will be discussed in the following analysis.

3.6.2 The Helsinki performance

The performance to be discussed took place in Helsinki, at the Sibelius Academy, in September 2009. The changes detailed above also apply to a performance in Vienna, at the Alte Schmiede, in March 2009, and this is

documented in the attached DVD (Alte Schmiede Video). For the performance in Helsinki the documentation consists of 400 photographs showing the performance space and features of the rehearsal, and a single stereo recording made from a position about 20 feet in front of the performance area. The photographs provide a good sense of the multiple perspectives which existed between performers, showing the details of their relationships to instruments and the nature of the space between performers.

The setting was one of semi-darkness, the reflected light from the Ouija board illuminating the players from below. The acoustic instrument players are further from the light, less visible presences. Nearer to the circle of light are the hands of the performers with a focus on the shadows that these create.

Thus the setting is staged for a circling around themes of presence and absence, with the most highlighted of presence (the hands of the Ouija players) being the agent of the clearest darkness. The playing of the Ouija is always a movement of shading between light and dark, where the hands function to create individual and contoured obscurity, the metaphor of 'presence' is reversed, and, in a multitude of ways, it is absence that sets things moving.

3.6.2.a Beginning: A first entrainment

Like Stern's analysis of mother child interaction, which was enabled by the slow motion and freeze frame of the video recording (Stern 1977: 12), this analysis of interaction benefits from the ability to replay a recording many times. The connections between small events, the timings of sounds made by different people, all become clearer when heard repeatedly. This to some extent compensates for the inability to remember exactly what it felt like to be performing and immersed in the experience.

Opening – Ambient Listening to entrainment between musicians

In the first extract, taken from minutes 4-7 (Disc 1, track 1 'Helsinki-1'), the sounds produced by the musicians are at almost the same level as the ambient sounds in the auditorium, only occasionally being noticeably louder. The performers are listening to the space that we are in together. We can hear the sounds of breathing, the hums from lights, the sounds of seats moving, occasional coughs, the footsteps of a latecomer, sounds from outside the auditorium.

While listening we are also noting any responses made by members of the group. This period has characteristics of the ambient exercise described in 3.2, in which a multiple focus can develop. My attention was able to move outwards to

the environmental ambience, inwards to the physical activities of my sound-making, and onward to the mutual engagement with other musicians. However, unlike the exercise, the frame determining what we are doing is less constrained. We do not know how we are to be together– despite our years of playing as a group – the state we are in relation to each other, in the context of the performance, is not readily subsumed by any collective theme.

Deviating from ambient listening towards entrainment

Some of the sounds made by the musicians deviate slightly from those in the ambient acoustic. For example there is a very quiet but high-speed tapping from someone, in groups of 3 and 4, and there is an occasional clang and rubbing of Tibetan cymbals by Stephen (on the left of the stage), every 5 seconds or so. Along with the tapping and clicking there are some sustained sounds from the Ouija, extremely faint, almost like breathing. The sound is made by one of the Ouija players who is gradually moving their hand into and out of the light (the noise itself is part of a recording of the ambient noise on the platform of a station in Vienna). Among the many potential narratives occurring, I can detect a small thread. Because it involves the interaction between two of the musicians it draws my attention[28].

There has been a change of focus**,** from the audience, inwards to the sounds created by the AWC group. We can detect a relationship, a partly reciprocated one, in which a tempo has been identified and a dialogue of tapping and creating sustained sounds or sustained silences has begun.

It could be that neither person authorised or imposed this regime of recognition, and that the chance concurrence of two kinds of sound production on an almost regular beat was seized upon. However, the question of authority and authorisation is already implicated in this nascent and almost inaudible exchange. The key point is that these two people are hinting at a way of being together, other than simply being an atomised collection of unconnected individuals.

Some of the narratives identified in these first few minutes, existing in a liminal form, are the following.

[28] The pace of Stephen's damped Tibetan cymbals and that of Kirsten's Ouija noise are similar. Thus an association is made, however cursory at this stage, between two people, and two very different sound morphologies. The Ouija breathing sound, which emerges from the barely audible quiet background of environmental noise, is potentially related to the sound which is most clearly in the foreground, the tap of the tibetan cymbal. The focused and localised sound, highly visible in the way that it was made (you can see Stephen make the movement) is linked to the slight movements of one of the Ouija players, with their arms held, almost immobile, in front.

- A play on the differences between a percussive hit and that created by the ebb and flow of a noise tone (both are 'noise based' but have different ways of filling the curves of expectation and release, one as a burst, the other as a curve.) The implications of these two ways of filling time, and their relation to each other, are hardly explored yet.
- A narrative about the adaption of Stephen's playing of the Tibetan chime, both in terms of tempo and playing technique, to entrain with others and provide potential material with which others can entrain.
- Exploration of two people (Stephen and Kirsten) synchronising around a pulse, and the disruption/observation/critique/expansion of that pulse by someone on the periphery.
- A narrative about my own initial frustration and a wish to find a way to integrate it in the context of the ongoing work.

The purpose of this description of the start of the performance is to emphasise the strength of the interpersonal liaisons and groupings between people, and their ability to channel attention. The following discussion, which focuses on the ways in which sonic interrelationships are conducted through the mediatising supplement of the Ouija, is part of this wider interaction, which occurs equally without the presence of any electronic sound.

3.6.2.b Middle – Reciprocation and Critique

At the level of the group, the states of reciprocation and critique are in constant exchange. A simple description of the process in the middle period of the improvisation is that it cycles between reciprocation and critique, where reciprocation is marked by a stabilisation of regimes of entrainment, and critique involves the introduction of new kinds of difference.

Ouija player on boundary between Reciprocation and critique

The Ouija players have unique ways of moving between reciprocation and critique. This is because their responses to an acoustic performer will always include the category distinction, 'sound produced electronically' which places the response on a potentially divergent or supplementary axis. Thus, in reciprocating an instrumental gesture they are also providing a re-contextualisation of it. By returning us continually to the material differences between electronic and acoustic instrumental sound making, the Ouija players can persistently insert new kinds of difference and break down existing forms of entrainment, and hence move us to other ways of being together.

For the performances in Vienna and Helsinki, the seven kinds of split discussed in section two (splits created by live amplification between the performer and audience, splits created by recording between the location recorded and the site of playback) were represented inside the following two main categories:

A. Expansion/Condensation of the live acoustic instrumental space	B. Supplement/Displacement of the acoustic instrumental space by external sources
1. Reduction. 'Timbral freezing'. A process using the Fast Fourier transform in which the timbre of an instant in the audio stream is resynthesised using 16 sine tones.	1. Location recordings made by members of the group. These mark our development as phonographers, supplementing our roles as instrumental performers. The recordings consist of conversations, journeys, locations, performances.
2. Multiplication. 'Double delay line'. Two delay lines, one with a four-second and the other with ten-second delay are used to duplicate and multiply the audio stream from selected microphones.	2. Textural material. A selection of noise generators (white, pink, recorded ambient noise (machinery, water, sand, wind, rainforest sounds etc)
NB The Ouija player can choose, at any time, which combinations of microphones provide the signal to these processes. The spatialisation of the sounds is also under the control of the performer.	3. Pre-composed acousmatic pieces from which excerpts may be played, or the whole work.

Table 3 Main categories of Ouija influences in the Helsinki performance

Numerous other sound-generating processes such as filtering, segmentation, mini-sample triggering, were abandoned. However, by exercising this cull it become possible to focus on a minimum group of effects with the maximum degree of difference from each other.[29]

The Ouija players can change the identity of the space in which the performance takes place in two distinctively different ways. The first space is one in which the electronic sound world is experienced as the principal context, in which the acoustic instruments and room acoustic are displaced by a virtual electroacoustic representation of space (in which the actual room acoustic may be treated as just one sound world amongst many). The second version of space is

[29] This is a further example of the 'balance of complexity' discussed in relation to Bryan-Kinns and the daisy-phone. A significant aspect of this limitation is that the vast range of possible audio effects is brought within the horizon of 'performability'. Although the number of permutations is potentially large, the unique character of different positions within the space is knowable, and can be sought out and brought into play by the performers of the instrument.

one in which the acoustic instrumentalists are exposed or uncovered by the Ouija players, and their sounds re-presented in exaggerated or selectively magnified form.

The character of movement between these different senses of space, between expansion/condensation and displacement/supplementarity, has many contours of intensity and levels. The operations of condensation and displacement are not confined to the acoustic changes of the performance alone, but may describe the interpersonal interactions as well. Freud referred to dream-displacement and dream-condensation as "the two craftsmen to whom we may chiefly ascribe the structure of the dream." (Freud 1961: 199). They can be linked to the processes of reciprocation and critique which occur among the performers – reciprocation having the character of condensation whilst critique has the character of displacement. However, I shall reserve the terms 'Expansion/Condensation' and 'Supplement/Displacement' for the description of sonic processes and 'reciprocation/critique' for those enacted by the performers.

In the following analysis of the middle period of the improvisation I shall examine moments that can be defined clearly by each of these terms.

Expansion/Condensation – placing the live sound of the acoustic instruments into a wider field

These are associated with the processes which mediate the live sound from a microphone or group of microphones. As outlined above, these were reduced to two processes, one which is more allied to condensation, the other more with expansion.

1) Condensation – 'Timbral Freezing'. An analysis / re-synthesis process using the fast Fourier transform to analyse the input sound and transform it into a cluster of sine tones. The sound at a particular moment (when the hand shadow passes a minimum threshold) is analysed as a combination of dynamically-weighted sine tones, retaining the fundamental pitch (if there is one) along with an important component of the timbre (16 of the strongest partials, according to the analysis). This pitch with timbre remains available to the Ouija player whilst shadow is over the point of control, varying in intensity with the degree of darkness offered by the hand. It represents an instantaneous picture of the moment at which the sound was sampled from the microphone. The Ouija player can take a new sample by moving the shadow away from the point and then returning, passing through the minimum threshold to trigger a new process of analysis/re-synthesis. The Ouija player can produce many such moments by fluttering hand

shadows across the Ouija shadow point.

2) Expansion – A pair of delay lines, (one timed at an interval of 4 seconds and the other at 10 seconds). This allows a continuous repetition and potential multiplication of the instrumental timbre as it varies over time. The generic or stereotyped output from delay lines (the sense that they can impose a rhythm or hierarchy on the sound making) is partly turned to advantage in the context of the Ouija. The extreme facility with which the Ouija player can shape the dynamic contour of the output, remove it, return it, grade it – allows for the more irksome and familiar uses of the delay line to be circumvented.

The principle of these two processes is that they work together, and contrast with each other. The sine tone re-synthesis performs a kind of timbral freezing, divorcing the sound from the fluctuations and rhythmic situation of the source sound, whilst the delay line performs a form of acoustic multiplication, allowing further mediatised versions of the player to be brought into the space. These two kinds of relationship to the sound presented to the microphone, allow for a complex and rich interplay in practice. Blending and balancing between the two allows for a variety of temporal, spatial and timbral re-calibration of the relationship between acoustic performers and ouija players and the acoustics in the room. Two of these will be discussed in more detail

1. Ouija players expanding the instrumental texture – Baroque flute and Ney timbre mediated by Ouija.

Baroque flute: After a period of multiple simultaneous sounds from many different performers the Baroque flute plays a phrase alone and exposed (Disc 1, track 2 'Helsinki-2'). It begins with a note played with a tremulous breath in a low register, and consists of a movement from a lower note to one a semitone higher. The wavering and fluctuating quality of the low note (in pitch, timbre and volume) contrasts with the flowering moment of eventual stability on the higher note, in which the elements of pitch, timbre and volume appear to cohere in a more composite identity.

Ouija: This micro process of stabilisation is taken into a different register by the intervention of a Ouija player (Peter), who has selected Stephen's playing (selected a microphone next to Stephen's flute), and has captured a moment of the higher note through the analysis/resynthesis process. The Ouija tone is derived from Stephen's, and initially seems to be fused with it. Since the overtone structure of the re-synthesised sound has a good correspondence with the sound produced by the Baroque flute, the two blend together almost indistinguishably.

However, when Stephen moves to a new tone, the Ouija version of his tone is left hanging, and introduces many new categories of difference.

Ouija2: The double delay line produces an effect which is the opposite of the analysis/re-synthesis tone. Instead of reducing the analysed sound to a steady and simplified timbre, it multiplies the source sound, creating a spreading image over several loudspeakers. If the source sound has no sharply defined changes then the spreading gives an atmospheric displacement of the timbre into the surrounding space, whilst if the source has clearly defined gestures these will be noticeable in rhythmic delay (once after 4 seconds and again after 11 seconds).

In this later guise the delay line can appear as a familiar electroacoustic effect, almost clichéd, and for this reason there is a pressure to reject it. However, within the rich and detailed processes of the group the presence of this cliché is not necessarily a disadvantage. It represents a familiar relationship between source sound and electracoustic consequence which can be exploited or subverted. For example, because the volume of the delay is under such direct gestural control the Ouija players can superimpose their own curves of intensity, their own rhythms and tempos on the material being delayed, and thus give clear alternative content to the material, moving between the rhythms of the source performer, the rhythm of the delay itself and their own superimposed rhythm.

In the particular moment under discussion, the delay is heard first as a slight intensification of the sustained Baroque flute note, and then four seconds later, as a repetition of the ornament.

The trace left by Stephen's playing is thus present in several forms, as a series of sustained timbrally-reduced pitches and as a spatially-expanded atmosphere which also includes occasional repetitions of key gestural moments.

Moving on:

Ney: at 28:41 (Disc 1, track 3 'Helsinki-3') Seth begins playing the Ney, starting on precisely the same pitch with which Stephen began the section.

Ouija: The stronger noise elements in the timbre of the Ney lead to a more dissonant and beating output in the analsysis/resynthesis tones with which Peter responds.

The interest in these dissonant beats becomes the focus of the interaction among the musicians, leading to new forms of entrainment and themes of being together. The Ouija reduction of instrumental timbre into a collection of 16 sine tones allowed an interesting hierarchical interplay to develop between the

performers, drawing on some of the cultural signifiers carried by the instruments. Thus the noisy Ney flute (many harmonics) produced more dissonant sine tones, and the Baroque flute fewer, whilst the cello playing artificial harmonics had minimal extra harmonics. This allowed a multiple interplay to develop among us, in which we reinsert our instrumental pitches back into the Ouija-produced sine tone clusters – substituting a fused and culturally-weighted instrumental pitch for a particular sine component.

Reciprocation and Critique

In the above section, which lasts just over a minute, the Ouija players work with material produced by the acoustic players, supplementing the details of their performance in various directions. The performer in turn responds to these supplements, which are both close to them (the pitches are directly available, the timbres familiar, the gestures recently produced) and have surplus differences (sustained, multiplied, given new space) which take the sound into new territories.

In these exchanges the question of power and authority is not entirely absent. The Ouija players engage with the acoustic instrumentalists by placing aspects of their sound production in a mediatised arena. In doing this there is the implication, to be examined, that the person being mediatised is given an increased presence in the room. By being able to select particular players to augment, to place in the spotlight, the Ouija player has a potential power.

There was an occasion on which I once asked Kirsten (left channel Ouija player) to give my sounds back more often (rehearsal at City University, May 2008). This request felt wrong at the time, and was even mentioned a year later in the public seminar [30]. In terms of power relations, the verbal request to be mediatised does seem to suggest that mediatisation of one's acoustic sound leads to a form of increased presence, and that this is desirable.

Over the course of the year that followed, and the changes to our performance practice, my toleration of states of being 'unrecognised' in the improvisation became higher, and began to be appreciated for their paradoxical value. As an instrumentalist, without the amplification and multiple presence in the room given through selection by a Ouija player, I nonetheless existed in the space, both latently 'awaiting selection' and acoustically as a diverse instrumental performer. The sense of awaiting selection and of deferral is one that, in the overall workings of the AWC, has developed a particular potency. Being outside

[30] A transcript of the seminar held at University of the Arts, London College of Communication on 18th March 2009 is contained on disc 6

the illuminated circle of the Ouija board does not exclude one from processes of authorisation.

Ouija players setting the instrumentalists as a subspace

In the following example, (Disc 1, track 4 'Helsinki-4') it is the Ouija players who introduce new material to which the acoustic performers begin to respond. This section follows on from the one discussed above.

Ouija: the ouija players (first one then both) interject some recordings of conversations from a seminar six months earlier [31]. The voices have a disorientating effect.

The meanings of particular words, which were so important at the original moment, have become detached from their context, and it is their fleeting spectral content which is most present to us in Helsinki. The timbres move in a quite different way from the pitched material we had become attuned to (in the section just described) as each word contains rapid and wide-ranging timbral changes. Hearing these rapid changes of spectrum is doubly strange because of the substitution of 'human voice' for instrumental timbre. The instrumental identities with which we had been concerned in the previous section (ney, Baroque flute, cello) are confronted with the identity held by a speaking voice.

Ouija, Kirsten Voice: The first voice we hear is Kirsten's. She was quite far from the microphone during the LCC recording, so although the level has been boosted for use on the Ouija board, it still sounds as if it is coming from far away. The identity implied by this rapidly-changing spectrum of sounds is almost incomprehensible. This is partly why the voices sounded to me, at that moment in Helsinki, like mountain ranges. The cohesion of these diverse timbres was derived from a remotely-perceived but none the less integrated personality, a person. As to the meaning of the words, these were linked at the original moment of recording, to a complex discourse with others, connected to that particular place and time – and they appear even more remote, a range of mountains beyond the first range which was linked to the intonation and mood of the recorded voice. This is despite the fact that the actual words spoken 'feed in and out' 'separate' 'uncomfortable rift' could be very well applied to the Helsinki moment.

Ouija players, all our recorded voices. The Ouija players are able to bring about a strange rematerialisation of our LCC seminar, as each hand is able to summon up and control a separate vocal stream, linked to our individual seminar

[31] A transcript of the seminar, held at University of the Arts, London College of Communication on 18th March 2009 is contained on disc 6.

voices. In the original seminar we were in dialogue with each other, and the sense of dialogue is recovered in the performance by creating layers and interchanges of voices, but without adhering to the strict sequence in which the dialogue occurred. The rhythms, accents, hesitations, umms, ahhs, laughs, groans of each of us are reassembled into a quasi dialogue by the gestures of the Ouija players.

Instrument players: ney, Baroque flute, cello. In the face of these newly-heard vocal identities, and the surprising challenge to our timbrally-constrained instrumental identities, we can only feel our way. The sounds produced by the acoustic instruments seem to represent our experience of floating and being dwarfed by the contrast of scale: Stephen rests on high whistle-tones, like some small bird hovering around the peaks, whilst the Ouija players, who are themselves caught in the strange dislocation of hearing voices, bring in pulses or hillocks of noise textures, like moments of wind or lines of light appearing around the verbal mountains. Like the sound poetry of Bob Cobbing, Kurt Schwitters, or Antonin Artaud's glossolalia, the words are on the threshold between their operation as sound and the concepts which they release.

Reciprocation / Critique – an ethical question.

The use made of the recorded voices may have been quite different. For example, on listening to the recording of the original seminar discussion, it is possible to look at the contradictions and ignored potentials of much of the semantic content of what was said. In the context of the seminar these defects can be seen as a contingent part of the situation, since we were responding to each other in an unrehearsed manner.

However, certain uses of these recordings may raise ethical issues. If one treats the recordings solely as musical material then their use may be unproblematic, but because they document specific people in a particular context, the breaching of the context may entail an ethical responsibility. By placing the recorded material in a different context, for example a radio programme, or transcribed in an academic journal, the individual speakers risk being exposed in an unintended context, thus changing the meaning of what was being said and breaking a code of tact or trust. This can be seen as the inverse of the 'shock' that we experienced as performers during the Helsinki improvisation, suddenly hearing our own voices from half a year earlier looming in the distance.

In our later work with Taina Riikonen, in which recordings of our conversations were taken for the multiple purposes of self-reflection, use in

performances, and for her own research, these differences of intended use became important. We experienced the possibility that a recording may breach the conditions of trust implicit in the original context, and indeed, began to re-examine the conditions of trust operating at the time of the recording. Informal dialogue can become 'evidence', and the kind of exploratory dialogue, which we had thought of as being under the conditions of forgettable speech, is available for later analysis, and can even be transcribed as text. (The contents of disc 6 'Automatic Writing Circle History' includes a transcript of the seminar in the data portion of dvd.).

Summary

The Ouija players play a significant part in the processes of reciprocation and critique. This is particularly so because their presence is part of a mode of representation that is already split. The split can be used to expand the immediate instrumental presence in a variety of ways (multiplication and reduction) or to displace the primacy of the physical acoustic environment by introducing location recordings or acousmatic material. The Ouija player is thus in a double spiral of reflexivity, one consisting of the relationship between a mediatised universe and its pre-mediatised character (which can no longer be disjoined from processes of mediatisation) , and the other consisting of the processes of entrainment and intersubjectivity that occur between members of the group.

3.6.2.c End and silence

The final twenty minutes of the performance are characterised by three principal types of drama.

1. Prolonged exchanges (> 8 mins). (Disc 1, track 5 'Helsinki-5') Small fragments are expanded by the whole group and have elements of increasing co-ordination and prolongation. Players find temporary stratified positions within the ensemble, sometimes holding their place through longer phrases, sometimes through tightly-coupled interchanges.

2. There are extremely slow sections, which focus on the detail of an evolving feedback sound generated from the Ouija board. (Disc 1, track 6 'Helsinki-6') These continuous and slightly pulsing tones are created by feedback from the delay lines alternating with their re-synthesis. It is an interesting image: the Ouija board, instead of expanding the instrumental space, works with the empty space created by non-playing musicians.

3. Extended periods of silence. (sound example Disc 1, track 7 'Helsinki 7')

These three kinds of dramatic behaviour illustrate an overall theme, which is the gradual movement over the course of the improvisation from narratives constructed by an outsider (both mediatised and in the room) to one which is a response to absence.

At first the AWC were the 'outsiders' in the auditorium, packed with Helsinki residents and students at the academy. The members of the group were marked as different because we took the official responsibility for sound-making. The opening period of performance consisted of a negotiation between the sounds already in the space of the auditorium and our own additions to it. Then the negotiations of difference moved their focus towards the definition of cohesion and critique within the group, exploring themes of entrainment between individuals, and also exploring the mediatised disruptions of acoustic instrumental performance and the boundaries between the electronic mediatised space and the actual room space. Finally, taking the theme of 'presence' and its boundaries a stage further, the performance engages more directly with the apparent antithesis of presence, which is absence or vacated space. The discipline of the Ouija players, in not touching the instrument and in working with shadow, has already brought the metaphors of absence into play, but it is in the final 20 minutes of the improvisation that the wider creative potential of this most 'outside' of outsiders begins to be realised.

It is as if our capacity for hearing the different forms within which difference can be articulated has been widened, and we no longer seek the Hegelian narrative of Thesis Antithesis and Synthesis to propel us forward. The logic of alterity gave the collective its values, and helped us to progress from one point to the next, via drama, collapse, boredom, crisis or redefinition. There had been a rhythm to this cycle of changes, perhaps lasting every 4 to 10 minutes and, along with the awareness of the character of repetition, came an awareness of the ending. However, after all contexts have been repeatedly brought, hurled or placed together, another kind of listening becomes more prevalent. In many ways it is indistinguishable from the content of our group dynamics of inclusion, critique and exclusion. The 'other' other with whom we are engaging is no longer the Ouija player, or a member of our group, or a specific sound.

When we return to silence, to listen again to the place we are in, it is a silence which also refers to the end of the performance. As far as we performers, or the audience, are concerned, any of the silences which occur after about an hour of performing could be considered the 'end'. In fact, the performance goes on for

another 20 minutes, entering silence and then re-emerging. This had an element of bravado, of pushing the limits of what is acceptable (there may be some in the audience who would leap at the opportunity to leave after an hour of this kind of improvisation), but it also allows a much deeper re-appraisal of our time together, of what we learned, and the conditions of ending under which it was always operating. Thus, at the periphery of the generative capacity of an actual outsider (an individual or soundscape or timbre) is the generative capacity of this future absence, the hovering of an anticipatory mourning – the place which needs to be available to enable our awareness of that which is no longer present, our own future non-presence. In a sense, this is the implication of the shadow in the 'Ouija', to bring in the voices of those who are not present – but it is only in the ending phase of the performance that its generative implication becomes clearer. The silence is not only the Cagean 'silence' in which one hears nonetheless the sounds of new forms of association; it is a silence which allows for reflections on absence.

After the first long period of collective improvisation, in which there is a sense of being able to reach genuine prolongation and merging and fluent passage between states, there is an extraordinary long silence, followed by the very gradual emergence of a ringing feedback from the Ouija players, playing the silence – mediatising the space.

This is not 'mourning' in some nostalgic or repressive sense, but, as the white space illuminated by the Ouija metaphorically shows, it is a space that needs to be offered for occupation. This cannot be undecidably distinguished from the experiences of personal outsider, or mediatised outsider, and the political clashes of organisational schemas – it is not a final reckoning, but some kind of pulse, which might take many forms, but which we do seem to be able to elaborate collectively.

Conclusion

Summary

The Automatic Writing Circle is an incomplete fusion between an acoustic instrumental group and an electroacoustic group – in fact, it grew out of two separate groups. In the first group, the Ecosonic ensemble, there was an exploration of entrainment and the role played by 'outsider' musicians in redefining processes of entrainment, whilst in the second, players of an electronic instrument, the Ouija board, sought to bring the experience of electroacoustic sound as 'other' into the politics of entrainment. The relationship between these two groups, and their conceptions of sound and body, changed as they began to work more closely together.

I am happy to have been a member of both groups, and to have been fundamentally concerned with the theorisation and construction of ways in which their new joint functioning takes place. One mark of their coming together was in a new name, the 'Automatic Writing Circle'. The name mixes various metaphors: 'circle' represents an aspiration towards community, whilst 'automatic writing' refers, amongst other things, to the way in which 'outside' voices influence us during performance, as well as to the different kinds of writing that occur in the group (writing software, recording sounds, discussing our work). The name brought into being something on the edge of what is possible and marked a turning point in the work of the group, encapsulating a change with which we had been struggling for several years.

At the core of this new group is a negotiation with split identities, not achieving a state of requited togetherness but nonetheless reflecting on what it is to be with each other. It is for this reason that I describe the work of the group as the 'rehabilitation of schizophonia'. The objective is not the overcoming of splits to create a finished whole, but to find metaphors and ways of working that allow our splits to take on a creative rather than a repressive edge. The notion of

schizophonia crosses the boundary between the sonic and the personal, linking ideas of a mental state with an effect of technology, and it is this association that has been explored in particular detail in this thesis.

The first section sets out a framework within which a notion of the mental state of schizophrenia can be understood, using Bateson's theory of the Double Bind. Like Murray Schafer's acoustic schizophonia, the Double Bind rests on a distinction between embodied, iconic communication and the abstracted symbols of linguistic communication.

The second section of the thesis explores the acoustic side of this dislocation, discussing not only electronic sound but also the splits in the acoustic space of the traditional musician, using the example of vibrato and the theatrical display of apparently unconscious bodily noise (breathing, finger sliding etc). The discussion then moves on to the electroacoustic definition of schizophonia and highlights differences in the conception of time implied by the two sides of the split: acoustic ecology referring to a unity that has been lost in the past, and musique concrète referring to a unity that will arrive in the future. Wider features of the world view of someone adopting one of these orientations are identified: the tape-recordist incarnated as Murray Schafer takes the social and physical scene in which he is making the recordings as the primary source of structures in which he is interested (acoustic ecology) whilst the tape-recordist incarnated as Pierre Schaeffer takes the abstract symbols derived from the sound at playback as the source of significance (musique concrète).

The somewhat pejorative label of schizophonia implies that one should resolve the split state, and move to one side of it or the other. However, a question arises over what would happen if one remained in a split state. The conclusion of the second section of the thesis suggests that the existence of splits and category inconsistencies is an intrinsic part of any symbolic system or social group. Whilst it introduces a problematic instability into the heart of identity, it is also the agent of change, allowing the symbols, individuals and groups to evolve and establish new networks of meaning.

The final section of the thesis charts the contaminating influence of schizophonia on the work of the Automatic Writing Circle. The two groups that preceded the Automatic Writing Circle were motivated by the idea that the 'other', initially at the borders of the group, could be integrated into the processes of musical entrainment, implying that the schizophonic state can be resolved. However, in bringing the two groups together there was a conceptual problem: both groups were in a sense occupying the whole space. The kind of presence that

they were working towards does not leave room for the other group, as each can saturate the environment. How could the instrumentalists hear and entrain with the Ouija players, and how would the Ouija players incorporate the individual expressivity of the acoustic instrumentalists? Because both groups had been moved by an ethos of fusion, of integration, it seemed that we had left no space for conceptions of splitting or of absence.

A turning point came with the new conception of the Ouija board, in its shadow version. This provided a physical metaphor for schizophonia, a coherent image of disjunction. This arrival marked the start of a negative dialectic, with a long chain of consequences.

The final section of the thesis charts the transformations in which the schizophonic Ouija played a part, acting either as a catalyst for change or permitting change which the earlier 'instrumental' concept of the Ouija had been obstructing. The expanding frame encompassed increasingly wide levels, loosening our reliance on previously defined structures for our performances, and allowing a subtle interplay to develop between the instrumental selves of the acoustic performers and the category-transforming sonic identities of the Ouija players.

Mediatised silence

The final part of the examination of the history of the Automatic Writing Circle ends with a detailed discussion of a single performance in Helsinki. The final twenty minutes of this performance suggest a particular further extension of the shadow metaphor of the Ouija. Rather than being a reference to the presence of others, this ending introduces the notion of absence, not simply as a simple negative of presence, but as the active opening of a space in which to consider loss, a space that is capable of transformation and which permits a less narcissistic definition of presence. It is on this ending that I would like to pause a little longer, as it brings into contact two issues germane to the conception both of group performance and the mediatised encounter with sound. These can be encapsulated very simply as a question about 'liveness'.

In *Spectres of Marx*, Derrida opens the Exordium by asking us to imagine someone, 'you or me', coming up and saying 'I would like to learn to live finally'. The book is an examination of this question, and hinges on the restless sense that individual presence is only partial, that liveness is not a state consequent on some simple fact of being alive. Rather, Derrida suggests that one of the conditions of liveness is a sense of justice or responsibility to those who are no longer or not yet

alive, in addition to a more direct engagement with the immediate community. Thus, learning to live involves a discourse not only with those who are present, currently living, but also those who are on a spectral periphery.

> Without this non-contemporaneity with itself of the living present, without that which secretly unhinges it, without this responsibility and this respect for justice concerning those who are not there, of those who are no longer or who are not yet present and living, what sense would there be to ask the question "where?" "where tomorrow?" "whither?" (Derrida 1994: xviii)

Liveness thus refers beyond the living present and includes consideration of borderlines, including those between the living and the dead. This has considerable bearing on those arguments which suggest an opposition between 'live' performance and electroacoustically produced sound, such as those advanced by Phelan (1993). If a requirement of liveness involves learning how to have a dialogue with spectres (as suggested by Derrida), then the non-presence hinted at by electroacoustic sounds (through the absence of tangible performers) is not a binary opposite, but an already entangled supplement.

However, it is important to point out that, despite the ephemeral nature of electronically-produced sound and its potentially disembodied origins, it nonetheless exists on a more material plane than the spectres considered by Derrida. In cultural terms, there is a complex aesthetic balance concerning the precise value attributed to the disembodied material from loudspeakers.

Allen S Weiss discusses this at length in his study of recorded sound in the books *Phantasmic Radio* and *Breathless* (Weiss 1995, 2002). In his analysis, a consequence of the sensory extension provided by sound recording is a profound change in the ontology of mourning and melancholia; changes which he suggests are foreshadowed in the writing of authors such as Poe and Mallarmé (Weiss 2002: 34).

Working at the core of the redefinition of lyrical nostalgia is an exploration of a technically-assisted and deepened form of melancholia, brought about through the persistence of the traces of liveness, without the living body at its source. According to Freud, melancholia is defined as an illness related to and distorting mourning. The void, which in mourning is experienced as the loss of an attachment in the outside world, becomes transformed into an internal void, and a psychically charged shadow of the person lost takes its place. Freud describes this transformation in his essay *Mourning and Melancholia* in the following way

> The shadow of the object fell upon the ego, and the latter could henceforth be judged by a special agency, as though it were an object, the forsaken object. In this way an object-loss was transformed into an ego-loss and the conflict between the ego and the loved person into a cleavage between the critical activity of the ego altered by identification. (Freud 1962 : 3047)

The difference between melancholia and mourning is linked both to the duration and the directions of the displacements involved. The shadow object that has been created by the melancholic as a defence against the experienced outer loss becomes the recipient of libidinous and critical energies usually directed outwards. This condition enters the spectrum of schizophrenia, in which the dialogue with exterior objects is similarly placed in ambivalent suspension.

Recorded sound can perpetuate the traces of the lost object, simulating, in a mechanical way, the shadow objects created by the sufferer of melancholia or schizophrenia. This allows certain genres of sound art to inhabit, vicariously, the melancholic or schizophrenic position, focusing on the psychically charged features of the remaining shadow.

Recorded sound is in a fine balance between the preservation of corpses ("radio bodies are nobodies" (Whitehead 1991: 85) and the dialogue with spectres advised by Derrida as a condition of our own liveness. It is not a balance that can be resolved decisively and without ambiguity. The potency of the technical prosthesis provided by recording can be seen in the shift from the lyrical nostalgia found in 19th-century Romantic poetry to the schizophrenic, multi-centred sensibility of postmodern identity. The new powers of recorded sound, with their potential to create and sustain numerous shadow identities within the principal subject, are a significant agent at work in this transformation.

The claim of this thesis, and of the work with the Automatic Writing Circle, is that it elaborates new ways of working with this complex cultural and ontological balance, crossing and re-crossing the chasm between the sound as an object, fixed as a shadow in our ego, and sound as a shadow, opening up a wider dialogue with others, both present and absent.

The movement between silence, object and shadow can usefully be compared with the approach to silence employed by Cage. In the quote which opens this thesis Cage suggests that tape has brought about "a profound alteration of musical action, the consequences of which are not limited alone to tape but will affect all music". In relation to silence, this brings two pieces particularly to mind: *Imaginary Landscape 4* (1951) and *4'33"* (1952). There is a strong link between

these two works – the first involved a performance in which a chance combination of circumstances (the late hour of the performance and the consequent lack of broadcast material) produced a radiophonic silence and the second brought about a deliberate instrumental silence. It was through Cage's expanded conception of radio as instrument that the initial chance performance of silence came about. His radical next step was to apply the insights from this encounter to the cultural situation represented by a piano recital, introducing audiences to a profoundly altered experience of musical action in Tudor's performance of 4'33".

The gap between radiophonic silence and Tudor's silent performance represents the new terrain of instrumental action, and as suggested earlier, is the space in which the exchanges and dialogues of the Automatic Writing Circle are made. However, there is a difference in emphasis. Cage valued silence and its accidental revelation of unintended noise as a way of accessing a space free of human judgement, pleasure or disgust. He described *Imaginary landscape 4* as being "free of individual taste and memory (psychology) and also of the literature and 'traditions' of the art… Value judgments are not in the nature of this work as regards either composition, performance, or listening." (Cage 1967: 59)

In this sense, like Murray Schafer and Pierre Schaeffer, Cage was offering an alternative to the complex politics of individual identity and its social and technical construction. The position which I have outlined in this thesis, and which I believe is articulated in the work of the Automatic Writing Circle, differs in that it engages deliberately with creative splits in identity and their potentially schizophrenic consequences.

This leads to a difficult rhetorical position in which the goal is not to advance a particular hypothesis but to bring areas constituted as having uniqueness into contact with each other. As discussed in 3.1.2, Jean-Luc Nancy sees the potential of community as residing in its ability to 'cut into' the absoluteness of any individual subject. The productive work is then to seek out situations in which defined positions are highlighted and placed within mutual reach, deconstructing autarchy and generating new forms of touch and conditions for exchange. Several such quasi-autonomous areas have been examined, including musique concrète, acoustic ecology, instrumental performance, improvisation, live electronics and ethnomusicology. Other territories which have not been discussed, but which are nonetheless present within the Automatic Writing Circle include gender, sexuality, and ethnicity.[32]

[32] A forthcoming collaborative project between Taina Riikonen and the AWC makes use of the London College of Communication's 'Her Noise' archive to explore relations between gender,

The field of enquiry has been wide and, although no specific formula for action results from the work, the thesis charts the development of new skills and capacities. The breadth of the terrain opened up by Cage suggests a range of actions that are un-circumscribed by factional or territorial interests, however, the work of the group consists precisely of an exploration of these factional and territorial interests, and the ideals and authorities that they represent. Part of the motivation for the work derives from an interest in what is excluded or placed outside the circle by an ideal, and the nature of the binary thinking through which this takes place. This thesis has sought to illustrate a mode of working which remains open to the shadows of these binaries, but makes use of them to construct new points of departure.

sound and performance, and a recent conference and music festival (*Volatile Frequencies: 18-21 November 2010, London*) curated by Seth Ayyaz (player of the Ney in the AWC) focussed on the Arab avant-garde.

Epilogue

Introducing the Epilogue

The start of my work with the AWC coincided with the conclusion of the compositions that make up the Epilogue. The compositions themselves are concerned with some of the broad themes discussed above – the transformation of lyrical nostalgia and the nature of the multifaceted, distributed space of electroacoustic sound. However, a fundamental difference is that the compositions have a single acoustic performer at their centre, rather than a group.

The rationale for making pieces for a single instrumental performer and the multiple voices of electroacoustic sound is a powerful one, as it offers the audience an anchored point from which to explore questions relating to gesture and sound sources. The work to be discussed, *Lipsync*, provided a successful way of engaging with many of the issues that interested me, however, after finishing the piece I became curious to understand more about the significations contributed, almost involuntarily, by its format (single acoustic performer with electronics).

The image of the solitary performer surrounded by the electronic traces of others formed a base for a wider exploration of gesture and its surrogates[33], and I wondered if these themes would be changed or unavailable if a wider group of musicians were performing. When there are several musicians involved in a performance a diverse range of activities compel attention, and it becomes harder to focus on the distinctions between physical gesture and electronic sound. It was in order to explore the new narratives that arise from the interactions between group, individual and electronic sound that I embarked on the work with the AWC. Thus, what follows as an epilogue preceded and gave birth to the group work that has already been discussed.

[33] For a wider discussion of these issues the reader is referred to Smalley 2001 and 2007.

Burying the singing bird – text and sound in 'Lipsync'

Der Tod, das ist die kühle Nacht,
Das Leben ist der schwüle Tag.
Es dunkelt schon, mich schläfert,
Der Tag hat mich müd gemacht.

Über mein Bett erhebt sich ein Baum,
Drin singt die junge Nachtigall;
Sie singt von lauter Liebe,
Ich hör es sogar im Traum.

———————————————————————————

Untitled poem by H. Heine, included as No. LXXXVII in Die Heimkehr.

———————————————————————————

Death – that is the cool Night,
Life is the sweltering Day.
It is darker already, I'm sleepy,
The Day has tired me.

Over my Bed grows a tree,
In it sings a young Nightingale;
She sings of everyday Love,
I hear it even in my Dreams.[34]

[34] The translation is my own.

In this chapter I will examine some of the features of my piece for cello, lips and live electronics: *Lipsync*. As well as a score, the material required for the performance includes software that I designed over a period of two years (created using MaxMSP and OSC – see Appendix 1 and software on disc 7) two microphones, one for the cello and one for the cellist's lips, and six loudspeakers for sound output. The live performance is supported by a variety of electroacoustic processes which adapt to follow the cellist's speed, timbre and rhythm.

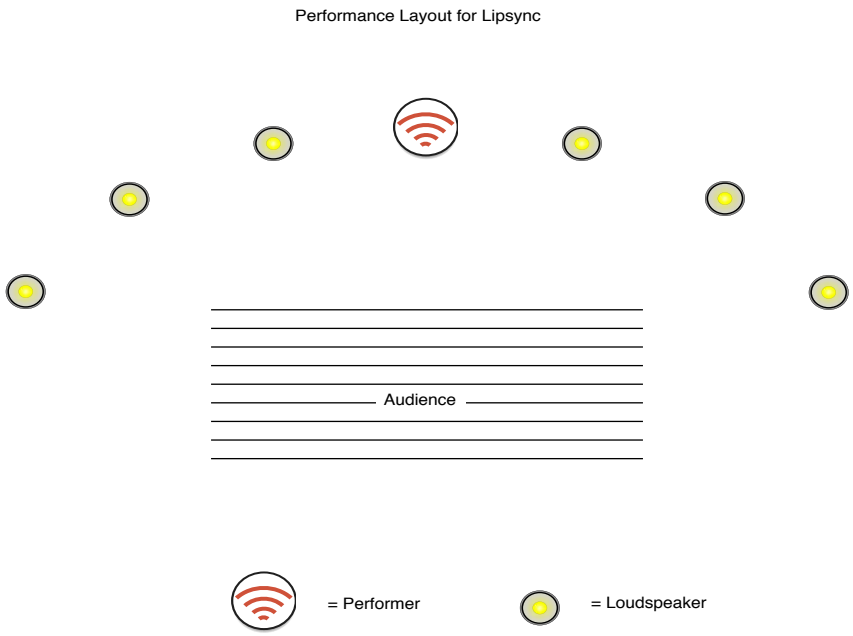


Figure 7: The performance layout for *lipsync*

As well as using the body in a traditional way, the cellist has to speak text (or shout or whisper it). The sound of the spoken text is used to control the computer processing (see appendix 2 for performer instructions). The text itself comes from the above poem by Heine and has a central importance in the piece, used as part of the work's exploration of relationships between nineteenth century lyric poetry and contemporary sound art practices.

The title of the work, *Lipsync*, refers to the speaking activities of the cellist during the performance. Speech gives rise to electronically produced sounds, some of which are synchronised with the lip movements and some of which are not. The

nature of the connection changes as the piece progresses, and allows a variety of sounding contexts to be explored. The changing balance between speech, text and other sound provides an important vehicle for the main ideas of the piece, and I will try to elucidate some of these, discussing the role of the poem used in the piece.

To help create the first connection between nineteenth-century performance practice and sound art I used a novel and eccentric technique which combines traditional cellistic gestures with lip plosives, using a small microphone in front of the performer's lips to trigger electroacoustic processes.

Figure 8: Photo illustrating the position of the lip microphone, indicated by the arrow.

A variety of twentieth century artists have made use of speech-sound in their works in order to break down earlier linguistic/musical hierarchies (as

discussed in 3.6.2.b, above). Speech in a sound-art context suggests a limit to the siren power of 'music', and this contrasts with the message contained in the actual poem spoken by the cellist. Heine's dissolution of text into singing implies the reverse idea, that music is a carrier of meanings unavailable to text. The poem is an excellent example of the sublime status accorded to music in 19th century poetics--—the singing of the love filled nightingale is used to indicate a state beyond the textually construed binaries of life and death.

The bird in Heine's poem is synonymous with love, but also, to us in the 21st century, carries links to a tainted German romantic mythology that some part of me, in common with large parts of the 20th century avant-garde, wishes was in its own grave. Cage, for example, comments that in America he was far enough away from European culture to write music (Cage 1961: 73). At its simplest, this distance assists in the move away from a unifying but potentially oppressive single perspective to one which includes multiple points; the single perspective seen in the layout of the classical concert hall gives way to performances with multiple viewpoints, notes become free of harmonic gravity and develop into independent sound objects…

While sound art, following Cage, benefited from the demythologising of 'music', to my mind there is no safe distance—there are many elements of nineteenth century lyrical nostalgia which continue to influence us. In the poem the resurgent bird can be seen to represent the power of buried myths to spring up from their historical confines, and in a similar way the presence of a live cellist in a piece of sound art is an anachronism. The cellist, like the bird, is an escapee from a tradition that might have been consigned to history, and its continued presence skews any attempt of sound art to categorically claim new territory. The balance of power between past and present, tradition and innovation is a fine one, and it is this balance that interests me.

Text, in my piece, functions as an indicator of where one's allegiance lies in this balance of power, either linking to a problematic past tradition (by speaking a 19th century poem) or joining with the attempt to break free from it and inhabit new ground. I have outlined the more general significance of the text – in the character of the poem, in the use of speech – but the text also works in a much more specific and detailed way.

Reduced from its full 43 words to a mere 10, only the barest skeleton of the

text remains[35]. Each utterance of a new word brings about new sounds and puts the text in new clothes. These varied embodiments repeat and re-explore the changes which sound art introduced. The piece can be seen as a signposted journey along the path from a single point of view, represented by the traditional focus on the cellist on the stage, to a multiple viewpoint where each of the 6 loudspeakers makes an equal sonic contribution to a distributed space. Additional markers of stylistic change are introduced by the harmonic plan, which is based on the following sequence of five 8-note chords.

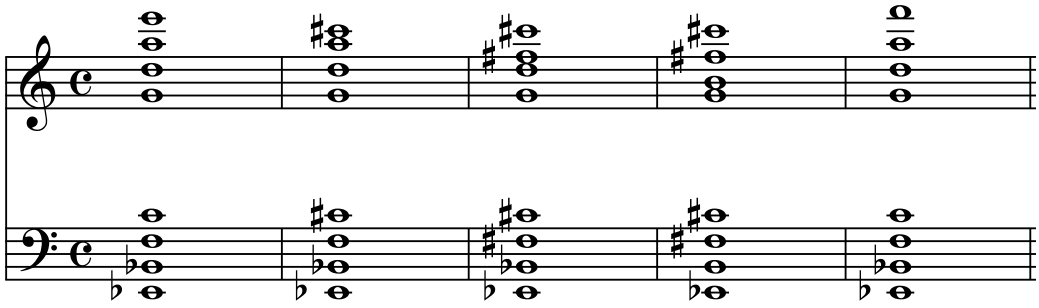


Figure 9: Principal chords used in *Lipsync*

The first chord is free of repeating pitches, whilst the following three chords all change from the original chord by one note, with new notes doubled in both the upper and lower registers. The sequence is positioned at the boundaries of several different harmonic frameworks: it has a strong cadential progression, contains 'just intonation' tunings produced by harmonics (the lower chords can be played as stopped notes on the cello and the upper chords can be played using high harmonics), the lower notes move by a series of chromatic changes, whilst the predominant spacing of the notes is in 5ths. In addition, the first chord and the changed notes of the subsequent chords make up a 12 tone series. These latent potentials in the group of chords allow a variety of links to be made between the pitched content of the piece and harmonic structuring frameworks, including the more timbral focus introduced by electronic processing.

The cellist is in front of the audience, and loudspeakers stretch out on either side, coming out from the cellist and enfolding the audience like wings. The piece travels through dynamic changes between the real acoustic space containing the cellist and the virtual space created by the loudspeakers. These changes are controlled by the shouting, whispering and speech of the cellist, and by a variety

35 It would not be possible to understand the poem from the 10 words used in the piece: Der, Tod, das, die, kühle, Nacht, schwüle, Tag, Bett, Baum. Each word is used many times. The final lines of the poem, referring to the singing nightingale, are not spoken.

of timing mechanisms embedded in the software programs (discussed in appendix 1). The cellistic material is sometimes projected outwards through the speakers in a ballistic way, fired by a lip plosive, or the sound of the loudspeakers may gradually engulf the cellist while they are silent or using vowel sounds.

The piece is divided into six sections, and as it progresses from one section to the next the vocal interventions have a wider and deeper effect. Each act of speech results in a sounding response, but the responses become increasingly separate from the current sounds made by the performer. At the beginning, when the cellist shouts 'Der' or 'Tod', all that happens is that the most recent 3 seconds of cello sound are projected through the nearest loudspeakers[36]. Later in the piece the words 'kühle' and 'Nacht' are spoken. These sustain the cold and icy chords that the cellist is playing, as well as giving a short burst of recently played material. The chords are heard in loudspeakers further away from the cellist, whilst the short bursts happen near them, and this is the first sign of the changing synchronisation between the spoken word and the sounds coming from the loudspeakers, of the breaking of the ties to lipsync. It is as if the near loudspeakers represent the immediate present but the further ones represent more remote or metaphorical links.

The process of temporal and spatial de-synchronisation continues through the piece. The distant speakers include more and more material which is either not generated by the cellist, or relates to things they are not doing at present. For example, in the fourth section the word 'Tag' brings in recordings of the speech of others – short recordings in German of people discussing a play about family breakdown, alongside the thematic chords and clusters of segmented pizzicati from section 3. These further sounds invade the space of the performer, and are distributed using a software process which sends sound to the quietest loudspeakers, leading to an equal distribution of sounds around the space. The listener is presented with two simultaneous kinds of space, one in which there is an equal distribution of sounds, and the other which places the performer within the traditional concert hall perspective.

In the sixth and final section of the piece a further change takes place, in which the space becomes filled with widely distributed glissandi suggesting a suspension of gravity. The glissandi move to different chords, but slowly and as if in a fog. In this weightless environment the cellist produces a gradual and grief-

36 The vocal sounds themselves are never amplified, they are heard in the natural acoustic and act through software analysis to control the processing of the cello sound and other more remote electronic sound sources.

filled shifting search for a new centre. This final section has no spoken text, as if the work of the text has been done. The constant interruptions and unsettling changes have led to a breakdown of the established perspective and the cellist has surrendered a precious element of their identity.

A strange fusion has taken place in which the acceptance of the multiple identities of the acousmatic space coincides with the romantic transfiguration through death suggested by the poem. The emotional brunt of the text, which deals with a heightened exploration of loss has a resonance with the loss of self in the postmodern world of multiple view points.

I began this chapter by looking at the role of the Heine poem within the piece. But there is another, equivalent, musical presence which plays a part. In constructing the final balance point I had very much in mind an earlier piece by Brahms, his Ballade Op 10 nr 4 for piano, written when he was 20 years old. This music stuck in my mind for years because of the way it ends – it has a strange impermanence. The piece alternates between sections with strong tonic harmony, and sections with chromatic harmony and substitutions by thirds. The end is like a temporary cessation of the constant flux between them.

This piece has many parallels with the Heine poem, particularly in its clear alternation between different states, and in the way that the formal ending also suggests the possibility of endless continuation. (In fact, thirty years later Brahms set the Heine poem to music in a song, Op. 96 No. 1). Although I never quote the Brahms piece directly, I am very interested in how it works. I think of the chromatic sections as opening the way towards serialism and the move away from a stable pitch centre. But this is combined with the need for compositional closure, and the incompatibility between these two aspects is a wide one: how to achieve an ending whilst doing justice to the endless reflexive mirroring between the past and the present?

The achievement of this balance seems in the end to be more than a technical or rational process. In both the Heine poem and the Brahms piece, whilst they play with the idea of endless continuation and formal structure, there is space for something else as well, something which needs the response of other people to confirm its existence. In the end it seemed to come down to a much more personal, and therefore incommunicable, sentiment. The courage and optimism that is required to allow for things to have endings.

Role reversal in *I slept by numbers*

I slept by numbers was written before *lipsync* and offered an initial engagement with many of the technical and aesthetic areas central to later work. In particular, it explores some of the relationships between an acoustic instrumental performer and a sound director, aspects of which have been discussed in Section 2 (2.3.1).

The piece is an investigation of the asymmetry between the flautist and the sound director, in which the flautist's sound retains a perceptible link with her[37] actions, whilst the sound director has less attributable gestures, acting more as an éminence grise.

The fixed physical and acoustic properties of the flute allow it to function as a focal point around which flautist identities can be constructed. Actions performed by the sound director, on the other hand, are ambiguous, sometimes producing sounds which have a direct Theremin-like link to his gestures, sometimes diffusing and altering those of the flautist, and sometimes seemingly unconnected to the electronic sounds. The instrumental identity of the sound-director is destabilised by the variable character of the instrument which he is performing (a touch and a turn sensor).

Two alternative narratives are presented in the piece. The first shows the interior world of a sleepless person attempting to fall asleep whilst the second shows sleep enforced from outside, as would be the case if the person was under the influence of a hypnotist or anaesthetist. These two alternatives animate the theatrical situation, and can be seen particularly in the roles played by the sound director. At one moment he could be understood as a figment of the flautist's imagination (perhaps the alter-ego responsible for the counting games), but later may seem to be a fully independent figure retaining a position of external control (the anaesthetist/hypnotist with a firm anchoring in the exterior world).

The role of the sound-director is, in practical terms, to create supplementary sounds that are either derived from the flautist (and may modify or substitute for the actual flute sound) or from external recorded material. For the audience the critical factor which moves the sound-director from his role as figment of the flautist's imagination to that of an actual outsider is the degree to which his supplementary sounds are heard as an intrinsic development of the flautist's

[37] In the description of this piece I will refer to the flautist as 'her' and the sound director as 'him'. This corresponds to the genders of the performers in actual performances of the piece, but has no other deliberate significance.

actions or as a controlling mutation of them. At the outset of the piece the interventions by the sound director are kept to a minimum, on the periphery of the flautists tone production, but as the piece progresses the interventions become more marked and the character of the electronically defined material becomes more prominent.

To illustrate the nature of the interventions and the features on which they focus I will briefly discuss four separate areas in the piece.

1. In the opening bars the action of the sound-director consists of the addition of a very slight tremolo to the flute sound[38] (Disc 1, track 8 'Slept-1'). The natural variations in loudness that occur in the flautist sound production are carried over into the variations imposed by the electronic amplification, and are supplemented by the wider oscillation in dynamics created by the electronic process—thus preserving a degree of mutuality and fusion in the sound. The regularity of the electronically imposed tremolo, and its capacity to move smoothly from a high to a lower speed, is linked metaphorically to the flautists attempt to access the stable rhythms of sleep. In this interpretation the sound-director remains in the role of alter-ego, assisting in the passage to sleep.

2. In bars 19 and 20 the intervention is more pronounced (Disc 1, track 9 'Slept-2'), and creates a mutation in the flute sound which goes far beyond that which can be produced physically. Whilst the flute plays a sustained multiphonic tone the sound-director produces a secondary set of pitches, created by ring-modulation, which rise and fall in an arc. The challenging breath length required of the flautist (to sustain a tone while the electronic effect completes its arc) and the complex additional artefacts created by the processing both contribute to a sense of external pressure on the flautist. This gives a more pronounced and independent character to the sound-director, pressing the flautist to enter new territory.

3. By bar 66 the interventions have progressed to the point where they are no longer generated by the flute and consist, instead, of a spatially and timbrally rich landscape of water and insect sounds. The flautist responds by setting aside some of the more conventional tone production techniques, and instead producing a series of sounds in the flute using fricatives such as 'fff' 'shshsh' and 'ssss' (Disc 1, track 10 'Slept-3'), which are then reincorporated into the material diffused through loudspeakers. The flautist steps back from her instrumental identity and

[38] Two sensors control the speed and depth of the tremolo: a touch ribbon and a dial. These are the only controllers used by the sound-director in the whole piece (apart from occasional presses on the computer keyboard to change the mapping of the controllers to different processes).

brings a new range of body-sound into the performance. Like someone finally gaining access to sleep, the conventions of muscular control that maintain the body in its social performance (the flautist identity) begin to be relaxed.

4. The emergence of the flautist's body, initially in the unvoiced fricatives, is given further material evidence when she sings a note. This is captured and diffused by the sound-director, creating multiple layers of voices which gradually sink in pitch and grow longer in duration, extending well beyond the capacities of a normal breath. Having made the symbolic reference to her body, the flautist once again picks up the flute, and plays a simple series of notes, accompanied by ring-modulated transformations.

The flute material has been reduced to a dream-like totemic stub, an almost stereotyped representation of 'flautist'. The sound-director, meanwhile, has become responsible for the projection of the voice, the representative of the inner sleeping performer whose waking identity as 'flautist' now appears only to be a character in the flautist's dream (Disc 1, track 11 'Slept-4'). Thus a reversal of roles has taken place—the originally solid 'flautist' identity now appears as a dream-like recollection, whilst the sound director has mutated from éminance grise to enabling medium, allowing the inner singing voice of the flautist to be heard.

Summary

Questions of control, instrumental identity and mutual engagement recur in all the works discussed, whether the performers are responding to a pre-composed dramatic narrative or to a more open-ended sonic relationship, as is the case with the Automatic Writing Circle.

The epilogue has discussed work which prefigures the research discussed in the main body of the dissertation, investigating the transformation of 19th century lyrical nostalgia in the case of *lipsync* and of role-reversal, and an early encounter with the 'negative instrument', in *I slept by numbers*. In *lipsync* I drew on two of the principal skills available to me: my professional experience as a cellist and computer systems designer[39]. An extensive process of development permited me to find a new quality of flexible fusion between the unfolding of a performance and the flow of control in the computer program. The need for an in-depth

[39] I worked for twenty years as a cellist, giving first performances of works by Feldman and Zimmerman. I was also senior computer systems analyst at the Design and Engineering Council, where I developed the Materials Database in collaboration with the European Space Agency.

consideration of programming technique was made evident to me by the limitations encountered in writing software for *I slept by numbers*. New techniques developed for *lipsync* in turn provided the underpinning for the rapid prototyping and re-engineering of instrumental and compositional relationships in the Automatic Writing Circle (described in more detail in the following Appendix).

In *I slept by numbers* the nature of the contact between the sound-director and flautist suggested a variety of alternative possibilities. However I was aware that the sound-director's physical engagement occurred through a turn-sensor and the ribbon sensor, and that the quality of touch and the metaphorical implications of the physical interface remained underexplored.

In this earlier work my concept of the rehabilitation of schizophonia had not been developed, nor the particular mediating metaphors of shadow and object. As indicated at the opening of this epilogue, one of the compelling outcomes of these earlier pieces was the wish to explore the function of electronic sound in the dynamics of a group setting—not the intimacy of single player as in *lipsync* or of a simply differentiated pair as in *I slept by numbers*, but a situation in which there is a more detailed exposure of a performer's instrumental identity to a social group. This entailed radical thought about the nature of instruments, both acoustic and electronic, and of the way that that sound and linguistic communication co-exist in the group construction of the musical situation.

The dissertation as a whole has explored a range of thematic areas, many of which warrant further research. These include the relationship between ethnography and performance, text and signal-network in computer programming[40], the theorisation of the 'negative instrument', the politics of group performance and the further deconstruction of the boundaries between Musique Concrète and soundscape composition. The areas are interlinked, and a new phase of collaborative research has begun under the title of *'The rehabilitation of schizophonia'*, in which the object is not to find a cure for schizophonia but to bring about a greater recognition of its creative potential—a rehabilitation of the term, not of the condition.

[40] The techniques I have used to write computer programs are discussed in Appendix 1.

Appendix 1 – Computer Programming

This appendix illustrates my approach to computer programming. The techniques that I have developed play a crucial part in the work discussed, to such an extent that at times I considered the software to be its focal point. However, whilst it is true that many of the issues connected with software and computer system design have relevance to the themes of the dissertation, I have nonetheless preferred to place these within the wider set of paradoxes that emerge when the human subject is in the foreground.

Body and code in computer programs.

The dissertation has explored the relations between a body (a human body, the body of an instrument) and the textual and symbolic network in which it is framed. Ways of articulating the connections and splits moved from Bateson's theories of schizophrenia to the sonic field of schizophonia. Many of the inconsistencies which were examined, and which mark us as human subjects, can be directly connected to problems in the programming domain: the aporia of computer coding can be seen as yet another location in which the discontinuities of human experience come into play.

These problems are introduced via many routes, for example in the break between analogue and digital modes of representation, or in the incomplete ways that recursion and reflexivity are used to model and control external events. The bridging of these gaps is always accompanied by sleights of hand in which metaphorical or category differences are either overlooked for pragmatic reasons, or resolved along political or ideological lines.

Indications of the ideological ground on which these inconsistencies are played out in electronic sound can be seen, for example, in the rival performance practices of hardware hacking and live coding[41]. Hardware hackers produce sound by intervening in the physical circuits (circuit bending) of the electronics and live-coders produce sonic performances by writing text that modifies program code at

[41] For further details of hardware hacking the reader is referred to Nicolas Collins book of 2009 'Handmade electronic music: the art of hardware hacking' and for an introduction to live coding to the article by Nick Collins, McLean, A., Rohrhuber, J., & Ward, A. (2003). Live coding in laptop performance.

runtime. The differences between these two practices centre on an ambiguity over what constitutes the computer/instrument, the physical circuits or the digital code.

Research into artificial intelligence and artificial life further demonstrates the slippery nature of distinctions between 'body' and 'code'. In the early 1990s the ecologist Thomas Ray developed the Tierra computer system modelled on evolutionary processes, allowing an unpredictable yet complex and almost stable set of virtual organisms to develop (discussed in Hayles 1999 and Stacey 2001). Ray's system abandoned the usual distinctions between program and data and hybrid 'organisms' were able to reproduce within this environment without crashing the computer[42]. If an analogy with human beings could be made it would be that our bodies consist of program code and that the language we use to communicate also constructs our bodies. Ray's system removes the complex interplay between our use of language to articulate and form relationships and its relation to bodily practices, abandoning the differences between what Hayles (1991: 194) describes as processes of inscription and incorporation.

In practice there is a crucial separation between these abstract organisms and the outside world—the organisms are not even allowed to interact with the 'real' computer operating system on which they reside. However, even though it is only a model, and is constrained in its operation in numerous ways, the Tierra system and others like it raise interesting questions about the relationship between embodiment and language. These systems have the potential to reflexively extend, displace or supplement the already unstable areas discussed in earlier sections, relating to the mediatisation of sound. Many systems have been developed which explore the potentially liberating practices that can arise in this extended situation, as has been effectively demonstrated by the political perspective of George Lewis's 'multidominant' Voyager system (Lewis 2000), the virtual GenJam quintet that improvise with Al Biles (Biles 2002) or processes of self organisation in Tim Blackwell's Swarm music (Blackwell & Young 2004).

My own pragmatic considerations

As discussed in section two, the period prior to the advent of computer programming gave rise to listening strategies influenced by the technologies of recording and playback. One of the intentions of my work was to enable

[42] Normally the operating system maintains a separation between programs and data, and has carefully established ways of distinguishing between them. Email viruses exploit loopholes in this segregation by masquerading as data, and can thus overwrite the computer's contents or hijack it in other ways.

performers to engage with this prior cultural history, and with the earlier instrumental practices which it supplemented.

The decision to invoke earlier 'historically informed' mediatisation added a further reflexive spiral to the situation, both in terms of the sound cultures recalled and the diverse relationships between body and sound that they enabled. This approach had the effect of ruling out an early adoption of the more radical self-generative approaches to computer coding. To have a partially autonomous re-wiring of disciplinary associations would have created a perceptual burden that was initially beyond us. In addition, it is doubtful whether the cultural weightings of these different experiences of sound could be adequately represented in the computer system—dealing as they do with assignations of value which are already politically charged and intimately connected with symbolic relations between language and body.

Rather, I contented myself with the exploration of a functional way of engaging with the representational paradoxes discussed above, developing a way of working both with the semiotic potency of text and the embodied quality of a signal network. The chief advantage of this approach was that it allowed for the rapid prototyping and reconfiguration of complex systems, as well as offering an initial creative engagement with the principal schizophonic split that occurs in digital systems. An overview of the development of my approach follows.

A change in approach to making software.

I had been using the largely visual metaphors offered by the programming environment MaxMspJitter[43] and had encountered difficulties when making the piece *I slept by numbers*, particularly when developing flexible ways to remap the functions of the sensor controls. After nearly abandoning Max and moving to a text based programming language (such as supercollider) I came across Open Sound Control (OSC)[44], a communication protocol based on text, and this changed the way that I worked.

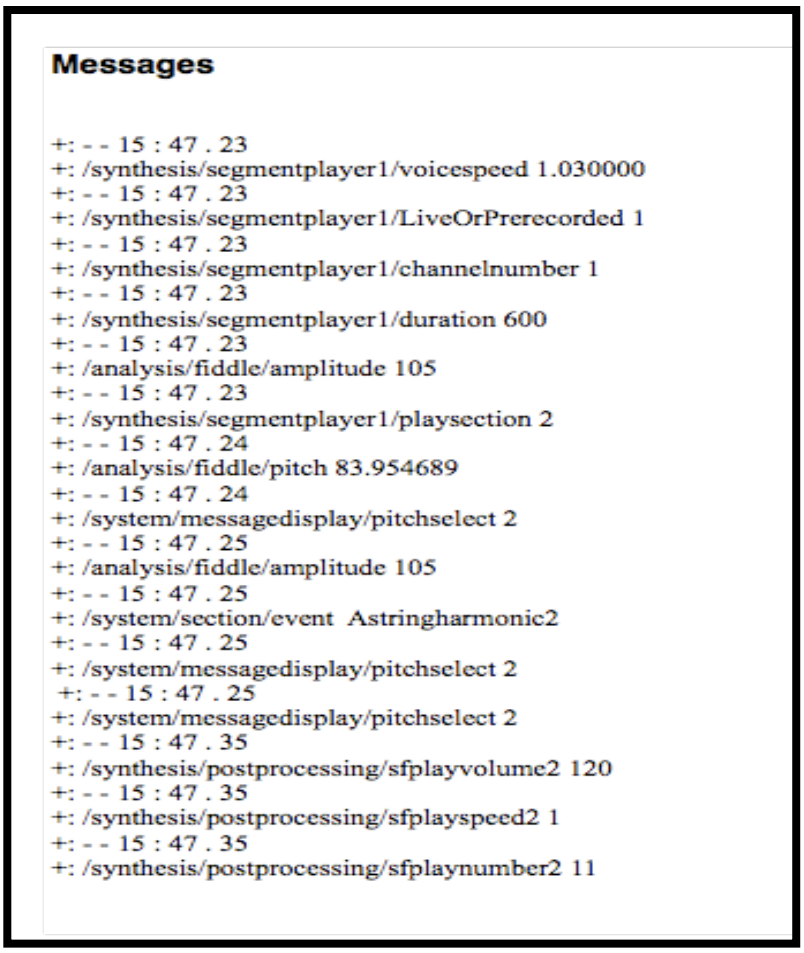
The essential insight was that text structures offer a flexible way of managing state change whilst flow (of sound) is best represented using a signal network, for which the visual metaphors of Max function very well. I place quite a high degree of importance on this 'discovery'[45] of the different roles of the

43 http://cycling74.com/
44 http://opensoundcontrol.org/
45 I put 'discovery' in quotes because both areas are entirely the work of other people, Matt Wright and Adrian Freed for the construction of OpenSoundControl – see Schmeder, A. (2008) and

message structure and signal network.

The following two examples illustrate how these different approaches appear in practice:

Text based message structures



Messages

+: - - 15 : 47 . 23
+: /synthesis/segmentplayer1/voicespeed 1.030000
+: - - 15 : 47 . 23
+: /synthesis/segmentplayer1/LiveOrPrerecorded 1
+: - - 15 : 47 . 23
+: /synthesis/segmentplayer1/channelnumber 1
+: - - 15 : 47 . 23
+: /synthesis/segmentplayer1/duration 600
+: - - 15 : 47 . 23
+: /analysis/fiddle/amplitude 105
+: - - 15 : 47 . 23
+: /synthesis/segmentplayer1/playsection 2
+: - - 15 : 47 . 24
+: /analysis/fiddle/pitch 83.954689
+: - - 15 : 47 . 24
+: /system/messagedisplay/pitchselect 2
+: - - 15 : 47 . 25
+: /analysis/fiddle/amplitude 105
+: - - 15 : 47 . 25
+: /system/section/event Astringharmonic2
+: - - 15 : 47 . 25
+: /system/messagedisplay/pitchselect 2
+: - - 15 : 47 . 25
+: /system/messagedisplay/pitchselect 2
+: - - 15 : 47 . 35
+: /synthesis/postprocessing/sfplayvolume2 120
+: - - 15 : 47 . 35
+: /synthesis/postprocessing/sfplayspeed2 1
+: - - 15 : 47 . 35
+: /synthesis/postprocessing/sfplaynumber2 11

Figure 10 Transcript of messages generated during 10 seconds of performance of 'Lipsync'

These messages have been generated at various locations in the *Lipsync* software and are in response to a variety of events, both within the program and outside. It is possible to distinguish some of the broad areas that the messages are associated with: indicated by the first word in each line, for example ‘synthesis’, ‘analysis’, ‘system’... Further steps into each line show more detailed focus, such as the exact pitch detected by 'fiddle', or the speed linked to the playing of a particular segment.

Miller Puckette and David Zicaralli (see Zicarelli 2002 for a) for the visual programming languages Max and Pd.

The message is an 'all at once', instantly transmitted [46] structure containing both the data to be sent and a reference to an external hierarchy. The hierarchy referred to is the ‘name-space’, which consists of an inventory detailing relationships between the key words defined in the system. The OSC message contains part of the name-space and this allows data associated with the message to be easily translated into new contexts. For example, message-data generated by a bend sensor can be translated into messages controlling the timbre of a synthesised note. The interior reference to an external textual hierarchy also allows the message to be more independent of meanings derived from its position in a time-based sequence of other messages[47]: it is 'stateless' in the sense that, at the most basic level, a message does not depend on a temporal flow for its meaning to be successfully interpreted.

In my own implementations OSC messages are sent to all locations in the system, with no separate streaming for particular types of message: All receiving objects receive all the text sent in the system. The messages thus have the widest semiotic potential, unrestricted in where they might go.

A given text may be filtered and transformed into new text or texts – allowing one piece of text to generate many others. The rules or processes governing the transformations constitute one of the principal components of the piece, along with the actual signal networks that have been built. These 'rules' are easy to change, switch off or delete, and can be remade according to the contingencies, critical reflections and discoveries that occur in the process of creation. Crucially, change does not involve a complete rewiring of connections in the system.

The transformation of messages, in the manner illustrated below, represents an initial negotiation between semiosis and embodiment: If one were to imagine an un-nuanced signal network as the equivalent to Artaud’s ‘body without organs’ (Artaud 1988), then the points at which messages are transformed from one type to another may represent the first formation of organs, hinting at functional processes which begin to move from inscription to incorporation.

[46] The notion of ‘instant’ is in terms of the software and hardware: the actual time taken for a message to be transmitted depends on a variety of factors such as the clock rate of the processor, the speed of the data busses and network, and the resource loading priorities in the system.
[47] This is not the case, for example, with Midi, where the meaning of a message is often dependent on a state that is left behind by a previous message.

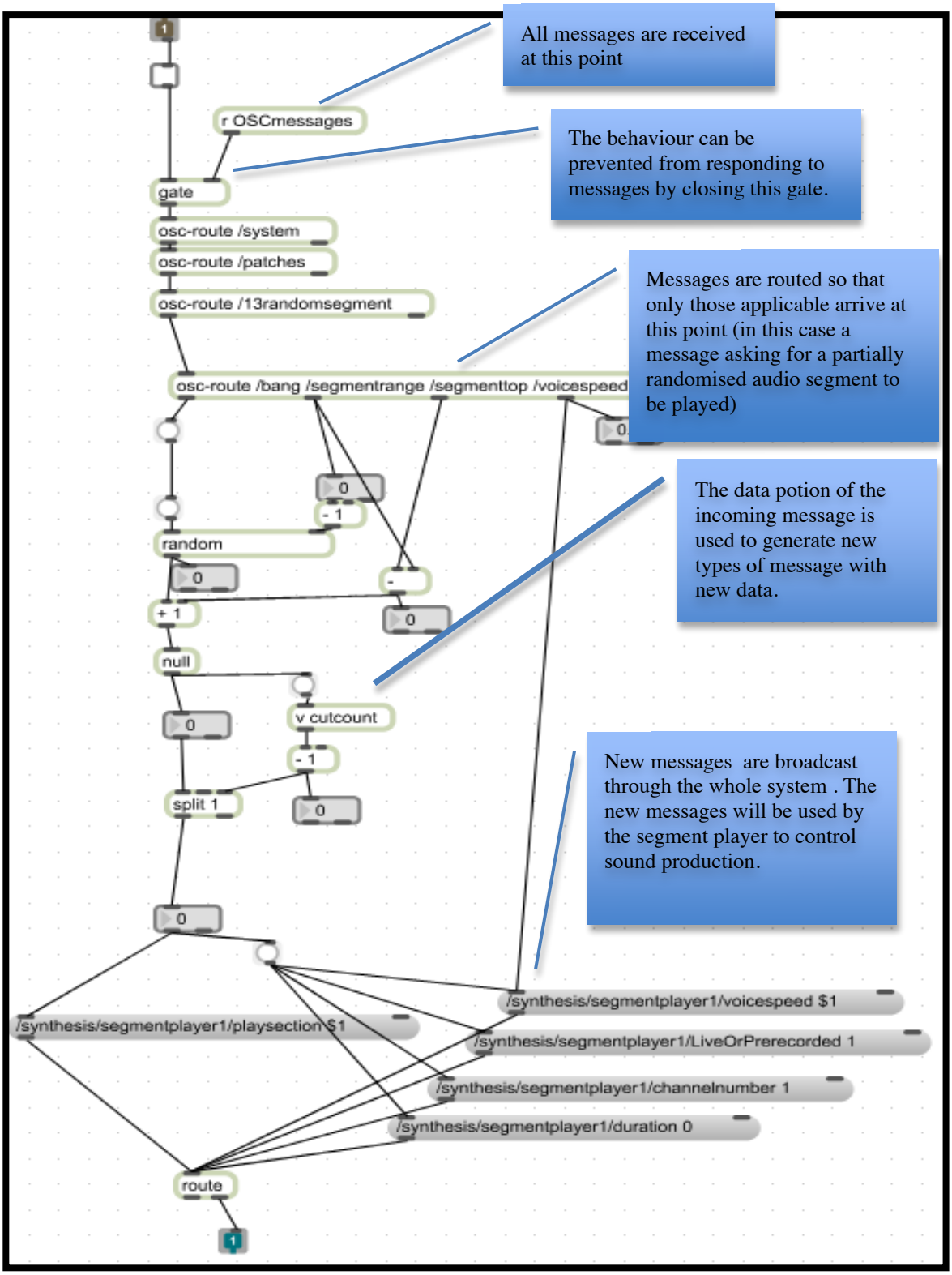


Figure 11 The interior of a behaviour (number 13 in *lipsync*), showing the transformation and rerouting of messages.

The signal network

The semiotic potential of text contrasts with the signal network, in which the path of the signal is not encoded in the signal itself, but must be traced through an

external environment. The following screen image shows the signal network that is used in *lipsync*.

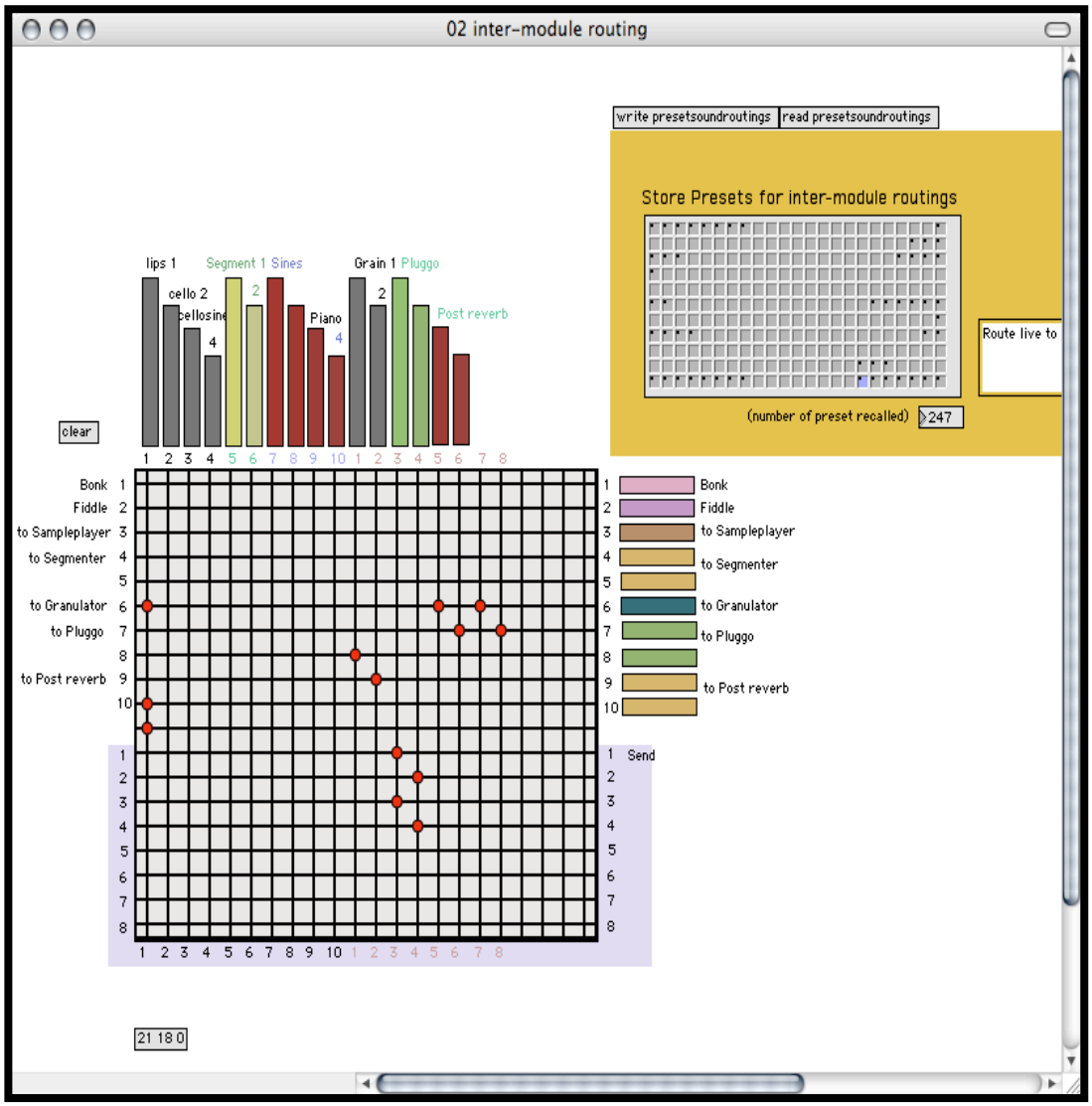


Figure 12 The matrix used in *Lipsync* to represent the signal network.

The dots on the matrix represent flows between the processes above and to the right of it. It is similar in function to a patch bay or old fashioned telephone exchange. By looking at the arrangement of dots it is possible to work out unambiguously (with a little practice) the route a signal takes through the various sound processing modules. Reference to the external infrastructure is required in order to understand the route that the signal has taken—it does not reference this path itself and the external routings need to be viewed separately from the sound.

Two Examples

There are numerous techniques which can be used to explore the gaps

between text and signal-network. These provide a metaphorical way of engaging with the dislocations being explored in the wider musical field, and offer practical ways of bringing about new connections between diverse situations.

I have selected two examples, one from Lipsync and one from the Ouija board, to illustrate different ways in which the techniques have been used[48]. Whilst both generate messages in response to 'gestures' the first example uses time as its principal structuring reference (with beginning, middle and ending) whilst the second is grounded on spatial differences (responding to the appearance and disappearance of a shadow over areas of the Ouija board)[49]. Although the focus is on a small subset of each system, the examples are also intended to give an insight into the more general architecture of the respective software used for each work.

1. Movement between sections in *Lipsync* – the 'Section' object

Overview

Lipsync is in six sections. Movement from one section to the next occurs in graduated steps which follow the performance of the cellist. Within each section there are four phases: initiation, continuation, waiting and ending, and within each of these phases there are a much larger quantity of smaller scale 'behaviours' which differ from one section to another. The behaviours are the main points in which mappings are made between text based messages and sounding events.

The section object provides the framework for a series of extended gestures, generating detailed behaviours and controlling movement from one section to another. The beginning of a section is triggered by a message from another section object, and the termination of the section in turn sends a message to another section, instructing it to begin.

[48] These are chosen from the large number that exist in both pieces, and which can be examined in the software included on the Data CD.

[49] My initial exploration of gesture was given direction by an article by Levitin, McAdams and Adams (2002). In this the authors present an alternative view of musical events, examining cognitive control structures rather than sound morphology. Their object is to describe the cognitive and physical conditions which operate in the production of a tone. Thus, a 'note' is not described in terms of an attack, sustain and decay, but as a conditionally linked route through cognitive and muscular steady-states and processes.

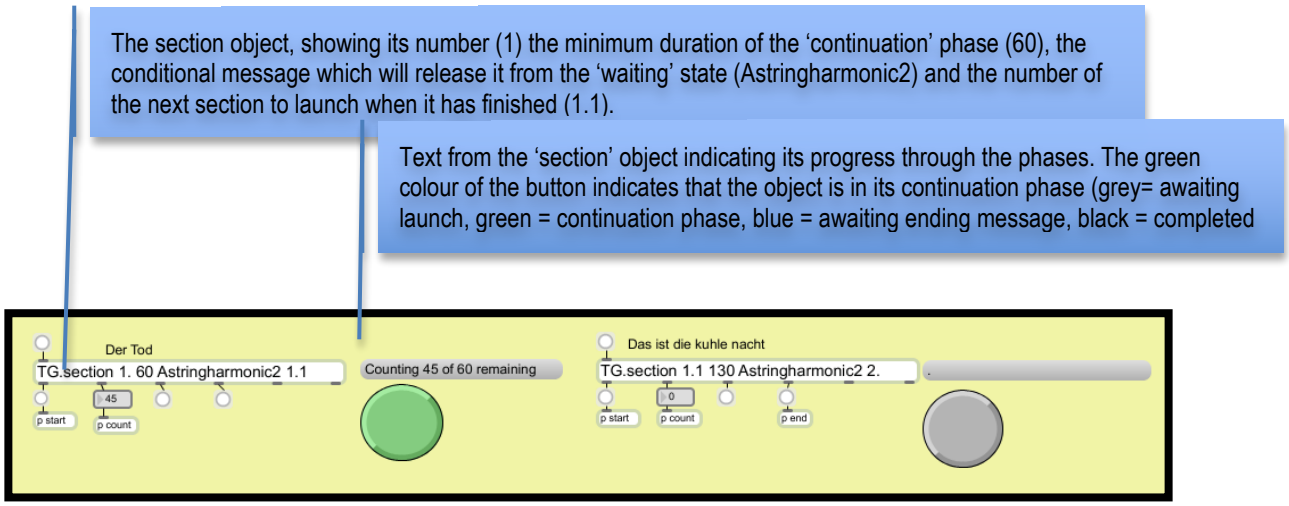


Figure 13 Part of the 'Performance timing control' screen for Lipsync

The above screen image shows two of the 'Section' objects for *lipsync*. The current place of the performer within the piece can be inferred from the colour of the buttons associated with each section. The image above indicates that the first section is in its continuation phase (green) whilst the second section has not yet begun (grey).

Detail

The first phase in each section is the *initiation*, which sets the system to the required state, for example by initialising the routings between modules and setting the parameters for any sound-modules used. The bulk of the audible activity occurs in the *continuation* phase, which has a given minimum duration defined as part of the section object. The *waiting* phase can be considered as an extension, of potentially unlimited duration, of the *continuation* phase, but it is primed to terminate on receipt of a message generated by the cellist (in this case the playing of a C# harmonic) which moves the section into its *ending* phase.

The image below shows some of the messages generated in the *continuation* phase of the fifth section. Some of the messages alter sound-generation parameters directly[50] whilst others initiate complex behaviours.

[50] For example the message '/synthesis/postprocessing/sfplayspeed2 0.25' initialises a sample-playing object to play at ¼ the normal speed.

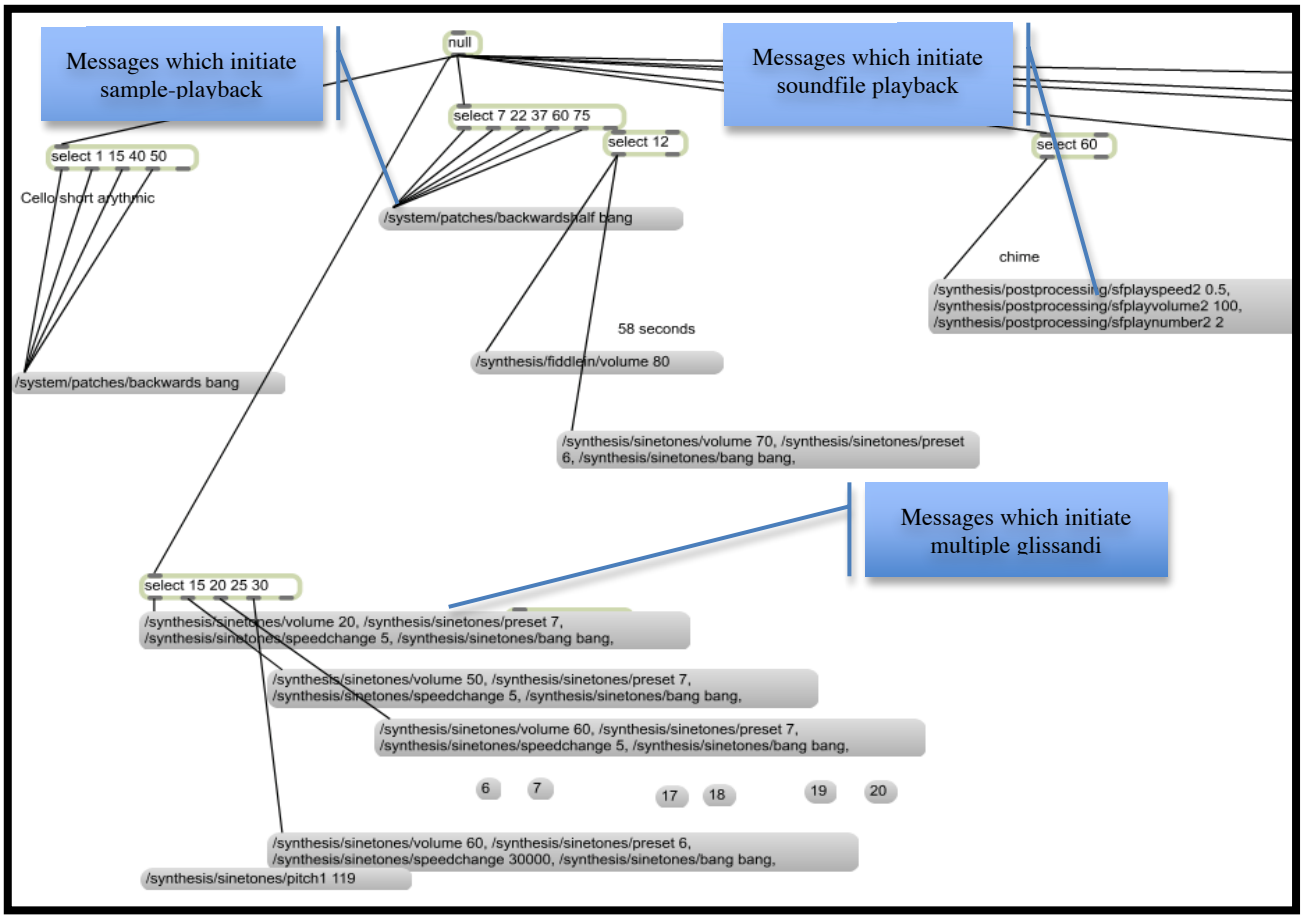


Figure 14 Some of the messages generated in the Continuation phase of the fifth section.

An example of a complex sonic response brought about by a single message (‘/synthesis/sinetones/) can be seen in the multiple glissandos between chords that occur in the fifteenth second[51] of the start of the phase. Other complex behaviours are initiated which do not immediately produce sound, for example the segmentation and storage of sounds detected by the microphone[52].

Summary

The above example demonstrates the way that message structures are used to break the continuity of time into phases related to the preparation, implementation

[51] The behaviour which produces this glissando is in a separate part of the program, and can generate material whenever a message of the correct format is sent. It produces 100 sinetones, each of which travel from a start-note to an end-note at slightly different speeds. These are assigned randomly at the moment of initiation so that different interference patterns are generated for each performance.

[52] The segmentation is based on the detection of peek onset transients and the data is stored as a collection of time points. These allow access to the recording in variable sized chunks with the time points indicating event boundaries.

and completion of an action. Within each phase numerous messages are sent which interact with and change the state of the signal network. The semiotic potential of text, to unpack metaphorical associations and to generate further textual output, is exploited to nuance the flows in the signal network.

2. Gesture mapping in the Ouija board – 'Sinetone-resynthesis'

The second example comes from the software used by the Ouija board in performances by the Automatic Writing Circle. It shows one of the ways in which the movement of the Ouija player's hand reshapes the sonic material of the group. The particular synthesis module to be discussed, 'Sinetone Resynthesis' (mentioned earlier in 3.6.2b Condensation – 'Timbral Freezing'), permits the analysis and resynthesis of the timbre of sound at a selected moment.

Position of the process inside the Ouija software

The particular process under discussion has its place in the wider environment of the Ouija software, which includes a number of interdependent areas:

1. Sound synthesis modules.
2. Management of links between sound-generation processes and Ouija-points.
3. Mapping and conditioning of the video input (resulting in the generation of Ouija-points[53]).
4. Routing signals between microphones, synthesis modules and loudspeakers.

'Sintone-Resynthesis' is found in the sound synthesis area listed above. However, to give a picture of the way in which text structures are used to nuance the production of the sound it is necessary to begin in the area which manages the links between the Ouija points and all sound-generation processes.

[53] The term 'Ouija point' is used to describe the link between a pre-defined point on the sheet and the video analysis that is performed on it. As the shadow of the performer's hand passes over the point the numerical value generated by the Ouija point increases.

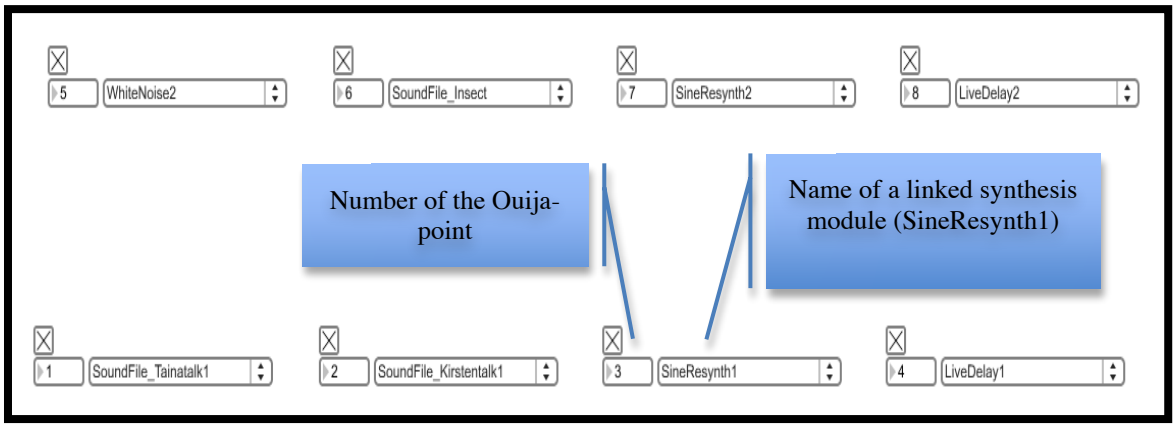


Figure 15 Part of a screen from the Ouija software showing the mapping of Ouija points to synthesis modules.

The above image shows the links between sound synthesis modules and Ouija-points. However, these links are not permanent and can be changed by the players using a touch interface (the 'Lemur'[54]). This allows the mediating environment of the Ouija board to be adjusted during performance[55]. Each Ouija-point currently has forty-six synthesis modules that may be linked to it, a quantity which could present an overwhelming number of choices. To make the moment of decision more rapid, preselected combinations of Ouija-points and synthesis modules are established in the rehearsals prior to performance, and can be recalled in a single gesture from the touch interface. Whilst the initiation and termination of synthesis modules occurs as a consequence of a performer's touch on the Lemur interface, the actual control of a module's output is in response to the degree of shadow cast over a Ouija-point.

The 'synthesis-choice' object, a link between the gesture and the sound

The link between a Ouija-point and synthesis module is made by a 'synthesis-choice' object, and there is one of these for each Ouija-point being used[56]. The object offers a common set of functions required to manage the

[54] Developed by the company 'Jazz mutant', the Lemur was one of the first multi-touch interfaces designed specifically for use in live electronic music. The Lemur ceased production in December 2010. (Jazzmutant 2011, Davidson 2006)

[55] There is a more lengthy cycle of observation and response involved in writing the software which, since it is not produced by live coding, occurs in the periods between performances.

[56] It is worth noting that in earlier versions of the software the linking occurred in the reverse way: rather than using a 'synthesis-choice' object which allows a selected synthesis module to attach to a Ouija-point, a 'ouijapoint-choice' object allowed the attachment of a Ouija-point to a synthesis module. The shift to the 'synthesis-choice' version followed the realisation that the governing metaphors of the system stem from the physical attributes of the Ouija-board itself, and that the

connection, such as the routing of Ouija-point data to the chosen synthesis module. Like the *Lipsync* 'section' object described above, the 'synthesis-choice' object helps regulate the beginning, continuation and ending of sound making processes. However, it differs from the 'section' object in that the high level shaping of events derives from spatial rather than from temporal metaphors.

The Sinetone-resynthesis module.

Responses to the light-intensity and 'start' and 'end' messages sent by the 'synthesis-choice' object occur within the actual synthesis module itself. In 'sinetone-resynthesis' (one of the 46 current synthesis modules) the shadow controls two aspects of synthesis: the moment at which the sound is analysed and the volume of the generated output. Analysis of an incoming audio signal is triggered when the amount of shadow on the chosen Ouija-point moves above a threshold of 10%. While the shadow remains greater than 10% variations in its intensity control the volume of the sine tones generated as an output of the analysis. This allows a variety of hand gestures to be used, for example:

- Rapid fluttering over the Ouija-point will generate new sinetone clusters, each of which will be a response to the current audio signal.
- Gradual casting of a shadow on the Ouija-point will allow an initially inaudible sinetone cluster to be generated from the current audio signal, becoming audible and emerging almost imperceptibly from the sonic background as the intensity of the shadow increases.
- Any exit and re-entry of a shadow into the Ouija-point will generate a new tone from the current audio signal – with the amplitude of the tone varying according to the depth of shadow.

The two diagrams below illustrate the main components of the 'sinetone resynthesis' module. The first diagram shows the objects in the first level of the patch whilst the second is a detail of one of the secondary levels.

number of shadows on the sheet and their intensity are a more important regulatory principal than the numbers or types of synthesis module.

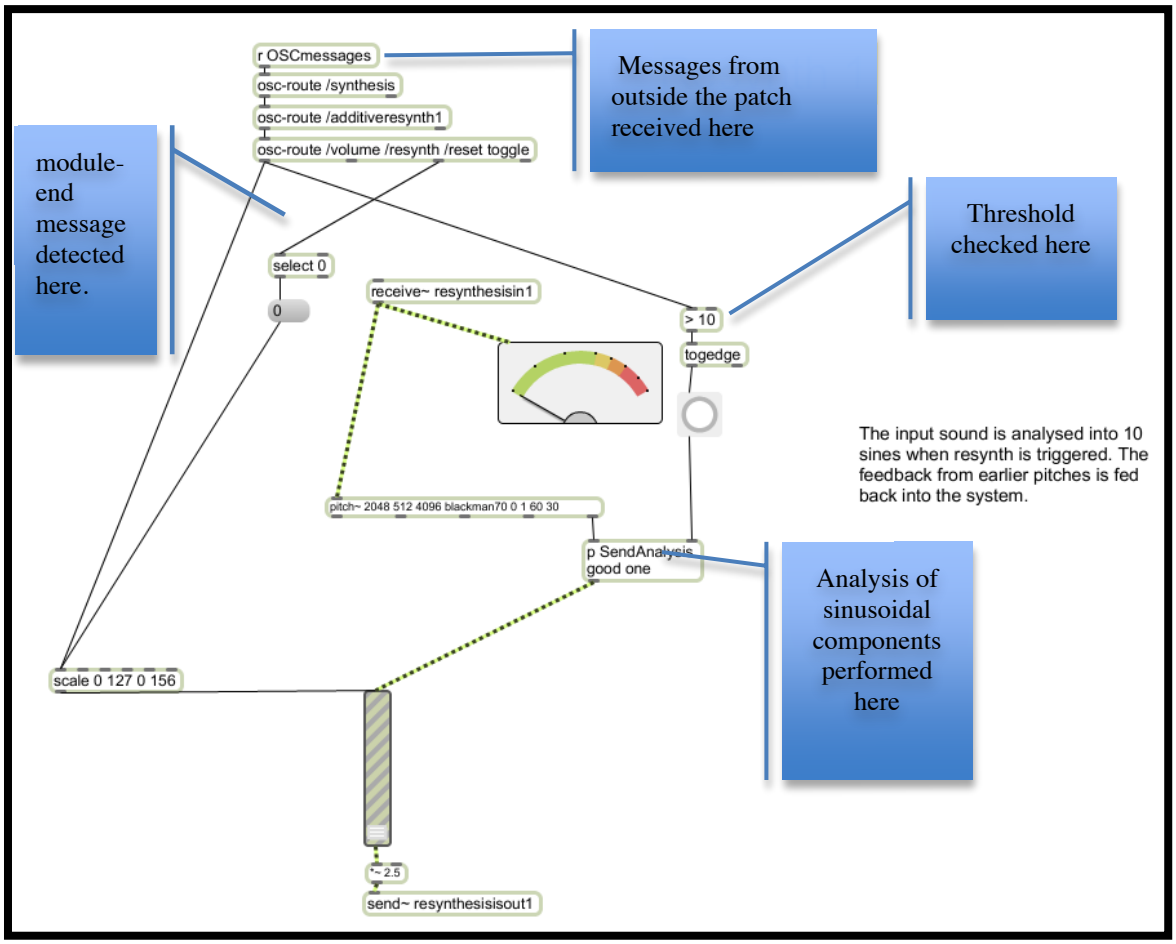


Figure 16 Main objects in the 'Sinetone Resynthesis' patch.

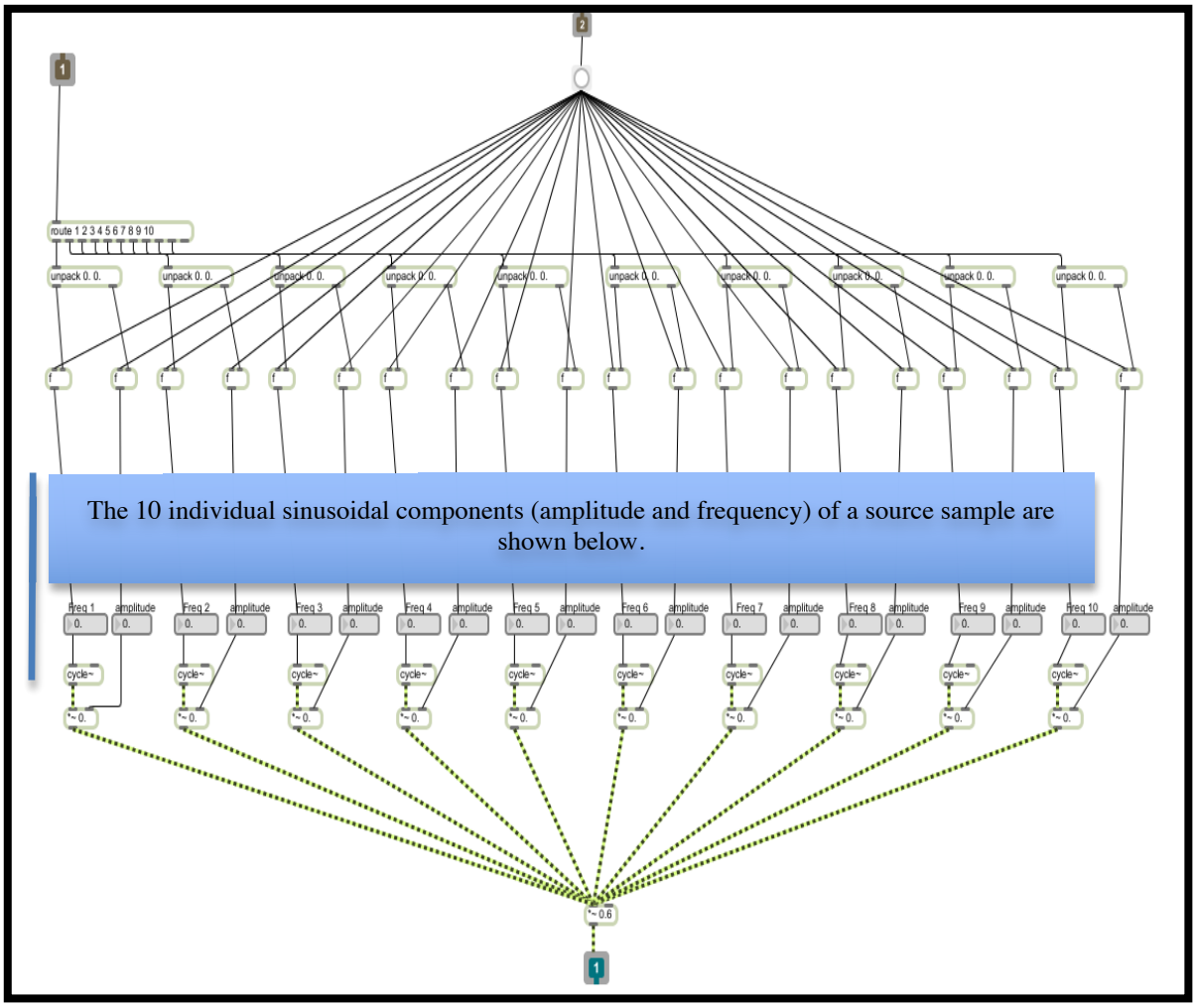


Figure 17 Detail of the module which generates 10 sine tones from the analysis function.

Summary

The above examples from *Lipsync* and the Ouija board illustrate some of the ways in which I use message structures and signal networks. The goal has been to refine and simplify software functions in order to articulate the wider concerns of the musical situation. The simplification of processes is only possible because the programming environment in which it occurs is sufficiently complex, thus allowing refinement and choice from amongst a wide range of possible approaches.

The complexity of the intersection between text structures and signal networks also has a wider potential: future plans include the incorporation of elements of artificial intelligence, for example using neural networks (Brown 2006) or hidden markov models (Kolesnik 2005), extending the scope of the already highly reflexive environment within which the Automatic Writing Circle

has been working. A further form of extension has also begun, in which artists are invited to curate the space presented by the Ouija board, contributing new software, sound-files and performance practices which mediate between the musicians and the sonic space.

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