Facilitating Heterarchic Collaboration: Practice-led Research and the Promotion of Egalitarian Compositional Creativity

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Abstract

This thesis interrogates and creatively explores the author's professional collaborative practice as composer and musician, using an ethnomusicological approach layered with performance to establish a new interactive composition environment. The exploration of theoretical and observational principles from ethnomusicology and contemporary music technology discourse are used to give new form to the author's practice; a process explored through the demonstrative portfolio of works and their analysis. New knowledge is created by:

1. Deconstructing composition and performance paradigms (including the author's) using theatrical/ musical performance models
2. Interrogating the findings from point 1. from the angle of both researcher and subject
3. Using the findings to develop unique software (AMP) that utilises FMOD sound engine technology
4. Using AMP to create an interactive multi-user client-server network as an alternative/ augmentation to the author's historic collaborative compositional approach; contributing new knowledge through the assimilation of modern gaming technology and collaborative composition and performance analysis

This thesis explores the process, development, and experience from the angle of actor and originator of interactive apparatus. It is a new approach to the author's collaborative composition, and an ethnographic report on the processes involved in its development. Socio-musical networks of interaction from Peru and Cuba are examined from the perspective of performance and ethnomusicology; extrapolating directions to assist the author's artistic output through technology, and contribute to the academic understanding of culture-specific paradigms of musical creativity.

The portfolio contains seven titled pieces, with each piece being presented through multiple variations. All titled pieces have been produced using AMP; illustrating the creative journey (through (auto)ethnographic observation) that harnesses modern gaming's recent focus on the exploration of terrain rather than winning. The works highlight the author's relationship with inter-personal, interactive music practice and explore how processes of musical creativity could be addressed in their professional environment, and in the wider context of musical interactivity discourse.

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Chapter 1. Introduction, Methodology, and Method

1.1 Introduction

This thesis proposes an alternative practice-led approach (using the AMP application as a platform) to the author's collaborative musical creativity. It does this by observing:

1. How AMP is developed and introduced to the collaborative creative practice of the author and his two colleagues/ collaborators; Dan Axtell and Gaetano ('Tano') Iozzi
2. The function of AMP and how it creates a compositional production tool on which the author and his collaborators can relocate elements of their historic composition methods
3. The development of a new and innovative platform (AMP) on which collaborative composition and performance can be playfully explored, drawing on the author's historic collaborative loop-based compositional approach

Having been engaged in the performance and production of music (both acoustically performed and computer-based) since tertiary college in 1996, this doctoral research project commenced in November 2011. It was initially to be an exploration of my professional collaborative composition practice, both observing and contextualising the requested representations of 'world music'[1] that I had experienced through commissions to create soundtracks for various moving image projects. As part of this process I planned to assess historical attitudes towards sonic representations of the Other in such commissioned requests. Introductory research areas and questions that were raised in the early stages of the process fell under three broad heading:

1. as a composer, what were the responsibilities that I held in representing people and places, musically?
2. how does “screened music” (Mera and Morcom 2009, 5) de/re/ and trans-contextualise image?
3. how does re-signification (giving a musical style or genre a new meaning through placement in film, television, or non-original performative context) ethically 'sit' with the composer; taking into consideration the educational and prejudicial properties that this exposure may offer to viewers and listeners?

1 'World music' is of course a deeply problematic term. I will never forget explaining this angle of my research to ex-Goldsmiths PhD candidate and fellow SOAS alumni Alejandro Toledo who in fact turned and walked off as soon I introduced this element of my research; presumably agreeing with Martin Stokes that the term “is not, of course, remotely adequate for descriptive of critical purposes” (Stokes 2004, 52). My use of the term actually refers to the way that I have been asked to *compose* music, not as a direct reference to how I grouped genres/ nations/ cultures together.

During the infancy of this research, I was struck not just by the attitudes towards such representations that I tacitly accepted, but additionally how I believed that I had subconsciously been attempting to justify a personal re-direction of my own practice-based professional approach to the production of music. Having performed music (drum kit and percussion) in a variety of genres (Jazz - predominantly big band and experimental modern, folk - borders revival, Javanese and Balinese gamelan, and various Cuban styles - *rumba*, *bata*, *timba*, salsa[2]) I was acutely aware that the appeal (to me) of some of these performative setting was not related specifically to the content of style, but in fact the inter-personal relationships and pedagogic approaches that were delivered, explored, expanded, and maintained through performance. Certain performance paradigms were not re-enacting my desired social life model, but were in fact the actualisation of my desired inter-personal relationships. By introducing such concepts as interpersonal relationships (and later interpersonal interaction) into this discussion, it is fundamental to locate such terms in the context of current thought to establish my discourse. Drawing on Austrian biologist Ludwig von Bertalanffy's introduction of general systems theory (1968), ethnomusicologist Martin Clayton proposed to relocate this theory to the acts of musical analysis; submitting that "dynamic or complex systems theory describes and models the behaviour of interacting systems comprising autonomous agents" (Clayton 2013, 17). Although Clayton recognised that there is a possible tension between the "culturally situated action" (ibid.) of music and the culturally removed systems theory/ dynamic systems theory, he proposed that we can "regard a group of performing musicians as a complex system. The group as a whole will behave in ways not conceived by any of its individual members, as a result of the pattern of interactions between those individuals" (ibid.). Clayton's approach serves a duality of purposes to my research. Importantly, it raises the subject of my 'desired inter-personal relationships', and this needs to be explained in greater detail. Performing music to an audience has never been a driving factor in my involvement with music, quite the opposite in fact. It has been an often necessary by-product of my true reasons for involvement with musical performance; a space in which I can shape a sense of affinity-based communal cohesion; a relatively non-verbal socialisation that allows people's individuality to become shared, uncovered, interpreted, and negotiated within a frame of collaborative performance, largely replacing more common paradigms of group socialisation spaces. This has sometimes proved to be difficult as 'it' (the music) has also

2 Although I understand that the term 'salsa' was invented in the USA by the Fania record label as a way of marketing Cuban-style genres to the North American market, I am here referring to the original Cuban genres of (and based on) *son* and *son montuno* popularised by Cuban artists such as Arsenio Rodriguez and Lili Martinez in the first half of the twentieth century.

become a space of professional work, and as a result it is often hard to establish the boundary between the two activities, having to internally negotiate the boundary between the social and the monetary.

Although not a completely new concept to me, this was a re-framing of a previous realisation that had occurred some seven years earlier. Spending four years (1999 - 2003) recording, touring, and performing extensively with Topic Records' Tarras[3], I had reached a point where I was unhappy to continue; the repetitive feeling from 'going through the motions' of 'rehearse, record, rehearse, gig' had disconnected me from my desired involvement in music and performance. At this time, I temporarily abandoned my performance practice as a professional drummer and enrolled on a undergraduate degree in ethnomusicology at SOAS, University of London, hoping to reconnect with and further uncover elements of performance practice that had been either rendered as obsolete in my professional practice, or had never even made themselves known. Surrounded by a faculty of internationally renowned performance instructors (Andy Channing, gamelan; Sanju Sahai, tabla; Bill Bland and Noda Hernandez, rumba) and ethnomusicologists (Lucy Duran, David Hughes, Rachael Harris, and Keith Howard to name but a few) I was provided a way of not only exploring the 'Worlds of Music'[4] that were out there being researched, but also to become immersed in the performance practices that I was attending lectures on. Coming from a professional practice where I was 'the drummer', it at first seemed very strange to me that in both gamelan and rumba practice, I was expected to not just sit behind one instrument, but learn all parts, techniques, and musical responsibilities for all instruments of the ensemble; at no point, for example during sixth form college (or later at the University of California, Riverside), had I been asked during a big-band rehearsal or practice to “move along and have a go at the trumpet part”. This new (to me) way of interacting with both my fellow performers and the actual musical material was a complete revelation – and I can't stress this enough. Particularly in rumba, the complex web of an instrument's hierarchic role and the resulting manifold network of musical calls, responses, questions, answers, and responsibilities within such practice caused me to completely re-interpret how I interacted with both my peers and my instruments during such practice and performance; all the while accepting particular 'rules' that were applied to particular genres, particular musical 'happenings', and particular performance contexts. I was not simply playing my part, but having a direct affect on the ebb and flow, and overall shape of a performance through the interactions that were happening through this socio-musical network of possibilities.

3 A Cumbria-based borders folk revival band

4 A core undergraduate module at SOAS.

In reaction to this realisation, my initial research areas and questions (as noted on page 4) began to evolve into a more pragmatic research enquiry. This had at its centre the interrogation and development of both my own personal and collaborative musical practice, and those of other selected socio-musical paradigms that I have been influenced by, both positively and negatively. Having reconsidered the *actual* stimulus for conducting such a research project, key research questions were re-framed to permit a sense of truthfulness to shape my thesis:

1. how do I interact with people and technology when I perform and compose music?
2. how do I attempt to recreate and/or represent socio-cultural power relationships through performance practices?
3. how have movements in cultural theory, popular culture, and technology affected and progressed models of musical practice?
4. how can I develop my own collaborative practice through the adaptation, and de- re/ and trans-contextualisation of answers to the above three questions?

In shifting my position of research in such a way - and acting as both challenge and asset in many stages of the research - was the justification of what creative arts and practice based research proponent Estelle Barrett titled “Art as the Production of Knowledge” (Barrett 2010, 1). Barrett states that “[t]he emergence of the discipline of practice-led research highlights the crucial interrelationships that exists between theory and practice and the relevance of theoretical and philosophical paradigms for the contemporary arts practitioner” and that the process of such research is “aimed at extending understandings of process and methodologies of artistic research within the discipline and the broader cultural arena” (ibid.). This understanding of process that Barrett proposes as a justification of such practice-led enquiries became a central and re-occurring theme for me, the exact manifestation of such a process in thesis form proving, at least initially, hard to imagine in relation to most recent version of my research questions.

As a musician, I have felt a certain tension between the two different 'types' of musical activities that I have predominantly become involved with; on the one hand, the sense of freedom and often complete immersion in my collaborative 'live' music performance and recording work, and on the other the sense of 'composer for hire' that exists in the world of composition commissions for moving image projects. To some degree, it has always been that the second type of musical work that I have undertaken has

been – although still located in the world of financial fantasy – to pay for the first type; allowing a far more subjectively led approach to my own non-commission based performance and composition work that exists in an almost symbiotic relationship with the first; the style of my collaborative composition work obviously being influenced by my performance practice and vice versa. This symbiosis has not of course happened purely by chance. Gaetano ('Tano') Iozzi and Dan Axtell – with whom I started the composition for moving image company Whitebox – were, before this, live performance collaborators across a variety of genres. Having met Tano while studying for my Ethnomusicology bachelors at SOAS, we often performed together both formally and informally, with projects ranging from the preparation for our Performance as Research modules at SOAS (Cuban rumba, Javanese and Balinese gamelan), to a wide array of informal experimental performance projects. Having met Dan through one of Tano's Performance as Research rehearsals, Dan, double bassist Jerelle Jacob, and I decided to embark on an experimental jazz trio project focussing on recording, although as a trio we did perform live on some occasions around London. As these relatively informal performance and recording projects came and went it became apparent - through the endless conversations around music - that all three of us were deeply interested in the 'soundtrack' category found in the then still prominent music shops around London. It was from these conversations that as a trio, Tano, Dan, and I decided to explore the possibility of composing music for moving image. Working with music for moving image was not completely new to us in the split groups mentioned above. With Tano, I had in 2009 composed the original score for Dave Arnold's *Mengejar Ombak* (*Chasing Waves*), a documentary charting the international rise-to-fame of Javanese free-surfer Dede Suryana. With music that grew from collaborative composition exercises at SOAS for my Masters, this soundtrack – and the accompanying film – ended up being very well received; gaining awards for both cinematography and original music at the X-Dance Film Festival in Utah, USA. With Dan, and as a spin-off of the experimental jazz studio work that we had been undertaking with Jerelle, we were asked to perform a live soundtrack to the documentary *Being the Change* for its premier at the Bloomsbury Theatre, London, in October 2011.

Formalising our collaborative compositional practice through the establishment of a limited company to offer our creative works through, as a trio of composers (now company directors) we had some creative concerns to attend to. Having no central office or studio (other than for the purposes of HMRC communications) we would predominantly work remotely in our own domestic studio environments, working to what politician and social theorist Jaques Attali referred to as “the

Production of Supply" (Attali 1985, 105) where "the entire production process of music is very different from that of representation, in which the musician remained the relative master of what he proposed for the listener. He alone decided what to do" (ibid.). Although we would no longer be alone in deciding on what constituted a complete work – the introduction of the moving image's production team would now be central to this – we were determined to maintain the deepest sense of collaboration and interaction as possible; developing systems of remote collaboration and interaction with both each other and the musical material to maintain a firm connection to what it was that got us performing and composing music together in the very beginning. This 'what it was' is a harder set of concepts to explain. From the outset of performing together at SOAS, there had always been a distinct sense of 'leaderlessness' between the three of us; that is, however formal the end goal of a particular music project was, it was consistently allowed to develop, redirect, and emerge from a quasi non-hierarchical point of authority. All performers had the freedom to introduce material, propose a new musical direction for a performance, and question the decisions made by any other member of the group completely. The concept of ownership was entirely absent, although sometimes the reason for a performance (for example if it was Tano's final performance exam) would dictate that it was 'his' performance, but this was purely to adhere to conventional requirements rather than representing the actual situation. In response to Attali's conceptualisation of the production of supply, I became increasingly absorbed in attempting to negotiate methods of maintaining inter-personal interaction found within my sought after acoustic performance paradigms within our commissions; a way of modelling our compositional interactions innovatively that would serve both the commissioner and the commissioned by system theory's deconstruction of interactions.

The objective of Whitebox is to be able to work both independently and collectively on musical projects, using sonic ideas put forward by any or all of the members to use as material that can then be shaped into finished musical products. The shaping of projects can take on a variety of forms, determined primarily by the aims of the project. For example, a project can be a commission, or it can simply be an addition to the company's repertoire, for use if and when a suitable commission arrives. For either of these eventualities, Whitebox has developed a practice that remains relatively stable. Each member creates a series of ideas that are shared and evaluated by the other members, and either taken up as starting points for further work, or deemed as unsuitable for the current project and put aside. These ideas can vary significantly in their content, ranging from simple sounds (either acoustically or

synthetically generated) such as a monophonic pad note or basic set of chord progressions, to far more developed ideas consisting of more recognisably 'complete' musical ideas that just need to be finished rather than developed further. All shared ideas are provided as:

- rough-mixed audio files (.mp3 and .wav)
- Logic project files so that all individual elements (including routing and effects) can be identified and edited by all collaborators
- all files are stored in the cloud[5] so that all members can access the material from their own studio, remotely
- these pooled ideas are then taken up by collaborators and developed in any way that the new collaborator deems productive
- no ideas that a collaborator wants to retain creative control over are ever made available as collaborative works

Through this process, the number of ideas is gradually whittled down, until a core group of ideas is left. This process is continued (sometimes for days, weeks, or months) until left with something that resembles a 'piece' of music. Tracks, parts of tracks, and new ideas are strung together both horizontally and vertically, reversed, pushed to the sonic background (or foreground), until a new sonic structure has been created through a form of musical brainstorming. Ideas based on an existing theme are produced individually, with the option of inclusion as the project develops, or to promote further development for other projects as they are picked up by other members; a digital, internet-based adaptation of ethnomusicologist Bruno Nettl's "Top of Old Smoky Effect" (see section 2.4 for an introduction to this concept) in which the genealogy of various pieces can be mapped through the sharing and adaptation of both structural content and influence. The visual progression of Logic projects is spider-diagram-like, as new ideas and material are connected above, below, and to the side of the original musical idea, triggering new thematic building blocks for new projects (fig. 1):

5 Third party storage facilities where large amounts of data can be stored and accessed online, for example Google Drive, Dropbox, SugarSync, etc..

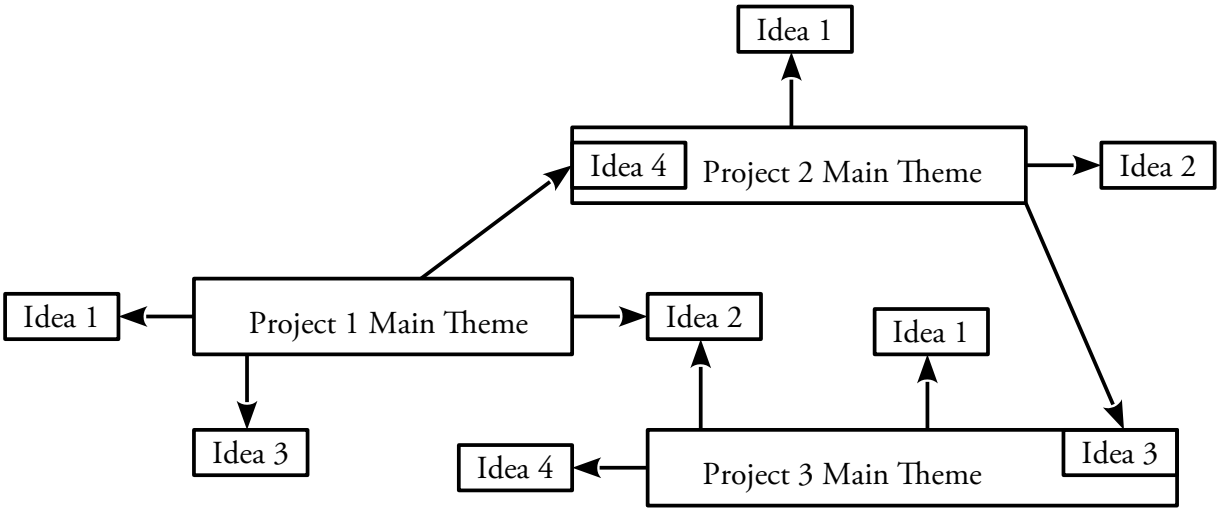


Fig. 1. Thematic and idea-based progression in Whitebox

This method of remotely brainstorming musical ideas manages to avoid some of the problems that can be encountered in a face-to-face situation. Discussing the problems often encountered during group face-to-face brainstorming in business development outside the arts, psychologists Jonali Baruah and Paul Paulus state that "most people want to be seen in a positive light and may avoid sharing half-baked or weird ideas that might actually stimulate the group to develop better ideas. To the extent that individuals feel their ideas are being evaluated by others or they are disproportionately anxious in groups, they may be less creative in groups than alone" (Barua and Paulus 2009, 33). Additionally, this method of working for Whitebox allows ideas to form individually within the group without 'bottlenecks' forming at the DAW (Digital Audio Workstation). However adaptable the group's members are, there is little future in attempting to input/play multiple ideas simultaneously on a single machine. This would only be possible if ideas were being put in exactly the same spot in the arrangement and were to be played without mistake by both performers, which is an unlikely scenario. It would be similar to two people trying to use the same computer to write two papers – it would very quickly get unworkable. As a result, members would have to spend time (seconds, minutes, or hours depending on the situation) waiting for the DAW to become available, and this can be deadly for creativity. Also of great importance is the retention of your idea. Cognitive overload[6] is not uncommon when trying to remember your idea, while simultaneously evaluating and feeding back on a completely different idea someone else has introduced, resulting in neither the idea nor the feedback being

6 The 'overfilling' of one's working memory; the mental workspace that deals with the immediate conscious perceptions of an individual.

delivered effectively, if at all.

Remote brainstorming can also provide the (sometimes) beneficial offering of anonymity. As mentioned by Baruah and Paulus, contributors may feel that what they are offering is just too 'half-baked' or 'weird' and may not want to make their identity known to the rest of the group. In these situations, face-to-face working would simply stifle individual input (Barua and Paulus 2009, 33). Our system of group-based (mostly) remote composition runs in contrast to what many consider normal in characteristics of group creativity. Specialising in the psychology of group creativity, Keith Sawyer proposes that "the defining features of group creativity are that it involves two or more people, creating together at the same time" (2003, 4). Authors such as Sawyer (2003), Paul Berliner (1994), and Ingrid Monson (1996) often use the collaborative elements of improvisation in jazz styles to explain their view that "no single musician can determine the flow of the performance: It emerges out of the musical conversation, a give-and-take as performers propose new ideas, respond to other's ideas, and elaborate or modify those ideas as the performance moves forward" (Sawyer 2003, 47). However, as Sawyer points out, in jazz improvisation, the point is not to create a 'product' to be displayed; the performance is its own goal, creativity is the product (Sawyer 2003, 5). He contrasts this with the idea of product creativity where revisions are made by the creator before the completed work can be exhibited, stating that "product creativity is found in artistic domains such as sculpture and painting, as well as scientific domains, where the products generated are theories, formulas, or published articles. In many creative domains, this private revision process is a solitary one" (ibid.).

In Whitebox, although the revision and development of ideas is often solitary, we are working with material that has arisen from intense (although often contact-less) interaction with the artistic endeavours of the other members' work. Through the way that ideas are presented and made available (this is always as fully editable multitrack Logic projects with access to all individual music/sound/plug-in components), the degree of access that each member has to the other's musical ideas (although not in a 'real time' performance space as with live ensemble musical interaction) allows for complete autonomy within each of our studios. Importantly for the Whitebox composition process, this opens up the possibility that multiple members can work independently on the same idea and make both developments available, so that the third member can examine both versions and construct a new third version from the two variations. This allows "the key characteristics of all group creativity: process,

unpredictability, intersubjectivity, complex communication, and emergence" (Sawyer 2003, 5) to become apparent and be central to our composition process. Management and group creativity psychologist Mihali Csikszentmihali (2012, online video interview) weaves these concepts in to what he refers to as the 'flow of creativity' and the central importance of interaction for such a state to occur:

> those artists that started out with the least preconceived notions of how the actual finished product would look like, those were the ones that turned out to be the most creative, and these were people who started out with just a kind of dimly felt emotional or intellectual problem, usually emotional, and as they began to put colours and shapes on the canvas began to think "Oh, wait a minute. I could do this, I could do that". They allowed the problem to to emerge through the interaction with the medium […] They discovered their problem, they didn't bring it to the canvas as an already established aesthetic idea of problem […] the evolving conversation, the changing and realising, recognising possibilities in the interaction.
> (Csikszentmihali 2012, online video interview)

Thus, in allowing members to access each other's musical workings (without exposure to their history or creative process) while removed from the original aesthetic, each member is permitted to derive their own interpretation to use as colour and shape for development; the transformation of ideas not to be seen as someone else arranging or orchestrating your track for you, but more as someone picking up where you stopped – or paused - ultimately allowing the composition to continue.

In the academic year preceding my enrolment to the Sonic Art PhD programme, a conversation took place between myself and a group of Music GCSE students I was teaching. Looking back, this seems to have stuck with me; helping to shape my modus operandi, while simultaneously triggering many of the questions that would go on to become stepping-stones in both theoretic and practice-led contexts. I was working in the capacity of Music teacher at a small independent school that focused on the performing arts (drama, dance, signing) and I had set my year ten class some group composition homework the previous week based around our current area of study, Javanese gamelan. The homework was to in groups, come up with a four-part cycle of any length based around the pieces that we had been listening to in class. The end of the lesson came, and I asked to collect in the recordings and/or notations that the class had done. Silence. Asking the class of eight boys to stay behind while I tried to understand why there had been a complete lack of any work done as requested, it quickly became apparent that they had all recently purchased *Call of Duty: Black Ops II* for their Playstation 3/ X-Box 360, and had been playing this, seemingly without pause, from when they had got home each day, until they were eventually too tired to play anymore. Importantly, they had been playing this collectively,

collaboratively, and remotely; ganging up on the 'baddies' and communicating via headsets to let the others know what the plan was. Attempting to approach this problem from the angle of a pragmatist, I sat them all down and asked what we could do to try and solve this problem, knowing full-well that they would be going home at the end of the day and repeating the above process. Once they had given me quite hollow-sounding guarantees that they would be getting this work to me by the end of the week they began to leave and go to their next class. On their way out, one of the boys, who could always be trusted for a frank and honest picture of what was going on said “you know Sir, if we had a way of making this that we could play it all at the same time on our consoles, you'd have it by tomorrow morning”.

By interrogating both my solo practice, my collaborative performance practice, the insight from my year ten Music class, and my collaborative composition practice I propose AMP, a bespoke interactive music composition and performance application. Designed in collaboration with computer programmer Jim Murray (who has been instrumental in the front-end API integration), AMP serves as a platform of possibilities, both in terms of exploring an innovative and experimental approach to my current collaborative methods, and also as a potential gateway into relocating my collaborative creative practice to a more experimental paradigm.

AMP's functioning is based on FMOD interactive sound engine technology, with no evidence of this software utilising such an approach previously. Networked multi-user clients are used to give collaborative control to the work's composers, presenting them with an interactive terrain of exploration similar to those found in contemporary VR experiences; winning or losing are of insignificance to the experience. Where acoustic styles are presented using AMP in this thesis, they are not done so to 'imitate' the performance skills of such genres. Instead, they are used as an alternative experience quite separate from the original setting; adapted and moulded to explore their collaborative potential in a new environment.

AMP serves two main purposes. Firstly, it is a proposed collaborative 'meeting point' for our musical experiments and developments, with regard to our remote collaborative composition process. It is a place where the experimentation and exploration of each others musical ideas can become building blocks in the next layer of musical development. As such, it becomes both a compositional and

production tool, an experimental phase of musical collaboration that allows the exposure of new musical content to be played with in a game-like environment. Secondly, as a result of our remote collaborative relationship, the material that has historically been made available to other members has often been 'loopable' – rhythmic and melodic ideas that are presented as repeatable segments. This is how musical ideas are normally presented to other members in the group. A key factor in AMP's development was to create an experimental environment where this compositional approach could be explored creatively in an interactive and collaborative manner. The role of AMP is not to create locked-in masters ready to be placed in moving image projects, but for us to creatively 'play' with our remote collaborative efforts, a collective next-phase of experimentation with our collaborative material. The documentary video examples that accompany this thesis are intended to illustrate the above points, demonstrating the play-like collaborative creativity that AMP introduces to our practice.

In my research, I illustrate interactivity between acoustic music performance, composition, and transmission, and utilize performance practices to produce a system of humanities computing developer and code writer Janet Murray's "procedural authorship" (1997, 126). It is within the rules and structure of this system that AMP's users will interact. In AMP, musical material is selected by a user that then drives and directs the choices made by other users. I propose that through AMP's facility for collaborative interaction, a new layer of collective musical material is developed through interactive performance, building on the original material initially composed to be used within AMP. This new layer is utilised by AMP's users, forming a creative feedback loop in which both individual and group choices are assessed in real-time and in turn affect further musical selections by individuals and the group. In doing so, collaborators establish a musical "game of emergence" (Juul 2005, 73), or as I propose – a 'performance of emergence' – that has the potential to lead to new networks of musical creativity and authorship, that I argue foreground theoretical issues including Umberto Eco's concept of openness in art and music (1989), and Roland Barthes' "death of the author" (1977, 142).

Eco asserts that performers of open works, when required to impose judgement in the form of improvised creation, do so to simultaneously occupy both performative and aesthetic planes (Eco 1989, 3), co-authoring and experiencing at the same time. Barthes marked this duality in music by claiming that "[t]here are two musics[...]the music one listens to, the music one plays. These two musics are two totally different arts, each with its own history, its own sociology, its own aesthetics" (Barthes 1977,

149). He held up each example in conceptual opposition to the other. I propose that while Barthes's duality of 'making' and 'consuming' still exists, these activities can occupy the same creative paradigms now available in the field of mobile-device-based interactive music composition and performance, and one that I interrogate as a model of my own collaborative composition practice.

1.2 Methodology

As a way of developing my methodological route to such an interrogation, I found it central to develop six core research approaches that would assist in the illumination and concretization of my research. These approaches were practice-led research, ethnomusicology, ethnography and autoethnography, games and the aesthetics of interaction, performance theory, and design-led research. All six of these approaches do of course include a huge array of subcategories that in themselves present complete research methodologies. My reasons for choosing such approaches, and the internal sub-categories that I have used in particular, will be explained in the following sections (1.2.1 – 1.2.6).

1.2.1 Practice-led research

With the continuing reflection, deliberation, and debate surrounding practice-based enquiries as acceptable academic outputs, practice-as, practice-based, practice-integrated, and practice-led research have, as drama specialist Brad Haseman notes, become central in "describing the research approach that enables practitioners to initiate and then pursue their research through practice" (Haseman 2010, 147). Preferring the term practice-led, Haseman, a strong supporter of this methodological approach to artistic research believes that it is:

> an effective and serviceable term. It describes what practitioner-researchers do, captures the nuances and subtleties of their research process and accurately represents that process to research funding bodies. Above all, it asserts the primacy of practice and insists that because creative practice is both ongoing and persistent; practitioner researchers do not merely "think" their way through or out of a problem, but rather they "practise" to a resolution. (ibid.)

Having established such a cogent and logical sense of authority surrounding the approach, Haseman raises what to many is a persisting thorn in the side of such methodological pathways; that of perceived academic rigour:

> [h]ow will it be possible for the person who is both a researcher and creative practitioner to take his or her place at the research table in a way that ensures that the primacy of practice and the embedded epistemologies of practice are respected and valued, and at the same time produce research which is recognised and respected for its rigour by the other

> researchers within and beyond the field of the creative arts?
> (ibid.)

To the many practitioners in his field (and all of those related to it) this is not so much a problem of self belief that their output is in fact research, but rather a reaction to the responses that their approach can be met with. In relation to the act of musical composition, composer and musical aesthetics academic John Croft's paper "Composition is not Research" opens with the attention-grabbing statement that "[t]here are, by and large, two kinds of composers in academia today – those who labour under the delusion that they are doing a kind of 'research', and those who recognise the absurdity of this idea, but who continue to supervise PhD students, make funding applications, and document their activities as if it were true" (Croft 2015, 6). While granting 'research' status to musical contributions such as the construction of compositional systems, it would appear that Croft's main issue with such labelling is his belief that "the answer to any conceivable 'research question' that might be involved is known in advance" (ibid.). Croft, in explaining (one of) his main issues with such 'research' asserts that if the answer to your research question is "always (trivially) 'yes', then there's no research going on" (2015, 7). In a strong and thorough response to Croft's assertions, composer and creativity academic Martin Dixon believes that Croft's issues surrounding the act of composition as research are not satisfactory, and that his attempt to separate composition and research "end up as hollow" (Dixon 2015, 1). Agreeing that the research questions put forward as 'typical' by Croft (such as "can I make music in which all pitch classes are played equally often?" (Croft 2015, 7)) are indeed not research questions, Dixon goes on to clarify that "these examples are *not* proof of the categorical impertinence of posing research questions in composition. They are just examples of stupid questions" (Dixon 2015, 2). Concluding his response to Croft, Dixon begins his closing statement with what I believe to be an important contribution to the argument; the difference between a research-type composer, and a non-research-type composer, with these differences being:

> their preparedness to set out and defend certain claims that pertain to their work for the benefit of the research community as well as actually write the music. A musical score or sound file by itself is not, and cannot be research, it can only [be] one dimension of a research process. For composed music to take its place in this research process will mean making their ideas explicit, it will mean writing and talking about their own music and the ideas that influenced the shaping of their practice in ways which other people can assess and reason with.
> (Dixon 2015, 4)

Fundamental here, I believe, is Dixon's key remark regarding the explicit nature of a research-type composer's ideas in the shaping of their practice. The relationship between the creative act of

composition and the marrying of this to a template of academic analysis, accountability, and integrity is of considerable importance for such practitioners. Faced at the end of their creative process by a key question on justifying the pretext for their approach, many research-type composers will either have to, or at least feel the need, to answer the question "[w]hat new knowledge/ understandings did the studio enquiry and methodology generate that may not have been revealed through other approaches?" (Barrett 2010, Introduction). This is, I believe, crucial to Dixon's argument, as well as to the nature and justification of this thesis. My portfolio and associated thesis of commentary, analysis, and techniques of academic location are, I propose, an example of Haseman's 'practicing to a resolution'. I do not pose a fundamental "Can I..." research question to which the answer will only be "yes". Instead, I look to my practice as a facilitatory partnership, that alongside what are generally thought of as 'bread and butter' research techniques (such as theoretical analysis), do create the most accessible and cogent expression, interpretation, description, and of great importance contextualisation, of my practice.

Stepping away from this argument, and into a more general view of the subjective artistic research process, I have become struck by a similarity to both my own approach to my research, and that with which I work professionally outside of the practice-led research context. It is described at this point to illustrate the observations that I have made regarding experiential learning, and the value that it awards to its participants; value that I have witnessed first-hand from the position of educator. Having been involved in 'education' (in terms of teaching, curriculum development, and senior leadership) for eight years, in January 2016 I took on the position 'Head of Quality Assurance' at The Write Time Alternative Provision in Croydon, South London. Although this position was predominantly geared towards the assessment, development, and stream-lining of cross-curricular and inter-departmental policies, it also required me to become familiar with the ethos, purpose, and 'USP' of the school. Alternative Provisions are establishments that compulsory school-age children get sent to when mainstream education/ PRUs are not working for them. 'Not working for them' covers a variety of situations, but generally falls within two main categories; the child displays severe behavioural issues, often resulting in violence, that make it unsafe for them to remain in a mainstream environment, or they have a health and safety risk-factor (such as being young expectant mothers) that means their original school (due to the institution's health and safety policies) cannot have them on-site anymore while guaranteeing their safety. With reference to the first category (that of behavioural issues), a downward spiral effect is often referred to when discussing student behaviour with representatives of

their original academic environment; the student struggles with a subject/subjects, they misbehave as a result, they get into trouble. This process is repeated in a seemingly never-ending process of behavioural deterioration, until the child is asked to leave the school. When a child comes to The Write Time, as well as being introduced to educational and behavioural psychologist William Glasser's principles of Choice Theory (Glasser 1998) that the school centres itself around, they are also quickly introduced to the idea of 'plan, do, review'. This concept is based on educational theorist David Kolb's experiential learning theory in which he states that "learning is the process whereby knowledge is created through the transformation of experience" (Kolb 1984, 38). Central to his theory's application at The Write Time is the constant observation, negotiation, and development of each child's own learning experience, as *they* see it; by allowing every child to help plan and assess not just what they will learn ('plan' and 'do'), they also reflect on their learning experience, drawing conclusions to how they think that they have done, and experimenting with how they could develop their own learning (review). In this situation, the ownership that is afforded to such children not only empowers them in a way that they may have never been exposed to, but also allows for constant (where needed) critical reflection on their learning process and *their* creation of *their* knowledge. Estelle Barrett states that Kolb's experiential approach:

> starts from one's own lived experience and personal reactions. Learning takes place through action and intentional, explicit reflection on that action. This approach acknowledges that we cannot separate knowledge to be learned from situations in which it is used. Thus situated enquiry or learning demonstrates a unity between problem, context, and solution. (Barrett 2010, 5)

Approaching my practice-led research from an equally heuristic angle has permitted my thesis and portfolio to evolve in directions that have been guided not simply by 'uncovering' answers to a research question, but to approach issues, problems, and creative strategies with a dualistic practice-theory rationale; reflecting on my experiences, and using the outcomes of those experiences to question and interrogate how I saw/see my practice progressing, repeating this process with the same cyclicity as Kolb's experiential approach.

Robin Nelson, stating that "PaR [practice as research] involves a research project in which practice is a key method of inquiry where, in respect of the arts, a practice (creative writing, dance, musical score/performance, theatre/performance, visual exhibition, film or other cultural practice) is submitted as substantial evidence of a research inquiry" (Nelson 2013, 4), importantly highlights the often complex relationship between the writing (words) and the practice elements in such bodies of work.

Being more interested in the "*resonance* between complimentary writing and the praxis itself" (Nelson 2013, 5), as a drama and aesthetics specialist, Nelson's approach supports that although the writing can and will be central to contextualising the practice, it "is not to demand a verbal account of the practice, and certainly not to require the transposition of the practice into words" (ibid.). As such, the written element of this submission, including the musical transcriptions, is not to be seen (or read) as an explicit explanation of what is heard in my portfolio, but as text to contextualise both what is heard, and how it came to exist.

1.2.2 Ethnomusicology

Having already introduced the subject with regard to music's 'meaning', I will now offer how areas in the field of ethnomusicology will be used in my approach to research. Alan P. Merriam, in his seminal 1964 book *The Anthropology of Music* describes ethnomusicology as "the study of music in culture" (1964, 6), with Bruno Nettl, some sixteen years later developing this statement to read "the study of music *in* and *as* culture" (1983, 1). These descriptions by themselves, although opening up the general areas in which ethnomusicological enquiry resides, do need some further qualification. Merriam continues with his explanation, stating that:

> [m]usic is a product of man and has structure, but its structure cannot have an existence of its own divorced from the behavior which produces it. In order to understand why a music structure exists as it does, we must also understand how and why the behavior which produces it is as it is, and how and why the concepts which underlie that behavior are ordered in such a way as to produce the particularly desired form of organized sound.
> (1964, 7)

Despite its age, there can be few people that consider themselves to be 'doing' ethnomusicological enquiry today that can dispute the authenticity and centrality of Merriam's proposition to their current practice. Nine years after Merriam's contribution, and of equal influence to the evolving practice of ethnomusicology, John Blacking's *How Musical is Man?* proposed that the title ethnomusicology:

> is widely used to refer to the study of different musical systems of the world. Its seven syllables do not give it any aesthetic advantage over the pentasyllabic 'musicology', but at least they remind us that the people of many so-called 'primitive' cultures used seven-tone scales and harmony long before they heard the music of Western Europe.
> (1973, 4)

Although when one looks to ethnomusicological publication and research in the present, there is still a canon of literature available that supports such historic views of the subject, and that "the art music/folk music/popular music trichotomy and the Western music/non-Western music dichotomy are still alive

in the popular imagination and serve as the centres of gravity for music disciplines in the academy" (Berger 2008, 62), in recent years there has developed an alternative.

With much of his research now focussed on Ohio's mixed genres that constitute the over-arching term 'extreme metal' and the assessment and enquiry into how such genres are used to both express emotional negativity as well as the promotion of critical thinking and personal responsibility (Berger 2008, 74), Berger believes that "all musics are equally worth studying; that music is inextricable from the rest of culture; that music doesn't have an inherent value, but is only valuable to particular people in particular societies; that it is not the job of the ethnomusicologist to engage in criticism, but to understand how music works from the perspective of the people who make it and listen to it" (Berger 2008, 64). Berger also believes the fact that these foundations have principally been applied to ethnomusicology's predominant immersion in non-Western music traditions and practices "at first simply seemed to be a historical accident"(ibid.). For Berger, it seemed:

> the anti-elitist thrust of ethnomusicology and folklore studies would easily embrace the musics I cared about. In the larger disciplines, though, the populist mission of these fields collided with other basic assumptions there, producing serious problems and contradictions. Though the Indiana ethnomusicologists were more than happy to see the discipline embrace popular culture, many in the field were wedded to the notion that mass mediated music was in some way ''inauthentic''– a strictly profit-oriented affair unworthy of attention, and, outside Western Europe and the United States, a corruption of the genuinely ''other'' cultures which were ethnomusicology's proper object of attention. (2008, 65).

Luckily however, many ethnomusicology scholars have embraced not only these 'real' sub-cultures that are visibly and tangibly part of their society, but also with increasing frequency, are now looking to the 'virtual world' as not only a site of investigation, but also as a location that can present and illuminate the musical goings-on that surround both themselves and others. In William Cheng's 2012 research into the "virtual musical democracy" (2012, 31) of online gaming communities, he believes that "[b]ehind a veil of pseudonymity, players of LOTRO [Lord of the Rings Online] and other games are accorded enormous freedoms to experiment with behaviors that they might otherwise not be able or willing to enact in -real-world setting" (Cheng 2012, 56). This, he believes, is "shedding new light on the numerous continuities as well as disjunctions between virtual and real-world experiences" (2012, 56-57) with his ethnography located at the meeting point of both gaming technology (both audio and visual) and social media. The relevance of this relatively new binary code-based location of musical

happenings, social interactions, and ethnographic 'field' has two main areas of significance to my research. When Rene Lsyloff put forward that "the World Wide Web seems to be huge ghost towns because human presence there is rarely synchronized temporally and never spatially. I won't find another person on the web, I'll only find traces they left behind"[7] (2003, 24), he brings to the foreground – in terms of my ethnomusicological approach – two key areas of interest. What are the possibilities of delivering a mode of practice-led musical creativity within the framework of such binary networks (both wide area and local area), and how can the findings of a more traditional ethnomusicological analysis of musical happenings establish, contribute to, and shape such interactions.

This thesis uses and approaches socio-musical analysis in a way directly relating to Merriam's statement regarding the relationship between music and human behaviour (Merriam 1964, 7). It does this by analysing the practices of two musical settings traditionally more aligned with ethnomusicological research – that is coming from outside of both my own current area of practice and the realms of Western Classical traditions – the Peruvian altiplano, and the Cuban port towns of Havana and Matanzas. By scrutinizing social structures that contribute to (and to some degree *define*) musical structures (and the reverse process of closely analysing musical structures that supply social structures with their organisation), I look to how such practices have both consciously and subconsciously become completely central in shaping my creative output. In doing this, and to understand the shared processes that exist between my own practice and that of the those that I introduce, I offer the same analysis to my own methods to ascertain the proximity of our shared practices.

1.2.3. Ethnography/Autoethnography

While objective analysis and discourse are offered across multiple stages of my research, the contribution of autoethnographic subjectivity as a source of both reflective and pragmatic material is of great importance. From an epistemological view, the practice-led approaches of this research (and the associated articulation of my creative, performative, and compositional paradigm) rely on the subjective belief and opinion of interpretivism: that reality is socially constructed; that the ultimate goal of such research is *understanding* (rather than the *explanation*-centred acts of positivism); and that knowledge is

7 I understand that Lysloff is here describing the effects felt when this work was written. Since 2003 internet speeds have dramatically increased and permitted far more 'real-time' interactions to exist online. Using data gathered from Ofcom, ispreview (http://www.ispreview.co.uk/index.php/2016/03/ofcom-2016-report-average-uk-home-broadband-speeds-reach-28-9mbps.html) has shown that between March 2013 and March 2016, average UK download speeds have gone from 12Mbps to 28Mbps – more than doubled, with the average UK internet speed in 2008 being 3.6Mbps (https://www.ofcom.org.uk/about-ofcom/latest/media/media-releases/2013/average-uk-broadband-speed-continues-to-rise). Both sources accessed 1st November 2016.

subjective, value-dependent, and contextualised. Carolyn Ellis, Tony Adams, and Arthur Bochner posit that "[w]hen researchers do *autoethnography*, they retrospectively and selectively write about epiphanies that stem from, or are made possible by, being part of a culture and/or by possessing a particular cultural identity. However, in addition to telling about experiences, autoethnographers often are required by social science publishing conventions to analyze these experiences" (Ellis, Adams, and Bochner 2011, 4). In place of autoethnography's traditional application of storytelling to invoke anthropologist Clifford Geertz' "thick description" (Geertz 1973, 3) of both behaviour and context, this research proposes an alternative. Instead, a narrative arc (the chronological 'telling' of the creative journey) of reflection, process, and contextualisation exist to offer accessibility and function "thus, the autoethnographer not only tries to make personal experience meaningful and cultural experience engaging, but also, by producing accessible texts, she or he may be able to reach wider and more diverse mass audiences that traditional research usually disregards, a move that can make personal and social change possible for more people" (Ellis, Adams, and Bochner 2011, 5). In doing so, I approach autoethnography from the perspective of anthropologist and ethnographer Heewon Chang's "'native ethnographies', ethnographies conducted by ethnographers about their own people" (2008, 44); contextualising, reporting, and learning from my own social environment. Due to the broad spectrum of interpretations regarding the definition of 'autoethnography', Chang proposes her own take on such a method, stating that her approach "combines cultural analysis and interpretation with narrative details. It follows the anthropological and social scientific inquiry approach rather than descriptive or performative storytelling. That is, I expect the stories of autoethnographers to be reflected upon, analysed, and interpreted within their broader sociocultural context" (ibid.). While avoiding the removal of the self from the autoethnographic process, I endeavour to maintain a pragmatic approach, and feel that these elements are the most honest representation of how I, as a practitioner, actually work; how I, in practice, actually reflect on my own practice and my surroundings. While my research utilises the subjectivity of autoethnography's deeply personal and often intimate approach, I have made the conscious decision to re-balance such an approach through combining the autoethnographic with the ethnographic. I contribute a layer of objectivity to the interrogation of my practice; an objectivity achieved by removing the exclusively reflexive.

1.2.4 Games and the aesthetic of interaction

The complex relationships between 'playing', 'performing' and the 'interactions' that occur within both

game-based and musically performative environments is a complex subject, but one that is influential to my thesis both in terms of development and illumination. In the following section I will address several key approaches to the theory of game play, interactive digital art, procedural authorship, and game audio configuration that have become influential themes in my methodological approach. In her recent book *The Aesthetics of Interactive digital Art*, professor of contemporary art Katja Kwastek said of her own work that "the word 'aesthetics' is consciously applied as an ambivalent term whose meanings can range from 'perceptions mediated by the senses' (aesthesis) to 'theory of art' (aesthetics)" (Kwastek 2015, 43). Explaining her interest in the relationships between playing, performing, and interacting, she believes that "it is possible to find common characteristics in many forms of play – above all else, the foundation of an experience on an activity that is not primarily purposeful, which applies to rules-based games and to free play. Since this is a fundamental characteristic of interactive art as well, play is an important reference system for this study" (Kwastek 2015, 71-72). Pointing to the relationship between aesthetics and play, twentieth century cultural historian Johan Huizinga discusses the central characteristic of play as being to animate an activity to create order and form (Huizinga 1938, 10). In doing so, he points to the relationship that exists between the concept of play, and the element of organisation within such events to create beauty (ibid.). Such orderly forms are never far from the implementation (or attempted implementation) of structures based around the application of rules-based systems of interaction; be they between people and objects (for example in the card game Patience Solitaire), or inter-personal. With particular emphasis on the centrality of rule systems to video-game play, Katie Salen and Eric Zimmerman's *Rules of Play* (2003) divide these into three separate categories; "operational", "constituative" [sic], and "implicit" (Salen and Zimmerman 2003, 130).

Where Huizinga's earlier work centred itself on the idea of operational rules – those that are contained in instructions and inter-player agreements – Salen and Zimmerman's contribution calls for the constitutive systems that refer to the structure of actions that take place during a person's interaction with a game, and implicit rules that "implicate the broad domain of social norms" (Kwastek 2015, 78). Kwastek relates the centrality of such distinction in play to the concept of interactive digital art by adding that "theories of play thus represent an important compliment to aesthetic theories. The latter don't look beyond the structures that become manifest in the gestalt work, whereas an analysis of the underlying rule systems can also reveal the structures that shape the process of gestalt formation" (ibid.).

Ludomusicology, a term coined in 2007 by digital-game researcher Guillaume Laroche, concerns itself with both music within games, and "the study of both the musically playful and the playfully musical" (Moseley 2013, 283). Paraphrasing Roger Callois' six core characteristics of play (1961, 9-10), Moseley states that freedom, separateness, uncertainty, unproductivity, regulation, and fictiveness must be apparent during such an event (2013, 287). Of importance is that when such a game takes place, it will be located somewhere on the scale between paidia - "defying or ignoring constraints, and the pleasure taken in tumult, improvisation, and contrary behaviour" (Moseley 2013, 290-291) and ludus - "the player's willing submission to the non-negotiable rules that govern the pursuit of games, and the pleasure taken in confronting – or ingeniously circumventing – arbitrary and recurrent obstacles" (Moseley 2013, 291). As Moseley believes, both of these elements (the six characteristics of play from Callois and the ludus-paidia scale) are also both apparent in environments that fall under the category of ludomusicology. Importantly, Moseley believes that "a central paradox lies in the fact that while both music and games are celebrated for the freedom of expression they are perceived to facilitate, the acquisition and manifestation of this freedom depends upon a complicated, inflexible set of rules and conventions" (2013, 293). Although discussing agency with regard to what she describes as "the post-modern hypertext narrative" (1997, 132), Janet Murray's concept of procedural authorship becomes central to both this immediate discussion and that of my thesis. While agency, "the satisfying power to take meaningful actions and see the results of our decisions and choices" (Murray 1997, 126), is central to the condition of player/reader/user empowerment in games, it is with the procedural author that the ultimate power within such environments resides; those that write the conditions of both the operational and constitutive rules (the author of the system), not those that use these systems in play (players).

As computer processing power has exponentially increased, so to has the complexity in which audio and spacial navigation can be configured within such environments. The emergence of complex non-linear systems, especially in the application of music and sound in video-games has been very well introduced by interactive audio researcher and practician Karen Collins and her application of the term "dynamic audio" (Collins 2008, 139). For Collins, this term covers both the interactive - "those sound events that react to the player's direct input" (ibid.) and "adaptive audio" - "sound that reacts to the game states, responding to various in-game parameters such as time-ins, time-outs, and so on" (ibid.). However, viewing the apparent complexity of such systems and networks of sonic complexity within games can,

as computer scientist Stephen Wolfram states in relation to the sciences, sometimes blur the true complexity that is happening:

> Whenever you look at a very complicated system in physics or biology you generally find that the basic components and the basic laws are quite simple; the complexity arises because you have a great many of these simple components interacting simultaneously. The complexity is actually in the organization – the myriad of possible ways that the components of the system can interact.
> (in Waldrop 1993, 86)

It is exactly this myriad of possibilities within such digital (both virtual and non-virtual) and inter-personal interactions that I will address with relation to my own practice-led, collaborative, and research-informed body of work.

1.2.5 Performance theory

Having introduced the above approaches, it is of paramount importance to propose the relevance of the wider discourse of performance theory to my thesis. Richard Schechner proposed that:

> [p]erformance is an inclusive term. Theatre is only one node on a continuum that reaches from the ritualisations of animals (including humans) through performances in everyday life – greetings, displays of emotion, family scenes, professional roles, and so on – through to play, sports, theatre, dance, ceremonies, rites, and performances of great magnitude.
> (Schechner 2003, xvii)

This extract from Schechner's work, although including central words such as play, theatre, ceremonies, and dance, makes no mention of music; this omission of course being significant – if not fundamental – to my thesis. As musicologist Nicholas Cook and performance theorist Richard Pettengill very eloquently put it, "After all, what is music if not performance, real-time collective practice that brings people together as players and listeners, choreographs social relationships, and expresses or constructs individual or group identities?" (Cook and Pettengill 2013, 1). In the following section, I will elucidate how the inclusion of music to Schechner's model of performance theory has directly affected my work; revealing components and factors that shape both my practice and those that I refer to throughout my thesis.

According to Cook and Pettengill, the field of performance studies and performance theory originated following a discussion between Schechner and anthropologist Victor Turner (Cook and Pettengill 2013, 2). Through Schechner's interest in performance art and theatre studies, and Turner's attention to the study of rituals and rites of passage processes and ceremonies, an integration of the two fields was developed to encircle what Schechner considered "[t]he broad spectrum approach" (2004, 7).

Clarifying Schechner and Turner's position on such a development, the purpose of such a discipline was to explain that the word 'performance' could in fact be used as an umbrella term and encapsulate just about about anything; the multitude of meanings that are created during such acts of performance, as well as the 'text' that initiated such acts (Cook and Pettengill 2013, 2).

It is with Schechner's deconstruction of the act of performance that my research is most directed towards; in applying Schechner's contributory elements of drama, script, theatre, and performance (capitalised from this point on to represent Schechner's usage) – most associated with the study of the dramatic/theatrical arts – to the analytical context of interpersonal musical interactions and choices that exist in my own practice, and that of the examples that I illustrate in my thesis – I approach the creation and performance of musical happenings from an innovative and illuminating perspective. Videogame theorist Clara Fernandez-Vara (2009) used a variant of such performance modelling (incorporating Patrice Pavis' *mise en scene* in place of Schechner's Performance), in her framework for studying videogames as performance. In doing so, she incorporated the MDA (mechanics, dynamics, aesthetics) framework proposed by Hunick, LeBlanc, and Zubeck (2004) to analyse the locus of rule-based game design and its resulting effect on player interactions. As performance studies and music technology professor Philip Auslander stated, "a truly productive approach to music as performance must move beyond formulations that mark off disciplinary territory, even in the interest of emphasizing complimentarity [sic], in favour of an approach that sees music and its performance as inextricably imbricated with one another" (Auslander 2013, 352). As such I propose a grafting of both Schechner and Fernandez-Vara's approaches to my own interpretation, addressing key conceptual, compositional, performative, and socio-musical occurrences that I use in my practice.

1.2.6 Design-led research

As the first three chapters of this thesis act as contextualisation for my demonstrative portfolio of sonic works, it becomes crucial for me to review and consider how design-led theoretical and reflective approaches have configured themselves within both my research and practice. In the title of his Critical Perspectives on Design session, design-led technologies proponent William Gaver asks the question 'what should we expect from research through design?' (2012, 937). Suggesting that design practitioner's work:

> often takes the form of *research through design*, in which design practice is brought to bear on situations chosen for their topical and theoretical potential, the resulting designs are seen

> as embodying designers' judgments about valid ways to address the possibilities and problems implicit in such situations, and reflection on these results allow a range of topical, procedural, pragmatic and conceptual insights to be articulated
> (Gaver 2012, 937)

Gaver reinforces the acceptance of method, conceptual framework, and theory acting as research output, alongside the primarily accepted forms of artefacts and systems (2012, 937); embarking on centrally implicit conceptual work that illuminates "important issues, dimensions of similarity, and criteria for choices and success" (Gaver 2012, 938) with reference to elements of influence and decision making that have shaped design practitioner's tangible outputs. Gaver proposes that the 'borrowing' of theories and concepts from outside of one's own discipline is not just prevalent in research through design, but also that such translation across fields has the opportunity to deliver new concepts by both inspiring new designs and enunciating existing models (Gaver 2012, 938).

Gaver's concept of the annotated portfolio is of particular importance with reference to my practice-led research and it's proposed contribution to knowledge. Gaver states that "beyond single artefacts, however, *annotated portfolios* may serve an even more valuable role as an alternative to more formalised theory in conceptual development and practical guidance for design" (2012, 944) and that "multiple examples can start to tease the individual concerns and judgements involved in a single situated design out of the particular configuration to which they were applied, making clear both the dimensions along which a designer's choices may range and the invariances among them" (ibid.). From this, I propose that the practice-led research that embodies both the design of my collaborative compositional practice as well as the theoretical contextualisation that informs, educates, and shapes such practice is simultaneously research through design and design through research; a return once more to the paradoxical duality of 'research informing practice' and/or 'practice informing research'.

With regard to design led research in the realm of human computer interaction (HCI), John Zimmerman, Jodi Forlizzi, and Shelley Everson State that "following a research through design approach, designers produce novel integrations of HCI research in an attempt to make the right thing: a product that transforms the world from its current state to a preferred state" (Zimmerman, Forlizzi and Everson 2007, 493); working to a definition of 'design research' as being "the upfront research practitioners do to ground, inform, and inspire their product development" (ibid.) with the intention of knowledge production taking precedence over commercial success. Such a transformation from their

proposition of 'current' to 'preferred' state within the field of subjective practice-led research (as this thesis is) is of course open to interpretation in terms of success or failure. However, even in the event of an artefact or framework achieving the unfortunate label of 'failure', processes that have been undertaken to reach such a conclusion have the potential to clearly illustrate working practices and contextual negotiations that can still prove fruitful to practitioners and research communities; both to the practice-led and theoretically situated camps.

Zimmerman, Forlizzi, and Everson establish their view on the differences between research artefacts and design practice artefacts in two significant ways. Approaching the process from a research perspective, they first believe that there is a requirement for the production of knowledge within both practice and research communities, with research artefacts not simply producing commercially viable products as can often be seen in design practice artefacts; with issues surrounding economic potential, distribution, and product marketing and branding having little (if any) significance to the artefact (2007, 500). Secondly, they assert that such research contributions should “demonstrate significant invention” (ibid.), assembling innovative combinations of theory, technology, and context to produce such knowledge. Proposing a set of principles for such evaluations of knowledge production to be framed by, they offer four evaluative 'lenses' to enable such appraisals: process, invention, relevance, and extensibility. These evaluative lenses will be applied to my research, with the unravelling of each context-specific element becoming apparent through the commentary and analysis of my portfolio of works.

As a result of these two angles (those of Gaver and Zimmerman, Forlizzi, and Everson) design-led research and its associated application of HCI serves as an interesting approach to my practice-led research. Gaver's 'borrowing' in the context of my research includes the adoption of techniques both internal to my historic practice and from external fields to create a proposed model of socio-musical interaction, embodying my judgements on validity and practicality. Such a model can then be 'tested' for its 'success' or 'failure' alignment. This process importantly includes the exploration of creative approaches to the adoption of such technology within the field of one's own creative practice; explored through Gaver's annotated portfolio in Chapter 4. In such a context, the concept of 'design' will not only refer to technological and coded occurrences, but also the design of musical material that is to be used within such proposed frameworks, interrogating the creative boundary between host (software) and sonic content.

For this thesis and its accompanying portfolio of works, a mixed methodological approach has been taken. Based primarily on the practice-led interrogation of my collaborative creative process and output, it explores the technical, theoretical, and practical relationships that have emerged during the process; utilizing a varying degree of all six methodological approaches across the breadth of this thesis, with all six particularly visible in Chapter 4. A symbiosis exists between the use of practice and theory; theoretical research has informed my evolving practice, while simultaneously, my practice has informed my theoretical research and analysis - contextualising my creative output.

1.3 Methods

In order to encapsulate my methodological approaches, three key (and purposefully wide-ranging) methods have been selected to conduct this thesis. To say that they have been 'selected' is, I believe, actually slightly misleading. I believe a more honest description would be that they have been developed; all three (theoretical analysis and practice reviews, practice-led interrogation, and interviews and digital communication) have been completely apparent in my professional practice since before the start of this doctoral programme, but have been refined, strategically directed, and explored through an awareness of my role as researcher. Importantly, I will be experimenting with a mix of methods, the bias of which will shift over the course of my research, focusing more on areas of both method and methodological approach that are proving to be be productive for specific research purposes.

1.3.1 Theoretical analysis and practice reviews

In its earliest stages, my research included combinations of case studies and related theoretical analysis to narrow-down the specific area and direction that my main body of work would take; exploring and assessing contemporary and historic techniques, methods, and approaches to both inter-personal and inter-medium musical events. Importantly, this approach identified central elements of further research that were both currently affecting my musical practice, as well as particular directions that I wished to explore in order to progress my collaborative artistic output. This initial research additionally allowed me to observe where, in the current climate of musical and compositional discourse, my research would be located. Particularly relevant to my research is an ethnomusicologically informed analysis of key performance practices, using the discipline's awareness of the social space that music is created in rather

than focussing purely on the actual sonic output. Additionally, the adaptation of Schechner's writing on performance theory is adapted and used as a tool of deconstruction to clarify interactions within ensembles, solo performers, and new digital gaming technologies. Practice reviews will be used not purely to observe and evaluate compositional approaches and strategies in terms of musical content, but to explore the social interactions that they afford.

1.3.2 Practice-led interrogation

Ultimately, the aforementioned system of practice reviews and theoretical analysis assisted the development, observation and interrogation of this practice-led inquiry. Each example of my individual and collaborative sonic output contributes to the exploration of a musical journey that has been taken; a journey of adaptation, analysis, approach, and self-reflection. With each example demonstrated by my portfolio of work, a combination of technological approach, conceptual technique, and inter-personal contribution amassed during all previous works, provide a series of stepping-stones that document the developing creative process. In doing so, they act not purely as artistic output (as could be proposed for related Doctoral studies in, for example, Composition), but should equally be viewed as a method for observing thought-processes and approaches to my creative practice; arriving not at an 'answer' to a proposed 'problem', but as a system of artistic, theoretic, pragmatic, and conceptual (re-) contextualisations that will continue to evolve and shape my collaborative practice. Although the practice-led element of this thesis does culminate in the presentation of a series of sonic works, the culmination of such works, to me, will be yet another starting point for further practice-led development and interrogation.

1.3.3 Interviews and digital communications

Throughout this thesis, and with particular attention to the text that accompanies the demonstrative portfolio of works, excerpts from original interview transcripts, email communications, and telephone conversations have been used. Although formal interview techniques have been employed at various stages of this project (Bland 13th January 2014, Axtell 25th May 2015, and Axtell and Iozzi 9th October 2016), email communications have also been central in the development of my collaborative work. In expressing the collaborative process between myself and lyricist Julian Brown (whose work is included in the composition *Release* (see section 4.4)), excerpts of email exchanges (16th - 26th February 2016) have been used to both understand the progression of the work, and also to illuminate the musical

relationship prior to the event of recording; adding vital elements of contextual ambience to our emerging musical product. As ethnomusicologist Deborah Wong expresses, "The ethnographer is always an outsider. Creating an ethnography of even a close family member would presumably entail crafting a new relationship beyond that of daughter or sister" (Wong 2008, 82). Although not close family members, I have worked with Dan Axtell, Tano Iozzi and Bill Bland professionally (Axtell and Iozzi as collaborators and co-directors of Whitebox - a music for moving image company - and Bland as collaborator and teacher) for over a decade and definitely consider them as friends and not just colleagues. As both author and participant, I will also be using my own participant-researcher reflections within this process of interviews and digital communications. To achieve Wong's "new relationship" I have consciously attempted to divide our verbal interactions into two distinct elements – those that take place during the musical 'happening' and those that take place in an environment where I have aimed to create the professional boundary of interviewer-interviewee for purposes of objectivity.

1.4 Chapter Synopses

In Chapter 2 I introduce a number of key theoretical approaches that will develop throughout my thesis. Exploring conceptualisations of participation, performance, and musical interaction, I begin to unravel my approach to practice-led investigation. Combining traditional ethnomusicological techniques such as participant-researcher reflection and formalised interviews with those of theoretical analysis, I look to the concept of procedural authorship, and how such rule-based structuring can be used to develop my creative practice. Importantly, concepts of performance theory and virtual world classification are brought to the foreground (including the use of contemporary practice reviews), introducing a facilitatory partnership of theoretical and performative concepts that I draw on in later stages of my research.

Chapter 3 examines the performative and compositional practices of Peruvian conimeños, Cuban rumba sessions, and the compositional and performative approach used by Stockhausen's *Klavierstücke XI*, in Chapter 4 I utilise Schechner and Fernandez-Vara's approaches to performance theory. Hybridizing this with Hudack and Berger's simple and complex feedback loops, I propose a Virtual Performance Model – a paradigm that integrates elements of historical practice with new concepts uncovered through my research. I fully appreciate that the examples from Cuba and Peru are not

comparable to *Klavierstücke XI*, and this has been selected for a very particular reason. Historically, I feel that to some degree this work typifies a move from the integral serialism of its predecessors to a more open form presentation of musical works; a move from the highly determined to the unlocked. It has been included to illustrate such practice as well as highlight themes found in my collaborative composition and performance. The concept of remote brainstorming and cloud-based composition and interaction are introduced as practices that are widely used within the company. From the introduction of such compositional techniques, I propose AMP's virtual performance model, a bespoke interactive composition and performance application that is harnessed to explore and develop the collaborative practices of Whitebox; maintaining central socio-musical approaches key to our collaborative practice.

The content of Chapter 4 is designed to act as both exploration of the collaborative compositional techniques employed by my colleagues and I, and also to map the creative path that has been established during the overarching collaborative processes and facilitatory partnerships that have emerged. Resulting from the merger and application of my proposed methodological approaches, Chapter 5 acts as the practice-led act in which my annotated portfolio provides both explanation and commentary on both the musical and the social.

Chapter 2. Musicking, Collaborating, and Creating: Exploring the Real and the Virtual in Composition and Performance

> A musical community is, whatever its location in time or space, a collectivity constructed through and sustained by musical processes and/or performances. A musical community can be socially and/or symbolically constituted; music making may give rise to real-time social relationships or may exist most fully in the realm of a virtual setting or in the imagination.
> (Shelemay 2011, 364)

2.1 Introduction

In part one of this chapter, utilizing ideas and concepts extracted from ethnomusicological and practice-based research, I explore various cultural concepts regarding collaborative musical composition, performance, and participation; introducing key theoretic and practice-based systems and genres of music performance that I propose have become central in providing my composition and performance practice with new systems and direction. Examining how ethnomusicologist Kay Kaufman Shelemay's collectivities and communities – both musical and non-musical – emerge through a variety of socio-cultural patterns of origination, I explore how these emergences artistically interact to create cultivated musical happenings. Ethnomusicologist Bruno Nettl's "Top of Old Smoky effect" (2005, 116) examines the concepts of originality and authenticity in situations where existing musical material is used in the creation of new content that then has its own musical identity subjectively connected to its predecessors but objectively appearing as new material. Similar to this, I additionally look to ethnomusicologist Thomas Turino's (1993) research on Peruvian panpipe compositional sessions. In these events, musical ideas are introduced by members of the ensemble and are immediately treated as the property of the ensemble and not the individual. With the option of acceptance or rejection through an egalitarian process of musical development, new material is built around the collaborative process of group participation, resulting in an inclusive process of musical creativity; a compositional characteristic that becomes central in my own collaborative compositional output. Further, the new piece of music does not need to be radically different from the original, in order to be classed as new. Percussionist Bill Bland's description of the interaction found during Cuban rumba sessions (2014) highlights the nature of musical 'building blocks' that are re-structured in the course of such performances. He brings to the foreground not just socio-musical relationships, but also relationships

between particular musical instruments that are relied upon in order to create the performance of rumba.

Making use of these concepts, I argue that relocating elements of such culture-specific methods of musical creativity into Mark Bell's "virtual worlds" (2008, 2) through Janet Murray's procedural authorship (1997, 152) creates a new model of interactive collaborative musical creativity that assimilates compositional and performative techniques and elements; offering my collaborative practice new direction. Creative music production in this model is achieved through playing *with* music, rather than just playing music, and through the formation and development of a quasi-egalitarian social community - whether this community is a long- or short-term in its existence. Further, using these concepts, I argue that in such situations, the musical products have the potential to be created and owned by the group, and not just an individual, bringing into question traditional views on authorship; this being a key attribute of my personal and professional practice.

In part two of this chapter, I look to the field of performance theory (Schechner 2003; Pavis 1992; Fernandez-Vara 2009) and explore how my practice can be relocated to the field of computer-based gaming to achieve my desired social-musical outcomes. I argue that by merging Murray's theory of rhizomic hypertext narrative structure (1997) with the branching methods of videogame audio programming explored by videogame developer and theorist Jesper Juul (2005) and Karen Collins (2008), musical creativity can be re-focussed to become the centre of the event rather than simply a bi-product of the online gaming experience. In doing this, I propose bringing a further level of creativity and production into game-playing, and an element of play into musical production and composition. Further, assessing contemporary models of interactive music delivery (Tanaka and Parkinson 2009; Tanaka, Tokui, and Momeni 2005; Kaltenbrunner et al. 2006; Bjork and Snibbe 2011), I argue that AMP progresses the nature of my collaborative music-making, and locates my practice in the field of collaborative composition and virtual world research.

2.2 Performing, Composing, Listening, and Musicking: Differentiating Musical Activities

As a musician, I perform music, I compose[8] music, and I listen to music. Each of these three instances of musical participation have their own culture-specific paradigms that shape, and are themselves shaped by, further models of both explicit and implicit cultural assertion – be it social, political-economic, or artistic. It is important to understand that the three elements of performing, making (composing), and consuming (listening) often share some degree of overlap and porosity. Musicologists Otto Laske and Siobhan Drummond attempt to explain this division and porosity by stipulating that as an art form, music requires the organisation of time, and that this assumption is fundamental to their proposal of concept classes; "music creates coherence only in terms of its function in a time flow", and our understanding of music is developed "through the mapping of elements that articulate the time flow into memory, where musical pasts are stored" (Laske and Drummond 1980, 73). They propose that the arranging of musical events into memory is achieved through the tripartition of musical concept classes (perception, action, and language). Further, time flow and structure should be seen as the two overarching categories of concept classes, where structure is "a result of the mapping of time flow into memory" (Laske and Drummond 1980, 74). Explaining the interplay found in their proposed network of concept classes, they explain that:

> Listening, the primary activity in music theory, is a realisation of concepts through perception. Performance realises concepts through action. Music analysis, although based on listening […] primarily articulates concepts realised through language. Composition depends on the synthesis of all three classes of concepts; composition is an action that presupposes both listening and analytical experience and is, historically, an outgrowth of performance.
> (Laske and Drummond 1980, 74)

Acts of musical performance and composition - although there are countless models for how music is performed - predominantly share several key characteristics. In some ways, the performing - listening relationship occupies the same cognitive space as the composing - listening relationship. For a player to perform to their best ability during a performance, an almost constant process of self (and group, when part of an ensemble performance) evaluation must take place. Composition, even when done in one's head, requires both the performance and 'listening to' (cerebral or auditory) of the music created in order to make any sense or meaning; a combination of realisations through Laske and Drummond's

8 This to me is a problematic word due to the many culture-specific interpretations of originality, 'borrowing', and ownership and will, I hope, be addressed suitably throughout the body of this thesis with regard to what the word composition means within my collaborative musical context.

action and perception. These actions and perceptions will be examined throughout Chapter 3 in a variety of performance and composition contexts, and will ultimately contribute to my proposed model of performance and compositional interaction in 3.6 and later with regard to analysis of the accompanying portfolio of works in Chapter 4. The evaluative feedback loops that Laske and Drummond suggest will be based on the established principles of musical vocabulary relevant to each performance genre, but the evaluation will be based more often than not on the performer listening to the performance and feeding back the information that they receive to instruct their playing for the rest of the performance.

These three musical participatory activities of performing, composing and listening contribute to what musicologist Christopher Small terms 'musicking'. Proposing that "[t]o music is to take part, in any capacity, in a musical performance, whether by performing, by listening, by rehearsing or practicing, by providing material for performance (what is called composition), or by dancing" (Small 1998, 9), Small allocates responsibility for the success or failure of a musical work amongst everyone that has played a part in the event, including "performers, listeners (should there be any other than the performers), composer (should there be one other than the performers), dancers, ticket collectors, piano movers, roadies, cleaners and all." (Small 1998, 10). Approaching musical event analysis from Small's perspective allows the observation of music as both an artistic and social process, a cultural representation made up not purely of organised sound, but also organised communities, whose goal may or may not be centred around (but will contain some degree of) sonic performance. As Small asserts, to ask questions relating to the musical meaning of a particular work is not enough, and can leave the observer "trapped in the assumptions of the modern Western concert tradition" (ibid.). As a result he expands this idea to encapsulate a wider spectrum of cultural environments, where the absence of the assumed rigidity found in Western concert tradition performance models means that the question, "[w]hat is the nature or the meaning of this musical work?" (ibid.) cannot be asked. Instead, Small seeks to establish a theory of analysis based not on the musical work, but the *performance* of the work; "[w]hat does it mean when this performance (of this work) takes place at this time, in this place, with these participants?" (ibid.). In re-framing the question as he does, the social process of cultural representation through "humanly organised sound" (Blacking 1973, 10) reaffirms that music can be observed and heard as culture and not just in culture, as Blacking and Nettl have collectively proposed.

To render such discourse useful it becomes imperative to gain further understanding of what is actually meant when words such as 'culture' and 'community' are used to explain the context of musical performance and events. If, like Kay Kaufman Shelemay, we are to agree that "most aspects of the musical experience cannot be studied without considering different modalities of collective experience"(2011, 354) then having some clarification on music-specific interpretations seems imperative. Turino proposes that culture is "the habits of thought and practice that are shared among individuals" (2008, 95), further clarifying this definition by dividing culture in to two distinct sections; cultural cohorts – groupings according to "aspects of the self (gender, class, age, occupation, interests, etc.)", and cultural formations – the "broader, more pervasive patterns of shared habits" (2008, 95). Some thirty years before Turino's contribution, anthropologist Clifford Geertz looked to Clyde Kluckhohn's *Mirror for Man* (1944) to develop a set of principles that constitute culture. Summarising Kluckhohn's definitions, Geertz suggests that culture can be:

> (1) "the total way of life of a people"; (2) "the social legacy the individual acquires from his group"; (3) "a way of thinking, feeling, and believing"; (4) "an abstraction from behavior"; (5) a theory on the part of the anthropologist about the way in which a group of people in fact behave; (6) a "store-house of pooled learning"; (7) "a set of standardized orientations to recurrent problems"; (8) "learned behavior"; (9) a mechanism for the normative regulation of behavior; (10) "a set of techniques for adjusting both to the external environment and to other men"; (11) "a precipitate of history".
> (Geertz 1973, 4)

However, Geertz recognised that instead of this eclectic and somewhat problematic semiotic concept of culture, it is necessary to choose a definition that works as a starting point for research, and to stick to it to avoid contradictory definitions, such as those in points (1) and (6) (1973, 5). Marxist theorist and academic Raymond Williams, in acknowledging the confusing nature of such a word reinforces this point, stating "[c]ulture is one of the two or three most complicated words in the English language […] mainly because it has now come to be used for important concepts in several distinct intellectual disciplines and in several distinct and incompatible systems of thought" (Williams 1976, 87). Similarly, the breadth of meanings and assumptions surrounding the word 'community' has, as anthropologists Vered Amit and Nigel Rapport note, left the word too vague and too variable to be much use as an analytical tool (2002, 13). It is though, precisely because of its inconclusive nature that it has continued to attract such attention from humanities scholars (Anderson 1983; Bauman 1996; Turino 2008).

For musicologist Kay Kaufman Shelemay, the formation of communities in and as musical social settings can be located in a tripartite framework in which any of the three proposed processes of

formation – descent, dissent, and affinity – can act as the starting point for community formation, with the potential for community members to migrate to any of the other processes and in doing so, unifying both social and musical spheres (Shelemay 2011, 367). Prevalent in traditional community discourse, Shelemay's "processes of descent" (2011, 367) refer to the unification of communities through the shared identities of its members. Characteristics such as kinship, ethnicity, religion, and nationality often lead to descent communities. It is of course common for two or more characteristics to overlap or merge, resulting in for example, the emergence of an ethnic community from the combination of biological kinship and religion (Shelemay 2011, 367). Shelemay's "processes of dissent" (2011, 370), in contrast to descent, are based on acts of resistance to (perceived) politically dominant/superior social groupings. Not necessarily in opposition to leading or pre-eminent groups in society, dissent communities are frequently minority coalitions that convene for social resistance to a particular event, occurrence, or socio-political development – utilising the political force of music-making in place of more overtly aggressive methods of public display. A classic example of this, and much written about by both jazz and ethnomusicology scholars (Acosta 2003; Monson 1997; Berliner 1994) is that of the bebop revolution and the duality of its dissent community formation through components of both race and marketplace. As ethnomusicologist and jazz researcher Scott Deveaux explains:

> the revolutionary qualities of bop are situated not within but outside the jazz tradition, in the collision between jazz as an artistic endevor and the social forces of commerce and race. Thus, bebop is often construed as a protest against commercialism: through the uncompromising complexity of their art, bop musicians are said to have asserted their creative independence from the marketplace […] as a movement by young African-American musicians (Parker, Gillespie, Monk) seeking to create an idiom expressive of the black subculture, not the white mainstream. While separable, these themes of revolution tend to intertwine as a rebellion by black musicians against a white-controlled capitalist hegemony.
> (Deveaux 2000, 4)

The final category in Shelemay's processes is that of affinity. Of all three this is the most relevant to my research as it it lays the foundation for most (if not all) of the performance paradigms that I discuss. Individual preference is the staring point for processes of affinity (Shelemay 2011, 373), which is followed by the desire to socialise (either in person or 'virtually') with people who have similar values, ideas or interests. Like with processes of descent and dissent, processes of affinity may or may not share common ground with other elements from the tripartite network of Shelemay's community construction. With affinity, members may well share other bonding norms such as ethnicity or gender,

but these are not necessary for the development of such a community. Instead, the asset of cultural capital[9] establishes the bond that holds the community together during the infancy of the emerging community. As Shelemay states, "the acquisition of cultural capital inevitably plays a role in the emergence and maintenance of communities of affinity, with financial gain frequently providing motivation for shaping a musical style or event that will engender the devoted affiliation of many" (Shelemay 2011, 373). Differentiating this from her other proposed models, Shelemay highlights that "whatever the basis of the attraction, an affinity community assumes its shape based in the first instance on individual volition, in contrast to the motivations deriving from ascribed or inherited factors (descent) or driven by specific ideological commitments or connections (dissent)" (Shelemay 2011, 374). Such affinity-based group cohesion will be discussed and contextualised in Chapter 3, with the bonding socio-musical factors that have shaped my creative output being located and explored.

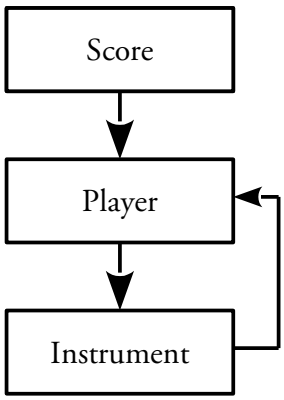
While such bonding connections have established and formulated people's identities into labeled groups, it is with these group's musicking that I am predominantly interested with. Exploring the relationships that exist or develop between performers during music making can reveal some intriguing insights, both musically and socially. The sheer number (infinite to some degree) of solo and ensemble performance configurations and spaces suggests that any useful categorization of such systems would seem to be an endless and unsolvable task; the fluidity of ensemble structure and hierarchical establishment require the constant renegotiation of musical powers, and depend on both interpersonal and interactional culture-specific formalities - or lack of. However, in the complex and overlapping subject of socio-musical relationships, there are some relative constants. The traditional Western classical orchestra, for example – as I will now go on to discuss - does offer some relatively unchanged and unchallenged systems of hierarchy and leadership.

2.3 Hierarchies of Interaction

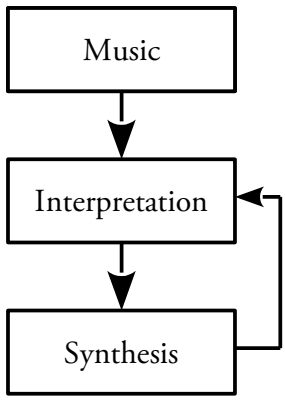
As computer scientist Paul Hudak and musicologist Jonathan Berger note, "not all interactions are created equal. In an orchestral setting, there is a hierarchy of interactions: from interactions between instrument and musician, to those between musician and section, those between the entire section, and those between the conductor and the individual musicians" (Hudak and Berger 1995, 1). However, this

9 Cultural capital is a concept introduced by Pierre Bourdieu in 1986 to forms of knowledge passed on through the subtypes of embodied, objectified, or institutionalized transmission. For more information, see Bourdieu 2011.

is not so clear when smaller ensembles from the Western classical field are analysed. In a recent publication, Alan Wing et al. (2014) evaluated the democratic and autocratic power distribution in string quartets in order to research which members, if any, were seen to be 'leading' the ensemble in the absence of a conductor. They found that different groups dealt with leadership in different ways. Sometimes all players would synchronise to the playing of a 'leader', and in other examples, all members would 'correct' themselves according to an analysis of the entire ensemble's performance. At its most basic level, it would seem that the initial level of interaction (that between instrument and musician) would offer the most solid foundation for all that would follow as the complexity of the performance develops with additional structural networks. Stating that "a performer is engaged in a constant "dialogue" with her instrument: what is played depends greatly on what is heard" (Hudak and Berger 1995, 1) establishes the most basic system of feedback that they go on to explore through the proposition of "mutually recursive processes"; in which they state that "1) Recursion captures feedback, 2) Mutual recursion captures the interaction of players, and 3) Architecture of the recursive network captures hierarchies of interaction" (Hudak and Berger 1995, 1). For such interaction between a solo player, their instrument, and the score, they use a simple feedback loop diagram (1a) to illustrate their approach (fig. 2 (Hudak and Berger 1995, 2)):



1a. Simple interaction between player and instrument



1b. Abstract representation of simple interaction

fig. 2. Hudak and Berger's simple feedback loop

To accommodate both contemporary and future methods of music performance that may not align with historical models of human-acoustic-instrument performance, they offer a second abstract

representation that encompasses other alternatives (1b.). Explaining the possible performance settings that this abstract representation can inhabit, they state that, “we have re-labelled the “score” box “music” (to free us from thinking too concretely about traditional scores), “player” as “interpretation” (to permit, for example, computer interpretations of music), and “instrument” as “synthesis” (to admit artificial, in particular computer generated, sounds)” (Hudak and Berger 1995, 3). From their simple one player/interpretation model, the complexity of the diagram can be scaled up to include multiple players/interpretations (fig. 3), now with the feedback loop displaying multi-player interpretations of instances of multiple synthesis:

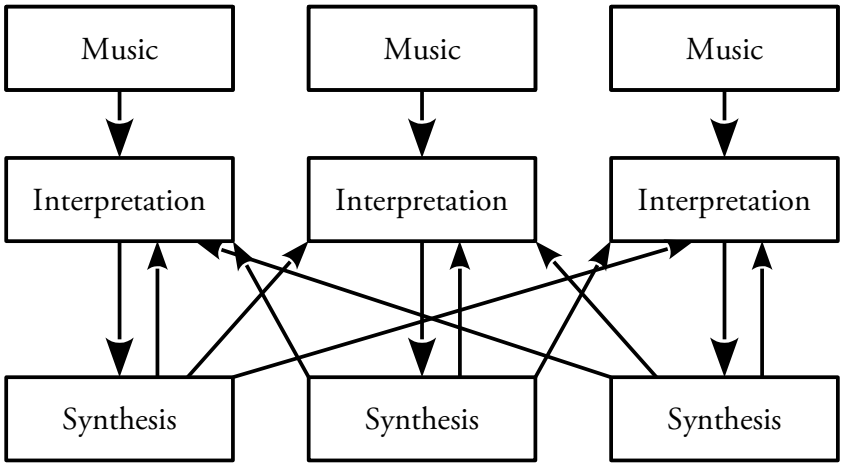


fig. 3 . Variation on Hudack and Berger's ensemble interaction model (1995, 4)

This feedback of synthesis to interpretation can and often will be interpreted differently from player to player, and depending on the genre, can be used in very different ways that can be intrinsically linked to other forms of social interaction. Whereas Hudack and Berger stipulate that the architecture of such recursive networks will lead to the establishment of hierarchies of interaction, in some genres, such networks do in fact solidify the heterarchic[10] or egalitarian systems that are in place in certain socio-musical settings. I initially contextualise and address this in the following section (see section 2.4), while using this model of deconstruction to analyse socio-musical events (see section 3.1-3.5) and to help generate my own model of collaborative composition and performance (see section 3.6).

10 The distribution of decision making and authority horizontally, as opposed to the 'top down' system of hierarchy

2.4 Compositional Egalitarianism in the Peruvian Altiplano: Ownership, Inclusion, and the Horizontal Distribution of Power

I n *Moving Away From Silence*, Thomas Turino (1993) explores the impact of Peruvian rural-urban migration on the flute and panpipe traditions of *Conima*, a province of the *Moho* district bordering Lake Titicaca. Although his study of the impact of rural-urban migration on musical continuity and change is deeply insightful, it is his dissection of the social spaces in which music is created in its rural locale that is of central importance to my practice-led research. In stark contrast to forms of musical performance such as Hudak and Berger's Western classical orchestra, the composition and performance in Turino's researched tradition strives for the removal of displayed personal creativity and ownership, instead looking to pass creative authorship, ownership, and license to the ensemble:

> Rural Conimeños [people from the Conima region in Peru] often stress the collective over the individual. Most older people simply do not like to stand out as individuals in public or social settings, and this includes musical performance. In the ensemble there is no place for highlighted soloists; when in public, individual composers will usually attribute their pieces to the ensemble as a whole. The circle formation used by musical ensembles and for most group activities in Conima is significant for maintaining and reproducing egalitarian relations.
> (Turino 1993, 23)

These egalitarian relationships, although both publicly and privately displayed through the physical structure and positioning of the ensemble – as noted in the above quote – are displayed through the assimilation of musical ideas into a group's repertoire, in which both new ideas and variations of existing ideas can be offered by any member of the group. As with many instances where musical ideas are presented to a group for further development, the degree of 'completeness' to which a particular member will present a musical theme to the group can vary. Often no more than a simple repeated phrase or melodic idea, these themes can, on the other hand, also take the form of more finished ideas. As Turino notes, sometimes:

> Entire pieces are created by individuals before they come to the rehearsal. When this happens, during the initial musical brainstorming period the composer will play his completed piece softly to himself. If it is appealing to the other musicians, they will begin playing it with him; if not, his tune will be ignored. Once the melody is taken up, it is subjected to the same group correction process for a final acceptance or rejection, and during this phase the tune is considered group material available for shaping.
> (Turino 1993, 78)

Here, these 'correctional processes' are explored through the uptake of the musical idea by other members of the ensemble. Once an idea has been accepted by another member of the group, it becomes

open to editing, variation, and complete reconstruction – to the point where the idea may only serve as a musical stimulus for the development of yet another idea. Utilised in a different way, the same idea may in fact be accepted by the whole ensemble, and then secured as a section (or sections) of a new group composition – musical material passed and evaluated through the group interaction of interpretation-synthesis/player-instrument as with Hudak and Berger's ensemble interaction model. Nettl's assertion, that "variants do not come about only in the vacuum of a tune family, they also develop under the influence of outside forces such as musical styles newly introduced, or a foreign stylistic environment" (2005, 115) seems relevant at this point in relation to how and where musical content is found in order to be included in such works. In the devising of new musical content for the ensemble, the extension or truncation of previously established musical material can serve as either a starting point for further idea generation, or with variation, sectional content for a new original piece. This, what Nettl labels "The 'Top of Old Smoky' Effect" (2005,116), is a common practice found in many folk traditions, including, as he notes, the Appalachian folk community (ibid). In this example, Nettl examines how sectional content from a particular song or piece, over time, is 'recycled' to establish musical examples with their own identity. Although he refers to the objective examination of material snapshots without the subjectivity of the insider's knowledge of a particular example's musical and historical evolution, his appreciation that elements from 'song 1' (V1.1 in fig. 4) in turn can be reconfigured and lead to the development of 'song 2' (V1.4 in fig 4) is clear from the quote below and its accompanying graphic that I have created to illustrate his position:

> In 'Little Mohea', the tune with the form AABA seems to have changed to BABA. But Bayard (1954: 19-23) reconstructed this kind of song history more dramatically, in the tune family he called "The Job of Journeywork." Here the structure ABCD seems to have spawned a version consisting only of CD, which, in time, added new material from an extraneous source, and so became CDEF. Very likely, if this process occurred in many songs, CDEF may be reduced to EFEF. If we know for sure what happened, we could clearly identify a clear genetic relationship between the two forms of the song, ABCD and EFEF. But they have no material in common, and we, coming on to the scene later, as is normal, would have no way of spotting the two as relatives if the intermediate versions weren't available. And yet even these two are in a sense manifestations of the same piece. (Nettl 2005, 116)

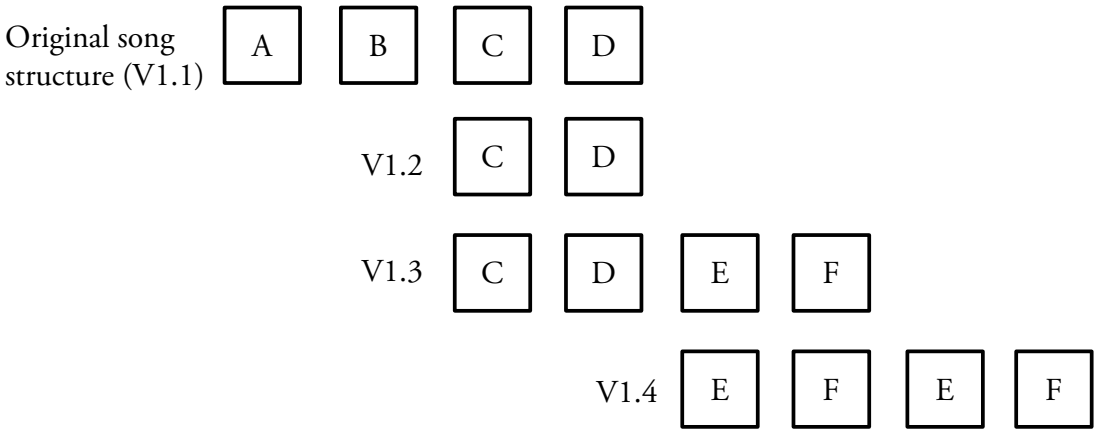


fig. 4. Illustration of Nettl's Top of Old Smokey' Effect

Such development of 'new' musical material from sectional content removed from its primary compositional location is a theme that has become central to the collaborative compositional processes employed in Whitebox (see section 1.1).

In contrast to what many people consider to be the pre-requisites of an original piece of music, Conimeños view the distinction between separate musical materials in a broader sense. They do not see that radical or plainly obvious differences are required in order for a performance or composition to represent a new piece of musical material. Through the interactive process of composition, small variations in existing material, the re-organising of pre-existing material with slight variation, as well as the addition of totally different material can all constitute new material for the ensemble; an aesthetic that I draw on and relate to in my portfolio of works and their associated commentary and analysis. As Turino observes, “Conimeños use, and recognise, a rather subtle scale of contrast to make meaningful differences: between ensembles' performance styles, between compositions, and between the sections of a piece” (Turino 1993, 89). In relation to these subtle scales of contrast, Nettl states that ascertaining the origins and genealogy of musical variations that lead to the development of separate creative works is a problem often hard to tackle in the field of ethnomusicology:

> the piece is something that is created once, plus all of the different ways in which it performed. The model is ideal but only rarely real. Tunes that are strikingly similar may be related in several ways, and only if we could observe the live process could we determine the kind of relationship. Thus, for example, the person who creates a new tune may be just imitating one he or she already knows, and it's hard, coming along after the fact, to distinguish something created as a variant from something that is the result of imitation.

> Variants may come in to existence as the result of forgetfulness or creative embellishment. (Nettl 2005, 114-115)

Nettl's excerpt above points to some intriguing characteristics of authenticity that I will address in chapter 4 of this thesis: examining the concept of producing open works that are essentially designed to create the possibility of variation through the application of both compositional technique and procedural authorship.

Turino points out that through the overarching principles of group composition and the acceptance of musical ideas, the level of interaction between members of the group establishes a very honest picture of how the rest of the ensemble feels about a particular musical idea or theme – something that in other group composition paradigms could often only be achieved through some degree of anonymity, to minimize the effect of group politics. This is achieved through the awareness and acceptance in the group that once material has been submitted for contemplation by other players, personal ownership has been relinquished; "as in decision-making meetings where the idea or issue on the floor is gradually shaped by interested parties in turn, once a musical idea is offered it is considered communal property; anyone is welcome to suggest changes of any scope without offence to the originator" (Turino 1993, 77). Such egalitarianism in compositional approach has, since first researching the subject at the University of California in 2004, remained highly influential to my own personal and collaborative compositional method. Such equality serves both to increase musical and social cohesion, removing the all to frequent 'leader' from the ensemble's politics to permit group evaluation in its truest form; assigning both responsibility and a sense of creative ownership throughout the ensemble.

In the examples given above by Turino and Nettl, the emphasis has been on the development of musical material in preparation for performance, working out the *what* that is *going* to be played and not the collaborative exploration of what *is* played during the course of an actual performance. Both Turino and Nettl's discussions are related to performance in as much that the points discussed will form the backbone of musical material for the event. However, looking at other examples where shared creativity takes centre stage is fundamental to exploring the next level of creative collaboration. How much do particular genres need to 'work out' what is to be performed before they make their work available to the public, and how do these elements grow and evolve in the course of performance to shape particular styles? What are the rules (if any) to which players need to adhere, and when the

performance has not been 'worked out' prior to the event (for example, following a prescribed set of musical symbols, such as with the time-line format of traditional western music notation)?

2.5 Rumba: Spontaneity, Frames of Reference, and the Distribution of Responsibility

> Rumba is like an argument, it's like a discussion. It's like a pleasurable - where one person is saying 'well, I'm doing this' and there's this improvisation - style of 'challenges'.
> (Bland 2014, interview with author.)

Yvonne Daniel, in her book *Rumba: Dance and Social Change in Contemporary Cuba,* outlined the central elements of what has become known as 'the rumba complex': "Rumba as a dance/music complex involves specific drumming patterns and instrumentation, special songs, a particular song form, three basic types of dance, and, above all, elaborate improvisation" (Daniel 1995, 63). Emerging from the Cuban *solares* (ghettos) in the late nineteenth century, port workers would spend their days loading and unloading freight ships; bringing supplies to the island, or sending the outward-bound cargo of sugar and tobacco for international (mainly European) consumption. The port environment included African and European workers, mixing skilled slave labourers with European ship builders and freight dealers. This led to the formation of several key Cuban musical genres that hybridized and fused international music styles, from Congolese *Baile Yuka* to the Spanish ten-line *decima*. Although Cuba's fascinating musical history has been the subject of intense musicological and ethnomusicological analysis (Waxer 1994; Acosta 2003; Sublette 2004; Perna 2005; Carpentier 2001; Schweitzer 2013) as well as producing a variety of instructional material used for the performance of the many percussive styles (Uribe 1996; Hernandez 2000; Sanchez and Silverman 2002, to name only a few of the hundreds available), there is little in the way of an explanation of the collaborative inter-instrumental interaction of material from text and notation. This element is of particular importance to this research as it observes the relationships between the structural building blocks of the genre, relationships that are spread throughout the network of performers, and the sum of which results in the performance; relationships that have come to shape both the approaches and methods of my performance and composition practice, and play a key role in the development of my proposed interactive model in section 3.6 and frequently re-appear in Chapter 4. How do performances begin in situations where spontaneity can be central to the performance aesthetics, and how can styles that rely heavily on improvisation (as rumba does) coordinate their practices? To gain insight into this area, I spoke to

London-based rumbero Bill Bland[11] about the systems of rules and etiquette involved in the performance of the genre. I wanted to understand how responsibility was shared between musicians in the lead up to, and starting of, a performance – how structural responsibility is dispersed amongst performers. As chapters 4 and 5 will explain in detail, gaining such analysis of the styles discussed with Bland was aimed specifically at highlighting key influential elements that the genres had already played in shaping my performance and composition practice[12]. In addition to this, it was intended that the discussion could highlight new areas that I felt would facilitate further collaborative development when applied to the rubric of AMP's interactive composition and performance paradigm.

> Bland: Well, okay [*pause*] my first suggestion initially is that the two things that anyone who took the responsibility to start a thing up, in rumba, they would choose the generic idea of what sort of rumba it is, in the sense of the tradition [...] Once you have clave, it's also self-evident from the [*pause*] if the rumbero starts the clave:

> then the assumption is you're dealing with yambu. If you're talking about *Matanceros*[13] and you play:

> then you'd know that [that it will be yambu]. If they started playing:

> you're dealing with a columbia. If it was:

Here, Bland is explaining the traditional, non-commercialised and exported[14] rumba. In its original

11 All transcribed musical elements were played by Bland acoustically and not presented in notation form during the interview.

12 A full interview transcription can be found in appendix 7.

13 Rumberos from the Matanzas region on the northern coast of Cuba.

14 Groups such as *Grupo Guaguanco Matancero* and *Los Munequitos de Matanzas* did develop prescribed personnel for each instrument, and through their International success, the original style of 'playing whatever instrument needs to be played' was not as widely appreciated by International audiences as it was/is in the genre's more traditional performance settings.

setting, the ensemble is constructed of musicians who will almost always be capable of taking on any of the musical roles in the group. Like other examples of the multi-instrumentality of performers such as that found in Indonesian gamelan, musicians will have learnt the genre's techniques and core musical material not have a particular instrument that they sit behind before a performance (Heaton and Steptoe 2000, 119). The process of learning the style and repertoire will have enabled them to feel comfortable performing any of the musical roles required. Looking at this style of starting a performance with reference to Hudack and Berger's systems of hierarchy and leadership, it seems important to distinguish between the systems in place prior to, and during a performance. It is only once instrumentation has been assigned to performers that there is an establishment of hierarchical interactions. If the clave player (the first instrument to mark the exact style of rumba) began a guaguanco and the tumba a yambu rhythm, this would be seen as wrong (unless being used as some kind of ironic reference). It would however be left open prior to the start of the performance exactly who would state the style of rumba that was going to be performed, as the instruments would not yet have been assigned. Once the style of rumba had been established through the clave, the conversational element of the music-making begins. Traditionally in rumba the three drums have very specific duties. The largest and mid-sized drum (the *tumba* and the *tres golpes* respectively) are responsible for maintaining the non-vocal melodic element of the music that intertwines with the clave, as in the example of guaguanco below (fig. 5):

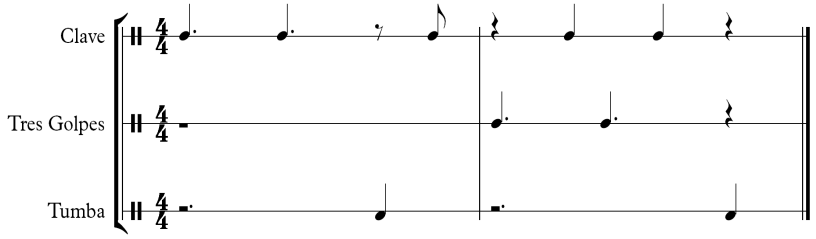


fig. 5. Basic guaguanco clave, tumba, and tres golpes ostinato

In Larry Crook's analysis of this rhythmic structuring in rumba, he notes that this basic rhythmic/melodic element of the tumba and tres golpes can be regarded as "the foundation onto which the particulars of any given rumba are built. Each performance is unique with regard to the actual improvisation that occurs. The real art of the rumbero lies in his ability to create various rhythmic and melodic relationships, while staying within the underlying framework" (Crook 1982, 101).

Questioning Bland, I wanted to establish if, around this core percussive framework, there existed a vocabulary of set musical phrases that in the course of performance were selected from – 'set pieces' that would be interactively assembled between multiple players to construct the genre, and importantly, if there are any anomalies that would contradict this pattern:

> Bland: To some extent, yes. Rumba has developed very quickly [...] guarapachangueo is a style now. It doesn't actually require any set patterns at all. The ostinato things are the clave and the guagua, and even the guagua is quite free. [...] You don't have to be playing:

> Murray: And this is specifically in guarapachangueo?

> Bland: In any form of modern rumba you don't have to be as limited [...] you might start with Matanzas guagua for the *diana*[15] and the text of the song:

> and then move into:

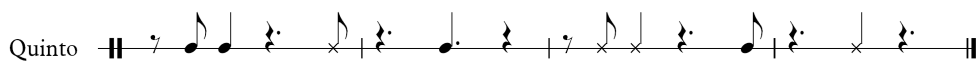
> The main family or group that developed the style known as guarapachangueo – *Los Chinitos*- when you listen to a rumba played by them now, you don't even hear the tres golpes the way it used to be played. It isn't even there. There's actually no such thing as a set pattern. It's lost. It's playing within the clave and what you thought you used to know, the defining things that gave you any sense of where you were in the music, are all pulled from under you. They create their own rules of engagement themselves.

Importantly, when Bland refers to musicians and ensembles creating "their own rules of engagement" he is not implying that the original interactive mapping of performance rules and hierarchies has been disbanded, but that the content and order of such rules have been altered. The reliance of guarapachangueo on clave and guagua is still just as profound as it is in guaguanco, but now the content of the parts has changed; the hierarchical network of systems is still just as apparent but the

15 The first section of a rumba that vocals are traditionally used in, where the singer will sing meaningless syllables before progressing to the verse section.

composition of the 'set pieces' and rhythmic ostinati have been altered in terms of rhythmic emphasis and the elongation of rhythmical cycles[16]. As well as looking at purely instrumental interaction during a rumba performance I also wanted to explore with Bland how the network of interplay between the quinto, the vocalist and the dancers is apparent in the construction of the performance, and how the theatrical spectacle of such dancing manifests itself through music-making:

> Bland: Basically [with the quinto] you're embellishing a simple structure:



> Murray: The quinto in that situation would be embellishing that rhythmic structure, but embellishing it in response to what the vocalists and dancers were doing?
>
> Bland: Yes [*pause*] or seizing the moment. You had numerous different calls that produce a couple of different variations of response. The response was not absolute.
>
> Murray: There are multiple responses from the one call from the tumbadora?
>
> Bland: It's like a musical equivalent of 'would you like a cup of tea' it could be a very short answer or it could include a lot more involvement.
> (Bland, interview with author. 13th January 2014)

In the examples of Turino's research on Peruvian music and Bland's explanation of Cuban rumba, I have tried to do two things. First, in exploring musical composition and performance using these two examples, I have exposed several concepts surrounding originality and its relationship to the culture-specific concept of musical creativity. In Conima, the assumption that musical material is collectively created by all involved in the process, regardless of how much particular members contributed, not only reinforces the egalitarianism of the music-making dynamic, but also highlights the cultural values placed on inclusion and equality in the wider social sphere. Not only do members of the rehearsing ensemble have the freedom to agree with musical ideas (and in doing so promote their prominence in a particular composition's development), importantly they are also permitted to disregard material that is thought to be unsuitable – creating an inclusive process of musical creativity. Through the variation on existing material, Conimeños have developed an understanding of originality that to others may feel more like variation on the theme. By re-visiting existing musical ideas and altering them in such an

16 See Schweitzer, K. 2013 for an in-depth analysis of guarapachangueo and its relationship to guaguanco. pp173-175

inclusive manner, these musical examples establish their own sonic identity, which through public performance becomes the ensemble's sonic identity. This negotiation of musical content affirms social values that in turn fuel the feedback loop of musical creativity.

Bland explains that in the course of rumba performance, there exists a network of hierarchical relationships that relies upon musical rules of engagement that need to be understood by all performers in order for a performance to take place. As he states, these rules can be (and are) in a constant state of flux. However, some underlying constants with regard to genre-marking through clave and rhythmic ostinati remain. It is not the case that rhythmic accompaniment *support*s musical creativity, but rather the collaborative development of material (both visual and musical) feeds back to produce a narrative structure based on predetermined structural components. The use of such compositional and performative components, as I will explore in Chapter 3 and 4, have become (both through historical exposure and present-day application) recurring themes within the context of my collaborative composition practice; both pre-AMP and in my proposed interactive application model.

Performance spaces in which musical communities collaborate to create sonic works are by no means restricted to face-to-face interactions such as those described by Turino and Bland. As Shelemay has introduced, the Internet has now become a central means to not just communicate, but also to facilitate networked virtual musical communities that have the ability to overcome geographical, political, and economic restrictions (Shelemay 2011, 364). In the following section, I introduce both technological and theoretical concepts that have become crucial to the development of my proposed interactive composition model.

2.6 Immersed in Binary: Music-making in the Virtual World

> It is a deserted metropolis where I find traces of life everywhere, but no people, no living bodies. The urban centre of this vast, software-driven city is made up of hundreds of thousands of elaborate websites that stand as deserted monuments to organisations, businesses, and public institutions[...]this is Softcity.
> (Lysloff 2003, 23)

For ethnomusicologist René Lysloff, conducting ethnographic fieldwork in Softcity did not require any flight bookings, immigration checks, or vaccinations. He did not have to contend with the

romanticisms historically associated with going out into 'the field'; making sure to have packed enough pens, paper, batteries for his field recording device, and water purification tablets. Softcity was the field, and virtual ethnomusicology was the discipline. Both observing and participating in the Digital Music Module (or Mod[17]) scene, Lysloff aimed to determine if the social relationships found in the virtual collectivity of the Mod scene constituted a true community, "intentionally shifting the perspective from offline presence to online telepresence, placing the Internet in the centre of the experience and reality at the margins" (Lysloff 2003, 27) – virtual ethnomusicological research of virtual communities. As Lysloff puts it, are virtual communities "extensions to, substitutions for, or alternatives to offline real-world communities?" (Lysloff 2003, 32). Professor of social studies in science and technology Sherry Turkle states that "we are moving from a modernist culture of calculation into a postmodernist culture of simulation" (1997, 20). In doing so, she asserts the historical model of the "modernist computational aesthetic" (1997, 18) that revolved around "calculation, one-way-processes, and hierarchical relationships" and the "grand narrative of scientific empiricism" (Lysloff 2003, 28) has been succeeded by Jameson's concept of postmodernity in late-twentieth-century multinational capitalism (Jameson 1998, 3). With this (Jameson's aesthetic of commodity consumerism informing the culture of simulation), interactivity, graphic user interface (GUI) and avatarial agency combined with the evolving nature of computer processing power and media technologies have changed "the way we think about the real and representations of the real" (Lysloff 2003, 28).

Discussing the facilitation of collective musical creativity in an example of such postmodern simulation, Atau Tanaka, Nao Tokui, and Ali Momeni (2005) express that the deployment of music and music-making tools through the infrastructures and networks now available can create "dynamic, living forms" resulting in the "democratization of the creative process and the inclusion of the listener in the compositional loop" (2005, 191). This process expressing the rise of social music systems that merge Laske and Drummond's realizations of action, perception, and language through the use of new media technologies. Such social music systems can take on multiple appearances and creative qualities, determined by the purpose they serve, and the technology on and in which they are deployed.

Exploring this approach, musician and sound artist Norbert Herber proposes the concept of the composition-instrument (2008, 103), introducing the notion of the conceptual framework that is

17 Binary-form music files created using 'mod tracker' software that is played back on 'mod players', giving the user or player a wealth of editing capability and manipulation over the shared files.

created for systems that use interaction in the performance of the work – in the fields of interactive media, art, or (computer) gaming environments. Stating that "[w]hen it plays, it enables a musical experience of sound. But it can also be played like a conventional instrument. This treatment allows the musical output of the work to be modified in the course of an interaction. Such 'instrumentalization' transforms the work into an agent for further musical expression and exploration. Thus a composition-instrument is a work that can play and be played at the same time" (Herber 2008, 104) he suggests that the composition-instrument is not the sound or visual output, but rather the approach and technique adopted in which the medium is developed and transformed, creating "systems with musical potential" (Herber 2008, 108).

2.6.1 Playing in the virtual world

Facilitating the development of such composition-instruments resides a some what paradoxical set of discourses centred around concepts of play, performance, agency, and creative originality; reality versus verisimilitude, author versus player, and perceptions of reality versus fictiveness. Although some sixty years since its original publication, cultural historian Johan Huizinga's remarks on the nature of play provides at least a gateway to enabling a harmonic balance between such discussions:

> All play moves and has its being within a playground marked off beforehand either materially or ideally, deliberately or as a matter of course. Just as there is no formal difference between play and ritual, so the "consecrated spot" cannot be formally distinguished from the play-ground. The arena, the card-table, the magic circle, the temple, the stage, the screen, the tennis court, the court of justice, etc., are all in form and function play-grounds, i.e. forbidden spots, isolated, hedged round, hallowed, within which special rules obtain. All are temporary worlds within ordinary worlds, dedicated to the performance of an act apart.
> (Huizinga 1938, 10)

The above extract from Johan Huizinga's *Homo Ludens* tells us that play, in all of its social and cultural settings, requires the marking off of space, and often time, from what we consider to be our normal life. In this section, I address several key points in relation to this observation. Huizinga's notion of the consecrated spot designates that these activities take place in a very specific area of both our physical and or virtual world. In the physical world, these consecrated spots are quite easy to recognise, with boxing rings, game boards, race tracks, stages, etc., signifying the boundary between the magic circle and the real world. Further defining this consecrated spot, Salen and Zimmerman go on to develop the concept by noting that:

> Although the magic circle is merely one of the examples in Huizinga's list of 'play-grounds',

> the term is used here as shorthand for the idea of a special place in time and space created by a game. The fact that the magic circle is just that - a circle - is an important feature of this concept. As a closed circle, the space it circumscribes is enclosed and separate from the real world. As a marker of time, the magic circle is like a clock: it simultaneously represents a path with a beginning and end, but one without beginning and end. The magic circle inscribes a space that is repeatable, a space both limited and limitless. In short, a finite space with infinite possibility.
> (Salen and Zimmerman 2003, 95)

The location of such magic circles of play is now far from limited by the tangibility of historical examples. Hybridizations of play, verisimilitude, fictiveness, and artistic creativity find themselves transported to Lysloff's Softcity; an arena of complex collaborative and technological intermingling where networks facilitate performance spaces, and conceptualizations of reality transpose to the virtual in their creative reinforcement of such paradigms. Networked machines (both local and wide area) are now all-to-common as both performance spaces and the facilitators of such spaces. Examples of such technology in the context of music-making will be explored in section 2.9-2.9.5, refining such approaches to the context of my collaborative practice in sections 3.6 and 3.7. Synthetic worlds economist and academic Edward Castronova defines virtual worlds as "crafted places inside computers that are designed to accommodate large numbers of people" (2004, 4). Over the past decade, these 'crafted places' have become increasingly important in both media and cultural studies as the distribution and networked potential of Internet-enabled devices have snowballed globally. As the Internet has become central to the study of human culture, virtual world research has developed into a gateway to observe "human culture realized by computer programmes through the Internet" (Boellstorff 2008, 126). While this realization of human culture enables the observation of individual activity and community interaction with both the environment in a particular virtual world, and with others that inhabit such places, they remain "software artefacts, communities, and commodities. They are places and spaces whose geography and landmarks can be as familiar as your own neighborhood, teeming with personalities that are rich and genuine and multifaceted, but– simultaneously and paradoxically– they are also always finally layers of logical abstractions mediated by the conventions of digital computing" (McDonough et al. 2010, 9).

Bell proposes that in order for such a digital environment to be classed as a virtual world, several key attributes must be apparent. He states that virtual worlds need to be a "synchronous, persistent network of people, represented as avatars, facilitated by networked computers" (Bell 2008, 2) in order to truly be

virtual worlds. Breaking this definition down to explain its key components, Bell proposes that the synchronous element of such places must offer some factor of common time shared between its inhabitants that permit some degree of "coordinated social activities" (Bell 2008, 3). The synchronisation in these environment also extends to the shared awareness of "space, distance and co-existence of other participants found in real life spaces giving a sense of environment" and that they must "regardless of scale, offer participants a sense of geography and terrain" (ibid.) in which to operate. When addressing the requirements of persistence, Bell asserts that such places continue to exist once some or all of the participants have left. This element, he believes, is a key factor that differentiates virtual worlds and videogames; "no longer is one participant the centre of the world but a member of a dynamic community and evolving economy" (Bell 2008, 3). Avatarial representation, he says, requires the ability to perform actions and be controlled by a real time human agent (ibid.). This element being what Adriano D'Aloia believes to be "the embodied manifestation of the player's engagement with the game-world; it is, at the same time, a reflection of ourselves and an envoy of ours in the parallel world" (2009, 51). These being worlds where we functioning like "user-controlled puppets", the combined characteristics of both user and avatar are "represented by how we communicate actions to others" (Bell 2003, 3).

In contrast to Bell's definition, McDonough et al. (2010) categorize the six essential characteristics of virtual worlds as being "shared space (multiple users), a graphical user interface, immediacy ("interaction takes place in real time"), interactivity ("the world allows users to alter, develop, build, or submit customized content"), persistence ("the world's existence continues regardless of whether individual users are logged in"), and socialization, or a sense of community" (McDonough et al. 2010, 9). In doing so, they replace Bell's need for avatarial representation with that of a Graphic User Interface, and bypass Bell's requirements mentioned above. McDonough et al. bring to the foreground the concept of 'exploring', rather than the 'playing' of a traditional win/lose gaming situation (2010, 11). In this context, participants seemingly abandon point scoring/game winning strategies. In its place, participants seem to roam, exploring the virtual world that they inhabit in an action resembling philosopher and film maker Guy Debord's *dérive*, in which:

> one or more persons during a certain period drop their relations, their work and leisure activities, and all their other usual motives for movement and action, and let themselves be drawn by the attractions of the terrain and the encounters they find there. Chance is a less important factor in this activity than one might think: from a dérive point of view cities

> have psychogeographical contours, with constant currents, fixed points and vortexes that strongly discourage entry into or exit from certain zones
> (Debord 1958, 62)

As McDonough et al. state "[t]his behavior anticipates the appeal of later, much more complex and fully rendered virtual worlds, such as those found in the *Grand Theft Auto* franchise, in which players often engage in "sandbox" mode, foregoing the missions assigned to advance the plot in favor of ... just driving around" (McDonough et. al 2010, 11). This being a clear (although facilitated by the author's of the original code) demonstration of the dropping of Debord's usual motives associated with game play in this context, becoming more pastime than game.

Historically, when more than one player wanted to play a videogame simultaneously it would either have to be a two-player game on the same machine, or run multiple machines via a peer-to-peer fully connected mesh topology. In this network structure, there is no client-server hierarchy, and all machines share data with all other machines with no immediately obvious master-slave data/power distribution. Although cutting-edge when first introduced, using this system for game play was soon seen to be outdated and not fit for purpose. Playing on a mesh topology lead to unworkable lag between machines, as programmer Glenn Fielder explains:

> First, it's exceptionally difficult to ensure that a game is completely deterministic; that each turn plays out identically on each machine. For example, one unit could take slightly a different path on two machines, arriving sooner to a battle and saving the day on one machine, while arriving later on the other and erm, not saving the day. Like a butterfly flapping it's wings and causing a hurricane on the other side of the world, one *tiny difference* results in complete desynchronization over time.
> (Fielder, n.d.)

To solve this problem, the now widespread client-server network was utilised. In this topology data is sent from the client and passed to a server that processes the data from multiple users. From here it sends back all amalgamated data including all other player's inputted data allowing each client machine to construct an image of all users movements and parameter changes. This ultimately meant that players could drop into/out of games/worlds that were being hosted remotely on server machines, and is a topology that becomes central to the player experience using AMP.

2.7 Ludomusicology and Procedural Authorship

In the virtual world, the concept of the magic circle I feel needs further clarification to illustrate its

relevance to my practice-led research. Not only does 'the game' need to be created (or recreated if it is a simulation of an already existing game), but also the virtual environment in which it is to be played needs building, through a process of developing strict rules and the application of authored judgements. This both allows the game to be played, and also restricts its players from venturing beyond the coded boundaries of computer-based experiences. Such restrictions – and I argue liberations – are no more apparent than with examples of composition-instruments and the field concerned with the study of ludomusicology. Referring to a term he believes was first introduced by Laroche in 2007, Moseley (2013) introduces the concept of ludomusicology as "the study of the musically playful and the playfully musical" (2013, 285). Within such a topic rest many aspects that relate to both the player of the game, and structural techniques that go on 'in the background' enabling a sense of play without obstruction. As Moseley states:

> Bringing music and play into contact in this way offers access to the undocumented means by which composers, designers, programmers, performers, players, and audience interact with music, games, and one another. It promises to account for competitive behaviour, the acceptance and evasion of protocols and constraints, the pleasure of rhythmic bodies in motion, and the dizzy delight taken in exhibitions of virtuosity. Ludomusicology is thus more concerned with performativity – with discourse that, in Austinian terms, do what they say – than it is with text-based preoccupations of representation, meaning, and interpretation.
> (Moseley 2013, 286)

Moseley discusses the interesting concept of what he has labeled "the *ludus-paidia* dialectic" (2013, 300). He defines the paidia aspect of gaming as "defying or ignoring constraints, and the pleasure taken in tumult, improvisation, and contrary behaviour" and ludus to be "The player's willing submission to the non-negotiable rules that govern the pursuit of games, and the pleasure taken in confronting – or ingeniously circumventing – arbitrary and recurrent obstacles" (Moseley 2013, 296). In exposing these two fundamental elements of game-play behaviour and the ludus-paidia dialectic, he reveals a fundamental inconsistency between the perceived freedom that the player feels, and the underlying contradictory nature of the rule systems that construct such games: "A central paradox lies in the fact that while both music and games are celebrated for the freedom of expression they are perceived to facilitate, the acquisition and manifestation of this freedom depend upon a complicated, inflexible set of rules and conventions" (Moseley 2013, 300). Central to this is Janet Murray's claim that "there is a distinction between playing a creative role within an authored environment and having authorship of the environment itself" (Murray 1997, 152). Clarifying this point, she states "interactors can only act within the possibilities that have been established by the writing and programming. They may build

simulated cities, try out combat strategies, trace a unique path through a labyrinthine web, or even prevent a murder, but unless the imaginary world is nothing more than a costume trunk of empty avatars, all of the interactor's possible performances will have been called into being by the original author" (Murray 1997, 152). With this, Murray establishes that in electronic media the designing of game-style environments is procedural. Through this procedural process it is not just the visual or sonic content of such worlds that is written by the author, but also the establishment of rules by which the interactor will interact with such content:

> [i]t means writing the rules for the interactor's involvement, that is, the conditions under which things will happen in response to the participants actions. It means establishing the properties of the objects and potential objects in the virtual world and the formulas for how they will relate to one another. The procedural author creates not just a set of scenes but a world of narrative possibilities.
> (Murray 1997, 152-153)

However, this does not detract from the creative element that is introduced by the interactor. Similar to Nettl's "vocabulary and the rules for its use" (2005, 32) introduced for the concept of originality in the composition process of music-making, the interaction with such procedural authorship can provide essentially infinite creativity achieved through becoming part of such temporary worlds:

> In electronic narrative the procedural author is like a choreographer who supplies the rhythms, the context, and the set of steps that will be performed. The intereactor, whether as navigator, protagonist, explorer, or builder, makes use of this repertoire of possible steps and rhythms to improvise a particular dance among the many, many dances the author has enabled. We could perhaps say that the intereactor is the author of a particular performance within the electronic story system, or the architect of a particular part of the virtual world, but we must distinguish this derivative authorship from the originating authorship of the system itself.
> (Murray 1997, 153)

The hybridisation of the ludomusical and the procedural that Mosely and Murray have introduced become central to AMP's concept, design, and development through the procedural analysis of external musical examples and establishment of my proposed interactive model and in Chapter 3. In section 2.8, Schechner's performance theory approach also plays a key role, contributing to the facilitatory partnerships that enables AMP to operate in my collaborative compositional environment.

2.8 Performance Theory

Temporarily stepping out of the virtual world, it is important to understand how theories of performance studies are related to this analysis. From here, we can then begin to piece together the

structuring of Murray's procedural authorship that codes such practices, virtually. As submitted in both my introduction and methodology (sections 1.1 and 1.2.5), the relocation, hybridization and re-contextualisation of Schechner's work has become central in the interrogation and practical development of my collaborative output; the dynamic systems theory approach suggested by Clayton facilitating a partnership between theory, analysis, and my practice. Schechner provides a model of performance that encapsulates a range of disciplinary examples and compiles them into a system relevant to performance in general. He proposes a diagram of concentric, overlapping circles, " the larger the size the more time and space covered and the broader the 'idea area' occupied" and that "generally speaking, though not in every case, the larger disc contains all those smaller than itself" (Schechner 2003, 70-71). Schechner titles these discs as:

- Drama: A written text, score, scenario, instructions, plan, or map
- Script: The basic code of events
- Theatre: The event enacted by a specific group of performers
- Performance: The precinct where the theatre takes place
(ibid.)

In proposing such a division of roles within any given performance, Schechner locates characteristics of such elements, stating that "the drama is the domain of the author, the composer, scenarist, shaman; the script is the domain of the teacher, guru, master; the theatre is the domain of the performers; the performance is the domain of the audience" (Schechner 2004, 70 (fig. 6)).

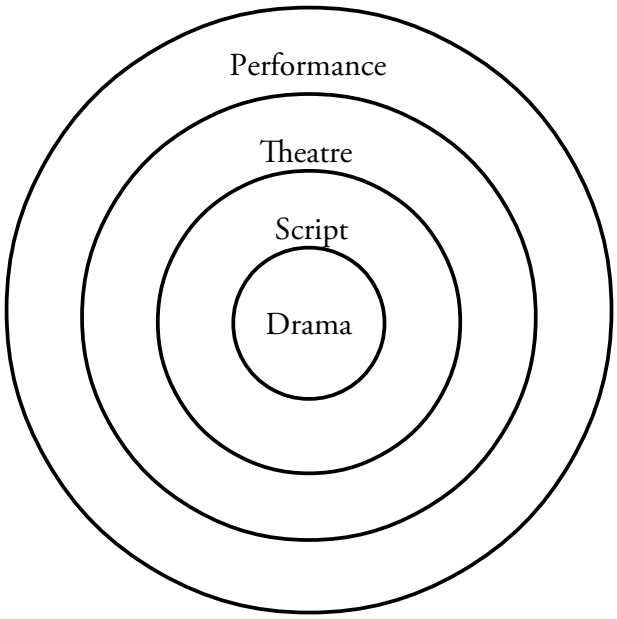


fig. 6. Schechner's concentric circles model

In developing this model to become relevant to the virtual world and video gaming, Fernandez-Vara (2009) merges Schechner's' model with elements found in the performance theorization of Pavis (1992) to establish a three-tier system that includes *mise en scene*. In this context, Fenandez-Vara looks to *mise en scene* as being the "confrontation of the dramatic text and its performance" (Fernandez-Vara 2009, 4) drawing on Pavis' assertion that "*mise en scene* tries to provide the dramatic text with a situation that will give meaning to the statements of the text. Dramatic dialogue therefore seems to be the product of (stage) utterances and at the same time the text used by the mise en scene to envisage a context of utterances in which the text acquires a meaning" (Pavis 1992, 30) in order to replace Schechner's Performance. Here, Pavis' *mise en scene* relates to the context of the text in establishing a meaning of the staged utterances. The combined content of such texts creates meaningful dialogue contextualised by all elements that come together to create the performance. There is, as Pavis says, no single context for the text to follow. Any "change in context of utterances goes hand in hand with renewed concretization of the dramatic text; a two-way relationship is established between the dramatic text and the Social Context", continuing that "With every new *mise en scene*, the text is placed in a situation of enunciation, which allows or facilitates a new analysis of the text and so on, *ad infinitum*." (Pavis 1992, 30). Fernandez-Vara hybridises Schechner's model to a three-tier system (fig. 7) to illustrate how these elements are viewed in a performative context of digital media and gaming environments (Fernandez-Vara 2009, 4):

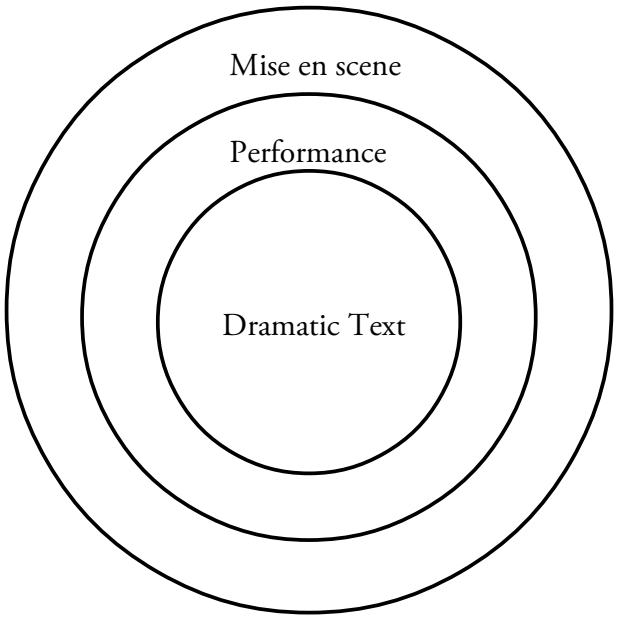


fig. 7. Fernandez-Vara's videogaming performance theory model

Signalling the introduction of the computer as part of the performance model Fernandez-Vara substitutes dramatic text, performance, and mise en scene with code, runtime, and interaction. She proposes that the code, the software that contains the instructions that the computer follows, works similarly to the text of a play – not becoming concrete until executed by some other force, usually the interactor. In computer science, the runtime of a programme refers to the actual execution of the code once the interactor has started the execution process. In this instance Fernandez-Vara does note an anomaly between performance and runtime in that "unlike theatrical performance, where the actors can ad-lib or ignore stage directions, computers must follow the code and cannot alter it" (Fernandez-Vara 2009, 5). This however does not take into consideration branches of computer science that implement machine learning and self-modifying code, in which the base code can in fact rewrite itself to promote its own development. Finally, interaction is the process of closing the performance activity. Fernandez-Vara notes that as in the theatre model, performance is not realised unless an audience is part of the scheme (since they are required in the process of meaning-making) and "the interactor is thus an active performer along with the computer" (Fernandez-Vara 2009, 5). To implement her tripartite performance model to the world of gaming, Fernandez-Vara looks to the Mechanics, Dynamics, Aesthetics (MDA) framework found throughout the videogame development world. In their article "MDA: A Formal Approach to Game Design and Game Research" Hunicke, LeBlanc, and Zubeck (2004) define the MDA approach to understanding games as:

> [o]ne which attempts to bridge the gap between game design and development, game criticism, and technical game research[...]this methodology will clarify and strengthen the iterative processes of developers, scholars and researchers alike, making it easier for all parties to decompose, study and design a broad class of game designs and game artefacts. (Hunicke, LeBlanc, and Zubeck 2004, 1)

In bridging this gap, the MDA framework formalises the consumption of games from the three components of 'Rules, Systems, "Fun"' and translates these across to their game design equivalents of 'Mechanics, Dynamics, Aesthetics' (ibid.). However, as LeBlanc notes, there is some degree of overlap in which there is "a grey area between the notions of mechanics and dynamics. Mechanics concerns with the direct consequences of the rules, whereas dynamics concerns itself with the emergent consequences of the rules"(LeBlanc in Nutt, 2008). Placing this in a real world situation, LeBlanc illustrates this concept by looking at the difference between set rules, and emergent behaviour that develops from set rules, in order to maximise player performance: "In baseball, you have to run the bases counterclockwise. In hockey there's no rule that says you have to skate backwards, but if you're

playing defense, it's a good idea [...] it's an emergent behavior that arises from the rules of hockey. Dynamics emerge from mechanics"(ibid.). Through the coded mechanics of a gaming experience, systems of dynamic behaviour develop that cannot act outside of the coded rules of the game mechanics. This dynamic behaviour leads to an aesthetic experience born out of the interplay with the coded mechanics, and interaction with other player's experiences with the same process. As Fernandez-Vara (2009, 6) and Hunicke, LeBlanc, and Zubeck (2004, 2) all recognize, designer and player perspectives approach game observation from opposite ends of the framework (fig. 8):

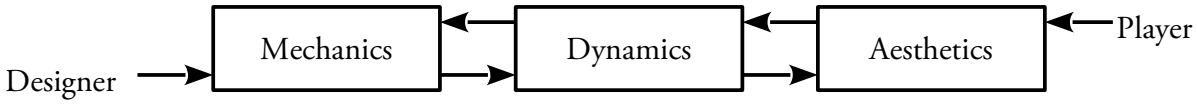


fig. 8. The opposed approaches to the MDA framework of players and designers

With regard to her performance framework, Fernandez-Vara states that "The player stands at the other end of the cycle, starting with the experience created by the game, then devising strategies to play the game, to finally figure out the mechanics of the game […] it is necessary for the player, as it was for the audience or interactor, to make sense of the system to complete the performance" (Fernandez-Vara, 2009, 6). From the player's perspective, this means that the most engaging aspect of playing is in the Aesthetic element of the MDA framework. Although, as Fernandez-Vara states, the mechanics and dynamics are essential elements for the player to understand in order to complete the performance model, they will initially be involved in establishing the game's aesthetic experiences. This opposed directionality of approach for designer and interactor is explored through the context of both my design of AMP, and the implications that this has on both compositional style and collaborative development and usage in chapter 4, with the application of Schechner and Fernandez-Vara's performance theory models being applied to the analysis of socio-musical events in sections 3.2, 3.4, and 3.5 of this thesis. Section 3.7 will demonstrate my application of their theories to my creative practice, contextualising my inclusion of such theories.

Central to this discussion, the element of "solutionlessness" described by McDonough et al. with regard to *Grand Theft Auto*'s sandbox mode (McDonough et al. 2010, 11) introduces another concept from Murray's work that I find conceptually resonant, and that is the concept of the rhizome and its application to digital storytelling. Murray discusses the theorisation of the rhizome, the notion of

indeterminate events that construct what she calls the "digital labyrinth" of the "postmodern hypertext narrative" (Murray 1997, 132). In contrast to her analysis of maze-based puzzle games that "sends you, the player, through a multitiered space vaguely resembling an *Arabian Nights* palace", Murray offers the "[r]apture of the [r]hizome" (ibid.), where the maze can be constructed of both moral and psychological choices as well as spacial twists, the rhizome offers a potentially "unheroic and solutionless" environment, with "no end point and no way out" (ibid.).

Although celebrating the rhizomic format as offering "an affirmation of the reader's freedom of interpretation" (1997, 133), Murray does offer insight into some of the more limiting aspects found in this style. Her main concern is that when taking part in such a story system, readers/participants have no way of noting what paths they have already taken. Murray expands on this aspect by saying that "[t]he indeterminate structure of these hypertexts frustrates our desire for narrational agency, for using the act of navigation to unfold a story that flows from our own meaningful choices" (Murray 1997, 133), but even when this has been taken into consideration, the rhizome still contains the potential for expression:

> [w]alking through a rhizome one enacts a story of wondering, of being enticed in conflicting directions, of remaining always open to surprise, of feeling helpless to orient oneself or to find an exit, but the story is also oddly reassuring. In the rhizome, one is constantly threatened but also continuously enclosed. The fact that the plot will not resolve means that no irreparable loss will be suffered.
> (Murray 1997, 133)

Murray ultimately comes to the conclusion that neither the maze-based model nor the rhizome are, on their own, suitable models for interactory pleasure in literary narrative structures:

> Both the overdetermined form of the single-path maze adventure and the undetermined form of rhizome fiction work against the interactor's pleasure in navigation. The potential of the labyrinth as a participatory narrative would seem to lie somewhere between the two, in stories that are goal driven enough to guide navigation but open-ended enough to allow free exploration and that display a satisfying dramatic structure no matter how the interactor chooses to traverse the space.
> (Murray 1997, 135)

However, when hybridized, they can offer the reader a more suitable method of storytelling that meets the requirements of relocating the paths that have already been taken, and also the joy of apparent wanderings through such immersive environments.

The observations in this section have been focused on the theory and construction of play, games, and

virtual environments from both ludomusicological and non-music game-based paradigms. I propose that the collective playing of music in organised virtual communities is now at a crossroads. Between the rhizomic nature of Murray's potentially unresolving hypertext narratives in storytelling, and Salen and Silverman's interpretation of Huizinga's magic circle – "a finite space with infinite possibilities" (Salen and Silverman 2003, 95) – a new performance paradigm is emerging. Based on collaborative interactive synthesis and/or collaborative interactive construction of pre-composed musical material, the performance models of Schechner, Pavis, Fernandez-Vara, and Hunicke et al. become increasingly relevant in locating the performative context of interaction in the interactive and virtual musical play-ground.

2.9 Practice Review

I now introduce five software platforms and applications, looking at both their musical functioning and their development and use of social interaction to produce their collaborative musical outputs; this second point being key to my development of AMP. Although the musical products I explore below do not advertise themselves as being 'games' or specifically located in virtual worlds, the use of technological advancements in their deployment is certainly moving them closer to these paradigms and as such require analysis. The purpose of such reviews is to both educate and guide my practice-led research in the formation of my own collaborative musical model that has at its centre a deep sense of collaborative social interaction. The purpose of the included practice reviews should not be viewed with the objective of compositional comparability, but as section 3.6 will develop, as a starting point for developing areas of social and musical interaction with my proposed collaborative model of performance and composition.

2.9.1 *4 Hands iPhone*

Professor of media computing Atau Tanaka and Haptic Wave developer Adam Parkinson's *4 Hands iPhone* performances are based on the Pure Data RjDj app to "re-appropriate the iPhone and its advanced technical capabilities to transform the consumer object into an expressive musical instrument for concert performance" (Tanaka 2009). Using in-built accelerometer technology to access and control granular synthesis parameters employing the performer's "free space gestures" (ibid.), their work highlights the ability of powerful mobile technology to generate free-standing performances – that is,

performances where no additional computer equipment is needed, such as additional sensors, or third-party server hosting facilities. In this example, the collaboration between the two performers is that of synthesis control, assigning accelerometer parameters to work in a similar way to the assigned pots or faders of a MIDI control surface in plugin-based synthesis environments. From the same developer, RjDj, also comes Dimensions, an adventure game that allows the exploration of sonic landscapes. The app incorporates data that is gathered and processed by the mobile device such as location, time, weather, and microphone input levels, to generate an evolving texture of sound and visuals. Although there is a traditional game-style collection of points, players are connected via social networking sites to explore and affect a variety of sonic objects in the game's 'collective dimension', sharing these with their contacts as they explore the landscape in their encoded surroundings. From the example of Dimensions, it is possible to see a definite blurring of boundaries between mobile devices that are used for music performance purposes, with the same devices being used simultaneously to place users in virtual gaming worlds. To this degree, Michael Breidenbrucker of RjDj believes that music and games may eventually become hard to separate, possibly even becoming "the same thing at one point" (Breidenbrucker in Greer, 2008), a claim clearly supported by Harmonix co-founder Alex Riopulous: "We're at the beginning of a similar revolution [to that of the MTV revolution] of music now where playing with music is what people are going to expect to do with music that they love. It's how they're going to expect to consume it, and that's going to start touching people in every facet of their lives where they're experiencing music" (Riopulous, 2008)

In both the example of *4 Hands iPhone* and Dimensions, Murray's procedural authorship is embedded in the synthesis parameters, and the nature (through sensors such as accelerometers and microphones) of how the granular 'grains' are stacked and manipulated collaboratively. In the *4 Hands iPhone* example, the magic circle in which the play occurs is limited to the set number of devices used for performance, and I believe that this is not a true magic circle. As Huizinga, Salen and Zimmerman all state, the magic circle needs to be separate from the real world. In this example, it is not so much that the music is created playfully in a separate ruled off area, but more that the working environment of granular synthesis has been framed in a different performative environment. It is still granular synthesis, but presented in a new and very innovative way. However, in the example of Dimensions, the introduction of social networking as a means of both gathering and dispersing data extend the space in which the game is played. Although this social network connectivity can affect 'in game' play, as Bell

has explored, this alone does not provide the necessary degree of agency required for virtual world construction. In this situation it is used to fuel the pre-existing augmented (not virtual) world that Dimensions has established through the sensory manipulation of real-world occurrences with no avatarial presence. With regard to *4 Hands iPhone* the live social interaction between the performers is, I find, very interesting. Both performers, in the course of their performances, look as though they are using instruments and not hand-held mobile devices. The physical movements that both Tanaka and Parkinson use to manipulate their parameters are very expressive, having harnessed the subtleties of accelerometer control to a very high degree. It appears to be, at least visually, comparable to an improvised duet performed on acoustic instruments rather than a performance of mobile device-based synthesis control. Although the building blocks of sonic content in *4 Hands iPhone* are set, the degree of manipulation available through granular synthesis is vast. This results in the performers being able to take the performance in a wide range of directions through the use of wildly different sounding synthesised content.

2.9.2 *CC-Remix*

Related to both of the above examples are the "live Social Music Software" techniques proposed by Tanaka, Tokui, and Momeni (Tanaka, Tokui, and Momeni 2005, 1). In the example of *CC-Remix*, a group of clients access music tracks that have been granted Creative Commons license[18] by their author and made available for remix. Once a client has selected a song from the available library held on the server, loops from the selected track are automatically extracted and made available, being shown graphically on the client software. Once all clients have selected their track to work with, the server beat matches and synchronises all selections so that they will be played back in time with each other. From here, each user is able to trigger beat matched loops to be played in conjunction with other user's choices, tapping into what the authors refer to as the "bootleg and mash-up culture" (Tanaka, Tokui, and Momeni 2005, 2). As all music used in this system is licensed through Creative Commons, Tanaka has enabled the server to extract details of original authorship of works used in such performance, and make this information available once the new remixed tracks have ben streamed back to the server and rendered as stereo audio files for consumption by the public. In this example, the server is undertaking one of the key roles of the live DJ in preparing audio segments that will fit in to a particular performance. This system is very interesting as it relies heavily on the server analysing the nominated

18 Copyright-licenses available free to the public that allow a work's author to instruct users/players which traditional rights they have chosen to waive to benefit other creative works.

audio and conducting edits such as beat matching to facilitate the performance of the new track. Whereas with *4 Hands iPhone* there is no set tempo across devices for example, with *CC-Remix* the performers are seemingly 'limited' to the matched tempo of the extracted samples, engaging with the collaborative arrangement of the extracted loops and their manipulation through synthesis controls. This system is very interesting as a developmental starting point for my purposes. The seemingly limited potential of extracted loops from other people's music could be made far more interesting if the looped material was originally created by the users of the application. If this was to happen, I believe that the platform could be a very interesting means of socially interacting with musical material; a playful environment where composers can collaboratively explore their work.

2.9.3 *Malleable Mobile Music*

In some ways similar to *CC-Remix*, *Malleable Mobile Music* uses mobile devices with additional hardware sensors to communicate across an ad-hoc wireless network. Based on the Max/MSP real-time music environment, the music generation engine allows up to four users to interact with the specific Max/MSP patch that alters whole songs, individual tracks, or loops. Much like in the example of *4 Hands iPhone*, data from the mobile device sensors are used to substitute MIDI information as it would be found in a traditional sequencer environment using a controller of some sort (keyboard, pads, etc.). Sensor data is passed from the mobile device to the *Malleable Mobile Music* server, where treatments such as time stretching and filtering are allocated to particular sensory controls. These various elements are combined and submixed as 'tracks' with particular clients being responsible for particular modular elements of sonic variation. These separate tracks, as well as an overall master mix of the performance are sent to the various clients taking part in the performance, so that everyone involved has a reference to not just what they are doing, but how it fits in to the overall musical structure. Both *CC-Remix* and *Malleable Mobile Music* work to the principle of augmenting current musical content collaboratively. That is, they take a section of audio (track, part of track, or loop) and alter it through on-board processing. Much like the example of *4 Hands iPhone*, the environment in which the sound is altered or edited is not dissimilar to the methods found in computer-based sequencers and again, although highly original and inventive in how collaboration has been facilitated, the GUIs of both systems are firmly located in the realm of sequencer and not game. However, what is particularly interesting with this platform is again the social interaction that such software and hardware facilitates. Such a system allows groups of performers to collectively 'build' music together in a collaborative environment, with the

choices made by all performers having a knock-on effects with regard to the choices that the rest of the group make. Although live synthesis control is not something that I plan to harness (as all synthesis will have been conducted during composition), the group social interaction afforded by *Malleable Mobile Music* would I feel be a very useful starting point to develop in my proposed game-like platform.

2.9.4 *reacTable*

Sharing some elements with *4 Hands iPhone*, Kaltenbrunner, Jorda, Geiger, and Alonso's *reacTable* was from the outset designed "as a musical instrument for several simultaneous players" (Kaltenbrunner et al. 2006, 1). It is a tangible user interface (TUI) that allows several performers to "share complete control over the instrument by moving physical artefacts on the table surface while constructing different audio topologies in a kind of tangible modular synthesizer or graspable flow-controlled programming language" (ibid.). The original hardware version is based around a translucent round table at which users sit. Underneath the table is a video camera that tracks the movements and placement of the tangible objects that are used to manipulate synthesis parameters. As Keltenbrunner et al. state:

> [t]he idea of creating and manipulating data flows is well acquainted in several fields, such as electronics, modular sound synthesis or visual programming, but the reacTable is probably the first system that deals with this connectivity paradigm automatically, by introducing *dynamic patching* where connections depend on the type of objects involved and on the proximity between them.
> (Kaltenbrunner et al. 2006, 1).

To extend synthesis parameters further, multiple *reacTables* can be networked via a conventional internet connection. At the moment, by far the most popular variation of the instrument is a downloadable app for touchscreen mobile devices. This makes the instrument far more accessible, priced at approximately £7 instead of the hardware version's price tag of approximately £5,500 (€6,700)[19]. Although the app version is slightly scaled-down in terms of synthesis parameters, the core elements of (now non-tangible) shape placement and their effect on modular synthesis parameters remains. Although *reacTable* hardware offers the function synchronised across multiple instances, this is not possible with the app version of the instrument. As a result it does not correspond with Bell's requirement of facilitation by networked computers. The hardware and software systems of *reacTable* are, at their core, hugely innovative and collaborative TUI-based synthesis, but it is not its synthesis capabilities that I am most interested with. As a place of focussed social interaction, *reacTable* offers its users a re-imagined everyday place of conversation and play; the table. So often the location of board

19 Prices given from iTunes store (app) and reacTable website (hardware) on 9th March 2014 and reflect exchange rates between the GBP and the Euro on this date.

games, puzzles, and even impromptu rumbas, *reacTable*'s developers have relocated complex tangible synthesis and sequencing parameters to an informal and playful environment so often associated with social interaction. Through looking at the various sales brochures for the product, two clear areas of marketing are apparent. First, the 'serious' musician using *reacTable* as a live dance music production tool, and second, the 'meeting place' around which conversation and play are able to thrive in a musically informal setting. I find this second point most interesting, and one that I hope to harness as I develop AMP. In contract to Tanaka and Parkinson's *4 Hands iPhone* performances, I plan for AMP to be a musical experience that instigates conversations around and during its use, where formalities often associated with on-stage musician behaviour are not required, and informal discussions can flourish.

2.9.5 *Biophilia*

Bjork's *Biophilia* (2011) and its suite of apps run in contrast to all of the above examples. As an album, Biophilia is available to download as a linear, standard-issue release. Each song is also available as an interactive app, with the degree and style of interactivity varying from song to song (or in this case app to app). In this version, the traditional track listing found on a cover of the CD or vinyl has been replaced with a fictitious galaxy that can be twisted and zoomed into/out of to locate one of ten major stars – each one representing a song. By selecting a song, you can then decide how you want to interact with the release. Sit back and watch the video, read the lyrics, learn about the various scale systems and time signatures used in the pieces, or, for example, in *Virus*, interact with the graphics of the game to determine how long the track lasts. Interestingly in *Virus*, if the player manages to 'save' the on-screen cells from the attacking virus that the track takes its name from, then s/he does not actually get to hear the whole tune. Only by allowing the cell to die is this possible.

Other tracks such as *Solstice* allow the user to remix various elements such as vocals and harp through a touchscreen interface as the track progresses through its linear form. As Seth Schiesel of the New York Times proposes, "[t]hese are toys that children could play with for a moment and in some cases serious musical tools that professionals, students and enthusiasts could spend many hours exploring" (Schiesel 2011).

What I find very interesting with *Biophilia* is that, unlike any of the other examples in this section, Bjork has composed tracks, and then handed over how these tracks can be experienced (to varying degrees from track-to-track). Importantly, in each instance, the core experience will be calling on core

sonic building blocks that Bjork has made available to the listener /user. This does not mean that every eventuality for each track's potential has been pre-mapped, but rather Bjork has facilitated a large degree of interpretive potential for the people or person taking part in the album experience. This concept of playfully experimenting with sonic building blocks as an anchor point for social interaction is what I find particularly interesting about this production. Experimenting in groups with the possibilities associated with such an array of options, I plan to experiment with this approach with AMP. Although the synthesis parameters that are apparent in *Biophilia* will not be used in AMP (as synthesis will have already occurred in AMP's initial segment composition level), I intend to facilitate a similar degree of sonic experimentation through social interaction as *Biophilia* has enabled.

To establish how, if at all, these six examples of music delivered through interactive technologies fit into both Bell and McDonough et al.'s definition of virtual worlds, the two tables below (table 1. and 2.) illustrate the alignment or misalignment with each of the definition-specific characteristics:

Instrument/Synth' /App/Release	Synchronous	Persistent Network of People	Represented as Avatars	Facilitated by Networked Computers
4 Hands iPhone	Y	N	N	Y
Dimensions	Y	Y	N	Y
CC-Remix	Y	Y	N	Y
Malleable Mobile Music	Y	Y	N	Y
reacTable	Y	N	N	Y
Biophilia	N	N	Y	N

Table.1. Practice review's alignment with Bell's classification of virtual worlds

Instrument/Synth'/App /Release	Shared Space	GUI	Immediacy	Interactivity	Persistence	Socialisation/ Sense of Community
4 Hands iPhone	Y	Y	Y	Y	N	Y
Dimensions	Y	Y	Y	Y	Y	Y
CC-Remix	Y	Y	Y	Y	Y	Y
Malleable Mobile Music	Y	Y	Y	Y	Y	Y
reacTable	Y	Y (App)	Y	Y	N	Y
Biophilia	N	Y	Y	Y	N	N

Table 2. Practice review's alignment with McDonough et al.'s classification of virtual worlds

The categorisation of such examples in this manner (tables 1 and 2) is primarily to establish how new technologies are being used (or proposed) to present musical/sonic works within the restrictions of the two included virtual world definitions. As sections 3.6 and 3.7 will develop, such categorisations both develop the design of my proposed model, and also contribute to AMP's location with regards to its alignment with contemporary technological applications within music performance and composition.

2.10 Summary

This chapter has predominantly been aimed at introducing components from the wide spectrum of issues, practices, and concepts that I have identified as influential and meaningful to my practice-led research. From such a diverse multiplicity of influences, I feel that it is important to compress such components; establishing what I am predominantly taking forward as information deemed central to my practice-led research.

- Within Small's idea of musicking lies Shelemay's tripartite framework of socio-musical community formation through processes of decent, dissent, or affinity; processes that are not mutually exclusive, and will generally include a degree of porosity and cross over within such a triangulation. Importantly, this community formation is not restricted to the 'real' world, but can also be used as a bonding factor within virtual communities.

- Observing any socio-musical setting, Hudak and Berger propose that a hierarchy of interactions becomes apparent; that mutually recursive processes – through their architecture – capture hierarchies of interaction. Observing such hierarchies of interaction allows the researcher to develop a deeper understanding of the complex interactions (personal, interpersonal, socio-musical, etc.) at play during a performance.

- Performance and composition practices from Peru (Turino) and Cuba (Bland) have been introduced as influential themes to my proposed practice-led research. Socio-musical aspects within such traditions have been highlighted, returning in Chapter 3 to be synthesized and merged with extractions from both Schechner's performance theory and Murray's procedural authorship.

- As has been examined though practice reviews and technological observations, traditional 'listening' and 'performing' paradigms within contemporary interactive musical products have begun to lose their sense of individuality, and 'identity of purpose' (in terms of 'listening to a new release' *not* 'performing a new release'). Such paradigm shifts offer a fertile bed of opportunity to explore developments in my practice-led compositional and performative practice; facilitating egalitarian collaboration through the medium of contemporary technology.

Chapter 3. Contextualising Theory in Practice-led Research

3.1 Conimeños and the Feedback Loop

As introduced in the previous chapter, the collective act of composition undertaken by Conimeños is deeply collaborative, and heterarchic. As I will now explain – using Hudack and Berger's simple and complex feedback loop approach as introduced in section 2.3 – an interesting, and for my compositional development very useful, set of practices and patterns emerge. As Turino discusses, the compositional process among Conimeños can start by appearing somewhat disorganised, and that "at times five or more people may be playing their own phrases or motives simultaneously" (Turino 1993, 76). These phrases, or 'scores' in Hudack and Berger's terms, will be individual ideas that a particular musician has brought to a composition session to act as a potential starting point for further development. Simplifying this group of five or more musicians to two (for illustration purposes), we can visualise this compositional autonomy using two separate simple feedback loops (fig. 9) according to Hudack and Berger's model:

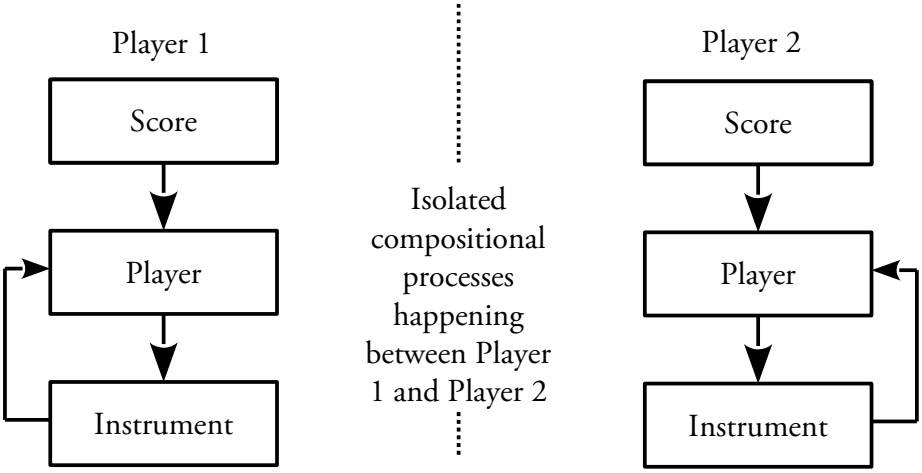


Fig. 9. Two-player autonomy in Conimeños compositional environment

This visual demonstration does however need to be modified. The complete separateness of the two composers in this environment is starkly different from separating them by a significant geographical distance where auditory perception of one and other's compositional material is impossible without the intervention of technology. Although both composers are at this point in the compositional process demonstrating their own musical ideas, they will, should they choose to, be able to 'tune in' to what the

other is doing, taking the evaluative loop from the player/instrument location of the individual performer and placing it between both players so as to facilitate a collaborative approach to composition. To accommodate this form of compositional environment, an evaluation of the sum musical output of both composers to account for Hudack and Berger's mutually recursive process is required, whereby "mutual recursion captures the interaction of players, and [the] architecture of the recursive network captures hierarchies of interaction" (Hudack and Berger 1995, 1). Note that in the below example (fig. 10), player 1 (with a creative flow of black) is composing and performing completely independently, separated from player 2's compositional ideas (in orange) by dotted red line signifying the choice of both composers to be in musical isolation:

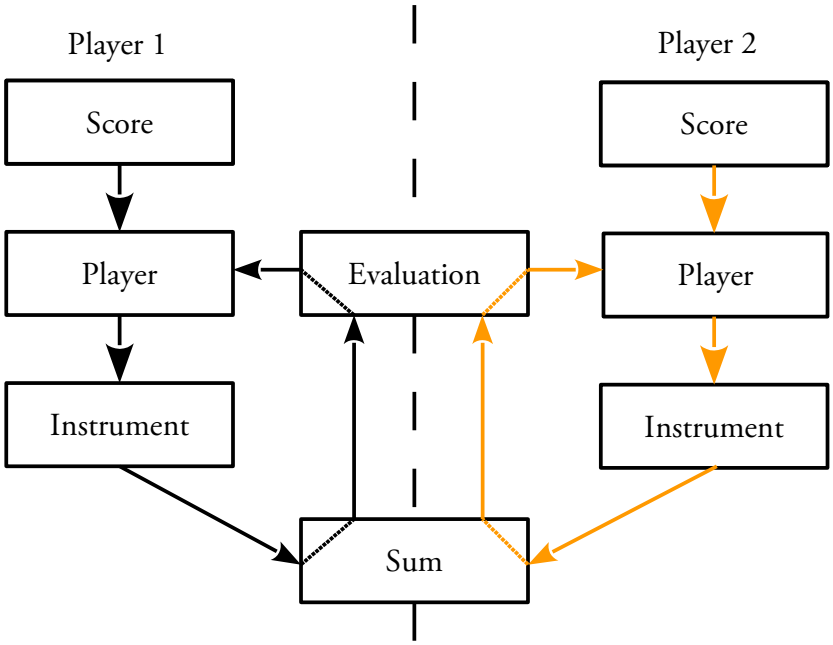


Fig. 10. The separation of compositional activity

As this process is continued, one of two things will happen to each composer and their compositional idea, as Turino states: "[a]fter a period of time, if a musician gets no reaction from the phrase of motives he is playing, he will drop them and play something else or simply fall silent. When an idea is found promising, however, others will gradually take notice, stop what they are doing, and join in softly on their instrument until everyone has taken it up" (Turino 1993, 77). What Turino is describing here is a composer's choice to relocate the other composer's contribution to their 'score' through the sum evaluation of both performer's combined musical contributions; player 2 has altered their musical material (fig. 11) as their acceptance that to develop the group's compositional material, they had to

change their contribution:

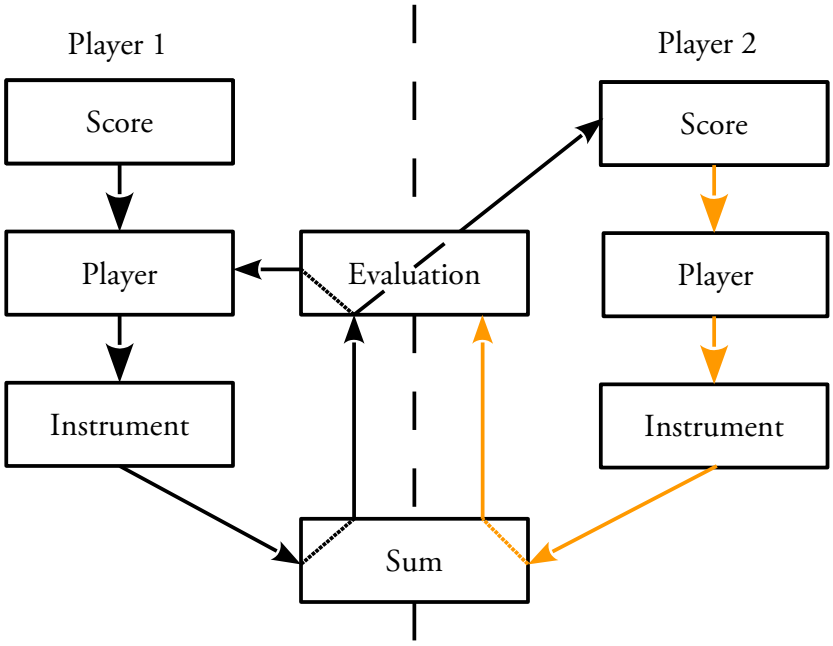


Fig. 11. Evaluative alteration of compositional material

At this point, both players will be in agreement that the chosen musical material is the most advantageous choice for the composition and its future development, with both composers now playing essentially the same musical material (fig. 12) with player 2's original compositional material (orange) being eliminated from the ensemble:

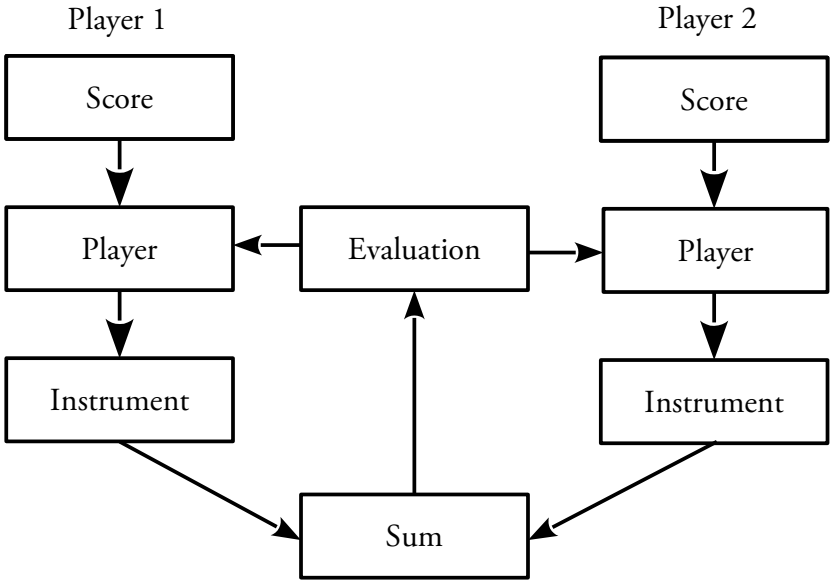


Fig. 12. Finalization through group acceptance of material

This explanation of the Conimeños' musical interaction is specifically applied to the compositional interaction amongst composers in their performance-based compositional environment. It is of great importance at this point to stress that the distribution of power within the group is strictly heterarchic. There is no 'lead' that demands that their musical material take precedence over any other ideas contributed by other members. In this way, the rule of following a particular individual's material or direction found in other ensemble environments has been abandoned (or to be more accurate, not introduced), and the only rule in place is that of heterarchical promotion; 'if someone likes what I'm playing more than what they are playing, they will follow my lead. If I prefer what somebody else is playing, I will follow their lead and change what I am playing'.

3.2 Conimeños and Schechner's Performance Theory Model

The purpose of the above description is to gain a greater understanding of the inter-personal musical interactions that occur during an ensemble's compositional session. However, to further understand the roles, responsibilities, and relationships between both the material and the members of the ensemble, a further sub-level of evaluation must be made. As I have already introduced in section 2.8, Schechner's (2003) model of concentric circles allows us to explore the the various creative and performative roles

that are at work during a performance, and to greater clarify the creative networks that are used during a Conimeños' composition session, these must also be applied. As I will now explain, the diagram below (fig. 13) is a hybridization of both the complex feedback loop of Hudack and Berger, and the performance theory model of Schechner. At the top level, as with Schechner's theory, is the Drama. To make this model more music-specific, and in keeping with Schechner's own description, I have labeled this Score. Importantly though, it must be understood that this does not necessarily require the musical material to be written down as would usually be the case with a musical score. In this particular situation, notation would be almost exclusively absent, and to accommodate this I have also introduced the concept of the Event that sits within the boundary of score. Event is used to symbolize a musical occurrence that has been introduced by a composer or performer in its largely un-notated form, and can, as will be explained in the later examples of rumba and Stockhausen's *Klavierstücke XI*, include the collection of numerous musical occurrences that collectively demonstrate a composer/player's musical input to their particular performance or compositional environment, either graphically represented or not.

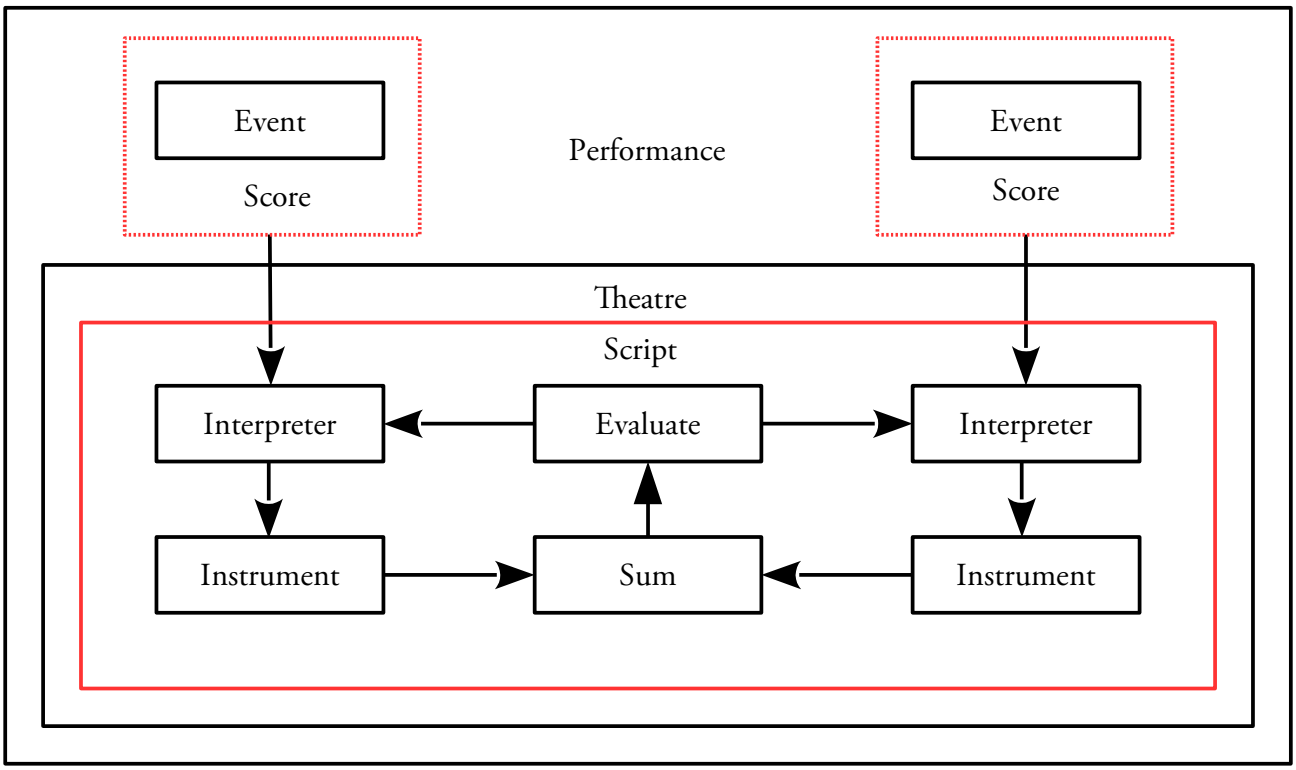


Fig. 13. Two-player Conimeños model hybridizing Hudak and Berger with Schechner's model

By introducing their top-level creative ideas into the Score element of the model, the Conimeños immediately become musical agents. They have demonstrated the creative freedom to bring a musical event to the ensemble's compositional paradigm. They have made a choice that, whether accepted or not by the rest of the ensemble, will 'matter' either through acceptance or rejection. It could be argued that at this point in the model procedural authorship is yet to be introduced. Murray has defined procedural authorship as "writing the rules about text, not just writing the text" (1997, 152), but I propose that by introducing a musical event (the sonic equivalent of Murray's 'text'), that a set of rules have been introduced. If, for example, an agent introduces an idea in 4/4 that is accepted by the group (either in total or in part), this will inevitably affect the shape and progression of the yet incomplete/ un-composed piece of music; an implicit framework will have begun to direct the future of the work, and as such the elements that the introduced Event display (such as tempo, time signature, melodic shape, etc.) will be integrated into the progression of the piece and be established as a rule-base or framework for the remainder of the work (see section 2.7 for more detail on Murray's approach to procedural authorship). I have consciously made the decision to remove Score from being held within the boundaries of script and theatre. As Schechner has stated, not every performance model requires the strict concentric circle structure, and I believe this to be the case in this example. Although in this example the actual musical content introduced by the composer will ultimately fit within the Script and Theatre of Schechner's performance model, the actual musical content has no relevance to the model; it is simply audio content that has no effect on the interactions that occur. The model would in fact remain unchanged if the content (or reason for producing the content) had completely changed. By this, I mean that there needs to be no knowledge of the musical event (and isn't) shared between composers or interpreters prior to the ensemble's compositional session, but all other elements of the performance model are known to all participants; the events introduced by a composer are essentially unpredictable (other than to the composer that introduced it), while all other elements and interactions are prescribed as socio-musical conventions.

Having stated that there is an element of procedural authorship present in the agent's introduction of musical material to the score, I will now explain how Schechner's Script and Theatre line up with this model. The socially constructed code of events is where I propose the majority of the ensembles procedural authorship is to be located. It is through the ensemble's heterarchic code of events that composers feel the greatest sense of agency. This agency is seen, felt, heard, and understood by the

ensemble when the code of events (or procedural authorship) is enacted by the ensemble in Schechner's Theatre; the code of events are performed. This heterarchic code of events is a manifestation of the composition's constitutive rules, its operational rules, and its location in the wider construct of social interaction. These constitutive and operational rules are fundamental to the successful negotiation of both musical material and the very foundation of the heterarchic musical network that is central to the Conimeños' compositional setting. I argue that these rule types, traditionally associated with the creation and dispersion of dynamic agency in video gaming simulations and play, are also central to understanding the distribution and pathways of power in the environment of musical composition and performance; with particular emphasis on occurrences of musical creativity that require knowledge of both tacit and implicit frameworks. Salen and Zimmerman state that "[c]onstituative [sic] rules are those concerned only with internal functioning of the game logic […] constituative rules are concerned with internal events (events relating to the processing of choice) and not the external events (events relating to the representation of a choice)" (2003, 147). Giving the example of tic-tac-toe (noughts and crosses), they list the core game fundamentals of play as being constitutive rules: two players alternate making a unique selection from a grid of nine spaces; each player has a unique identifier, either a 'x' or an 'o'; the first person to select three adjoining spaces in a straight line with their identifier is the winner; if no player can make a selection and there is no winner, the game ends in a draw (ibid.). Applying this level of constitutive rules to the composition environment of the Conimeños, we could say that: a group of composers/performers sit roughly in a circle; each composer introduces a musical event that is either accepted or rejected by the rest of the group; a musical event is accepted when taken up by all members of the group; once an event is accepted by the whole group, the material becomes common musical property; this process is repeated until the ensemble has no more musical input; the composition is complete at this point. These constitutive rules importantly provide the top-level framework for such an event to occur in its social setting. They do not stipulate any ideas on what the actual musical content should consist of (in terms of key, timbre, tempo, etc.) but establish the essential practices within such an environment in order for it to be enacted in its required form.

3.3 Rumba and the Feedback Loop

In contrast to the compositionally heterarchic practice of the Peruvian Conimeños tradition above, the performance of Cuban rumba illustrates some significant allocation of power in its performance setting. As already stated by Bland (section 2.5), the instrumental (and vocal) use of calling to prompt a

response introduces a degree of choice that is significant in the feedback loop model. I will again here be looking at the percussive interaction and not the vocal, and as with the example of the Peruvian ensemble, I will be reducing the number of performers/composers purely for illustrative purposes; importantly, all of the diagrams that I use can be scaled up to match the required number of performers/composers for a particular musical event. Here I will be specifically looking at the more traditional forms of rumba, and not concentrating on the more recent development of guarapachangueo. In guaguanco (fig. 14) – as with yambu and colombia - both the tumba and tres golpes' musical content is thematically prescribed, with the 'default' musical phrase, and basis for all other thematic options and variants being based on the previously noted two-bar musical segment:

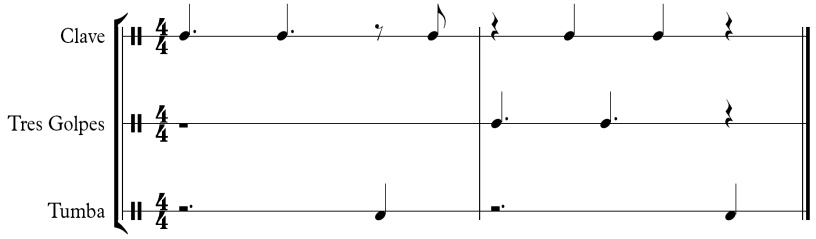


Fig. 14. Basic two-drum guaguanco default marcha

Looking first at the feedback loop for one player (of either the tumba or tres golpes), the immediately obvious difference is that of options available in the Score section of the loop (fig. 15). Each of the players has at their disposal a choice of thematic material that can be chosen from according to the performance:

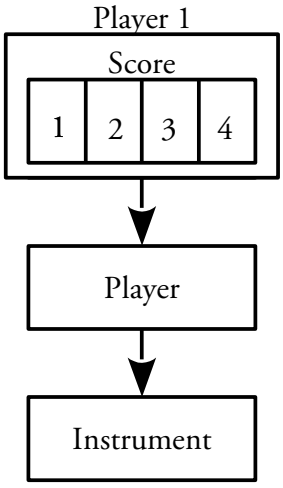


Fig. 15. Score options in guaguanco

Importantly, both the tumba and tres golpes have at their disposal various thematic options, that much like many examples of call and response music, will have matched thematic options that are composed to work in groups (be they pairs – such as in rumba - or across three instruments such as in bata ensembles) with the other instruments performing. Once the tumba and tres golpes are both viewed on the feedback loop, much like in the example of the Peruvian compositional ensemble, the sum and evaluate elements are constructed to express a sense of collective performance between at least two players (fig.16.). With rumba, and in stark contrast to the example of the Conimeños, it must be highlighted that there is a definite hierarchy of musical power during performance. It is the role of the tumba to signal changes to the tres golpes; when the tumba calls a particular phrase in variation to the default pattern transcribed above, it is the tres golpes' musical job to respond with a suitable phrase. As highlighted in the feedback loop below (fig. 16), if the tumba is playing its default phrase (option 1) then the tres golpes will also play its default response (option 1). When, however, the tumba changes to option 4, the tres golpes player will at that point have to respond with its own matched response, from its option 4. However, both of these instruments will have a bank of available phrases within these options so that a call by the tumba from option 2 can have a variety of responses from the tres golpes from its option 2 bank of variations, all of which will be a fitting response (fig.17):

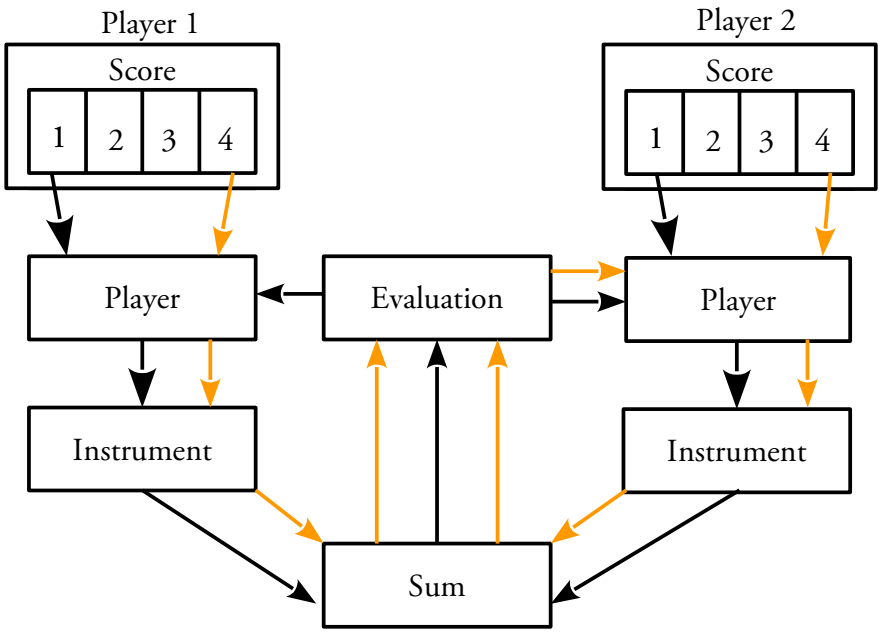


Fig. 16. Tumba and tres golpes call and response hierarchy

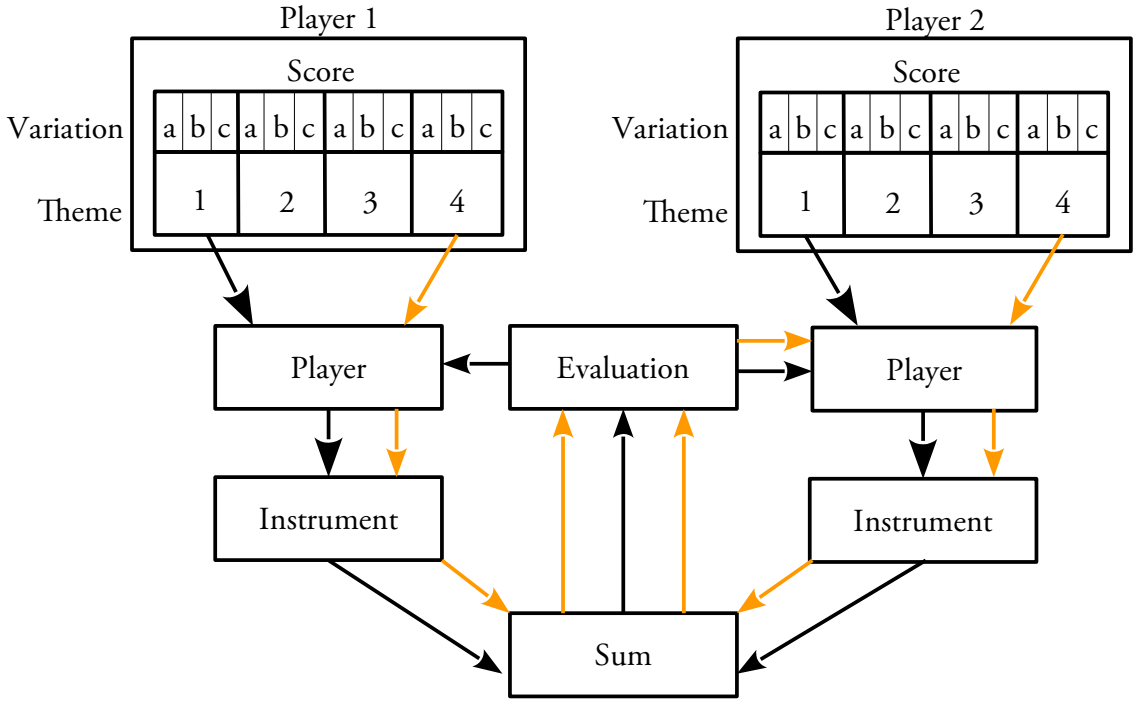


Fig. 17. Theme and variation form of tumba and tres golpes in guaguanco

As I have explained with this example of rumba, it is possible to appreciate that in the context of a rumba performance, even though there is an essentially infinite number of variations of any particular rumba style arising from the number of variations available to performers (and this is of course not taking into consideration the effect of the quinto's improvisatory nature at a rumba), there is also a strict set of rules that govern the power distribution, and therefor nature of the event; while the tumba is free to call as it sees fit (in line with other musical and dance-based events contributing to the overall performance), the tres golpes does not have this luxury. It is essentially following the tumba's lead, albeit in a very open fashion. However, as Bland has highlighted, once the call has been made, the length, style, and content of the response is not set.

3.4 Rumba and Schechner's Performance Model

In the hybridized model for rumba, again I have mapped elements in a non-concentric manner. During a rumba performance, I propose that both Score and Script are implicit/tacit frameworks, containing a large degree of - and license for - improvisation through choice. This results in the exact content of each performers' material not being known by other performers prior to performance. Although each

performer will need to ensure that what is played adheres to the fundamental musical characteristics that will enable the constitutive rules to be enacted, they do have license to engage their own operational rules within such a framework through permitted improvisation and choice. In the below diagram (fig.18, page 85), Events signifies the incorporation of both themes and variations. In such a performance, different degrees of agency are awarded to different instrumental roles. We could say that the tumba would be the primary agent as its choices matter more to the directional shifts in the performance than that of the tres golpes, which is the responder waiting for its secondary agency to be invited by the caller (the tumba). In this sense, there is a clear hierarchy of agency at work during such a performance setting. This agency is embedded in the rules-based procedural authorship of rumba's musical environment, with two levels of rules-based coding being found in the Script; constitutive, and implicit/tacit. The constitutive rules, being those that give organized existence to the musical event, will include the rumba performance beginning with the clave; the tumba marking the '2+' on the three side of the clave with a bass note (bombo); the tres golpes waiting for 'calls' from the tumba to initiate 'responses'; etc., while its implicit/tacit rules would require all performers to remain what Cuban music historian Ned Sublette has termed "clave conscious" (2004, 445), and to perform sympathetically towards all other performers.

Compositional and performative techniques discussed above in the context of Cuban rumba and with Conimeños are not limited to such environments. Various techniques have been developed and adapted, predominantly starting in the 20th century and moving through both the avant garde and post-modernist movements, to allow composers to move away from the long-established, historically conventional techniques of "closed and well-defined" (Eco 1989, 2) sounds represented by equally well-defined and closed symbols. Such compositional systems, sharing some similarities with the explanations from Bland and Turino, have become necessary to investigate and interrogate. Through their perceived and intended openness, the sense of agency felt by performers becomes a central theme and one that can be used to illuminate, influence, and to some degree guide elements of my practice. This is particularly relevant to the selection of pre-composed musical blocks within AMP that are then used to create both works and variations.

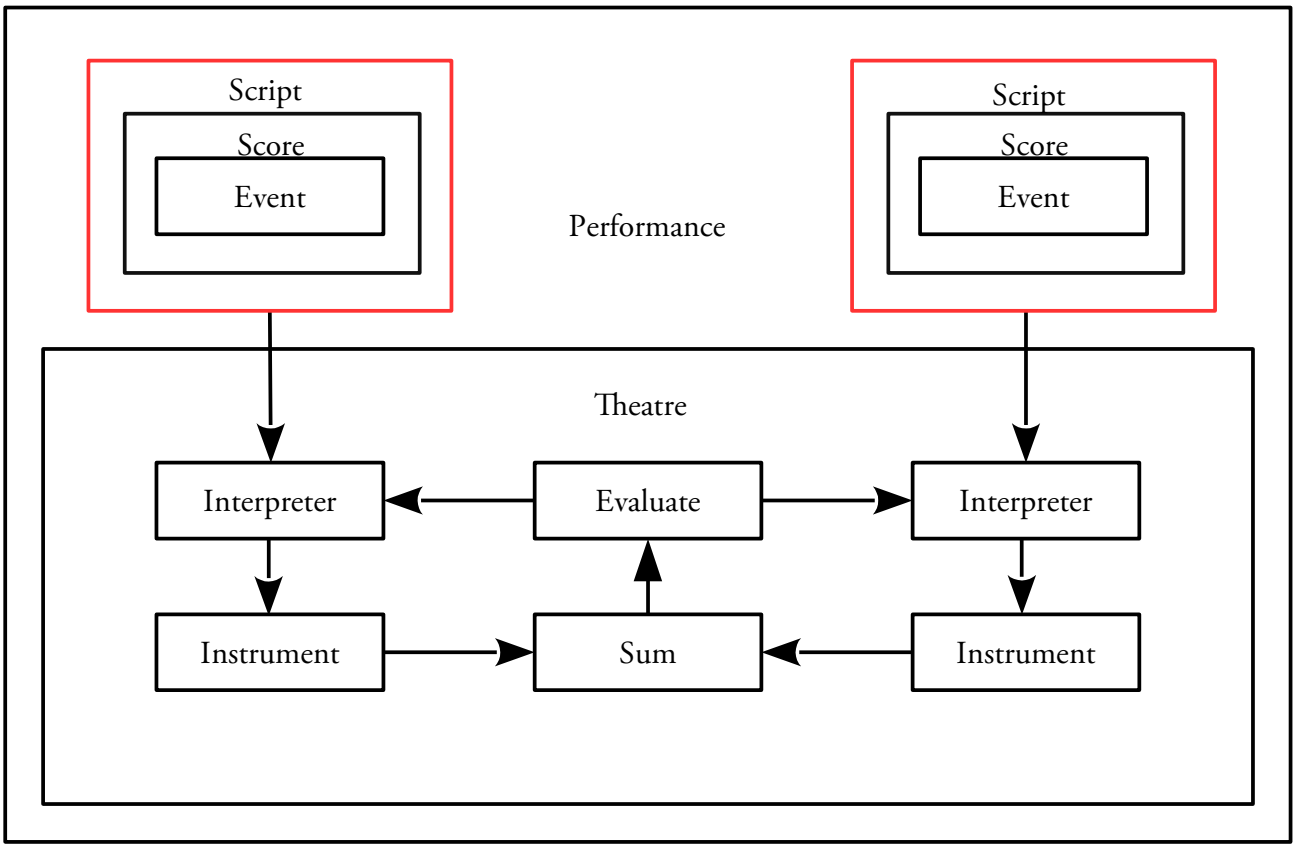


Fig. 18. Hybridization of Schechner and Hudak and Berger's model to guaguanco

3.5 Simple/Complex Feedback Loops in Aleatoric/Open Form Examples

When introducing Henri Pousseur's approach to open form electroacoustic composition, electroacoustic music researcher and historian John Dack reminds us that "The subject of 'open' form in music no longer seems to occupy a position of central importance for many contemporary composers. And yet it remains one of the most innovative and challenging aesthetic concepts in formal procedures of the post-war years" (Dack 2009, 177). Referring to Eco's classic text *The Open Work* (1989), Dack highlights a significant point made by Eco relating to the distinction between artistic creations that are either open works, or follow the open form: "According to Eco, an open work is fixed as far as the formal unfolding of its constituent sections are concerned but it remains open to different readings. For example, the resistance of a literary work to a single, unchanging interpretation will create numerous potential, alternative texts" (Dack 2009, 179). Dack asserts that although in music there can be many different variations and styles of the open form, they can generally be located in the quadrants

of composer and musicologist Walter Gieseler's schematic explanation (table 3):

		Global	
		determined	indetermined
Local	determined	1	3
	indetermined	2	4

Table 3. Gieseler's Local/Global schematic (1975, 139)

In this, Gieseler suggests two groups of categories in local/global and determined/indetermined, leading to two main types of open form – numbers 2 and 3. Number 2 in Gieseler's diagram relates to a musical form that is unchanging in its global form but is "indeterminate as far as the details of the constituent sections are concerned" (Dack 2009, 179). Number 3 in the diagram refers to the opposite structural function; the global form being variable and not precisely fixed by the composer, but will "result from the arrangement of its local sections, the details of which remain fixed" (ibid). As Eco summarises, this approach leaves a heightened degree of choice manifesting in the "considerable autonomy left to the individual performer in the way he chooses to play the work. Thus, he is not merely free to interpret the composer's instructions following his own discretion (which in fact happens in traditional music), but he must impose his judgement on the form of the piece, as when he decides how long to hold a note or in what order to group the sounds. All this amounts to an act of improvisation" (Eco 1989, 1).

According to Barthes, true interpretive individuality can only arise when the author of a work has been removed and the reader is allowed to criticize and decipher text without being exposed to the author's experiences, perceptions, and contexts (Barthes 1977, 147). However, as Cage proposes in his work on indeterminacy in open form compositional practice and performance, the individuality and interpretive functionalism of performed open musical works do not offer the same dynamic scope of freedom to the performer as they do to the composer (Cage 1958, 176). Due to the inherent reliance on core, pre-composed building blocks that make up the fabric of open form musical works, sonic restrictions occur not through the choice and selection of sonic building blocks, but the fact that they are pre-formed blocks as a starting point for open-form composition and performance.

Premièred in 1957 and considered to be "one of the first European works to employ open form" (Kostka 2012, 283), Stockhausen's *Klavierstücke XI* presents the performer with nineteen musical fragments or phrases (for the piano) to be performed in any order that the performer wishes. Although the performance of this work hands over a great deal of artistic interpretation to the performer, Stockhausen did stipulate certain performance rules and criteria; although the order of the fragments was entirely at the discretion of the performer, the performance was to end when any one fragment had been played for the third time, with the second playing of a particular phrase having the option of *8va* as a way to add variation. In this example, it is up to the performer to define and create the narrative arc of the performance, creating their own path through the piece's possible forms. Sharing similarities with the previously explored example of feedback loops in the context of Cuban rumba performance (section 3.3), the performer is again confronted with numerous options and choices for how a performance will unfold. Importantly, in line with Hudack and Berger's "more abstract representation of interaction" (Hudack and Berger 1995, 2) I have here renamed Player as Interpreter in the below illustration (fig. 19), as with the example of rumba. I am consciously making an important distinction here summarised well by Nettl; "Just as all of the performances of Beethoven's *Waldstein* Sonata, however different in interpretation and conception, are versions of the same piece" (2005, 114). Of course, even if a performer attempts to perform a piece of "closed, well defined" (Eco 1989, 2) music twice in exactly the same way, it will not be possible. However minute the difference may be, it will be there. Yes, the performer of *Klavierstücke XI* is performing *Klavierstücke XI*, but although the sonic building blocks may be exactly the same between any two performers and performances, the actual sonic output can be hugely varied due to the very nature of the performance rules put in place by Stockhausen; the performer is structurally *interpreting* Stockhausen's score as it was intended to be interpreted. For this reason, in the context of performance where the performer is confronted with such openness and choice, I have re-labled the player/performer as interpreter:

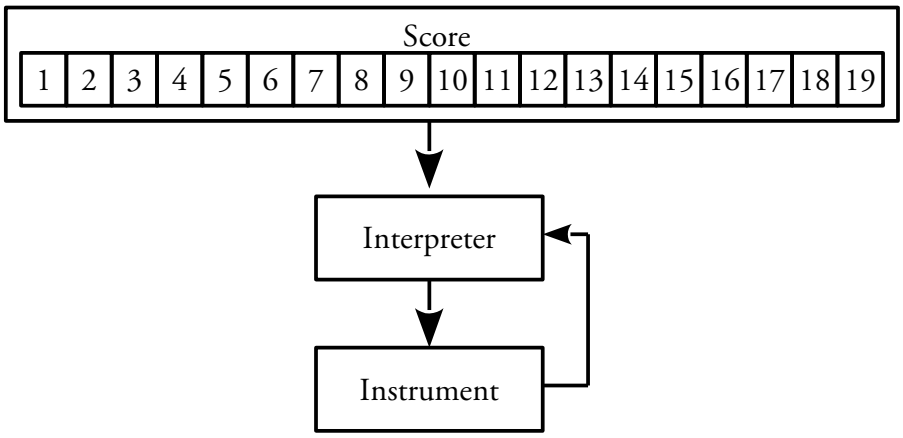


Fig. 19. *Klavierstuck XI* in Hudak and Berger's model

As Dack notes though, a certain paradox exists with such works, as performers will usually have chosen a very particular navigational channel through pre-chosen musical figures that will make up their performance (2009, 179). I think that one point relating to Dack's observation is important to note; even though certain performers may choose to perform a pre-determined course through the piece, Stockhausen's method of presenting the musical material did not make this option *necessary* – just favourable by some performers. In creating such a system of composition and performance for *Klavierstücke XI*, Stockhausen facilitated agency for the performer of the work by composing in a style that offers choice to the performer. Although the score of the work is fixed, the pre-determined rules of the script state what must happen schematically in order for the piece to be performed 'correctly'. As with the examples of the Conimeños and rumba performance, there is additionally an initial layer of procedural authorship within the score, whereby the composer, in composing the musical material, has introduced the rule-based framework within which the script of the piece will function; by composing particular musical 'texts' an effect will be had on how the future code of events will be designed and implemented. However, unlike the example of the Conimeños, the Script for *Klavierstücke XI* is embedded as musical rules *in* the score, and not as socially constructed rules among the composers/performers. In contrast to the Conimeños, there is no social negotiation required during performance as there is only one performer, one agent, and as a result the Score and Script are contained within Schechner's Theatre (fig. 20) as the performer is simply enacting the written rules. In Stockhausen's example, the Script - the composer-created code of events - is actually embedded through the written rules of the performance; the Script is actually part of the composer's written score and the

rules cannot be separated from the composers score without the piece ceasing to be 'the piece' as prescribed by the composer. The composer has facilitated agency for the performer, but nobody else; there is no interaction other than between the performer and the written score. In doing this, the composer has prescribed a hierarchic code of events that are enacted by the performer when this code of events is executed in Schechner's Theatre of performance.

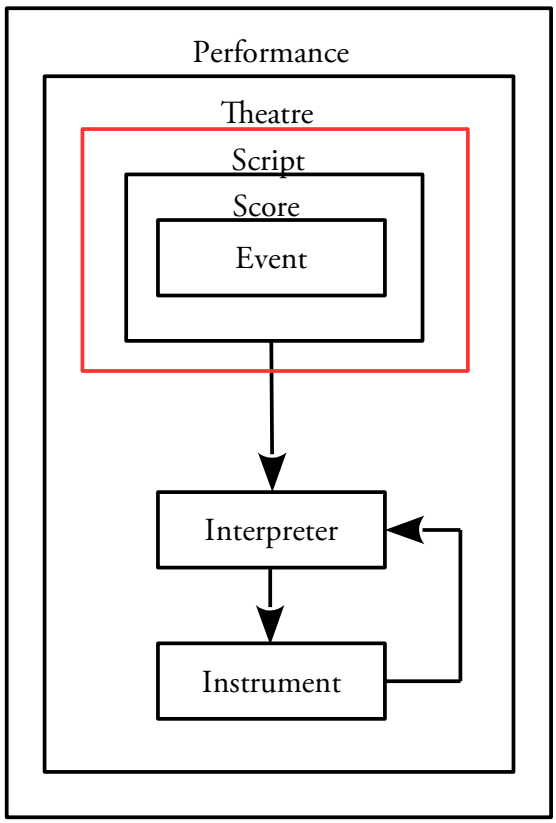


Fig. 20. Schechner and Hudak and Berger's model applied to *Klavierstücke XI*

3.6 Proposed Virtual Performance Model

So far, this chapter has explored the processes, both musical and social, that have been used in three particular and contrasting performance and composition settings; the composition sessions of the Peruvian Conimeños, the Cuban percussive practice of rumbas, and Stockhausen's *Klavierstücke XI*. Although all three offer tremendously different models of power distribution and the agency provided to their practitioners, one central element continues to bring them back together; the use of choice during either performance or composition. It is this unifying characteristic that I am most interested

with. By isolating and mapping key characteristics of composition and performance, how can I utilise – and how have I utilised - elements from such practices to develop a model of virtual interactive performance and composition; borrowing desired elements from each to both inform and shape my own practice, hybridising the social and musical structuring of these examples with contemporary video game interactivity. From the deconstruction of the performance theory of these examples, I propose a virtual performance model (VPM), that at its heart contains the same fundamental principles of social networking (in its original context) embedded in the rules-based procedural authorship of contemporary emergent video game technology; a pragmatic process that has both led my practice and also shaped my research. Returning briefly to my earlier introduction of the relationship between Schechner's performance theory, that of Fernandez-Vara, and the MDA framework of Hunicke, LeBlanc and Zubeck (section 2.8), it is useful to see at this point how each of the author's elements relate to the other proposed models (table 4):

<table>
<tr><td>Schechner</td><td colspan="2">Fernandez-Vara</td><td>MDA</td></tr>
<tr><td>Drama</td><td rowspan="2">Dramatic Text</td><td rowspan="2">Code</td><td rowspan="2">Mechanics</td></tr>
<tr><td>Script</td></tr>
<tr><td>Theatre</td><td>Performance</td><td>Runtime</td><td>Dynamics</td></tr>
<tr><td>Performance</td><td>Mise-en-scene</td><td>Interaction</td><td>Aesthetics</td></tr>
</table>

Table 4. Comparison of Schechner, Fernandez-Vara, and the MDA framework's performance theory models

Fernandez-Vara positions the Dramatic Text in a location that equates to both Schechner's Drama and Script, with this Dramatic Text relating to the code or mechanics of a video game environment (see table 4 above). Stating that "[t]he code of the videogame works like the text of a play: it is the software itself" (2009, 5) Fernandez-Vara omits one central element of the activity; the actual artistic content of such code. Fernandez-Vara is pointing to the binary mechanics of the software itself, and not the audio-visual manifestation of such code. My proposition is that in order for such performance models to be developed for the application of musical games, the re-separation of Fernadez-Vara's Dramatic Text into Schechner's Drama and Script must occur to map the interactions (both human and machine-based) that are required in the hybridisation of videogame interactivity and choice-based musical

composition and performance. This disentanglement of Dramatic Text, Code, or Mechanics permits the introduction of acoustic, socially constructed human interactions to be simulated, as I will now explain. If I am to model interactions on the example of the Conimeños, I have already explained that two levels of procedural authorship exist in such an environment; that of the single musician introducing previously unknown material to the group, and secondarily, those which are accepted by the ensemble as socially constructed rules that allow a composition to 'happen'. The Conimeños' score is understood as a template into which sonic content can be dropped as long as it is applied within the socially accepted boundaries of such a compositional session. If this approach is taken, it would be possible for Fernadez-Vara's Dramatic Text or code (and the mechanics of Hunicke, LeBlanc and Zubeck) to operate with or without the addition of any sonic content to the framework. By doing so, the execution of such code would of course not provide any sonic output, but would still simulate the performance model accurately, acting in this example as a template on to which the score can be placed.

Returning to the above three examples of hybridized complex feedback loops and performance theory models (fig. 13, 18, and 20), it is apparent that the rules-based procedural authorship (represented by a red border) of such environments occurs consistently around Schechner's Script. As explained, this is a manifestation of both socially constructed implicit/tacit rules (Conimeños and rumba), and clearly prescribed constitutive and operational rules (*Klavierstücke XI*) determined by the environment. In all three examples, the application of procedural authorship is to facilitate choice to at least one performer or composer. Central to my proposed VPM is the application of Schechner's model to a client – server - network environment and how I can replicate the required elements from such acoustic paradigms to a digitally interactive context.

As with the Conimeños' example in section 3.2, I propose that in my VPM the score element is similarly unconnected from the rest of the model, and this is to frame the initial layer of composition as more of a 'satellite' sub-routine to the larger performance model that is being performed (fig. 21). This is specifically to accommodate the infinite variations and stimulus being drawn upon – with their own embedded top-level procedural authorship (rules and conventions that are adhered to at the point of composition, not at the point of instructing the software to run; a procedure that will be explored in chapter 4's commentary) – that are then applied as a whole to the subsequent interactions within the VPM. Following on from this, it is required that the core elements that construct and formulate

interaction within a client (AMP) – server (AMP server) – network relationship then be mapped to establish how Schechner's model will be applied to the coded components and establish AMP's VPM (fig. 22):

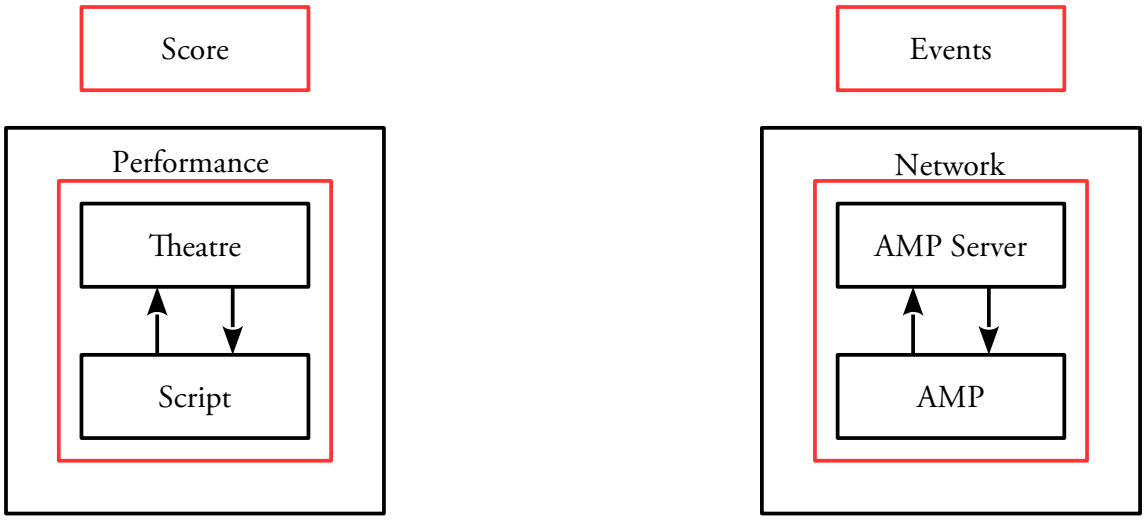


Fig. 21. Mapping of Schechner's model to AMP's client – server network

Explaining the various elements that contribute to fig. 22's model, I propose the following definitions and explanations:

Score (Events):

It is here that the audio content to be used by AMP is made. In making audio events that can in themselves not be altered, an initial frame of authorship has already been introduced (as previously introduced describing Conimeños and rumba examples), with this satellite routine of core compositional content embedding the initial layer of procedural authorship. In the same way that that games use specific props to construct performative environments, these events are set in the core compositional process as the props that will be used by players to enact their "games of emergence" (Juul 2005, 73). Both the composition of sonic material, and the mapping of such material to the FMOD patch deliver their own de- and re-contextualisation of procedural authorship; through elements ranging from the initial choice of time signature and tempo (Logic) to the audio segment's parameter allocation (FMOD).

Script (AMP):

This is the client software, and as Schechner states, where “the basic dramatic script may be the same, but the way you act it out is different” (Schechner 2014). It is by creating the script using AMP that the Score or Events are given any meaning to the player/performer. Importantly, it is in this process that the player/performer feels agency, that their choices matter.

Theatre (AMP server):

The server enables Schechner's enacted event, and is the meeting and unification of the client's Scripts to fully facilitate a feeling of inter-personal interaction among the players; the applied procedural authorship is brought to life, and its sonic manifestations confront the players for the first time. Importantly, these two components (Script and Theatre) exist in what I have called 'digital symbiosis'. Although they are two completely independent pieces of code, they require each other to realise their own part in the creative process.

Performance:

The precinct of AMP's Performance includes both the tangible and the invisible; tangibly, the site of the composition and performance setting constitute the Performance – the studio, the living room, the theatre. However, I propose that the network (wide area or local area) is the Performance's true precinct. It is 'managed' as any performance space is through the establishing of network suitability and site-specific modification, especially where local networks are used as forms of communication. An area of such networks is 'ruled off' to create Huizinga's magic circle, where considerations such as IP addresses and router port-forwarding facilitate an enclosed space in which the musical happenings can occur. It is this network that facilitates the top-level communication function between clients and performers and facilitates the performance.

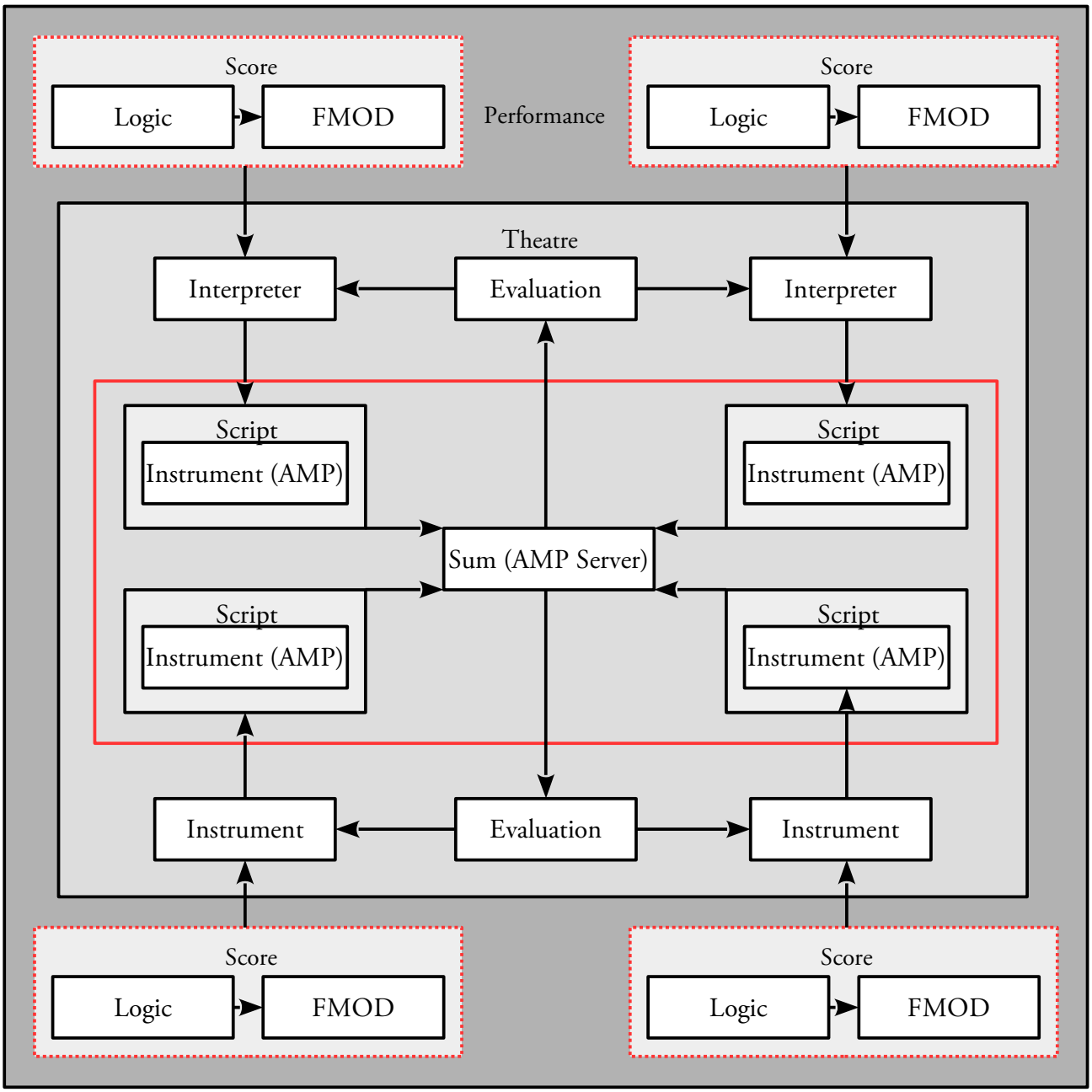


Fig. 22. Four-player/user AMP VPM

3.7 Virtualising the Piece: Whitebox Inside the AMP Application

AMP allows users to navigate around four virtual 3x3 sound-producing grids using Android mobile devices that have access to the Internet or a shared wireless network. Utilising accelerometer technology, the user navigates a virtual ball around one of four grids, each containing an individual set of nine

sound sources; the content of which can range from single audio files, to banks of audio files. The user employs movements similar to those needed when playing a ball-bearing maze game, tilting the device on its x and y axis to control the movement of the ball. Accelerometer technology allows the device to report on how it is being moved, using gravitational force to change output data when it is tilted on its x or y axis. Each grid is set up so that it simulates the shape of a parabolic curve, meaning the ball will not continue to move once the device is stopped in any particular position, simulating rolling a ball around the inside of a satellite-dish shaped object. The audio will be triggered when the ball rolls over the grid's square, and audio will be assigned using the FMOD sound engine. This software is a powerful tool used in game audio environments and can be introduced to arrange complex systems of branching that are used to accommodate the non-linearity of interactive and/or adaptive dynamic audio found in video game sound and music, assigning particular cues to particular in-game parameters. This method of attaching sound to particular narrative events in contemporary game design can be problematic for composers and sound designers, as Collins explains:

> [t]he most significant problem facing game composers is the nonlinear basis of games in general. Put simply, games are largely unpredictable in terms of the directions the player may take, and the timings involved. Many game narratives progress in a "branching" manner, similar in shape to the branching of a tree, in which there are many possible paths and endings.
> (Collins 2008, 142)

Being used for its conventional purpose to accommodate the requirements that Collins discusses, FMOD has the ability to allocate particular cues to game events; anything ranging from the tweeting of birds when a character emerges into an outdoor environment, siren sounds to alert a player that they're running out of 'life', to increased breathing sounds as a character starts to run. For AMP, I have created a series of musical event maps that replicate the graphics of the application's front end (a 3x3 grid), sonically (fig. 23).

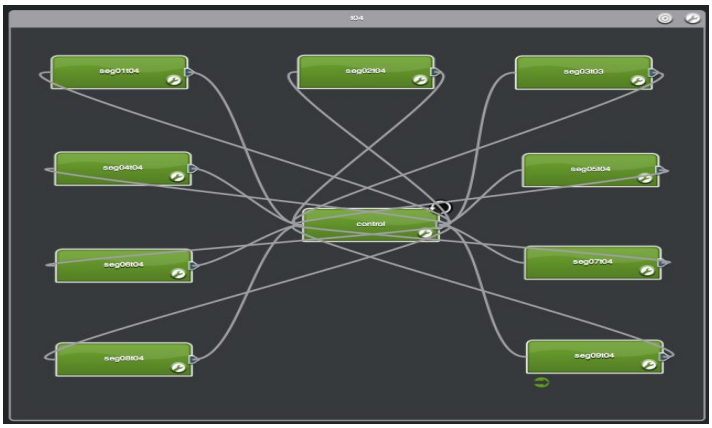


Fig. 23. Mapping the 3x3 Grid in FMOD Designer's 'Music Viewer'

In this example, we see nine audio segments corresponding to the nine squares of a 3x3 AMP client, each one having an independent send and return connection to the central control segment located towards the centre of the above graphic. All ten segments (including the control segment) are located in the greyed-out theme area, Theme 1. All segments in Theme 1 (t01) are assigned a parameter (p01), and this has a numerical value of between 0 and 10. In the control segment, the parameter function is assigned to each segment; when p01< 2, link to segment 1; when p01 <3, link to segment 2; when p01< 4, link to segment 3; when p01<x, link to x+1. These parameter values are replicated on the GUI grid so that when the ball moves from square 1 (when p01< 2, link to segment 1) to square 2 (when p01 <3, link to segment 2) the audio transitions at an author-specified point. Transitions can be set up in a variety of ways, either on the beat, at the bar end, or at the sample end, depending on what content is being used and what kind of transition is felt to work best musically and/or contextually. This theme structure can be repeated as many times as required (limited only by a device's computing power) so that a large catalogue of source themes can be used in a particular project. Synchronisation between both segments and across AMP client themes is achieved by assigning a shared time-line between all segments and themes and is similar to SMPTE or MTC, allowing complete synchronisation across multiple devices. A visual explanation of the FMOD-based interface functions can be found on the accompanying storage device (Audio Visual Content/ FMOD Interface Function). The tracking of all four client's activities is handled by a third-party server that is run as a hosted service, for example on a static computer that has WAN or LAN connectivity (depending on the performance goals[20]). Although

20 A detailed installation guide and introduction to the AMP client-server model architecture is included as appendix 1

each of the four clients can only access one theme of nine squares it has all other clients' segment sounds in its memory. This allows the server to pass on the ball location data of each client to all clients, allowing users to be able to hear all other users. Importantly, the FMOD theme/cue/segment maps have been designed to be used as templates so that audio samples of any style/genre/size can be 'dropped' in to the map, enabling an infinite degree of variation in 'tool box' construction. Although users can occupy separate physical spaces, they will be virtually present in the same communal sonic locality.

3.8 Summary

Such deconstruction of performance practices have been used for several key reasons throughout this chapter:

- By using Hudak and Berger's simple and complex feedback loops in collaboration with Schechner's performance theory model, it becomes possible to establish core characteristics of composition and performance practice in my researched traditions; the addition of Stockhausen's *Klavierstücke XI* being used as contextualisation for my developmental processes and deconstructions, and standing in as a symbol of the marked trajectory away from integral serialism towards openness.

- Such characteristics can be extracted as necessary – and observed through their inclusion in my practice - to develop a hierarchy of interactions that represents/ contributes to my desired collaborative compositional process.

- As Murray's procedural authorship is applied to such interactions, I establish a virtual performance model (VPM) that can progress my collaborative compositional practice through the application of AMP; a creative process that will be traced and evaluated in chapter 5 through the commentary on my portfolio of submitted works. Such a VPM is presented as both a pragmatic contribution to my practice-led artistic development, in addition to being a contribution to the fields of sonic art, interactive audio, virtual world, and ethnomusicological research and theorization.

Chapter 4. Annotated Portfolio of Works

4.1 Introduction

One aim of this chapter is to discuss the music that I have individually and collaboratively created, considering and interrogating influential events and approaches in a manner that it both accessible and illuminating; an attempt to practice to Haseman's "resolution" (Haseman 2010, 147). At the same time, it acts as both socio-musical commentary and analysis of social interaction. Although an array of situations call for a deep evaluation of the actual notes that are being composed and performed, this is not the point of this chapter. Far more concerned with the development and thought processes involved in the creation and delivery of the works, it is hoped that the reader will see this chapter as a joining of the dots laid out so far in this thesis; the realisation of facilitatory partnerships that converge to form a pragmatic and creative journey that will progress my practice. For the purposes of accessibility and coherence, particular aspects of each work's creation are discussed, with not all works receiving the same style or approach to analysis. Narrating both the experiment – in terms of testing techniques in an unfinished or finalised systems of development, and the experimental, experiential development and learning act as both guide and process through which this practice-led exploration takes place. The social interactions that occurred during the compositional, performance, and evaluative elements of each piece are often hard to isolate from the description of musical material. This is due to (other than in the examples of *Guaguanco* and *Guarapachangueo* which at least compositionally remained quite isolated) the fact that in describing the musical content's construction I am simultaneously describing the social interactions that were facilitating such content development. It is hoped that by including elements of conversations that occurred prior to, during, and after compositional and performance activities had occurred, a balance of both social interaction and musical content description will allow a clearer understanding of the complete compositional process that occurred around each piece, truly representing the social and the musical.To accompany the audio visual content that represents the submitted pieces, each example is also represented by:

- multi-client FMOD Designer file (located at Audio Visual Content/FMOD Files/"name of piece" on accompanying storage device) containing complete pre-build configuration[21]

21 If these are to be loaded for audition purposes, please note that the software will require the location of the sound sources (all located at Audio Visual Content/AMP Segment Audio Appendix/"name of piece") to be updated depending on where they have been placed on the reader's machine.

- client .apk file and server .exe file (to be found on the accompanying storage device under Audio Visual Content/APK and EXE) so the reader can, if required, install and test the VPM

A table of contents for the accompanying audio-visual material and software that accompanies this thesis can be found on the submitted USB storage device, with a Finished Versions folder on the USB storage device making all named audio-visual compositions and performances easy to navigate to for the reader.

4.2 *Track 1* and *Track 2*

Track 1 and *Track 2* were composed collaboratively between Axtell, Iozzi, and myself between February and March 2014. Both the development of AMP's software and our familiarity with the workings of FMOD and AMP's GUI were still in their infancy. As a result, these two tracks were developed to act as sonic prototypes, to both help explain the suitability of AMP as a mode of collaborative composition and performance, and also to highlight any immediate areas of design concern that might come to light during the process of both composition and performance. As this was the first attempt using AMP, I took the decision to take the first musical step, creating a series of sixteen short piano phrases in 6/8 at 146bpm. As with our standard collaborative compositional practice, these were made available to Iozzi and Axtell as a Logic file. No further instructions were given to Iozzi or Axtell, again in keeping with our method of remote composition, other than raising the idea that we might – during the actual compositional performance of the AMP project - find it useful to have the opportunity to access a square of silence if we wanted our AMP client to fall silent during the performance. Independently, and without any conversing regarding what should be the next compositional move by either Iozzi or Axtell, Iozzi took the Logic file and began to edit the contained piano phrases, reducing them to shortened one bar phrases, doubling some phrases and parts of phrases on the marimba. At this point, Iozzi also took the decision to approach the sixteen separate piano phrases as representing two sets of eight; one set of eight to be mapped to AMP's client 1, and the next set being mapped to client 2, editing and auditioning to ensure that he was happy with the musical interactions that would become apparent with such a split in each client's musical representation. With a separate AMP client in mind, Iozzi also developed a series of arpeggiated one bar synth lines (client 4). Independently, Axtell created a series of eight synthesized, one bar bass phrases. Once all three separate Logic files (the original that I had made available to Iozzi and Axtell, and each of their own independently created files) had been amalgamated, all segments of audio were bounced as .mp3 files in their AMP client groups (client 1 and

2, piano and marimba; client 3, bass synth; client 4, arpeggiator) and placed in there respective FMOD theme segments. Having independently agreed that an optional segment of silence would be beneficial in composition and performance, each theme had its square 5 as a one bar segment of muted audio assigned to it. Exactly the same process was followed for the development of *Track 2*, with Axtell this time putting forward an initial bank of piano phrases and melodic lines that Iozzi and I could use as the building blocks for our additional musical content.

As the compositional process for *Track 1* and *Track 2* had two main purposes - first to familiarise Iozzi and Axtell with the compositional requirements for creating music for such an interactive paradigm, and second to allow myself and Jim Murray (who has been instrumental in the front-end API integration) to test the functionalism of both FMOD and the associated GUI, this did present some artistic concerns within the group. Once the audio for *Track 1* had been sent to me from Iozzi, he commented that "it's difficult to know (for me personally) what will work and what won't without testing it in FMOD I think - we should prob [sic] get a copy of your FMOD test patch if we're going to do more of this kind of composition?" (Iozzi, email to author, 14th March 2014). Having considered making this available to both Iozzi and Axtell, I decided that in its current prototype form this would probably not be advantageous, reassuring him that the process would become more familiar as we continued to create music for AMP, and that these attempts were additionally to aid Murray and I to test the compositional system; then feeding back to them both regarding any concerns. Having compiled both *Track 1* and *Track 2* in FMOD so that all media could be recognised by AMP, Murray and I tested the functionalism of the software (audio of these tests can be found at 'Audio Visual Content'/'Track 1 and Track 2'on the data drive that accompanies this written thesis . Individual client/square content can be found at 'Audio Visual Content/'AMP Segment Audio Appendix' on the data drive that accompanies this written thesis).

Once these initial tests had been completed, a process of evaluation and reflection was required. Although the tests had 'worked' (that is both the technology functioned as expected and planned, and the audio 'sounded' as I had imagined that it would), a process of artistic thought was required to align my own personal composition practice that with that of AMP's work-flow; this was obviously not going to be a simple case of creating music in exactly the same fashion as I had been doing, it couldn't be, there was now an additional section in the compositional and performative chain – AMP – that needed

to be learnt. Not necessarily learning a completely new approach to composition, but a tailoring of old methods to suit new technologies. Due to this, I concluded that I would need to spend some time getting to know the technology and its application to composition in a more thorough and intensive way. The tests Murray and I had done had established that AMP worked, but now I needed to establish its creative role within a professional collaborative environment; with more emphasis on application that trial.

4.3 *Guaguanco* and *Guarapachangueo*

In this section of the chapter, I will be examining both the composition and device-based performance of two pieces, *Guanguanco* and *Guarapachangueo*. These two pieces grew out of both a previously held performance and research interest (at undergraduate and postgraduate level at SOAS, and also professionally) in the Cuban percussive genres that fall under the umbrella term of rumba, the exploration of the genre's suitability to be applied to AMP's interactive framework, and importantly the need for me to develop a working relationship with AMP that could ultimately progress my collaborative compositional work using the application - culminating in the creation of two unique works of both composition and performative capabilities (see sections 1.1. and 2.5 for an introduction to my musical history with rumba and Bland's evaluation of the style's inter-instrumental and interpersonal relationships, and sections 3.3 and 3.4 for a breakdown of these relationships using Schechner, Fernandez-Vara, and Hudack and Berger's approaches). Having already prototyped the workings of AMP with *Track 1* and *Track 2* (and importantly how Iozzi, Axtell and I could interact remotely on such a project), I wanted to explore a specific genre's application to the model to both initiate further development of the software, and to gain a greater understanding of the musicality of such a genre's application to the existing framework.

4.3.1 *Guaguanco*

For *Guaguanco*, I decided to experiment with moving away from the call and response relationship discussed in relation to rumba in Chapter 3, while maintaining a sonic aesthetic that would enable both performer-composers and listeners to associate AMP's performances of this piece with that of the style guaguanco. As with the pieces *Track 1* and *Track 2*, I was particularly interested in exploring the possibility of being able to play any combination of squares across the 4 client build of the piece, not being confined to the musical hierarchy that exists between the tumba and tres golpes in its traditional

acoustic socio-musical setting. Having decided the elements that I wanted to move away from with this piece, it was also important for me to establish some core musical aspects that I would be retaining in accordance with its acoustically performed model. As previously mentioned (sections 2.5 and 3.3), the tumba and tres golpes have a core rhythmic and melodic interplay across the two bar clave pattern that acts as the foundation and base for all thematic variations that occur during a performance. Within this pattern, although not indicated in such a reduced form, is the concept of the bombo[22], the accented 'two and' of the of the '3' side of the rumba clave. Especially in the Havana-style guaguanco, the bombo is performed with a palm strike – often lifting the tumbadora slightly off the ground while being struck to allow a deeper, more resonant tone – by both the tumba and tres golpes.

Guaguanco began largely as an experiment into applying limitations through AMP's interactive model versus its traditional acoustic alternative; both forcing its performer-composers into some elements of 'correctness', while simultaneously restricting elements of choice-based performance found in its traditional setting (see section 2.4 for an introduction to this theme through procedural authorship). At its most basic level, the two-drum melodic phrase detailed in Chapter 3 is initiated by a call from the tumba on the fourth crotchet of the 3 side of the clave. This is then responded to by the tres golpes on the '1' and '2 and' on the 2 side of the clave, before the tumba rounds off the phrase on the fourth beat of the 2 side of the clave; a more detailed notation of this interplay can be viewed in fig. 24 below, with the melodic element being played by open tones on each drum:

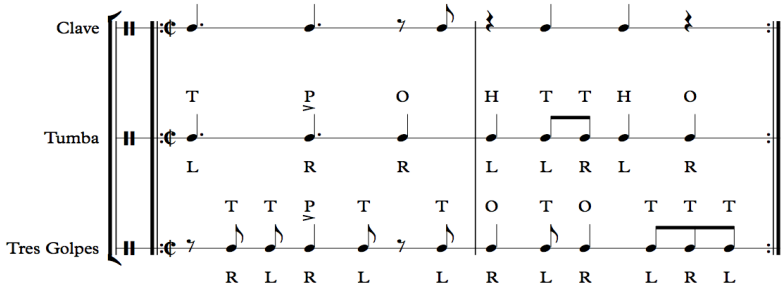


Fig. 24. Melodic element of guaguanco's tumba and tres golpes

22 The importance of the *bombo* as a tool for referring back to traditional rumba styles is widespread and found among many genres of Afro-Cuban and 'Latin' music, from timba to songo. While studying Cuban-style drum kit performance in 2006, my teacher Enrique Pla (the long-time drummer for the Cuban group *Irakere*) would often stress the importance of playing the bass drum on the 'two and' of the '3' side of the clave in order to reference guaguanco and other folkloric genres (Pla, personal communication, 2006). Although there are many examples of such referencing, the percussive coda (starting at 6:38) to Irakere's *Lo Que Va A Pasar* on their *The Legendary Irakere in London* album is a perfect example.

I wanted to explore staying with this concept of the tumba calling on the 3 side of the clave with the tres golpes responding on the 2 side, but imposing limitations on the thematic elements with such call and response patterns. As described in Chapter 3, the concept of having thematically 'matched' calls and responses in rumba is widespread, but as I will now explain, the compositional cyclicity that I chose for this piece required a different approach. During a traditional rumba, the tumba player will call on the 3 side, and then the tres golpes can adapt what they are playing at that moment to accommodate a response. With this AMP project, I had consciously made the decision to remove this option. Instead of having a bank of 1 bar phrases for each drum (with a variety of calling phrases and non-calling phrases on the 3 side of the clave for the tumba, and likewise responding phrases for the tres golpes on the 2 side of the clave) I chose to restrict both drums to 2 bar phrases – both drums having to choose their patterns before either knew what the other was going to play. Compositionally, this concept grew out of the remote work that took place during the composition process for *Track 1* and *Track 2*, and was a technique that I wished to apply to the rumba framework; developing a series of cycles that could be mapped onto any other cycle (across clients) within the project.

To begin this project, I initially created a series of nine variations of the two bar rumba clave, guagua, and shekere; arranging the variations in a way that would allow maximum variation of combinations of all three rhythmic cycles (audio of these can be found in the AMP Sample Appendix/Guaguanco/Client 1 on the data drive that accompanies this written thesis). In keeping with the compositional development of *Track 1* and *Track 2*, I then initially created a series of eight 2 bar (1 clave cycle) patterns for the tumba, with the addition of a clave cycle of silence (number 5) should a player wish to remain silent for any length of time (audio of these can be found in the AMP Sample Appendix/Guaguanco/Client 2 on the data drive that accompanies this written thesis). As can be heard from the audio, in cycles 1, 2, 7, and 8 I decided to retain the bombo note with its original palm emphasis, acting as a clear reference to the acoustic performance of guaguanco, but chose to move away from it for the remaining cycles. Once I had these cyclic patterns established, I then proceeded to create the same number of tres golpes patterns, thematically associated with the style's acoustic performance, but applying the same 2 bar cycle limitation as applied to the tumba (audio of these can be found in the AMP Sample Appendix/Guaguanco/Client 3 on the data drive that accompanies this written thesis). All cycles (1 - 9) for both tumba and tres golpes were, during composition, consciously developed as fitting into one of four categories (table 5.); the 'basic pattern' (as described in the basic two drum

melodic phrase), the 'embellished basic pattern' (largely based on the basic pattern but with small elements of change added throughout the examples), 'calls'/'response' (on tumba or tres golpes respectively), and 'other' (with both tumba and tres golpes having both their options for silence, and additionally a rhythmic pattern that although 'in clave' is used as a device for creating rhythmic tension rather than playing an integral part of the call and response relationship):

Tumba	Tres Golpes
Basic pattern 1	Basic Pattern 1
Embellished Basic Pattern 2, 7, 8	Embellished Basic Pattern 3, 4
Calls 3, 6, 9	Response 2, 6, 7, 8
Other 4, 5	Other 9, 5

Table 5. Categorisation of tumba and tres golpes cycles

Once all three collections of cycles (1. clave, cascara, and shekere, 2. tumba, and 3. tres golpes) had been finalised, the process then began for establishing a series of improvisations on the quinto, embellishing Bland's "simple structure" (audio of these can be found in the AMP Sample Appendix/Guaguanco/Client 4 on the data drive that accompanies this written thesis). As the quinto patterns were to be improvised, I wanted to simulate an AMP performance of the piece as a guide track that would imitate a performance of the piece as it would be when ultimately mapped in FMOD and performed on mobile devices with AMP. To achieve this, I randomly arranged the already recorded tumba and tres golpes musical cycles in a Logic project, supported by a basic, solo, rumba clave, and used this as a stimulus for the quinto's improvised material.

4.3.2 *Guarapachangueo*

For the second piece in the rumba genre, I chose to explore the possibilities of the style

guarapachangueo. Of central importance to this decision is the application of percussive patterns in guarapachangueo that spread their cycles across more than one clave cycle, and create a less dense sonic texture between the instruments involved. This reduction in density is largely due to the removal of the melodic structure between the tumba and tres golpes that is so prevalent in guaguanco, freeing up the lower drums to play a role similar to that of the quinto. As ethnomusicologist Kenneth Schweitzer states:

> In the broadest terms, and effective way to distinguish guarapachangueo from guaguanco is to perceive it as more open. In the guarapachangueo of the late 1970s, the overall sonic movement is less dense, that is, less busy than the guaguanco. While the bass sound of the cajon speaks substantially loader than does the conga, the edge tones of the cajon are noticeably quieter than the conga open tones, allowing them to be perceived more as rhythmic touches, taking the focus off the repetitive drum-melody that characterizes guaguanco. The sense of openness and space is further exaggerated when the single bass hit variant is employed. Instead of repeating patterns every one or two measures, the guarapachangueo cajon player stretches his patterns, employs variations, and expands his cycles to four or more measures. Consequently, the quinto player is also encouraged to play linearly, spreading his solo phrases over multiple cycles of clave. Liberated from playing the guaguanco melody, working within the call and response dynamic that had previously constrained the lower drums, and armed with the expressivity of a powerful, down-beat oriented bass tone, the lower parts of the guarapachangueo ensemble adopted an elevated role, on par with the quinto.
> (Schweitzer 2013, 173)

As Schweitzer introduces above, also of importance is the cajon – with its more audible bass tone and less audible edge (slap) tones – and this was an element that I wished to incorporate into the piece. For this, I decided to create a hybridized percussive set-up consisting of three parts. The clave, cascara, shekere would remain the same as in guaguanco. However, for the remaining cajon and tres golpes, I constructed a bass cajon with the required height and length so that it could be sat on and played, while also allowing enough manoeuvrability between it and the tres golpes (stood next to it to the right of the player) without having to adopt the traditional sitting position where the cajon is struck between the legs as this had proved limiting in previous performance contexts.

Once I had completed the construction of the cajon, I began to explore and create a series of nine two-clave patterns for the cajon and tres golpes that would become the central rhythmic and melodic framework for the piece, eventually settling on a choice final set of nine patterns (audio of these can be found in the AMP Sample Appendix/Guarapachangueo/Client 4 on the data drive that accompanies this written thesis). As I had developed all of the cajon and tres golpes parts in four bar cycles, this

allowed me to explore the concept of overlapping squares across clients. By creating the following quinto patterns (played along to the same style of guide track as with guaguanco) of four bars (examples 1, 2, 3, 4, 5, 6, 7, and 8) with the addition of a two bar pattern in example 9 (audio of these can be found in the AMP Sample Appendix/Guarapachangueo/Client 3 on the data drive that accompanies this written thesis), I was able to create overlapping rhythmic content across both clients (see graphic example in fig. 25) that would ultimately facilitate a greater degree of choice and variation during performance:

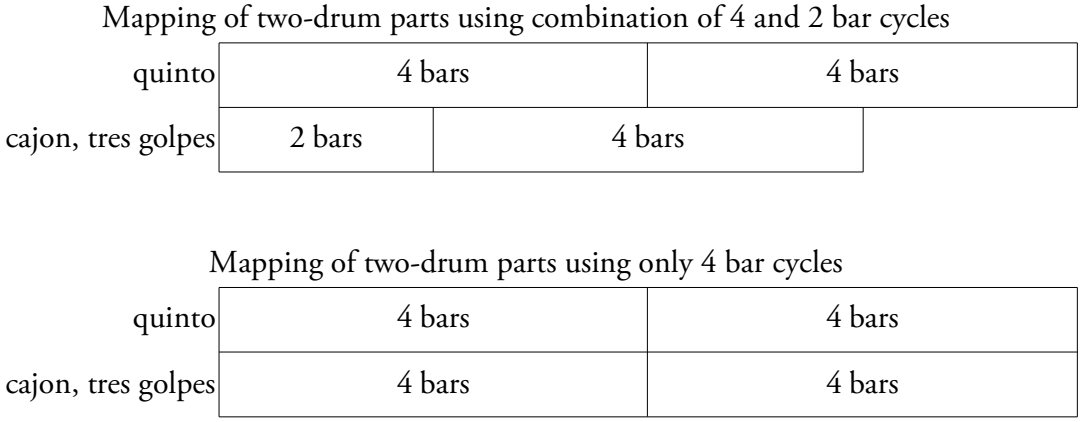


Fig. 25. Example of the application of a 2-bar cycle to increase variation across 2-client performance

All of these separate instruments and instrument groups (in the case of the clave, cascara, and shekere) for both guaguanco and guarapachangueo were then placed into the FMOD project architecture, and were ready to be performed. A video documentation of these events is included with this thesis and can be found at Audio Visual Content/Guaguanco and Guarapachangueo on the accompanying data drive. For these performances, Axtell had not been exposed to the sounds that he would be exploring during the session. Instead, he had approximately ten minutes to familiarise himself with the sounds that were to be used, and also to familiarise himself with AMP's GUI.

Fig. 26. Axtell (left) and Murray (right) preparing for the initial *Guaguanco* session. Clients (left to right): tres golpes (mobile), tumba (tablet), quinto (mobile), and clave, cascara, shekere (tablet).

Immediately following the performances, I interviewed Axtell (25th May 2015) to establish, through pragmatic reflection, what he felt had worked well with the event, and importantly where he felt that modifications were required; I was keen to establish what Axtell's initial observations about the experience were, having previously been involved in collaborative composition for AMP, but having not used it before[23]:

> Axtell: It's like learning the interface felt like learning what was there as well. [...] So I'm not so much thinking about rolling the ball around, I'm listening and finding out what's going on. […] A bit like banging a piano and hearing the sounds it makes and trying to refine 'what do the keys do?'

In preparation for the event, I had thought that it might be worthwhile to present Axtell with some form of graphic notation/ representation of what was embedded in each of AMP's squares for both pieces, or weather this might make the whole thing a bit too obvious; removing the element of memory and surprise:

> Axtell: Yeah, it's quite nice that it's not obvious. [...] I mean, maybe there could be a slight hint, like different colours or something, but I don't think it's required. I don't think it would enhance the experience of it by telling you what it is.

Closely related to this point, what I found interesting was if Axtell had been consciously trying to remember where particular sounds were stored (in what squares of the clients), or if he had just been rolling the ball around in a random/semi-random fashion:

> Axtell: Well I'd just start with one thing so I could just hear it start and then almost knowing that it would change going to a different square I could just musically try and drop something different here, but I don't know what that different thing is so just move

23 A full interview transcription can be found in appendix 8.

> one of the balls in to a different square. I can build a sort of map, even if that's wrong. [...] So I'd go to something I know, and I know 'this is going to drop'. Slowly I learnt more, in each hand, about what was in the squares as the time went on. [...] You're pulling in ideas.

Two key elements that I wanted to discuss with Axtell were his views on the performance practicalities of attempting the same type of performance with us being in different locations - having no eye contact - and if he felt the allocations of the various sounds to particular squares had been successful; I wanted to understand if he could actually tell what he was controlling and what I was controlling having had no prior exposure to the sonic content of the tracks:

> Murray: Do you think there needs to be more definition between each client's role?
>
> Axtell: Yeah, a little bit maybe.
>
> Murray: So having two clients each. Do you think that's an advantage? Having one in each hand, or do you think that it complicated it compared to if there was three or four of us each with one client each?
>
> Axtell: The only disadvantage to having a client in each had was, if I wanted to hold on to something in the right hand and I start focussing on the left hand then the right hand drifts. […] It's like those games where you have the ball in the maze.
>
> Murray: So in those recording we weren't actually saying a word in terms of deciding where to go, whereas if we were playing a gig together, we'd be like 'chorus in four' or 'head' [*taps top of head as in during a salsa performance*] and then everyone would have a signal that there was going to be a change. I'd be interested in us doing it again with us actually vocalising changes.
>
> Axtell: I think to do that we need to know the parts or there needs to be a visual guide.
>
> Murray: So if you're on a client and play square one, and then immediately go to square nine, it's going to play the entire segment of square one before moving to square nine.
>
> Axtell: Well, if they were all the same length it might become a little bit...I mean it would still be cool. But if they're different lengths then it becomes more about the music, it's more 'this sound last this long', whatever. But if the music is distinctive enough on each client that that would be really easy to hear. [...] Is it possible to interrupt the segments?
>
> Murray: So what you're saying I could do. As long as, you tell it in FMOD 'I want you to transition at segment end, on the beat, or on the bar'. So if you've got a two bar loop you can interrupt it half way through to move to the next segment. But what you then have to do, is you have to make sure that all of your segments are transition-able half way through. So if you've got a segment that's seven bars long, in the composition you need to make sure that it transitions musically at three and a half bars. You see what I mean?

> Axtell: Yeah, it's in the composition of it. That's really very interesting. That's like technology creating a new limitation, a new form of composition.
> (Axtell, interview with author, 25th May 2015)

4.4 *Release* and *There Shall be None*

Having taken a more individual approach to the compositional elements of both *Guaguanco* and *Guarapachangueo*, I was eager to re-visit and develop the collaborative interaction and remote compositional activities that had begun with *Track 1* and *Track 2* and explore how a more collaborative compositional approach could be applied to AMP. Having this far only been concerning myself with musical content for AMP, I had also decided to explore the text-based possibilities that could be harnessed by the application. For this element, I called upon London-based spoken work artist Julian Brown (known on the London spoken word and rap scene as 'JB' or 'JB Sparks'). I had come across Julian's lyrical style in 2004 while listening to him perform with London hip hop group Django Thief, a live outfit that was in fact started by Axtell and Iozzi. I had not ben in contact with Julian since then, but thought that it might be the kind of project that he would be interested in, having moved away from the hip hop scene and more towards the alternative spoken word/ poetry genre. My initial email to JB tried to encapsulate the major concepts behind the project[24]:

> my work is looking at interactivity in music, and primarily looking at how I can create music that can be 'played' in the same kind of way as a video game. […] What I was thinking was that it might be really cool to get some text from someone such as yourself that could be used in some of the pieces. [...] I have no idea how possible this is - I've only ever done it with music, but I think that it could end up being very very interesting.
> (Email from author, 16th February 2015)

Luckily, JB had some experience of working – or at least being around – artists working in the realm of interactive performance (Deptford's Heart 'n' Soul organisation) and thought that his "style of poetry/rap writing could actually suit what you're trying to achieve, interchangeable bits of verse that still seem to make sense no matter what order they are in" (Brown, email to author, 17th February 2015). Although the basic concept of AMP had been given to JB, no musical guidance had been offered in any way. This was a conscious decision on my part, as I was interested in only stipulating the rules or conditions of what happens to sounds in AMP, and not regulating the actual artistic content. JB soon contacted me again and requested a little more guidance: "Whats [sic] the brief writing-wise? I mean,

24 A full transcript of email communications with Julian Brown can be found in appendix 9.

do you prefer Rap-style lyrics, or more Free-form poetry? Also, is there a specific subject matter? Or am I free to write about whatever I want?" (ibid.). Although I had anticipated this question, I was a little unsure of how to respond. I wanted to keep the subject matter completely up to JB, but without seeming unhelpful:

> the brief is in keeping with the whole vibe of the app, which is to allow each contributing artist to decide what they feel works best. [...] Really it's just taking the material that you hear, and interpreting it your own way - then this in turn will prompt me to change the core musical material, ad infinitum.
> (Email from author, 18th February 2015)

A little while later, when reviewing my correspondence with JB I realised that I did in fact need to clarify one element as I had overlooked it originally, and informed JB that:

> Creatively, one thing that it's probably worth me mentioning is that when I do the 9 audio chunks of music, I generally leave 1 silent. This is just so that the 'player' can choose not to play anything at that particular point if that makes sense?
> (Email from author, 26th February 2015)

Although it was not critical for this information to be passed on to JB (or used by either of us at all) I felt that the concept of silence within a collaborative project would not normally need to be 'planned' in as much detail as it is in AMP, having already addressed this issue between Iozzi and Axtell in relation to *Track 1* and *Track 2*.

During the process of writing his lyrics, JB had asked me to provide some sort of musical backbone that he could work to. Although I was at first opposed to this, when he spoke to me about why it was necessary I did understand:

> [I]Know you said you cant [sic] really send me a beat to write to, but perhaps you can email me a section, like the control/default bit of music the track falls back on? Because I will need something as a guide, mostly for BPM/tempo, so I know im [sic] on the right track.
> (Brown, email to author, 17th February 2015)

JB was creating his lyrical content in a different way than the musical content was being created. While at all times the openness of the lyrical content was to be upheld, JB wanted to write his lyrics in a linear style – that is, in a way that made sense to him in a traditional 'beginning – middle – end' narrative form, but that were created to be edited at a later stage to be applied to the openness of AMP. My original opposition to this was that the musical ideas sent to him would to some degree inform and shape his lyrical content, but I agreed with JB that he would ultimately need some kind of sonic guidance so that he felt confident with what he was doing. While establishing these guidelines and

clarifying Julian's image of what was required, Axtell, Iozzi, and I had been remotely working on the remaining three client's musical content. Of particular importance following the work on *Guaguanco* and *Guarapachangueo*, and through interviewing Axtell, was the concept of attempting to disguise the cyclicity of the musical content. Where the two example of rumba had both their time signature and rhythmic backbone (clave, cascara, and shekere) somewhat prescribed so as to clearly be examples of the genre, *Release* did not have the same requirements in place, and through experimenting with various simple and compound time signatures we eventually decided to remotely work to 11/8 at 120 crotchet beats per minute; Iozzi and I were to develop two separate percussion clients, with Axtell developing the melodic element. Once this initial decision had been taken, Iozzi and I then needed to address how we proposed that our two separate percussive parts would work collaboratively. Having discussed it without actually attempting any musical ideas, we decided not to place any further conditions regarding rhythmic content, and simply to see what each of us created and how it worked once auditioned. We did however decide to allocate each of our clients one additional melodic instrument; for Iozzi this was an arpeggiating synth, and for me a simple lead synth tone. Somewhat contradicting my inclusion of a two bar section of audio for *Guarapachangueo* to facilitate the overlapping effect across the two percussive parts, for *Release* we had decided to attempt to all work to groups of three bars. This decision was taken as we were aware that Julian's spoken word would almost certainly not fit with this division perfectly and would in effect act as the overlapping element for the piece.

Approaching the compositional element of *Release* in the same fashion as with *Track 1* and *Track 2*, Iozzi, Axtell, and I then began working on our allocated elements, storing work -in-progress files in the cloud so that they could be listened to, edited, and used as inspiration amongst the group. Once this process had been completed and we had created content for the three clients it was auditioned in FMOD and finalised (audio examples of these can be found at Audio Video Content/AMP Segment Audio Appendix/Release on the accompanying data drive). Once the music for clients 1, 2, and 3 had been mapped to FMOD, in the same style as with *Guaguanco* and *Guarapachangueo*, I created a guide track for Julian in Logic by randomly assembling the various parts that had been composed for clients 1, 2, and 3, and sent this to Julian so that he would have more of an understanding of the direction of the piece. Julian visited my studio shortly after this guide track had been sent to him, having prepared two spoken word pieces (Section 1 and Section 2) that he thought would suit the track (table 6). These two sections were recorded as whole pieces, after which they were divided into their nine respective pre-

planned sub-divisions (table 7):

Section 1	Section 2
Nothing is surplus, customer service Repetitive niceness, competitive prices Life's a tight fit, astonished by the rises Economic crisis, be careful. You might slip Contingency plan. Now that everything's a marketing scheme, An industry scam 'Culture' is reduced to sound-bytes As long as it shocks, or it sounds nice The fragmented illusion of free expression Digitally, we're all parts of the same programme All on the same boat, but will it sink or float? Who-ever owns the cloud owns your soul Since we've given up our privacy, hopes, dreams and goals No heart is safe in this market-place Pixelated personas The sophisticated manipulation of owners Evicted by police and bailiffs while they get a bonus De-sensitised by the various contracts that own us Distanced from the world's reality By tablets, and laptop screens that gradually kill off our empathy And make 'reality' seem virtual This insanity that hurts us all	Continuous dynamic risk assessment, Omnipotence; more than nine planets spin in perfection. I spit from the lithosphere, grounded to the core, I am diamond-encrusted mineral-rich ore. My soul-force soars into orbit, like a sonic spear, I become formless spirit surviving the journey through the ionosphere. Travel through space and time, Condensed matter like Singularity principle; Personality as digits and pixels. Binary code, upload my consciousness, Like the Internet, the globe as One continent. No borders, No rules, Microchips inserted for learning so no schools, No local just global.

Table 6. *Release* lyrics

1. Nothing is surplus, customer service Repetitive niceness, competitive prices Life's a tight fit, astonished by the rises Economic crisis, be careful. You might slip. Contingency plan.	2. Now that everything's a marketing scheme, An industry scam 'Culture' is reduced to sound-bytes As long as it shocks, or it sounds nice The fragmented illusion of free expression Digitally, we're all parts of the same programme All on the same boat, but will it sink or float?
3. Who-ever owns the cloud owns your soul Since we've given up our privacy, hopes, dreams and goals No heart is safe in this market-place Pixelated personas	4. The sophisticated manipulation of owners Evicted by police and bailiffs while they get a bonus De-sensitised by the various contracts that own us Distanced from the world's reality By tablets, and laptop screens that gradually kill off our empathy And make 'reality' seem virtual This insanity that hurts us all
5. [silence]	6. Continuous dynamic risk assessment, Omnipotence; more than nine planets spin in perfection. I spit from the lithosphere, grounded to the core, I am diamond-encrusted mineral-rich ore.
7. My soul-force soars into orbit, like a sonic spear, I become formless spirit surviving the journey through the ionosphere. Travel through space and time, Condensed matter like Singularity principle; Personality as digits and pixels.	8. Binary code, upload my consciousness, Like the Internet, the globe as One continent. No borders, No rules, Microchips inserted for learning so no schools, No local just global.
9. No local just global.	

Table 7. Segment sub-divisions of *Release*

The post-production on Julian's spoken word was consciously kept to a minimum so as not to interfere too much with the original delivery of content. Simple techniques such as some breath removal, mild

equalisation, and compression were applied to allow the vocals to find their own space in the mix, while not detracting from the original performance too extensively. Once again these segments were placed in the FMOD patch (theme/client 4) and auditioned. Significantly, I wanted to achieve a sense of randomness with regard to the final performance timing of the vocal client, so at this point started to explore the possibility of removing the shared timeline from this client's FMOD build; meaning that client 4's synchronisation to all other clients would be lost, permitting a sense of release from the confines of strict metric formality. As previously mentioned, this was to facilitate a stronger degree of individuality across compositions and performances, accentuating my desire to disguise the cyclicity embedded in the procedural authorship of the piece. In line with our collaborative approach to composition, on hearing Julian's un-segmentised spoken word, Iozzi had decided to use these as inspiration for a separate piece. After Iozzi had developed a few simple ideas – predominantly a 'tougher' sounding percussion part, these ideas were shared with Axtell and myself and a similar process to that of *Release*'s composition began to form in the shape of *There Shall be None*. At this point, several things were happening. Iozzi and Axtell were developing the musical content for the piece, and I was beginning to experiment with yet further subdivisions of the spoken word; a process that would be reflected in Axtell's comments after the performances, and would become fundamental in our collaborative approach to *Because There Are Things*. I was determined to explore FMOD's potential in increasing the possibility of choice within composition and performance to include elements of chance, breaking down each of Brown's spoken word subdivisions into further sections of *a* and *b* (table 8).

1a. Nothing is surplus, customer service Repetitive niceness, competitive prices	2a. Now that everything's a marketing scheme, An industry scam
1b. Life's a tight fit, astonished by the rises Economic crisis, be careful. You might slip. Contingency plan.	2b. Culture is reduced to sound-bytes As long as it shocks, or it sounds nice The fragmented illusion of free expression
3a. Digitally, we're all parts of the same programme All on the same boat, but will it sink or float	4a. No heart is safe in this market-place Pixelated personas

3b. Who-ever owns the cloud owns your soul Since we've given up our privacy, hopes, dreams and goals	4b. The sophisticated manipulation of owners Evicted by police and bailiffs while they get a bonus
5. [silence]	6a. De-sensitised by the various contracts that own us
	6b. De-sensitised by the various contracts that own us Distanced from the world's reality By tablets, and laptop screens that gradually kill off our empathy And make 'reality' seem virtual This insanity that hurts us all
7a. Continuous dynamic risk assessment, Omnipotence; more than nine planets spin in perfection.	8a. My soul-force soars into orbit, like a sonic spear, I become formless spirit surviving the journey through the ionosphere.
7b. I spit from the lithosphere, grounded to the core, I am diamond-encrusted mineral-rich ore.	8b. Travel through space and time, Condensed matter like Singularity principle; Personality as digits and pixels.
9a. Binary code, upload my consciousness, Like the Internet, the globe as One continent.	
9b. No borders, No rules, Microchips inserted for learning so no schools, No local just global.	

Table 8. Experiment with A/B split of original spoken word segment divisions

With FMOD's ability to include more than one audio file within theme segments, I began to experiment with allocating the software's transitional properties between segment content to explore if this could expose a style of interaction that I was looking to achieve; it soon becoming obvious that in order to achieve the interactive aesthetic that I was trying to create – that of creating variations on

thematic material (as introduced using Hudack and Berger's hybridized model in section 3.3) – that a larger pool of text would be required. As a result, *There Shall Be None* remained within the same interactive parameters as *Release*. A video documentation of these events is included with this thesis and can be found at Audio Visual Content/*Release* and *There Shall Be None* on the accompanying data drive. I was however determined to explore this concept further as my collaborative practice with AMP progressed.

4.5 *Because There Are Things*

> Carpenter: When the game is being played [pong], and the ball is going back and forth, if it's down here and it's heading that way, some people are going to have to show red to keep it from going all the way to the top. If everybody just showed green it would climb all the way to the top, and the ball would miss. So, something happened in that group of people where some decided to show green, and some decided to show red to cause it to stop in the right place. And we have no idea what did that.
> So they're all acting as individuals, because each one of them can decide what they're going to do. They have total freedom of what to decide to do. But there's an order. There's an order that emerges that gives them a kind of a amoeba-like effect, where they surge and they play. It was kind of in the nature of an experiment; I wanted to see if no hierarchy existed at all, what would happen.
>
> Curtis: And what did happen?
>
> Carpenter: They formed a kind of a subconscious consensus.
> (Carpenter and Curtis, 2011)

The starting point for this piece is really an extension of all of the choice elements that I have encountered along my journey of research, listening, performing, and collaborative composition; the hybridization of practice-led composition and performance technique with the interactive creativity that has emerged since the earliest experiments with AMP. It is not about demonstrating the capabilities of the software. Artistically it has far more personal significance than that. It is about how I have, in collaboration with Dan Axtell and Tano Iozzi, been given the opportunity to think about both my own originality, and as Eco states, to question the potential of the open work and "the actualization of a series of consequences whose premises are firmly rooted in the original data provided by the author" (Eco 1989, 19). It is, paradoxically, both the realisation of compositional limits, and also the 'freeing up' or liberation that such stipulations afford. Through research, these ideas of 'original data' and 'compositional limits' have become issues so shrouded in cultural subjectivity (with regard to the

acceptability of, and in, degrees of 'change'), that it becomes hard to establish if what I am doing leans more towards Voltaire's "judicious plagiarism" (quoted in Deathridge 2003) or cognitive scientist and artificial intelligence researcher Margaret Boden's "historical creativity"[25] (Boden 2004, 2). Turino, examining these degrees of change in both musical and non-musical social contexts amongst Conimeños makes what I believe is a very profound observation, and I believe this is where the crux of the matter is found to be located:

> From my perspective, Conimeños use, and recognize, a rather subtle scale of contrasts to mark meaningful differences: between ensemble's performance styles, between compositions, and between the sections of a piece. The aesthetic appreciation of small contrasts in a musical practice has parallels in other spheres of life in the ayllus [the traditional community setting in Andean communities]. In the culinary style, for example, the same type of food, prepared in much the same way, is consumed day in and day out during particular seasons. Dishes that are alike in all but one ingredient, spice , or detail of preparation (and that to my palate taste the same) are considered distinct and given different names. In culinary style and musical style, as with the sense of time in daily life, small variations are highlighted in a context of extended repetition
> (Turino 1997, 89)

This concept of 'meaningful difference' that Turino observes has for this piece of my portfolio been a central concept, and something that I was keen to overlay with several other musical approaches that have become influential to my practice; established both through practice-led exploration and analysis. Interestingly, and by no means planned in advance, what became apparent with this piece was the requirement for the sonic material from different clients to draw on sometimes quite different elements of my research. For this reason, I will explore and address these inter-client differences to some degree separately, before addressing the piece as a whole. This piece, *Because There Are Things*, although utilising four clients in its performance, can be thought of as a three client piece. Having worked with JB's lyrical content in *Release* and *There Shall be None*, although the scope of spoken word variation was huge, as previously noted, I wanted it to be even greater. Having explored ways of developing the sonic potential from increasing the number of variations (by subdividing JB's lyrical content into smaller and smaller chunks) to allow its re-formation into new audio segments of both content and meaning, I soon realised that this was not to provide any personal meaningful artistic value. As an answer to this artistic problem, I looked to a hybridization of practices, merging the hocketing styles found among Conimeños, with that of the beat generation's cut-up technique most associated with beat generation

25 Boden defines historical creativity as the first time, as far as we know, that something has been done in a particular way. Psychological creativity relates to the first time that a person has done something in a particular way, even if others have done it before them.

artist William Burroughs, artist/ performance artist Brion Gysin, and (from the mid 1970s in the emerging Art Rock scene of London) David Bowie, as will be discussed in more detail later in this section.

Discussing the instrumental hocket techniques used so prominently in many Andean communities, Turino describes the practice as "[a] single instrument pair […] tuned so that the pitch series alternates between the two rows, requiring two musicians to interlock their respective ira and arca parts to create a melody" (Turino 1993, 43). This sharing of musical content is certainly not for purely musical aesthetic purposes. The establishment of the ensemble's unity, collective identity, and shared artistic ownership is, as always with the music of Conimeños, of complete centrality. Turino emphasises this approach to collaboration, reminding us that:

> When Conimeños say that a good ensemble is one that "plays like one instrument" and that no individual's instrument should "escape" from the dense, integrated fabric of the ensemble's performance, they are talking about sound, but they are also articulating a certain vision of the relationship between the individual and the community. In Conimeños musical ensembles there is no place for highlighted soloists; in general, people are no more anxious to draw attention to themselves during music making that they are in any other public setting.
> (Turino 1993, 55)

For this piece, I wanted to explore both the inter-instrumental hocketing of the Conimeños, and also to introduce the element of the 'unknownness' (introduced in Chapter 3) associated with different members of the Conimeños compositional ensemble's contribution to such events. Returning to my reading on openness, and in particular the work of Oulipo co-founder Raymond Queneau's *Cent mille milliards de poèmes* (1961), I wanted to develop a set of audio events that while inspired by both of these practices, developed and hybridized them to fit my own personal aesthetic goal. The concept of the 'cut-up', rearranging established text to create new meaning, was introduced via the world of visual art, and specifically the cubist movement of the early to mid-nineteenth century. However, before it started to shift from a position of great artistic prominence to that of a lesser public position, as art historians Charles Harrison and Paul Wood state:

> [c]ubism had hit upon a device whose potential transcended the circumscribed circle of an artistic avant-garde, tied intimately to its haut-bourgeoise sponsors. This was collage. Developed into photomontage it became the main weapon in the critical artist's armoury against convention. Nowhere was this transition from a more or less hermetic art, through cultural contestation, to an explicitly politically motivated intervention.
> (Harrison and Wood 1992, 219)

This visual art of collage was appropriated and integrated into the world of audio-visual and cinematic art arguably some time later (Burroughs 1983), and was soon found to be a platform of artistic exploration and experimentation for the likes of William Burroughs and Brion Gysin. As with collage, the degrees of borrowed-ness and manipulation of material is impossible to refine to a set of simplistic rules to adhere to, but when interviewed about the process, Burroughs reflected that:

> There are of course many ways in which cut-ups can be done. One very simple way which I have used frequently is to take a page, cut it down the middle and across the page so you now have four sections, and you re-arrange the sections in a different order. And when this happens, of course you get new word combo's – you also get new words created by the cut-up […] this was simply applying the montage method which is really rather old-hat in painting at that time. As Brion [Gysin] said, 'writing is fifty years behind painting'.
> (Burroughs 1983)

Here, Burroughs is discussing how his cut-up technique was used to create essentially stand-alone works; works that existed in their own right and were not necessarily contributions to a larger artistic output, made up partially of cut-ups and partially of some other material (although his video cut-ups did address this). However, later in the twentieth century, composer, song writer, and performer David Bowie did use this technique as an aid to songwriting, to assist in his creative process; using varying quantities of his cut-up creations as either staring points, core content, or inspiration for his compositional process:

> This is the way I do cut-ups. I don't know if it's the way Brion Gysin did his or Burroughs does his, I don't, but this is the way I do. I've used this method only on a couple of actual songs. What I've used it for more than anything else is igniting anything that might be in my imagination, and you can often come up with very interesting attitudes to looking to...I tried doing it with diaries and things, finding out amazing things about me and what I'd done, where I was going. And a lot of things I'd done, it seemed it would predict things about the future or tell me a lot about the past. It's really quite an astonishing thing. I suppose it's like a Western tarot.
> (Bowie 1975)

Where JB had provided me with spoken word text (and then later making recordings of him reciting this text) for *Release* and *There Shall be None* (which I would then cut-up and break down into smaller chunks), for this piece I wanted to start with a more abstract approach to spoken word text collection. Having experimented with extracting small excerpts (words, lines, paragraphs, etc.) from poets such as Alan Ginsberg and his associate Tom Pickard (a pioneer of the British Poetry Revival movement that I had previously worked with in the capacity of documentary film production), I felt that this was casting my net a little too shallow in terms of core material. I wanted to explore the creation of spoken word from material that would be largely considered dialogue; attempting to give both new meaning and

context, rather than new meaning. I approached the collection of such material in a semi-random fashion, deciding to extract audio from 'interesting interviews'[26] found on youtube. The material that I came across was eclectic to say the least, and however supposedly random my choices were (or at least I thought they were), I extracted the audio from five of the interviews and decided that these would act as the core material with which I would conduct my experiment in interactive theme and variation cut-ups. These videos were; *Aldous Huxley Interview – 1958 (full)* (TruthTube1111), *Hippie Chick – LSD* (PhantomAudio83), *Alan Watts – You Created God In Your Mind* (TheSpiritualLibrary), *Eight Finger Eddie interview – Goa Hippy Tribe* (goahippytribe), *Daniel Dennett – Arguments for Atheism* (Closer To Truth), *Weird Satanist Guy* (Amalgam Studios) and *Homeless guy spits some truth*[27] (Tyler Mann) (full audio of these videos can be found at Audio Video Content/Because There Are Things/Raw Audio Content on the accompanying storage device and are used under the 'Fair dealing' doctrine of United Kingdom law[28]).

Once I had extracted the audio from the videos, all of the stereo stems were imported into Logic, and in much the same way as Burroughs and Bowie suggested, I began to extract words, phrases, sentences, whole statements, and any other chunks of dialogue that caught my ear as I listened through to the whole extract (a complete list of these extracts can be found in text form in appendix 2) and these were exported as their own file; creating the next level of core audio material for my experiment in spoken word montage. Essentially, what I wanted to achieve was a series of eight hocketed statements shared across clients 1 and 2 of AMP. To achieve this, and to fit in with the thematic design of my FMOD patch, I decided to have eight 'beginnings' on client 1, and eight 'endings' on client 2; this being both a suggestion from Axtell (see interview in section 4.3.2) and also an area I had briefly explored with *There Shall be None*. Through experimenting with audio segment length, starting points, and other rendered[29] parameters I decided to have clients 1 and 2 operating with 12 bar audio samples at 131 bpm, giving

26 This being the search-term that I used to narrow-down the available material.

27 Full referencing for this material can be found under Cut-up extracts in the bibliography.

28 Part 1, Chapter 3 (*Acts Permitted in Relation to Copyright Works)*, paragraph 29 (*Research and private study)* of the *Copyright, Designs and Patents Act 1988* states "Fair dealing with literary, dramatic, musical or artistic work for the purposes of research for non-commercial purposes does not infringe any copyright in the work provided that it is accompanied by sufficient acknowledgment" (29, (1)) and that "No acknowledgment is required in connection with fair dealing for the purposes mentioned in subsection (1) where this would be impossible for reasons of practicality or otherwise" (29, (1B)). For further details, please see http://www.legislation.gov.uk/ukpga/1988/48/part/I/chapter/III.

29 By rendered parameter, I am here specifically talking about things that are done to the actual core audio that is then bounced down to a simple stereo file before being placed in FMOD, at which point various other parameters will effect the sound's relationship with the rest of the content, but not the actual core sound that was created in Logic.

each segment's audio a length of exactly 22 seconds. From here I took the decision to have all of client 1's segment audio as being 'active' (having audible content) between bars 1 and 6 (inclusive), and all of client 2's segment audio as being active between bars 7 and 12 (inclusive).

Approaching the inter-client interaction in this manner would facilitate a style somewhere between hocket and call and response, with client 2 finishing client 1's call. As a significant development from the lyrical text created by JB, I was also determined to somehow increase the variation available to the composer-performer, and for this I drew inspiration from my performance experience with rumba. Rumba works on the understanding of an established music framework. Within this framework, a great deal of liberty can be afforded to the performer, but it must be within the framework or it will be considered 'wrong', 'not in clave', or just not good rumba. Rumba's call and response nature is, as Bland has illustrated, not as straight-forward as some styles. Returning quickly to a quote of Bland's during interview, when asked about how the tres golpes would respond to a call from the tumba, Bland stated that "The person who calls it [tumba], it's down to the person that responds [tres golpes]. It's like a musical equivalent of "would you like a cup of tea" it could be a very short answer or it could involve a lot more involvement" (see section 2.5 for Bland interview material). Here, Bland is introducing the idea of the open response; a percussive answer that is not restricted by factors such as complexity or phrasing, as long as they meet the framework requirements stated above (see section 2.5 for more detail on Bland's analysis of this relationship, and section 3.3 and 3.4 for this concept mapped across Schechner, Fernandez-Vara, and Hudack and Berger's hybridized models). As is often the case in more traditional rumba events, there will be a set of 'common' calls – each with their own variation, and the same for the responses; essentially establishing a theme and variation structure that works across the tumba and tres-golpes, and while allowing a degree of predictability, it importantly introduces an significant element of choice, variation, and originality to each performance. I decided to harness this concept with my interactive theme and variation cut-ups, additionally utilizing Collins' "branching tree" approach (Collins 2008, 142) to interactivity in video game music. By starting to assemble the cut-up audio files in Logic in the length and bpm stated above, I was able to create variation on particular thematic material. Below (table 9) is a graphic that I will explain to allow a greater understanding of my approach:

Client 1; Square 1

	there was a light in my room		such horrible things
right here in the middle of the city	from a biological point of view	just think for a minute, maybe there is something worth caring about	because there are things
	a thousand judging eyes staring back at me		It's called Anjuna

Client 2; Square 1

	a thousand judging eyes staring back at me		it's like you can't have one without the other, you know?
it doesn't have as it were a dramatic purpose	like a sun	and one day	the burden of proof is on the other side
	you didn't have to pay		they didn't want me to be part of their society any more

Table 9. Arrangement of branching tree dialogue extracts

From this figure we can see that the audio in Client 1 (reading only from left to right) is four 'cut-ups' long. However, when we get to the second cut-up, there are three options. There is only one option for the third cut-up, and then again three options for the final cut up. So, from having these variations on the theme, we end up with nine possible variations of content (table 10).This process is then repeated for client 2, square 1 (table 11):

1. Right here in the middle of the city There was a light in my room Just think for a minute, maybe there is something worth caring about Such horrible things	2. Right here in the middle of the city There was a light in my room Just think for a minute, maybe there is something worth caring about Because there are things
3. Right here in the middle of the city There was a light in my room Just think for a minute, maybe there is something worth caring about And it's called Anjuna	4. Right here in the middle of the city From a biological point of view Just think for a minute, maybe there is something worth caring about Such horrible things
5. Right here in the middle of the city From a biological point of view Just think for a minute, maybe there is something worth caring about Because there are things	6. Right here in the middle of the city From a biological point of view Just think for a minute, maybe there is something worth caring about And it's called Anjuna
7. Right here in the middle of the city And a thousand judging eyes staring back at me Just think for a minute, maybe there is something worth caring about Such horrible things	8. Right here in the middle of the city And a thousand judging eyes staring back at me Just think for a minute, maybe there is something worth caring about Because there are things
9. Right here in the middle of the city And a thousand judging eyes staring back at me Just think for a minute, maybe there is something worth caring about And it's called Anjuna	

Table 10. The nine possible variations of spoken word for client 1, square 1 after being arranged interactively

This process is then repeated for client 2, square 1 (table 12):

1. And it doesn't have as it were a dramatic purpose And a thousand judging eyes staring back at me And one day It's like you can't have one without the other, you know?	2. And it doesn't have as it were a dramatic purpose And a thousand judging eyes staring back at me And one day The burden is on the other side
3. And it doesn't have as it were a dramatic purpose	4. And it doesn't have as it were a dramatic purpose

And a thousand judging eyes staring back at me And one day They didn't want me to be part of their society any more	Like a sun And one day It's like you can't have one without the other, you know?
5. And it doesn't have as it were a dramatic purpose Like a sun And one day The burden is on the other side	6. And it doesn't have as it were a dramatic purpose Like a sun And one day They didn't want me to be part of their society any more
7. And it doesn't have as it were a dramatic purpose You didn't have to pay And one day It's like you can't have one without the other, you know?	8. And it doesn't have as it were a dramatic purpose You didn't have to pay And one day The burden is on the other side
9. And it doesn't have as it were a dramatic purpose You didn't have to pay And one day They didn't want me to be part of their society any more	

Table 11. The nine possible variations of spoken word for client 2, square 1 after being arranged interactively

These were assembled in Logic as cut-up stereo stems, with each client assigned 6 bars of time to their stem montage. A 'master arrangement' (all possible cut-ups being present, with all non-required cut-ups for a particular variation being muted) was created for each client square, and then each variation bounced as a new stereo stem to be used in FMOD. As not all cut-ups and cut-up variations were the same length, it was necessary to go into the master arrangement for each variation and make small degrees of change to the timings of each cut-up (in terms of start time, not length), so that all of client 1's bounced stems would complete and fall silent just before client 2's stems would progress from silence to spoken word. The graphics below show square 1, variation 1 from both client 1 and client 2 (fig. 27); client 1's non-changing text (“Right here in the middle of the city” and “Just think for a minute, maybe there is something worth caring about”) is displayed in green, with the selectable variation in blue. Client 2's non-changing text (“And it doesn't have as it were a dramatic purpose”, and “and one day”) is displayed in purple, with the selectable variations in yellow. Note that all unused

variations for a particular bounce are muted, with only a thin band of their colour visible.

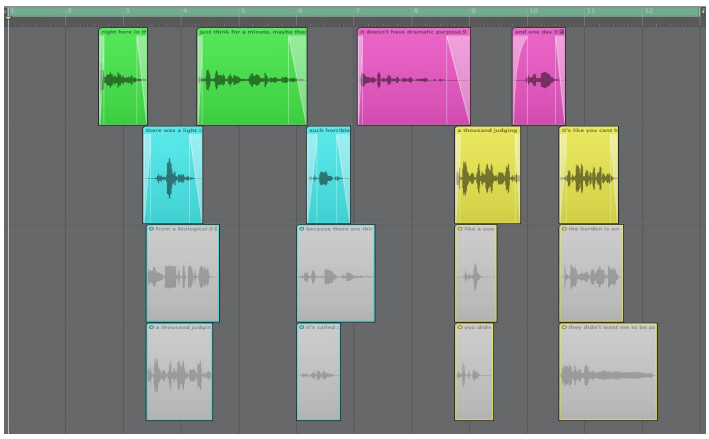


Fig. 27. Client 1 (green and blue) and client 2 (purple and yellow); square 1, variation 1.

As a result of the timing restriction placed on client 1's spoken word (in order to not overlap with the start of client 2's introduction of spoken word), I had to alter the start times of client 1's text. This is illustrated in the start of client 1's opening passage “right here in the middle of the city” from half way through bar 2 of fig. 27, to just after the start of bar 2 in fig. 28. These alterations varied from client to client, and from variation to variation, and were figured into all final stereo bounces for use in FMOD.

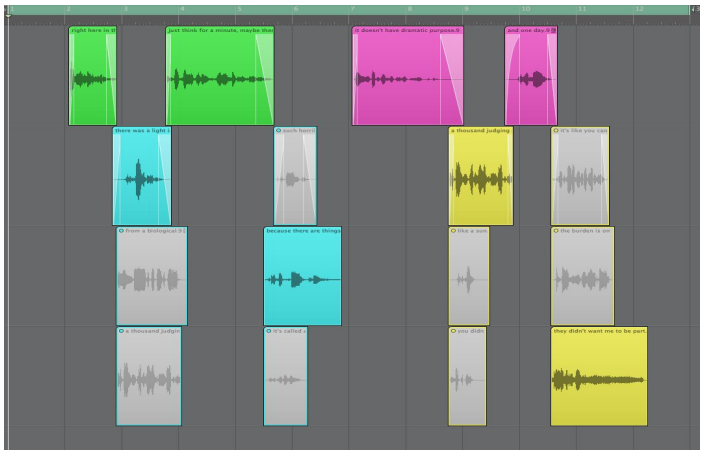


Fig. 28. Client 1; square 1, variation 2. and client 2 (purple and yellow); square 1, variation 3

The result of this is that when both client 1 and 2 are both on square 1 of AMP, there is a collective possibility of 81 variations than can be achieved. Clients 1 and 2 of AMP in this piece use a

combination of the inter-personal 'unknown-ness' of the Conimeños compositional practice (each player in this example has no previous knowledge of what other composer-performers will be introducing as musical ideas and inspiration) and the 'call and response' and 'theme (1, 2, 3, 4, etc.) and variation' (a, b, c, d, etc.) element of a rumba performance. However, unlike in rumba, where the caller determines the musical movement, in AMP, this project has been designed so that - although there is a caller part (client 1) – client 1 can choose a new square (1-9) if they in turn want to 'respond to the responder's response'. As a result, even though the weighting of the traditional call and response directionality has been removed, it rhizomically re-emerges to re-order the call and response power allocation to create what I think of as a rhizomically heterarchic relationship between the performer-composers (see section 2.7 for an introduction to concept of the rhizome in this context). The below diagram (table 12) gives a breakdown of the number of variations that are held within each square of client 1 and 2's AMP patch for this piece. As with previous pieces, in clients 1 and 2 for this example, square 5 contains a section of silence (equal in seconds to all of the other squares - 12 bars equalling 22 seconds), to accommodate performers requiring a period of extended silence during their composition-performance. Although the text has been arranged so that any combination can 'make sense' – there is a definite sense of hocket between the two clients. In squares 6 and 8, the hocket effect is more prevalent, with the two clients being required to perform the same square number simultaneously in order for the text to fully realise its interactive potential. However, I have arranged the audio so that either of the paired squares (6 and 8) may perform outside such a pairing, although the full effect of the spoken word text will not be uncovered.

Square No.	Client 1	Client 2
1	9	9
2	9	9
3	4	4
4	4	4
5	1	1
6	1	8
7	4	5
8	1	6
9	8	6

Table 12. Variations per square in client 1 and 2 of *Because There Are Things*

The resulting possibilities of combinations that are achievable from such a configuration are huge; a consequence of the combinatorial explosion that occurs when dealing with such large numbers in the field of combinatorics. Table 13 gives an overview of such numbers. It shows the possible combinations available from a series of nine 'moves' across clients 1 and 2 of AMP (see appendix 3). If all four clients were to be considered the number of combinations would clearly be even larger and for nine phrases would have of the order of 60 digits.

No. of Squares Played	No. of Possibilities from Client 1 and 2 Collaboratively
1	2,132
2	4,358,879
3	8,539,135,542
4	16,015,630,682,205
5	28,733,895,844,958,800
6	49,270,373,525,791,100,000
7	80,673,667,195,048,200,000,000
8	126,020,633,788,731,000,000,000,000
9	187,639,086,931,334,000,000,000,000,000

Table 13. *Because There Are Things* client 1 and 2 possibilities

Importantly for this piece I decided to incorporate an element of random selection into the FMOD build of this project. For each of the squares, FMOD has been programmed to playback the audio within each square under the condition 'Random Without Repeat (Global)' (fig. 29); essentially what FMOD does with this instruction is to shuffle all of the audio content within the particular segment and then play through the selection until all of the options have been played. At this point, the content will again be shuffled by FMOD, and the process will begin again. Importantly, this is a global instruction, meaning that if for example the below segment is set like this, it will arrange the content randomly (1.2.g, 1.2.a, 1.2.f, 1.2.c. 1.2.b, 1.2.d, 1.2.e) and then play them in this order until the client is instructed to move to another square. If the client is then instructed to move back to the original square it will return to the shuffled content and start where it left off – continuing with the original shuffle variation until it has been exhausted, and ultimately reducing repetition. This process is explained in further detail under the sub-heading 'Case 3 AMP' in appendix 3, with a complete list of the final spoken work cut-up text for client's 1 and 2 to be found in appendix 4.

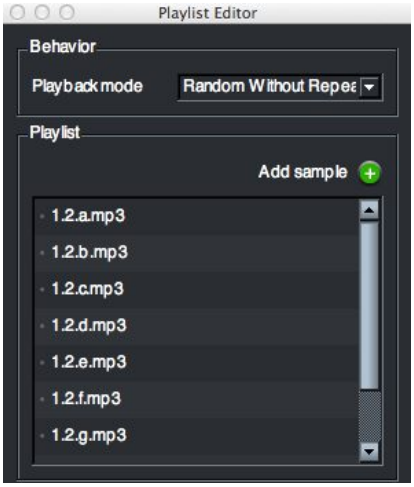


Fig. 29. FMOD's 'Segment Playlist Editor' that allows the selection of various audio playback behaviours ('playback modes')

As this cut-up approach had not been something that I had thoroughly discussed with Axtell and Iozzi – and it was an approach that I considered to offer real possibilities in the development of our collaborative practice – I felt that I needed to explain such a possible advancement. As I had taken on the role of preparing the spoken word cut-ups, I had planned for Axtell and Iozzi to somehow between themselves create some kind of experimental sonic underscore for the piece; again wanting to offer them complete autonomy over the content of this, but allowing them to build in this development if they felt that it would be advantageous to their content. As an introduction to the approach, I sent them an introductory email outlining the approach and content to my recently completed interactive cut-ups:

Notes on New Variation Approach

1. this is the spoken word for two 'clients' (mobile devices)
2. I've divided up the tables below into separate clients
3. clients 1 and 2 have nine squares (themes) that can be rolled into, and this will trigger (randomly) one of the audio segments (variations) saying one of the phrases from the list
4. Each of the audio segments are 22 seconds long, and in client 1 the audio is only in the first half (bars 1-6 @131bpm) and in client 2 the audio is only in the second half (bars 7-12 @131bpm)
5. This means that whatever two squares client 1 and 2 are in, there will be no overlap between segment audio across clients, so you get a 'question and answer' or 'call and response' between client 1 and 2, but you only have control over the thematic content and not the variation. The only time that this is not the case is in square 6, which is a little bit different in as much as the audio segments for each 'fill in the gaps' for each other; but don't worry about that at the minute.
6. It might be interesting to look at the same kind of compositional approach for the sonics/music

> for the two remaining clients (3 and 4), and these can be relatively autonomous, not needing to stick to the 131bpm 22 second timeframes? Let me know what you think.[30]

Axtell and Iozzi spent the next three weeks working collaboratively – initially working on a client each, and then swapping Logic projects to allow their own individuality to be imparted on to both client's content – creating the musical works for the piece; with Axtell initially taking on the more melodic client (client 3) and Iozzi creating a largely percussive client (client 4). Other than the initial email explaining the new approach, as with the initial interaction with JB for *Release*, I wanted to remove myself as much as possible from their creative process; although this stance could be seen as 'un-collaborative', having reflected on previous AMP composition practices I felt that by creating the spoken word client content, and additionally sharing my 'New Variation Approach' outlined in the above email, I had said enough and needed to allow their creative input to be exposed. When Axtell and Iozzi were happy with their collaborative compositional content, a master Logic file was created and shared with me containing the multitrack components that they had been working on. This was then mixed down my Axtell and I, ensuring that both clients 1 and 2 were mixed according to the spoken word of clients 1 and 2. Once this process had been completed, we were left with the following number of variations for each square of client 3 and 4 (table 14). As can be seen from the variations column for both client 3 and 4, Axtell and Iozzi had decided amongst themselves that, following Axtell's experience with AMP for *Guaguanco*, *Guarapachangueo*, *Release*, and *There Shall Be None*, square 9 would contain there silence option, as Axtell thought that it would be easier to manoeuvre the ball to this square than that of square 5.

Client 3			Client 4		
Square No.	Length (bars)	No. of Variations	Square No.	Length (bars)	No. of Variations
1	5	3	1	2	3
2	5	3	2	1	4
3	9	3	3	2	6
4	4	4	4	2	4
5	8	3	5	2	4
6	5	4	6	2	3
7	5	4	7	2	4

30 Email sent to Axtell and Iozzi on 4th August 2016. Email contained attachment of all client 1 and 2 cut-ups (see appendix 4)

Client 3			Client 4		
Square No.	Length (bars)	No. of Variations	Square No.	Length (bars)	No. of Variations
8	4	4	8	2	16
9	4	1	9	4	1

Table 14. Variations and bar lengths of client 3 and 4 in *Because There Are Things*

The following section is in response to a live composition-performance session played by Axtell, Iozzi, and I on the 9th October 2016. The session comprised of six variations of the collaborative composition *Because There Are Things*, and a complete transcription of the session can be found in Appendix 10. In presenting the entire transcription with positioned audio-visual material that was created during the session as an appendix, I aim to provide the reader with an in-depth understanding of both the musical interactions that occurred (through the recorded material), and also the social interactions that were taking place to enable such performances should they find this additional contextual information useful. Before the recordings began, Axtell and Iozzi were given approximately twenty minutes to re-familiarise themselves with the content of clients 3 and 4 and AMP's GUI. Before the fist variation, Axtell and Iozzi requested that a reminder of bar lengths for each square be given to them, so a copy of appendix 5 was given to each of them for their respective clients. Audio-visual recording to accompany the transcription can be found at Audio Visual Content/Because There Are Things/Variations on the accompanying storage device[31]

Having completed the performances of the six variations of the piece, I was eager to speak with Axtell and Iozzi in an environment that would allow a more pragmatically reflective conversation to take place; a means of critically assessing both the performances that had just taken place, their views on the social interaction that it had allowed during the course of composition and performance, and additionally to establish their view on the successes and limitations of AMP, and how they could imagine such an application in our future collaborative compositional environment. One key difference between these performances and all previous ones was the inclusion of graphic representations of the

31 During the course of this session, it was noticed that some low frequency interference was being captured on the recordings. An attempt was made to establish and remove the source of this problem, but this was unfortunately unsuccessful. I took the decision to continue with the recording/documentation of the session with the interference still apparent, as I felt that too much time spent establishing the source of the problem could jeopardise the performance of the material. An attempt to remove the interference in post-production was made, but with limited success due to not wanting to unnecessarily over-EQ any sound sources.

sonic content of the GUI's squares, and I was intrigued as to if Axtell and Iozzi thought that these had developed AMP's compositional and performative potential. Asked about this, both responded with a positive view on the inclusion of such representations to the performance:

> Axtell: Yeah, so I wasn't thinking of it in terms of how it looked of felt because I'd seen it before. In terms of playing it, the visual thing, having the graphics with the wave forms and the bar lengths and that sort of stuff was crucial because it was missing from the GUI.
>
> Iozzi: Yeah, there's no visual feedback other than the ball being on a square, and what these pieces of paper enabled us to do was fill in those gaps.
> (Axtell and Iozzi. Interview with author. 9th October 2016.)

This reinforcing Iozzi's statement "Right, that makes more sense. I really like that [Appendix 8] as a guide" (Iozzi during *Because There Are Things* live session. 9th October 2016)

As the transcription of the six variations supports, these inclusions were also something that I not only found helpful, but also felt were essential to my creative input to the compositional variations. The sheer number of variations available to me on clients 1 and 2 at one point left me quite confused, having to rely quite heavily on the visual prompts to realign myself with exactly what spoken word was being produced from each client and each square, with Iozzi adding that "towards the end I knew what was mine but that definitely took a while". I was also eager to examine if Axtell and Iozzi could see the relationship between our historic collaborative compositional practice, and the modelling of AMP's interactiveness; the manner by which we have historically afforded each other equality of directionality within our compositional environment, and how AMP's application of both chance and choice lined up with their collaborative compositional aesthetic:

> Axtell: To me it was like you're playing the concept but the actual material of it is chance, which I think really ties in with how we've been making music together for years. I kind of offer stuff to you guys and I want to see where you want to take it. I have no idea how it's going to sound when I hear it again, and that's a really creative way of approaching composition I think.

Importantly to my research questions , here Axtell is clearly acknowledging a link between our historic collaborative composition techniques and the use of AMP as a creative tool that utilises modern interactive videogame audio technology. On the same subject, Iozzi went on to state:

> It's like having a player in a band and you point at them but you're not quite sure which riff they're going to play. But that's what it's achieved. It's chance with actually a surprising amount of control in there, especially a couple of the last takes we were able to say "right we're going to start with some drums, then some melody, then some voice in the right

> hand". There were ways of making it. But then we did one that was almost the same [*in terms of agreed instructions*] twice, but it felt completely different. […] I really like that because I think you, for every few you do you think "oh I like that, that's interesting" and then that could then take you off in a new direction.
> (Axtell and Iozzi. Interview with author. 9th October 2016.)

This 'new direction' that Iozzi mentions is very important to my research and how it has created new knowledge. According to Iozzi, AMP has the ability to create the same 'Top of Old Smoky' effect as illustrated in fig.1 through AMP's alternative/ augmented collaborative composition approach. This means that all three collaborators (Axtell, Iozzi, and I) have realised the compositional potential of introducing such technology to their collaborative working environment. Following on from this point, I was interested to understand how different Axtell and Iozzi felt that each variation had been, and if any other composition and performance environments they had been involved with shared any similarities:

> Iozzi: It definitely felt like variation. Some were more different than the others. [...] Also where me and Dan were deciding to start on more complex stuff. We did one version that I felt compositionally was the most effective which was take 5 I think. That was the one that I felt, compositionally, it really worked in terms of what we've got today, that piece was the really satisfying one. It kind of just [pause] it was the way I'd imagine trying to do it, if I was arranging it on Logic, I might try and do that kind of thing but I probably wouldn't get the same result.
>
> Axtell: It felt like a jazz recording session with mixed ability players. Let's say you're doing three takes of the same tune, some jazz tune, in fact not mixed ability but lets say nobody's met each other before and you don't know what their playing's like, and you start playing a tune, you do a take and then there's this break that was improvised but that person didn't know it was coming so they went on too long. So that's like the squares being quite long. You go "let's do another take", completely different but it's the same tune, but maybe you have the guy hits the drum solo bang on point because we did it last time.
>
> Iozzi: It was like a meeting of three musicians puppeteering some other musicians. Even though the other musicians were actually us. It's like a continual cycle. That's where this is interesting. I see it [AMP] as a very interesting compositional tool that you can use with groups of musicians in different capacities.
> (Axtell and Iozzi. Interview with author. 9th October 2016.)

Iozzi's statement above that " It kind of just [pause] it was the way I'd imagine trying to do it, if I was arranging it on Logic, I might try and do that kind of thing but I probably wouldn't get the same result" is I believe fundamental to my research question and also my contribution to knowledge. The collaborative use of AMP as a compositional tool to be used between us had not only reminded him of our file-sharing collaborative approach noted in the introduction to this

thesis, but it had also produced a different – and desirable – result; the development of AMP as an alternative/ augmented collaborative compositional environment.

4.6 Summary

Throughout this chapter I have attempted to demonstrate – with the aid of the accompanying audio-visual material and documentation – the amalgamation of a broad range of influential facilitatory partnerships that have shaped my practice. It has demonstrated influential events and approaches to my collaborative compositional practice, and followed the arc of development from testing to application. In doing so, I have attempted to document my mental compositional processes, and attempted to present these in an approachable, tangible form through AMP. *Because There Are Things* marks the end of this phase of my research. However, as my conclusion will comment, I believe that this is really just the starting point for further research. Research that will both shape and be shaped by my practice, using AMP as an instrument of compositional and inter-personal navigation that serves both pragmatic and theoretical functions. As a demonstration of the collaborative and creative output that has been enables through the use of AMP within my collaborative artistic practice, this chapter has served three key purposes:

- By beginning with my initial collaborative attempts using AMP, a process of both application (software) and compositional adaptation has been highlighted during the journey of the accompanying portfolio of works.

- Such a portfolio of works is not meant to serve as an 'answer' to a 'problem' but both to subjectively and objectively question my creative requirements and desires in the context of practice-led research; highlighting my own internal socio-musical requirements juxtaposed with pragmatic 'product'-driven attempts to develop my collaborative creative practice.

- By having no fixed sonic output in mind, I have enabled a sense of exploration through both technological and non-technological adaptation and creative exploration; using AMP as both a platform to deliver my internal musical thoughts and thought processes, as well as triggering and developing such thoughts and thought processes; research informing practice informing research.

Chapter 5. Conclusion

As a practicing musician and composer that has worked extensively both individually and in a variety of collaborative settings, the motivations and influences to my research are deeply tentacular; pulling on, and extracting from, what some may consider a too-far-reaching net of influences, practices, and conceptual models. This is an opinion that I completely respect, and one that I assume I will continue to have to answer for; both to myself, and objective external parties. I view myself subjectively as a pragmatist, and as such, I am always looking for fields (both large and small) that can contribute to my musical output – be this from a purely 'productive' ("how can I/we get this commission done by the deadline?") or conceptual ("how can I/we approach this project that might allow an interesting work-flow or product to emerge?") point of view. As such, a facilitatory partnership exists between my roles of performer, composer, ethnomusicologist, teacher, post-graduate researcher, and company director. As likely to harness ideas arising from a conversation with a student, the analytical extrapolations of contemporary performance theory, to the performance practices that I have engaged with for over a decade, the eclecticism of my approach is not there to baffle or misdirect, but simply to explain and contextualise how I do what I do, and why.

This thesis will not conclude with an answer to a clear-cut research question set out in its opening pages; John Croft (2015, 6-7) would be slightly eased to read that there is no *trivial* 'yes'. It will however contemplate not just the importance of my research in its current state, but also its centrality in providing direction, establishing motivation, and inaugurating further conceptual occurrences to my practice. Additionally, and of central importance to the academic purpose of this thesis, will be answers, responses, and proposals directly relating to my earliest re-framed research questions (see section 1.1). These questions have never disappeared from my view. Clear-cut answers to these questions are harder to express. Instead, they are weaved across the remaining text of this chapter, often correlating to more than one original question, being shaped by and influencing others as they develop.

Through both written and portfolio content, this thesis has demonstrated a proposed paradigm shift in my collaborative composition practice; a shift that has further embraced the application of technology, and also explored my own subjective influence. I have documented the core working practices of Whitebox (see section 1.1), and in doing so have introduced the collaborative relationship between

myself and my two business partners/ musical collaborators, Dan Axtell and Gaetano Iozzi. In doing so, I have allowed our historic working practices to become apparent, so as a marked detour can be noted in my proposed working method (see section 3.6 and 3.7). Introducing our system of remote composition and brainstorming, a picture has been painted of our intrinsic systems of collaboration and artistic creativity; a system that has relied – and continues to rely – on a strict notion of egalitarianism and equally shared ownership of all musical material put forward as available to use by the company.

Looking at the influences that have shaped such collaborative creativity, I have introduced numerous theoretic positions that I feel are of particular importance to the development of my practice; so that the reader can ascertain a firm grounding of my historic techniques and practices, as well as help in unravelling the creative and developmental journey that has occurred during this practice-led inquiry.

Objectively attempting to unravel both simple and complex musical interactions (sections 2.3, 2.4, 2.5, 2.7, 3.1-3.6), I have adopted an ethnomusicological discourse to further interrogate two main socio-musical happenings. This approach has been taken so as to decode not the actual notes that are being played (as these are of little significance to my research), but to observe the influences of, and harness the adaptation, adoption, and reconfiguration of shared socio-musical happenings. First I have looked at the panpipe and flute traditions of Conima in the Peruvian altiplano (section 2.4). This example, unlike rumba, has not played a pivotal role in my historic performance practice. However, since studying the tradition (under Dr. John Ritter at the University of California, Riverside) and its symbolic relationship with Andean urban migration, I have been fascinated by the tradition's use of musical egalitarianism; the horizontal distribution of power through heterarchical relationships and networks.

Exploring the same processes in the performance of Cuban rumba (section 2.5), I have adopted a similar approach to that which I approached the flute and panpipe traditions of Conima, additionally engaging with rumbero Bill Bland to help disentangle the musical 'goings on' that form such socio-musical events. Of significant difference here is my previous exposure and immersion in this genre as a practitioner and researcher; having played such styles, and also having undertaken research in this area at post-graduate level (MMus, 2009). Although not falling under the traditional ethnomusicological rubric, I have also applied the same style of analysis to Stockhausen's *Klavierstücke XI* (section 3.5). This

has been used to illustrate a particular approach to the application of choice within the discourse on open form musical composition and performance.

As all three of these musical and social examples include elements that I either strongly feel would benefit my practice, or include elements that I am already utilising in my practice, I have applied a combination of Schechner's performance theory model (Drama, Script, Theatre, Performance) and Hudack and Berger's complex feedback loop analysis (score, player, instrument/ music, interpretation, synthesis) to locate the fundamental positioning of Murray's procedural authorship in such musical events (sections 3.1-3.5). The purpose of such analysis has been to clarify and exhibit how such desired interactions – that I both currently use and also that I plan to combine into my practice – could be integrated into a my proposed virtual performance model (section 3.6); the performance and compositions of which have been delivered through my bespoke mobile device application (AMP) and demonstrated in my accompanying portfolio of works.

In order to contextualise my virtual performance model at the juncture between pragmatic tool and platform of play-like musical exploration, I have simultaneously introduced discourse centred on videogame audio configuration (sections 2.1, 2.6.1, 3.6, and 3.7) and more general theories and concepts of play, analysing contemporary examples of music delivered through interesting and game-like platforms. This approach has had at its centre the duality of both research informing my practice, and practice informing my research.

Chapter 4 serves a plurality of purposes. It is fundamentally the written text that accompanies my demonstrated portfolio of works, but should be understood as contextualisation, explanation, and navigational exploration of - and through - my individual and collaborative approach to the creative potentials of AMP. It is not the purpose of my submitted portfolio to trigger questions such as “but is this music?”, or “but is this sonic art?”; instead, its contents are demonstrations of my practice relocated to a new model. The relocation of which serves as a starting point for further questions and pragmatic undertakings that I as a practitioner will initiate and tackle. As a musician both committed to, and engaged by, practice-led research, this interrogation of my creative practice serves a dual purpose that unifies to a shared resolution; nestled within such a duality, is where I propose my original contribution to knowledge is located; a contribution presented through a collage of ideas and concepts, and not

solely the evidenced practice. I have developed and assembled both theoretical and practice-led content (including critical reviews of existing technology, consideration and examination of wide-ranging theoretical materials, and analysis of my creative collaborative practice) in a manner that displays how my experiential learning process has informed my practice. Such an experiential learning process has been exposed to include a wide and diverse spectrum of contributory elements (including performance, ethnomusicology, the application of technology to music production, and the adoption and hybridization of socio-musical practices external to my historic involvement with music) that exist symbiotically, contributing vital characteristics to their over-arching facilitatory partnership; a partnership that has established itself as my approach, technique, and modus operandi.

In its infancy, my research changed direction and purpose, and this is I believe an important contributory factor of my contribution to knowledge. While engaged in the process of researching and examining compositional briefs that I was collaboratively paid to fulfil, it became apparent that this was in fact not the true reason for wanting to undertake a doctoral degree. What I in fact wanted to explore, interrogate, and document was the hunger that I, as a practicing composer, had to conceptualise and propose an interactive method of musical composition and performance that gravitated towards musical practices I felt were closer representations of my desired musical inter-personal interactions; formalising, re-contextualising, and re-enacting both theoretic and practice-based musical happenings that could illuminate a potential trajectory of practice-led creativity. This serving the dual purpose of granting me a framework of musical creativity that had been missing from my musical 'products' (ones that include monetary value) and of equal importance, the personal searching for a system of developing my collaborative approach to group performance and composition.

As such, I also propose that the work in development of, and that AMP itself, is a distinct contribution to knowledge. I assert this for three main reasons. First, in establishing my subjective need for such an application, I have explored and documented the deconstruction of procedural occurrences that contribute to three socio-musical styles, genres, or events in an innovative and original style (sections 3.1-3.5). Secondly, in doing so I have developed bespoke, unique software that is presented as a way of extracting and formalising core compositional and performative elements that I wish to creatively harness into my practice (sections 1.1, 3.6 and 3.7). This software has been created to sit - with intention- precariously between pragmatic compositional and performative tool, and game-like

rhizomic open form musical apparatus; its collaborative design (with regard to Jim Murray's API and front-end engagement) again reinforcing my approach to practice. Lastly, as a result, this element of my research engages video-game audio configuration theory, music and the post-modern condition, and discourse centred on artistic originality and creativity in a unique and innovative manner. I propose that all three of these elements are manifested in my portfolio of original works and that these embody and narrate my contribution to knowledge. A conscious decision was made early on in this research to utilize interactive video-game audio technology (FMOD) so as to maintain a close dialogue with current progressions within this field. Alternatives to FMOD could have been such softwares as MAX/MSP, but this was not elected for the aforementioned reason.

Through the process of explaining how my research has acted as an academic contribution to knowledge, I am quickly reminded that although paramount, this was not actually the controlling purpose of undertaking a doctoral degree. In its infancy, my objectives were firmly grounded in establishing how I, as a composer and collaborator, assume responsibility in interpreting musical Otherness while fulfilling commercial composition briefs put forward by directors, music supervisors, and other members of audio-visual production teams. As I have introduced at the start of this thesis, this approach was soon overtaken by the realisation of my actual stimulus for such an undertaking. As a practitioner and researcher, it soon became obvious that I was looking to explore, interrogate, and offer pragmatic solutions to a much more personal, subjective issue; one that has clearly played a pivotal role in not just the music that I play, but in my reasons for playing such music. Being able to explain why it is that we approach a problem in a particular way, or using a particular method, is a deeply complex subject that creates a seemingly inseparable mesh of cognitive behaviours, personal 'tastes' (whatever that may actually mean to an individual), mixed histories of exposure and protection (from a vast plethora of socio-cultural goings-on that contribute to our conretized subjective life choices and values), and biological necessities. Understanding *why* it is that we know *what* it is that we know neglects to confront the issue that seems to be at the centre of my research; for me personally, the disentanglement of such an array of tentacular contributory factors, issues, and influences has served a key purpose - to manifest such implicit and tacit processes into a format with which both myself and the reader can begin to understand my approach (both current and desired) to musical creation, collaboration, and aesthetic value.

Of equal importance is not just the act of 'getting my influences on to paper', but in fact explaining how it is that I have come to be where I am, experientially: exploring the "learning that comes about through thinking about and reflecting on life's experiences" (James and Thomas 2011, 146). In this context, these life experiences mix and blend concepts and practices ranging from my work as educator, to my deep-seated desire to explore and promote my own subjective collaborative models of musical creation. In searching for academic views that I have felt securely represent elements and ingredients of my creative practice, I have encountered an issue that was first raised by Professor Roger Redgate in my MPhil/PhD upgrade viva. When interrogating my relationship between practice and research I was questioned as to if my research was informing my practice, or my practice was informing my research; was my research element simply a justification and contextualisation of my practice, or was my research having a direct effect on my practice. I felt at that time that although my practice had most definitely been informing my research, this was somehow not quite how it was 'meant to be'; that my research should in fact be directing my practice so as to fall within the customs and procedures of doctoral study. Although I fully comprehend that this comment was more likely made to trigger important 'chicken and egg' questions that I should be conceptualising as part of my research, it was a poignant moment that I will continue to remember. What I have learnt from this process is that for me, there is no particular directionality of correctness that this relationship must adhere to, and especially so when viewed through the discourse on experiential learning. In its reduced format of 'plan-do-review', each of these three individual elements of Kolb's experiential learning can contain both theory and practice either individually or collectively; the exact construct of such a system determining the nature of the following step in the cycle (see section 1.2.1). This results in either practice and/or research temporarily assuming the dominant role and providing the characterisation of the immediate development of personal knowledge.

Through examining my approach to musical analysis, the use of techniques associated with ethnomusicology, and my attempt to re-negotiate the rubric of my practice, a recurring question – or in fact subject – continues to interrupt my though process; can I claim, having undergone such a practice-led academic undertaking to 'practice what I preach'? First, do I honestly think that I have both developed a system that truly reflects the issues that I claim it reflects, and secondly (of equal importance) am I using it, and do I plan to continue using in the future if the answer to the first part of the question is 'yes'.

Reinforcing the sentiment I hopefully put forward in my methodology, this research has never been about 'Peruvian-ising', 'Cuban-ising', 'virtualising', 'post modern-ising' or 'game-ifying' the existing schema and fabric of my practice. If it had been about these (and other introduced areas of research), then the onus would undoubtedly be on me now to support such claims. Essentially, when all the elaborate diagrams, theoretic interpretations and examinations, and dialectics revolving around various intellectual paradigms and causes have been stripped back, this research is fundamentally about proposing an alternative practice-led framework on and in which I can explore my musical creativity. This 'musical creativity' does of course require some demystification due to its reliance on such a complicated and problematic word, and will ultimately allow a clearer view regarding my research. Boden puts forward that "creativity is the ability to come up with ideas or artefacts that are new, surprising and valuable" (Boden 2004, 1). Fundamental in Boden's approach to creativity is her distinction between historical (H) and psychological (P) creativity. She separates these two strands by explaining that "P-creativity involves coming up with a surprising, valuable idea that's *new to the person who comes up with it*. It doesn't matter how many people have had that idea before. But if an idea is H-creative, that means that (as far as we know) no one else has had it before: it has arisen for the first time in human history" (Boden 2004, 2). This of course means that H-creativity will always be P-creativity, but P-creativity does not have to be H-creativity. Within such H and P-creative occurrences exist, according to Boden, three forms of creativity. The first of these is focused on creative acts that use "unfamiliar combinations of familiar ideas" (2004, 3) and include artistic techniques such as imagery and collage, but the second two forms refer to the revolution and expedition of conceptual spaces in the mind of the creator. Boden believes that conceptual spaces are "structured styles of thought" (Boden 2004, 4) and that "they are normally picked up from one's own culture or peer group, but are occasionally borrowed from another culture" (ibid.). For creativity to occur in such a transformation of space "the supposedly impossible ideas can come about only if the creator changes the pre-existing style in some way. It must be tweaked, or even radically transformed, so that thoughts are now possible which previously (within the untransformed space) were literally inconceivable" (Boden 2004, 6).

What I hope to have illustrated through my practice-led research is that, in Boden's terms, there has been a transformation of my conceptual space. It is not meant to be a relocation of my existing conceptual space to that of the Peruvian altiplano any more than to the docks of Havana or Matanzas, but a demystification of my creative approach that "involves some new combination of previously

existing elements" (Boden 2004, 40); pragmatically assessing the creativity (both H and P) that these elements possibly offer through their integration, assimilation, and synthesis, neatly fitting into what Arthur Koestler expressed as the bisociation of matrices; making a "distinction between the routine skills of thinking on a single 'plane' as it were, and the creative act which […] always operates on more than one plane" (Koestler 1964, 36). This, I claim, is also what I have undertaken with this thesis. In Mera and Morcom's terms the matrices that I have looked to (and drawn from) have been de- re- and trans-contextualised, with each element's re-contextualisation providing the de-contextualising force for the other (Mera and Morcom 2009, 6); resulting inevitably in a collective trans-contextualisation of all elements that have contributed to the bisociation of matrices.

Callois' concepts of fictiveness, uncertainty, and separateness as a prerequisite for games are additionally interesting points to address with regard to what I have been able to take from this whole process. For something to fall under the categorisation of fictive, the Concise Oxford Dictionary states that it must be "creating or created by imagination, or; not genuine" (Allen 1991, 434). I do of course have major issues with both of these definitions, that I will now address. If we agree that for something to be imagined is for it to become known as a mental creation, this would appear to include a huge number of both planned and unplanned conceptualisations, designs, 'ideas', artistic endeavours (be they visual, tangible, or audio-based), and so on. Even if such an idea occurs accidentally or "unconsciously" to put it in Boden's terms (Boden 2004, 3), it will still have started its existence as something that has been created by the imagination. However, the abstraction that games are not genuine is I feel far more interesting with regard to what I have taken from this whole process. This idea is closely related to the requirement of separateness in games, and particularly in discussing my work. In creating a new interactive paradigm on which to explore my artistic output, initially it appeared to me that I had created a digital, virtual space that was clearly marked off from the rest of my creative practice. Of course its contents were the individual or collaborative endeavours of such practice, but once audio had been 'built' into the application (and as a result had no choice but to adhere to Callois' 'regulations' (importantly including rules)) they were 'locked' into this form. As an initial concept, this relocation of my practice to AMP had no option other than to occur as part of my imagination, and of centrality, as it was not my existing method of creativity it was additionally not *genuine*; it could not be 'authentic' to my then 'original' practice, as it would clearly be a significant shift from my historic methods of music-making. Here then lies a paradox. It would appear that through imagination, I created a fictitious,

game-like, magic-circle on and in which to play with music. Simultaneously though, this creation has become, I propose, a genuine instrument of creativity that is no more marked off from reality than computer that I am writing this thesis on, but equally as ruled off from reality as noughts and crosses. This paradox will, I believe, not go away and has good reason not to. As introduced in my methodology, the fundamental shift from my original research questions was to interrogate, among other things, my relationship with music and music-making, and I believe that this is where such a paradox resides. It is exactly due to such a bisociation of my personal social space, with the collective creative space that renders the possibility of strict categorisation impossible; the paradox itself contributing positively to the network of facilitatory partnerships that morph, blend, separate, and reconfigure – allowing me to do what it is that I do through exploration, interrogation, and suggested pragmatic response.

This research has consciously been an *exploration* through interrogation, not a proposal of solution. As a composer that is collaboratively involved in commercial projects, it would seem natural to now turn my attention to such commissions. Returning to my own historic practices will, however, I believe not be possible. Dissecting and magnifying my practice in the way that I have has allowed me to question both my role, and that of emerging technologies, and the centrality that I believe both will play as I move forward professionally. It would appear that it is not just me that has been looking for ways to re-distribute and reconfigure the application of music. Interviewing Kate Sumner – who had acted as the online creative lead in the Whitebox *Shoe Carnival* commissions for Selfridges - I was surprised and encouraged to find that applications such as AMP could have a reach outside of the original compositional circle. Asked if she would have any interest in actually using such technology to become part of the musically creative process, Sumner commented that:

> creative types love new experiments, so it's not just about producing a good end result. It's about myself and Yandis [Yandis Ying, creative director on *Shoe Carnival*] being interested in new pieces of technology. That's the industry we work in. So we want to explore new things by nature anyway, so working in web design your going to be in to if there's a new app or anything like that, so I definitely think that's the target [for AMP]. We'd be perfect for that kind of experimental piece, and it's also very creative.
> (Sumner, interview with author, 31st January 2014)

Sumner's comment appears to be supported by recent technological advancement that have been made available to project supervisors and music placement co-ordinators. Library music agencies and placement firms are now seeing the financial advantage of such manoeuvrability and bespoke tailoring

of the audio that they represent; Extreme Music now going as far as offering its users access to Customix, giving subscribers access to the original mixed audio stems so that bespoke, perfectly timed musical material can be delivered for each audio-visual project, online. Previously, without such access and without having to pay for bespoke commissions, such placement would rely on the successful combination of variant mixes provided by the composer/s to agencies such as Audio Network and Pond5 among others.

Of course such uses as noted above are geared towards external users playing with, re-mixing, and trans-contextualising music composed by external parties, but of interest to me now is how this application and method can be used within my professional collaborative practice also. When questioned about AMP's possible future uses within the context of Whitebox's practice, Iozzi commented that "This would be really useful for those ten second half finished ideas, where you just chop them up, whack them in it [AMP] and then you've got a tool to turn them into compositions. So getting ideas to work in AMP and then out of that you've then got new stuff" (Iozzi, interview with author, 9th October 2016). I believe that this will be a very interesting direction to look in. Throughout this thesis, the works that constitute my portfolio have been composed closely to our historic methods, but nevertheless, there has been knowledge of the audio's final location – AMP. By revisiting the historic 'half finished ten second ideas' that Iozzi talks about (and there are lots of these) and relocating such examples to AMP, a further de-, re-, and trans-contextualisation of such works would I believe inevitably produce some very interesting (although probably not always particularly practical) results. Such continued internal use, although possibly offering no doubt artistically rewarding results, does neglect to take into consideration the possibilities of removing myself entirely from the musically artistic process. I plan, in the near future, to hand AMP's FMOD model on to London-based live electronic music duo The Energy in preparation for them to release an interactive EP of apps; with the possibility of later developing a tangible user interface to accompany such a release.

Through this whole process I have revisited, reinterpreted, and created in - I feel - equal measures. But, at its core, has always been the hunger to de-code, re-code, and expose my creative practice to elements that were either there - and hiding - , or were required as additions in order for me as a musician and composer to be comfortable with my practice. Exposing myself to this degree of transparency and objective analysis has been both problematic and enlightening in equal measures, and a process that that

will I'm sure bear fruit in not just my work as a composer, but also as educator. I'm sure that as I return to work and attempt to embed Kolb's ideas of 'plan, do, review' to the young people that I work with, I will subconsciously also be saying it as a reminder to myself. A reminder that the direction that my knowledge takes through experiential processes is one that should be both listened to and respected; a process that has facilitated my collaborative relationship with music, people, and theory. Decisions always have to be made, even in creative, artistic processes, but how they are made, and in what way, is a matter for each individual practitioner:

> Iozzi: Are we going to try one? How long do we play for?
>
> Murray: That's up to us.
> (Iozzi and Murray during *Because There Are Things* session, 9th October 2016)

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Appendix 1: Installing and running the AMP system

The AMP system consists of a Windows based server and a set of Android clients. This document details how to install and run the server and the clients. Note that both the server and each client comprise executables (programs) and music files and the assumption is that the system builder includes the same music files in both the client and the server but this is not imposed by the AMP system.

Installing, running and testing the server

The server package consists of the AMP server executable together with support DLL files (Windows Dynamic Link Libraries) and a set of music tracks. These will normally be distributed as a ZIP file which should be extracted into a top level folder with a ZIP file extract tool such as Winzip.

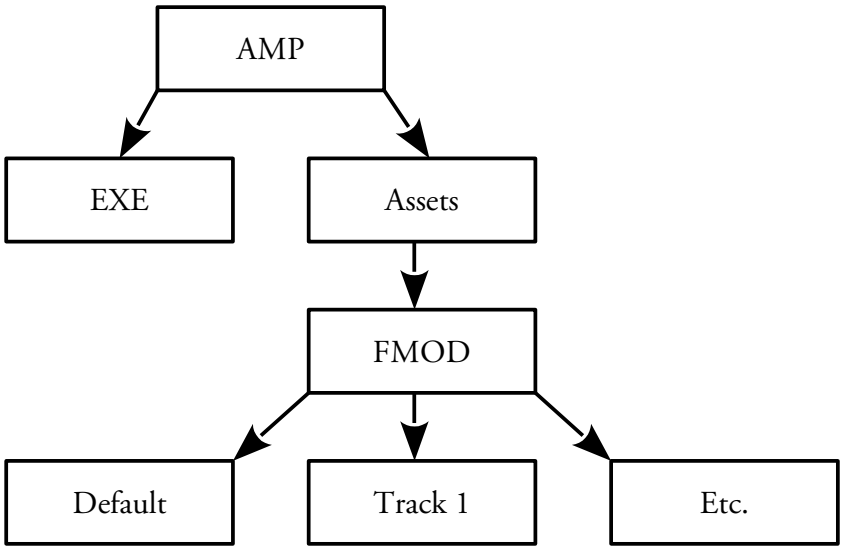
Assume that we have extracted the contents of the ZIP file into a top level folder (AMP) on the Desktop. Below that folder will be 2 sub-folders:

1. The executable subfolder AMP\exe
2. The assets folder containing the music tracks. This will have the structure AMP\assets\fmod and below that a number of subfolders each of which is a track, containing the FSB, FEV and other sound files. One subfolder/track should be named "default" which will be used as the default. It will be easier to omit spaces in the folder/subfolder names

AMP\exe\ will contain:

1. ampserver.exe
2. fmodex.dll
3. fmod_event.dll

Directory structure:



Operation:

- Open a command window <WINDOWS BUTTON> -> run -> cmd
- cd to the AMP\exe subfolder; e.g. cd c:\users\<user>\Desktop\AMP\exe
- Run the server giving an optional subfolder argument

e.g.

c:\users\<user>\Desktop\AMP\exe> ampserver [track] - where "track" is the name of the track subfolder to be used. If this is omitted then subfolder "default" will be used. e.g.

c:\users\<user>\Desktop\AMP\exe> ampserver mytrack1

c:\users\<user>\Desktop\AMP\exe> ampserver mytrack2

c:\users\<user>\Desktop\AMP\exe> ampserver (this is identical to entering ampserver default.)

- The server will then run until stopped by entering ctrl-C. While running the server will log the client messages to the screen.

Access to the server through the router

Often the clients and server will connect via a local router but it is also possible to access the server

across the internet.

In local mode , when the clients and server share the same router the clients only need to know the internal IP address of the server.

In remote mode via the internet. the clients need to know the external public address of the router. That can be found out by typing "my ip" into a browser on the server and noting the public IP address shown. Note that for many installations this IP address is volatile and should be noted before each session. Also in this case the router which the server is using must have Port Forwarding enabled , forwarding external port 8081 to internal port 8081

Testing the server using telnet

telnet is a command line utility run from the command prompt to send commands to the server. You can run a telnet test either from the same machine as the server is on or over the internet

To run over the internet you need the server IP address and port number - the port is always 8081. To run on the local host - the computer that the server is running on you can use "localhost" instead of the IP address.

Get the server IP address in the CMD window before running the server as follows:

> ipconfig | find "IPv4"

eg

C:\users\<user>>ipconfig | find "IPv4"

IPv4 Address. . . . . : 192.168.1.3

The port number is always 8081

The command based client can be run using the telnet client as follows

> telnet IPADDRESS 8081 or telnet localhost 8081

eg

>telnet 192.168.1.3 8081 or telnet localhost 8081

You can them emulate the client GUI by entering single character segment numbers 1-9 , 0 indicates exit.

Installing and running the client

The client consists of a single APK file which contains the executable program and the music files. To ensure the integrity of APK apps most apps have to be 'signed'. However AMP is part of a research project and being a trusted app is not so signed. Therefore each Android device which hosts the client must have certain features enabled. The method of enabling these features varies from device to device but using the Samsung Galaxy S3 mini/ Samsung Galaxy S5 as an example, and before attempting to install the APK The following settings must be made.

- Enable USB debugging. Select Settings -> Developer Options -> Enable USB debugging
- Allow unknown sources. Select Settings -> Security -> Enable Unknown sources.

Upon starting the client the user must set certain preferences either when the client is first loaded or if the IP address of the server changes. The preferences are accessed via the Preferences button on the startup splash screen:

1. IP address - the IP address of the server. This will normally be an internal Local Area IP address if the clients and server are using a local router but can be an external IP address if the server is being accessed via the internet and if the server has an external IP address.
2. Port number - must be 8081 at present
3. Orientation - not used , development option
4. Scale - used to set the size of the client screen on the device. Set after first installation of the clients.
5. Track - not used , development option
6. ONESHOT - not used , development option

Appendix 2: Complete list of extracted cut-ups

Aldous Huxley Interview – 1958 (full)

enemies of freedom	sinister persons deliberately trying to rob people of their freedom	pushing in the directions of the	the force which in general terms can be called	people have less to eat and less goods per capita
obviously the central government has to	seems to be pushing very strongly towards	then ironically enough	according to your thesis	from a biological point of view
practice death control	in a most intensive manner			

Hippie Chick – LSD

kind of afraid that it's	not going to be really true and it will spoil the whole thing for you anyway, you know?	because, these guys aren't just doing a regular film	it makes it sound very clinical, like as though	oh, not me. I'm a happy person
medical doctors say you're likely to go psychotic	because there are things	but when somebody makes you say it	and it's true	then it just makes it more beautiful of a thing
who are you?	who *are* you?	They're doing it for you because it's your idea	because you're somebody that knows about stuff like this	I'm glad that you're doing it
it's not that way at all	it's nice to go back up there	seen any monsters lately?	you can't have any monsters	you know, I don't know
we can look out at the other people that haven't	that…are more beautiful			

and everybody else is your dream	that all these other people exist	if ever you get involved in philosophical one-upmanship	the oedipus-complex theory	experiment
I find it exceedingly odd	since observed by yours faithfully, God	the Bishop	but if you will be a little naïve for a moment	you do not know anything except in your own mind
therefor it would not be at all	well now you know	in relation to the whole problem of illusion	subjective idealism	this is the theory
that all reality is mental	but the difference here is that	disproving your idea	if it could be brought forward	what would happen
but the difference between	and seem at least to understand what you mean when you use the word 'mind'	the whole existence of an external world	is something	known to you in your mind
is a distance that exists	unless it be	an experience	because being is always being for something	organs of vision
for a mind	the sun gives forth no light	it gives forth no heat	because it's only in relation	only in relation to a certain
by their impact on something	so the zen poem says	you see?	breaks up into a thousand fragments and	in the mind
is incredibly plausible	sometimes logical analysts	sometimes logical positivists	and they said	basic to all thought

Eight Finger Eddie interview – Goa Hippy Tribe

they call me Eight Finger Eddie	any kind of thing, like this	you're a very lucky person	you didn't have to pay	sometimes people are sceptical at first
he doesn't want anything	It's called Anjuna	it became the centre of the scene	it became well known	I said "I'm not enlightened"
I'm just older than you, that's all	they were in their twenties	and I would dance	to the music	and one day
what fucking energy	ding ding ding	then I felt this	body is shaking	there was a light in my room
like a sun	but it didn't bother me to look at it	in fact I could not look away from it	this is the source of all life	if it's in me then it has to be in everybody
automatically	we all come from the light, we must all come from the light	there's nothing to believe man, it's just	the best thing is to be completely disillusioned	it aint going to get you anywhere
it's not no accident	unless you wanted to contribute something you could do that	and I would dance	to the music	not making any effort at ll
this has never happened to me before	and suddenly	and err	this is where all life comes from	doesn't matter what you were…a criminal
where else can you go?	but erm	some people want to believe	with everything	with everybody
be completely hopeless	if they told me	and err	I guess	instead of somebody telling you
I've done what I want to do	I'm doing what I want to do	and suddenly		

to know whether god exists	and I've been asking a lot of smart people	arguments here and all that	would seek to attack	I'd like to flip that around
what are the	I think the first one simply has to be	the burden of proof is on the other side	especially since we've got	a surfeit of
reasons for seeing why	so we don't have the puzzle	No, I think we can just set that aside	it's a sphere of copper two miles in diameter	so we can never see it
we might as well assume it doesn't exist	the burden is on the other side	that makes a good story	such horrible things	you can't explain it away
it doesn't have as it were a dramatic purpose	and once you decide to get rid of the bad guys	then you have this nasty problem with explaining	they had to invent kryptonite	so we have to compromise one or the other
diminish the all powerful	and therefor eliminate the inconsistencies	the idea that	and they're playing by some pretty tough rules	this is the best they could come up with
what does that have to do with what's true	why are they praying	what we have to face though it that	don't multiply entities beyond necessity	so
especially since we've got…	reasons for seeing why	plenty of natural arguments to explain why	gosh!	for the same reason we should assume
so we can never see it	I think that	because it can	human spirit or whatever	nasty problem with explaining
I can't take it seriously in any other way	and to say 'ok'	so we have to	then I think	and maybe there's an incomprehensible spirit of badness to
at least you maybe find a consistent position				

Weird Satanist Guy

I'm just excited to see my lord and saviour	represented in such glorious Italian stone	I do hope his eyes gaze upon me	and that my allegiance is recognized	notice me, notice me
part of me wishes that angel statue would come to life	right here in the middle of the city	what stands at the centre	only to be torn in twain	it's like you can't have one without the other, you know?
and only supreme light will wash my body clean	so I carry my wrong-doings on my back	to rescue him from the valley, but again I find nothing	a thousand judging eyes staring back at me	stop asking me that

Homeless guy spits some truth

The hard part wasn't going to prison, it was getting out	and trying to be part of society agin	I had to lose it all to realise it's just stuff	I became a citizen again, I could actually vote	they didn't want me to be part of their society any more
you can be standing there on the corner bleeding and people just drive by you	I walked up to a woman once and asked her what time it was	I just wanted to know what time it was	makes them so terrified of people and relationships that they just don't want anything to do with nobody	because there's so much beautiful things in life
I've got over 240 friends on Facebook	call me.Let's have a conversation	they want the kind of relationships where they can be who they want to be and be who they are	instead of be who they are, be who they want to be	people don't want conversations, they don't want nothing no more
Because you were playing your guitar when I walked up	just think for a minute, maybe there is something worth caring about			

Appendix 3: AMP possible combination

The AMP system allows collaborative agents to select sequences of sound phrases which are combined to produce a unified output. Even with a relatively modest number of phrases the number of possible combinations is huge. Evaluating the number of combinations is a problem in combinatorics.
The present system allows each of up to four collaborators to select sequentially one of nine groups of phrases. A different set of nine groups is allocated to each collaborator. Within each group there are a, possibly different , number of actual phrases. This means that in the case being considered there are four sets of groups, one for each collaborator. Then within each of the four sets there are nine groups of phrases and within each of the nine groups there are a variable number (one to nine) of sound phrases.

To give an idea of the large number of possible combinations of sounds it will be well to review some standard concepts in combinatorics and to recast the domain of sound phrases and groups of phrases into a domain frequently used in combinatorics and statistics; that is of bags containing balls with the balls being drawn randomly from the bags. In this case the bags represent the groups of phrases and the balls represent the phrases. In the recast model each agent sequentially selects a random ball from a random bag.

When using the bag and ball model we often want to calculate what combinations are possible when balls are drawn at random from the bags. There exist a number of standard scenarios of which two are important in this case. The questions are 1) are any of the balls identical? In the AMP case all of the sound phrases are different so this maps to all balls being different; and 2) after a ball is drawn from a bag is it replaced or not? In the AMP case there is a non-standard rule as follows. When a ball is drawn from a bag it is not replaced . But when a bag is empty it is replenished with the original contents. This means that in the case of AMP , neither of the standard cases applies and thus the calculation of possible combinations id non-trivial and probably not analytic.
Consider the following cases in which there are nine balls which are or are not replaced after each drawing:

Case 1 with replacement. There are nine balls in total therefore the first selection will be one from nine. The ball is replaced and the second selection will also be one from nine giving 9x9 possibilities. With N

balls in total and M selections the number of possibilities in general will be NxNxNxN.... i.e. N^M.

Case 2 without replacement. With nine balls in total the first selection will be one from nine. The second selection will be one from 8 giving 9x8 possibilities and so on . With N balls in total and M selections the number of possibilities in general will be N! / (N-M)! using the standard symbol "!" for the factorial function.

Case 3 AMP. The balls are replaced only when a bag is empty. This means that the number of combinations is less than case 1 but greater than case 2. This author has not found any analytic solution to the calculation and the only way of calculating the actual number of calculations was found to be by brute force. However In fact by running a set of test simulations it appears empirically that the number of combinations for case 3 is only a few percent greater than in case 2.
The calculations were performed for two of the four sets of groups. Set 1 had 9 , 9 , 4 , 4 , 1 , 1 , 4 , 1 and 8 phrases in the nine groups and set 2 had 9 , 9 , 4 , 4 , 1 , 8 , 5 , 6 and 6 phrases in the nine groups (table 13).

A brute force calculation was performed for each of the two sets for between one and nine phrases. Above nine the calculation became prohibitively long. An estimate for 12 phrases was that it would take an average-power domestic Windows-based PC approximately one month of continuous processing.

Appendix 4: ***Because There Are Things***

Client 1 and Client 2 Cut-up Square Variations

Client 1

Square 1

Variation 1.	Variation 2.	Variation 3.	Variation 4.	Variation 5.
Right here in the middle of the city There was a light in my room Just think for a minute, maybe there is something worth caring about Such horrible things	Right here in the middle of the city There was a light in my room Just think for a minute, maybe there is something worth caring about Because there are things	Right here in the middle of the city There was a light in my room Just think for a minute, maybe there is something worth caring about And it's called Anjuna	Right here in the middle of the city From a biological point of view Just think for a minute, maybe there is something worth caring about Such horrible things	Right here in the middle of the city From a biological point of view Just think for a minute, maybe there is something worth caring about Because there are things

Variation 6.	Variation 7.	Variation 8.	Variation 9.
Right here in the middle of the city From a biological point of view Just think for a minute, maybe there is something worth caring about And it's called Anjuna	Right here in the middle of the city And a thousand judging eyes staring back at me Just think for a minute, maybe there is something worth caring about Such horrible things	Right here in the middle of the city And a thousand judging eyes staring back at me Just think for a minute, maybe there is something worth caring about Because there are things	Right here in the middle of the city And a thousand judging eyes staring back at me Just think for a minute, maybe there is something worth caring about And it's called Anjuna

Square 2

Variation 1.	Variation 2.	Variation 3.	Variation 4.	Variation 5.
Well it's a sphere of copper two miles in diameter In a most intensive manner And only supreme light will wash my body clean That makes a good story	Well it's a sphere of copper two miles in diameter In a most intensive manner And only supreme light will wash my body clean I had to loose it all to realise that it's just stuff, but still	Well it's a sphere of copper two miles in diameter In a most intensive manner And only supreme light will wash my body clean You can't explain it away	Well it's a sphere of copper two miles in diameter What fucking energy And only supreme light will wash my body clean That makes a good story	Well it's a sphere of copper two miles in diameter What fucking energy And only supreme light will wash my body clean I had to loose it all to realise that it's just stuff, but still

Variation 6.	Variation 7.	Variation 8.	Variation 9.
Well it's a sphere of copper two miles in diameter What fucking energy And only supreme light will wash my body clean You can't explain it away	Well it's a sphere of copper two miles in diameter Because these guys aren't just doing a regular film And only supreme light will wash my body clean That makes a good story	Well it's a sphere of copper two miles in diameter Because these guys aren't just doing a regular film And only supreme light will wash my body clean I had to loose it all to realise that it's just stuff, but still	Well it's a sphere of copper two miles in diameter Because these guys aren't just doing a regular film And only supreme light will wash my body clean You can't explain it away

Square 3

Variation 1.	Variation 2.	Variation 3.	Variation 4.
Might just as well assume it doesn't exist He doesn't want anything And once you decide to get rid of the bad Gods The best thing is to be completely disillusioned	Might just as well assume it doesn't exist He doesn't want anything And once you decide to get rid of the bad Gods Medical doctors say you're liable to go psychotic	Might just as well assume it doesn't exist It aint going to get you anywhere And once you decide to get rid of the bad Gods The best thing is to be completely disillusioned	Might just as well assume it doesn't exist It aint going to get you anywhere And once you decide to get rid of the bad Gods Medical doctors say you're liable to go psychotic

Square 4

Variation 1.	Variation 2.	Variation 3.	Variation 4.
So we don't have the puzzle Because there's so much beautiful things in life But if you will be a little naïve for a moment That all these other people exist	So we don't have the puzzle Because there's so much beautiful things in life Well I think the first one, it simply has to be That all these other people exist	So I carry my wrong-doings on my back Because there's so much beautiful things in life But if you will be a little naïve for a moment That all these other people exist	So I carry my wrong-doings on my back Because there's so much beautiful things in life Well I think the first one, it simply has to be That all these other people exist

Square 5

12 bar tacit

Square 6

They're doing it for you because it's your idea So we can never see it Instead of somebody telling you Because being is always being for something Especially since we've got The whole existence of an external world

Square 7

Variation 1.	Variation 2.	Variation 3.	Variation 4.
Not, not no accident That all reality is mental But when somebody makes you say it Unless you wanted to contribute something you could do that And seem at least to understand what you mean when you use the word 'mind'	Not, not no accident That all reality is mental But when somebody makes you say it Unless you wanted to contribute something you could do that That are more beautiful	Then I think That all reality is mental But when somebody makes you say it Unless you wanted to contribute something you could do that And seem at least to understand what you mean when you use the word 'mind'	Then I think That all reality is mental But when somebody makes you say it Unless you wanted to contribute something you could do that That are more beautiful

Square 8

I think that In the mind Breaks up into a thousand fragments But erm If it could be brought forward Then I think You can't have any monsters It's not that way at all

Square 9

Variation 1.	Variation 2.	Variation 3.	Variation 4.
You didn't have to Practice death control And suddenly It doesn't have as it were a dramatic purpose And err Disproving your idea	You didn't have to Practice death control And suddenly It doesn't have as it were a dramatic purpose And err Breaks up into a thousand fragments	You didn't have to Practice death control And suddenly It doesn't have as it were a dramatic purpose And err But the difference here is that	And they said Practice death control And suddenly It doesn't have as it were a dramatic purpose And err Disproving your idea

Variation 5.	Variation 6.	Variation 7.	Variation 8.
And they said Practice death control And suddenly It doesn't have as it were a dramatic purpose And err Breaks up into a thousand fragments	And they said Practice death control And suddenly It doesn't have as it were a dramatic purpose And err But the difference here is that	And they said Practice death control And suddenly It doesn't have as it were a dramatic purpose Disproving your ideas Bu the difference here is that	You didn't have to Practice death control And suddenly It doesn't have as it were a dramatic purpose Disproving your ideas Bu the difference here is that

Client 2

Square 1

Variation 1.	Variation 2.	Variation 3.	Variation 4.	Variation 5.
And it doesn't have as it were a dramatic purpose And a thousand judging eyes staring back at me And one day It's like you can't have one without the other, you know?	And it doesn't have as it were a dramatic purpose And a thousand judging eyes staring back at me And one day The burden is on the other side	And it doesn't have as it were a dramatic purpose And a thousand judging eyes staring back at me And one day They didn't want me to be part of their society any more	And it doesn't have as it were a dramatic purpose Like a sun And one day It's like you can't have one without the other, you know?	And it doesn't have as it were a dramatic purpose Like a sun And one day The burden is on the other side

Variation 6.	Variation 7.	Variation 8.	Variation 9.
And it doesn't have as it were a dramatic purpose Like a sun And one day They didn't want me to be part of their society any more	And it doesn't have as it were a dramatic purpose You didn't have to pay And one day It's like you can't have one without the other, you know?	And it doesn't have as it were a dramatic purpose You didn't have to pay And one day The burden is on the other side	And it doesn't have as it were a dramatic purpose You didn't have to pay And one day They didn't want me to be part of their society any more

Square 2

Variation 1.	Variation 2.	Variation 3.	Variation 4.	Variation 5.
I find it exceedingly odd Any kind of thing Like this And it will spoil the whole thing for you, you know? Sinister persons deliberately trying to rob people of their freedom	I find it exceedingly odd Any kind of thing Like this And it will spoil the whole thing for you, you know? You can be standing their on the corner bleeding and people just	I find it exceedingly odd Any kind of thing Like this And it will spoil the whole thing for you, you know? To that I say, my soul is at the centre	I find it exceedingly odd According to your thesis And it will spoil the whole thing for you, you know? Sinister persons deliberately trying to rob people of their freedom	I find it exceedingly odd According to your thesis And it will spoil the whole thing for you, you know? You can be standing their on the corner bleeding and people just

Variation 6.	Variation 7.	Variation 8.	Variation 9.
I find it exceedingly odd According to your thesis And it will spoil the whole thing for you, you know? To that I say, my soul is at the centre	I find it exceedingly odd In fact I could not look away from it And it will spoil the whole thing for you, you know? Sinister persons deliberately trying to rob people of their freedom	I find it exceedingly odd In fact I could not look away from it And it will spoil the whole thing for you, you know? You can be standing their on the corner bleeding and people just drive by you	I find it exceedingly odd In fact I could not look away from it And it will spoil the whole thing for you, you know? To that I say, my soul is at the centre

Square 3

Variation 1.	Variation 2.	Variation 3.	Variation 4.
I walked up to a woman once to ask her what time it was Sometimes people are skeptical at first You know, that makes it sound very clinical, like as though If it's in me it has to be in everybody	I walked up to a woman once to ask her what time it was Sometimes people are skeptical at first They want the kind of relationships where they can be who they want to be and be who they are If it's in me it has to be in everybody	You do not know anything except in your own mind Sometimes people are skeptical at first You know, that makes it sound very clinical, like as though If it's in me it has to be in everybody	You do not know anything except in your own mind Sometimes people are skeptical at first They want the kind of relationships where they can be who they want to be and be who they are If it's in me it has to be in everybody

Square 4

Variation 1.	Variation 2.	Variation 3.	Variation 4.
In a most intensive manner Since observed by yours faithfully, God Therefor it would not be at all You're a very lucky person	In a most intensive manner Since observed by yours faithfully, God Well then ironically enough You're a very lucky person	So we don't have the puzzle Since observed by yours faithfully, God Therefor it would not be at all You're a very lucky person	So we don't have the puzzle Since observed by yours faithfully, God Well then ironically enough You're a very lucky person

Square 5

12 bar tacit

Square 6

Variation 1.	Variation 2.	Variation 3.	Variation 4.
Well now you know We can look out at the other people that haven't In relation to the whole problem of illusion	Well now you know Don't multiply entities beyond necessity In relation to the whole problem of illusion	Well now you know Don't multiply entities beyond necessity Because you're somebody that knows about stuff like this	Well now you know We can look out at the other people that haven't Because you're somebody that knows about stuff like this

Variation 5.	Variation 6.	Variation 7.	Variation 8.
Some people want to believe We can look out at the other people that haven't In relation to the whole problem of illusion	Some people want to believe Don't multiply entities beyond necessity In relation to the whole problem of illusion	Some people want to believe Don't multiply entities beyond necessity Because you're somebody that knows about stuff like this	Some people want to believe We can look out at the other people that haven't Because you're somebody that knows about stuff like this

Square 7

Variation 1.	Variation 2.	Variation 3.	Variation 4.	Variation 5.
It's nice to go back up there Not making any effort at all So The sun gives forth no light Then it just makes it more beautiful of a thing With everybody	It's nice to go back up there Not making any effort at all So The sun gives forth no light Unless it be With everybody	It's nice to go back up there Not making any effort at all So The sun gives forth no light Unless it be With everything	What would happen Not making any effort at all So The sun gives forth no light Then it just makes it more beautiful of a thing With everybody	What would happen Not making any effort at all So The sun gives forth no light Unless it be With everything

Square 8

Variation 1.	Variation 2.	Variation 3.	Variation 4.
Organs of vision You know, I don't know Instead of somebody telling you	Organs of vision You know, I don't know Bu the difference here is that	Organs of vision I'm doing what I'm doing Bu the difference here is that	Subjective idealism I'm doing what I'm doing Bu the difference here is that

Variation 5.	Variation 6.
Subjective idealism You know, I don't know But the difference here is that	Subjective idealism You know, I don't know Instead of somebody telling you

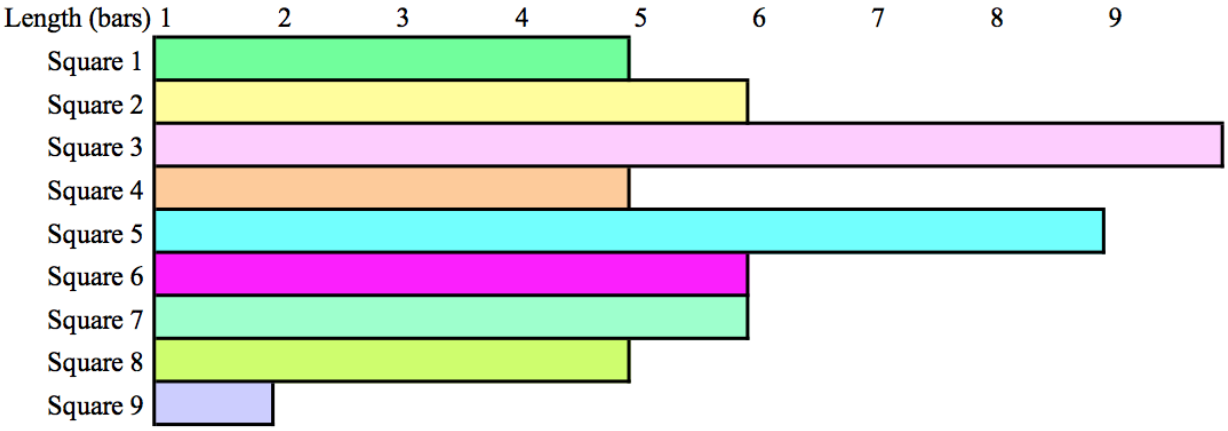
Square 9

Variation 1.	Variation 2.	Variation 3.	Variation 4.
Because it's only in relation Instead of somebody telling you Sometime logical positivists From a biological point of view Are more beautiful By their impact on something	Because it's only in relation Instead of somebody telling you Sometime logical positivists From a biological point of view Are more beautiful This is where all life comes from	Because it's only in relation Instead of somebody telling you Sometime logical positivists From a biological point of view Are more beautiful Some people want to be Completely hopeless	If they told me Instead of somebody telling you Sometime logical positivists From a biological point of view Are more beautiful By their impact on something

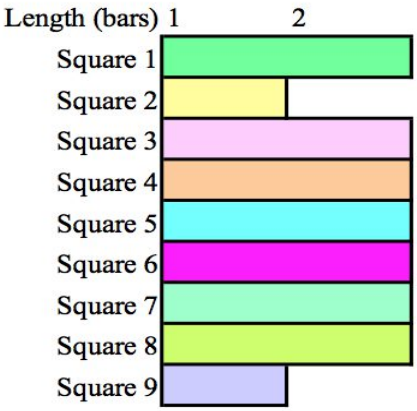
Variation 5.	Variation 6.
If they told me Instead of somebody telling you Sometime logical positivists From a biological point of view Are more beautiful This is where all life comes from	If they told me Instead of somebody telling you Sometime logical positivists From a biological point of view Are more beautiful Some people want to be Completely hopeless

Appendix 5: *Because There Are Things* bar length graphic notation

Client 3

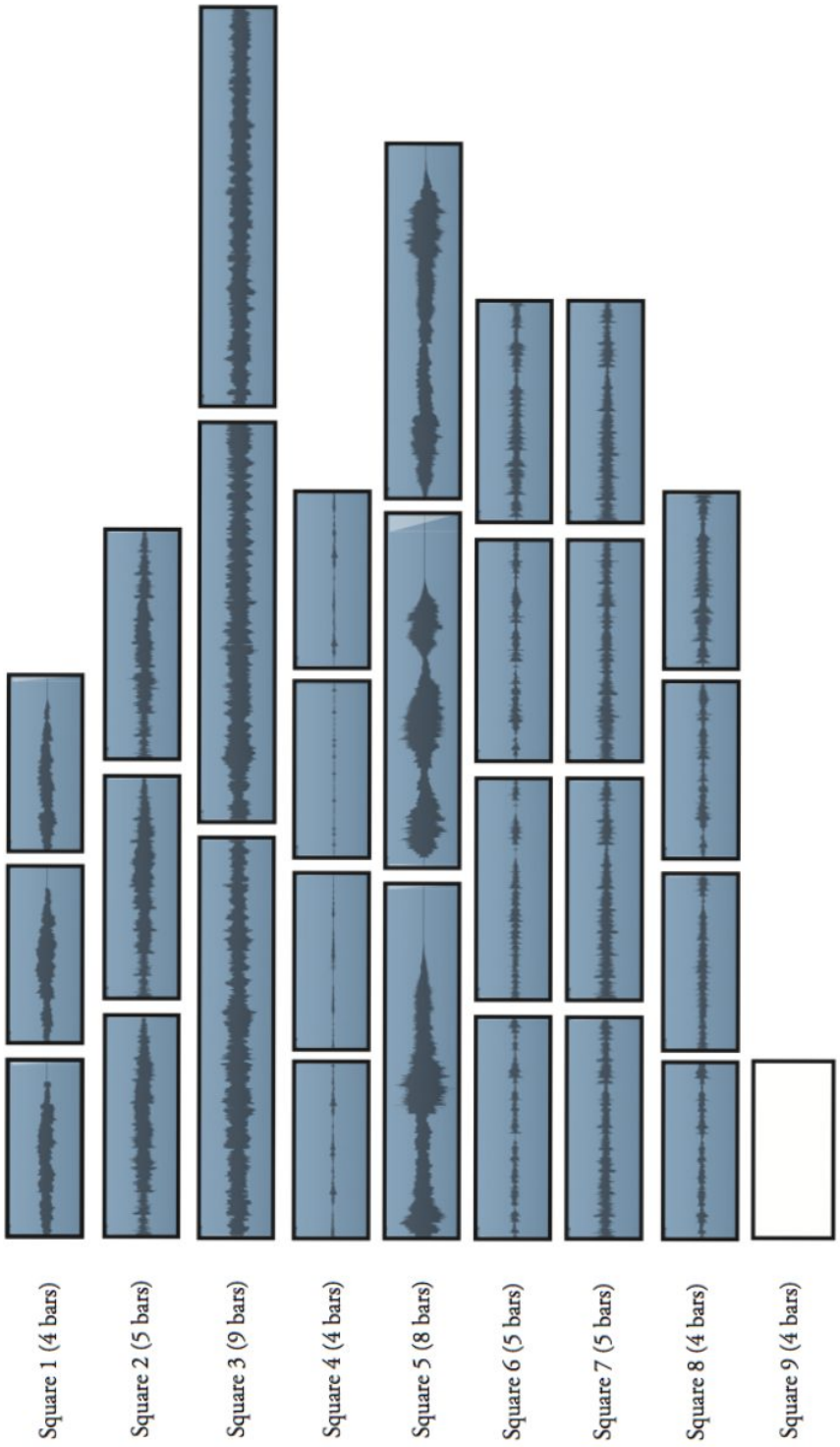


Client 4

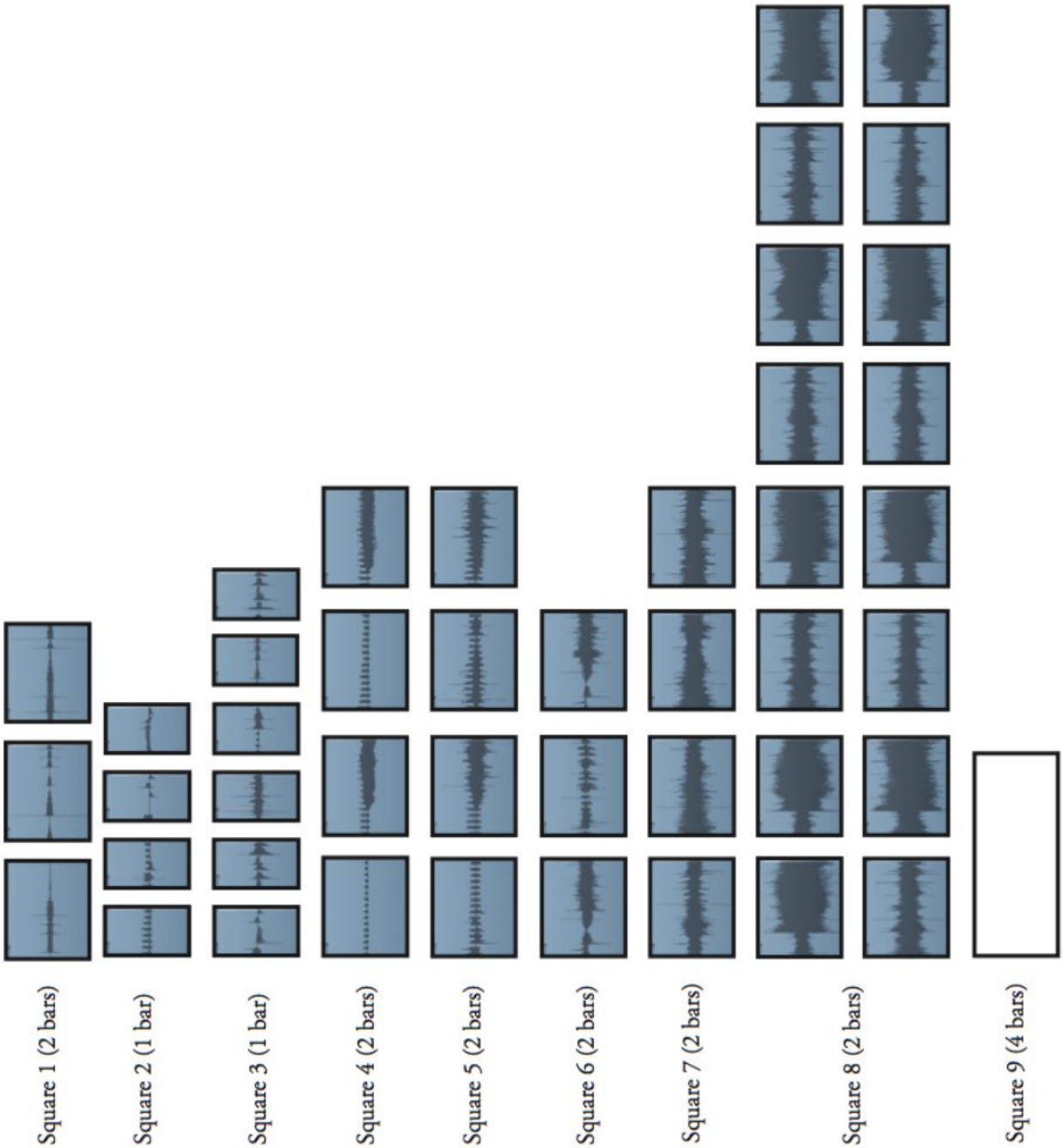


Appendix 6: *Because There Are Things* waveform graphic notation

Client 3



Client 4


Square 1 (2 bars)
Square 2 (1 bar)
Square 3 (1 bar)
Square 4 (2 bars)
Square 5 (2 bars)
Square 6 (2 bars)
Square 7 (2 bars)
Square 8 (2 bars)
Square 9 (4 bars)

Appendix 7: Interview with rumbero Bill Bland

Conducted by Sam Murray
13th January 2014

Murray: One of the things that has come up in my research is the idea of rules, that mean as an app designer, I make the rules of how people are going to interact with each other. They could be hidden very well, but they're still there and you can't play outside of the rules. What I'm trying to do is look at how you can map instrumental and interpersonal interaction in different music styles; different acoustic and electronic music styles, and how that works in various styles, which is why I thought I'd have to talk about *rumba* in terms of looking at who's in charge, who cues what, where does that go when this person does that.

Bland: Well, okay, I'm going to make, my first suggestion initially is that the two things that anyone who took the responsibility to start a thing up, in *rumba*, they would choose the generic idea of what sort of rumba it is, in the sense of the tradition; a *yambu, guaguanco, columbia*, or something else. That something else is a very wide term. It could be *guarapachangueo*, or it could be a combination of folkloric elements that come in to the same *rumba*. That's the first element. Frames of reference come up mentally amongst those people that know a particular style of thing. All styles of music are a language. Each style is a language within itself, and the more someone is experienced in playing within that language the less has to be said about it because it's as if the subject matter of the discourse, the wider your knowledge of the discourse and the wider it is share with the people you are sharing with, the greater the trust to be able to express yourself freely within it. I'm going to take jazz as an example, but *rumba*, finding the genre, and then you've got the genre and you have tempo, then between the musicians involved they will ascribe themselves their own responsibilities depending on who's in the room. Someone will pick up *clave*, someone will pick up *guagua*. It's likely that the singer will play *clave*. Then they can dictate the tempo for the song to be sung. Once you have *clave*, it's also self-evident from the [*pause*] if the *rumbero* starts the *clave* [*Bland plays 3/2 son clave*] then the assumption is you're dealing with *yambu*. That would be a typical Havana way of dealing with the *clave* of *yambu*. It

could be *rumba clave*, but with *son clave* you're going to play *yambu*. If you're talking about *Matanceros* and you play [*Bland plays Matanzas cascara*] then you'd know that. If they started playing [*Bland plays columbia cascara*] you're dealing with a *columbia*. If it was [*Bland plays 3/2 rumba clave*] you know then that you're dealing with *guaguanco*. It's all about a number of people knowing a particular language. It might be easier to say this in comparison to, say jazz, where the same applies. So that jazz, a lot of people that don't have any interest in jazz regard jazz as showing off, and people who love jazz, "no this is not showing off, if you play like you're showing off, you're not playing jazz". That's not jazz. Jazz is a language in itself and it gets, the more people can share the understanding of what each and every person is doing conceptually, the more intellectual it can be as an exercise. The people engaged in that exercise of testing themselves in their ability to improvise comfortably and be creative and not do what you did yesterday. Jazz musicians don't want to become predictable. They're always looking for change. In other kinds of improvised music people don't want to be too risky. There's all kinds of styles that use improvisation, but jazz is probably the most improvised where you've got a chord sequence, or you might have a chord sequence; you may not need a chord sequence like the form catapulted by Ornette Coleman in the late 1950s dispensed with the need to have chords. The melodic idea would be enough. If people are all listening to each other enough, you don't really even need to have, in theory, a time signature, but you will have a pulse. If a bass player and a drummer can work with pulse they can phrase things organically and the language and the communication dictates if it is formalised in to a time signature. It has a pulse and it has movement. The ideas of playing in a very free form of jazz is the ability to feed off each other's thoughts and they hear ...if we compare it to modal jazz, the style of Miles Davis and his 60s quartet, which was very free, if anything structurally some of the freest music ever, but there was a formalised idea of, like replacing harmony with a modal ideas.

Murray: Comparing a *guaguanco* and a 'bop performance, in the *rumba* example, would there be more 'set pieces' or set call and response patterns between the three main drums, or particularly between the two larger drums?

Bland: To some extent, yes. *Rumba* has developed very quickly. It's gone through some

very fast developments in the last fifteen to twenty years, so that from when we were last talking [conversations and lessons at the School of Oriental and African Studies, London, 2005], *guarapachangueo* is a style now. It doesn't actually require any set patterns at all. The ostinato things are the *clave* and the *guagua*, and even the *guagua* is quite free. So as long as you're playing within the constraints of what makes *guagua* then you're correct. You don't have to be playing [*Bland plays 3/2 guaguanco cascara*] any more.

Murray: And this is specifically in *guarapachangueo*?

Bland: In any form of modern rumba you don't have to be as limited. There would be a tendency towards starting the modern style now, because it's expected that a piece should develop and it should not be too boring, therefore you could allow for increases in tempo as it build up intensity – a faster tempo. Likewise, you might start with Matanzas *guagua* for the *diana* and the text of the song and then move in to [*Bland plays 3/2 guaguanco cascara*] when you call the first chorus, but it's down to the lead singer – they call the chorus, then sing an improvisation before the actual chorus is sung by everyone else to make that chorus a chorus. So it's introduced. In the modern sense it's therefore 'called'. That's why the terminology has changed. Words which we use now like *guie* for a singer, now these days when you when refer to salsa – what we used to call the *pregon* or *la inspiration*, these days you'd call it the *guie*, 'the guide', simply because the responsibility now is for the lead singer to guide the changes. So the lead singer will guide the sequence of choruses because it's now presumed that you don't just come up with one chorus but you have multiple choruses. You play with the dynamics so that you can extend the piece by changing the structure within it, or how many people are playing at any given time. Like for example, this was a trick that James Brown used to use in his live performances. So he's play the same song for fifteen to twenty minutes or half an hour by extending sections. He'd use a scream, that would be his technique to end up on the one, and then the volume would go down. Loads of instruments would cut out and you'd just have this bass groove coming on. The same trick was used by Fela Kuti in the development of Afrobeat. It was taken out of the principles of playing James Brown songs in the hotel in Ghana. And because he was in Ghana in bands made up of Ghanaian and Nigerian they were playing soul for tourists but

they found that they could actually identify some traditionally African elements in the way that music existed that you could introduce things from different styles. Their common language was pigeon English, which is why Fela Kuti's songs were usually in pigeon English. Rumba, likewise, has become more open. Traditionally, when you listen to recordings from the 1970s and 1980s you hear tunes that go on for about four minutes. These days you don't have to restrict yourself to that. You can start and take it up to a peak and then drop it back and more or less start again. And you could start with something that was medium paced and use tempo changes to change genres and from a couple of movement ideas by a breakdown which you take out the drums and just leave the *cascara* and *clave*, the changing of the *cascara* could equally cue the *clave* player to make a small change and you could change from a *columbia* to a *guaguanco*. And you can do all that in the same piece. Likewise, the ideas when we first started learning to play rumba, what's the basic pattern for a *tumbadora* and what's the basic pattern for a *tres golpes*, in certain units that applies today, but not every group plays that way. The main family or group that developed the style known as *guarapachanghueo – Los Chinitos-* when you listen to a *rumba* played by them now, you don't even hear the *tres golpes* the way it used to be played. It isn't even there. There's actually no such thing as a set pattern. It's lost. It's playing within the *clave* and what you though you used to know, the defining things that gave you any sense of where you were in the music, are all pulled from under you. They create their own rules of engagement themselves. So the idea that the rules of engagement are entirely set is not the case. What is the case is that people all around the world who have learnt these lessons to experienced tutors do have a common sense of what the rules are, so if you took a *rumbero*, they don't have to be Cuban, but if they've studied enough then they'll be able to play with someone on the internet the other side of the world who's also studied, and you don't know what you're going to play until you've played it.

Murray: What's the equivalent of the *quinto* and vocal interaction for the other two drums? In that example, you've got the vocals freeing up space essentially for the *quinto*, and that is the dialogue between those two parts of the ensemble. You've got the vocals leading that dialogue, and giving the *quinto* space, even though it's not based on a catalogue of set pieces.

Bland: Basically you're embellishing a simple structure

Murray: So the *quinto* in that situation would be embellishing that rhythmic structure, but embellishing it in response to what the vocal was doing.

Bland: Yes, or seizing the moment.

Murray: So it wouldn't need to be in response to a particular vocal phrase?

Bland: It's what's right there and then but also based on the space allowed. If you seize the moment and take that space, being creative will, the singer will acknowledge the compositional value of making more from that section and delay by two or four bars the next line of the song. Each line can hang in the air for as long as is necessary and if anything, it creates a new dynamic "well if we have that big space there then we can maintain that space and have a more developed drumming contribution".

Murray: So that's the vocalist inviting the *quinto* to input something. Now with the other two drums, what would be the equivalent of that? Is there an equivalent?

Bland: Okay, their interaction certainly when we use the tricks we used to use for the style that became Matanzas style of call and response patterns that got set up. You had numerous different calls that produce a couple of different variations of response. The response was not absolute.

Murray: So there are multiple responses from the one call from the *tumbadora*?

Bland: Yeah.

Murray: So the *tumbadora* would call, and it would be up to the other drum to finish the phrase, to call the end?

Bland: Yes, to resolve. But you're delaying the resolution. You set up something to be resolved but if the person responding says "ah ha!" then you extend the idea of the interaction and communication. It is done. However it should be done so it isn't carried away too early in the song, in the *diana*. It depends on the drama that is going on. Rumba is like an argument, it's like a discussion. It's like a pleasurable, where one person is saying "well, I'm doing this" and there's this improvisation, style of challenges.

Murray: It's up to the other person to resolve the music.

Bland: The person who calls it, it's down to the person that responds. It's like a musical equivalent of "would you like a cup of tea" it could be a very short answer or it could involve a lot more involvement, and this same principle is going on with *bata* drumming – what they call *inventos*. Each group of people come up with their own tricks for communicating amongst themselves...It's a game within the music and the drama. It's inviting the spirits. So the other drums in that situation, has this inbuilt in to it because it has structural calls and responses, structuralised. As it starts, it's more open, so you might have for example [*Bland plays some set calls and responses between tumba and tres golpes*]. These parts are set up, each of them has different stages in the dance and in the performance where they occur so that you start off with something wide and open with not too many conversations and as the lines get shorter...and the same happens with, you find this also with the possessional thing in Afro-Cuban music, in the way that they use lines of songs so that a song that has, over many lines, then it's response is the same song over many lines, then gets a little shorter, shorter, shorter, until you get two or one bar songs.

Murray: So it's building up the intensity, doubling it as it halves?

Bland: Then equally, the calls and responses played you don't do too many calls and responses. By the end with the short calls and responses, the drive is so intense with fast call and response. That's designed to get very energetic dancing from someone becoming slightly possessed until the movement and the steps making them dance off the tempo -it's in 4/4 but you're making them dance in 3/4 against it. Their breathing, to do all those

movements, to stay with it, starves them of oxygen and they get properly possessed. The process of working the *Orisha* in to frenzy works a person in to a full state of possession. That's what the drummers and songs are there to do, to make the *Orisha* appear for the public. Likewise, when you're playing rumba, the idea is to do that with the professional concerned – the people who do this, the *rumberos*. One *rumbero's* the dancer, another *rumbero's* the singer, another *rumbero's* the drummer. It's not always the same people who have the same range of talents in everything.

Appendix 8: Interview with Dan Axtell

Conducted by Sam Murray

25th May 2015

Murray: Until today, AMP has only been tested to see if it works, to se if the technology works. It's never actually been 'played' with.

Axtell: Okay

Murray: So it's incredibly useful performing with it to see what has to be changed to the style of the content, and to see what elements of what tracks work well and what don't work well. What new ideas or approaches does it give us.

Axtell: I guess also that there's that sort of discovery element. I haven't been involved in the development, so it's like finding out. It's actually quite nice not knowing.

Murray: What were your initial observations and ideas

Axtell: It's like learning the interface felt like learning what was there as well. Do you know what I mean? It wasn't just, because I suppose the interface is invisible because I don't know what it's about to do. So I'm not so much thinking about rolling the ball around, because I'm listening and finding out what's going on. Then I suppose, after that there's the operation of it. A bit like banging a piano and hearing the sounds it makes and trying to refine "what do the keys do?"

Murray: No, the two approaches I had to it were (1) go in blind – you can't actually see anything that refers to the musical content of each segment. There's no representation about the music that is in each square, so you have to either remember or kind of mind-map it in a way that you kind of remember the shape or dynamics that are in each square. Now, what do you think about the idea of having it how it is -so having nothing – and then also the idea (2) of having some kind of sheet in front of you. So for example, for JB's

lyrics, I could have eight boxes, each with the lyrics that are in those boxes. So you can think “ah, now I want to go to square four, and then to square nine”. Or do you think it's nice almost not being able to remember and just wanting something different?

Axtell: Yeah, it's quite nice that it's not obvious. If there was an image of a trumpet and an image of a drum it would take the element of surprise out of it, which is kind of what's nice I think. I mean, maybe there could be a slight hint, like different colours or something, but I don't think it's...I don't think it would enhance the experience of it by telling you what it is. Maybe some hint, but maybe not even that.

Murray: So did you find yourself just rolling the ball in to different squares, or mentally trying to remember the kind of sonic shape that was...were you building up your own idea of what was in the squares or was it just “now I want something different”?

Axtell: Well I'd just start with one thing so I could just hear it start and then almost knowing that it would change going to a different square I could just musically try and drop something different here, but I don't know what that different thing is so just move one of the balls in to a different square. The it's like “okay, so that's doing that”. I suppose if you've got one device in one hand and another device in the other hand and you're focussed on this one [*signals one client device*] and you're finding out what's on the squares I almost build up in my imagination what's there, based on the fist couple of squares. So there's some kind of sense to it..”so I've got vocals there. I've probably got more vocals there”, rather than number one is this, two is this. It becomes this very loose “right I don't need to explore every square. It gets a bit heavier towards number nine- a bit more layered”. I can build a sort of mp, even if that's wrong. I think that's what it leans towards. It's like if square one was yellow and square nine was red, and it built up to red, you could get a vibe that it gets heavier maybe. But of course after a couple of times I didn't feel like I was remembering what was in the squares. I'd hit a square that felt good and then I go to something else knowing that I'd come back to that because I knew what it was. So I'd go to something I know, and I know “this is going to drop”. Slowly I learnt more, in each hand, about what was in the squares as the time went on. So it's the kind of thing that could start

off a real mess, and you could evolve it in to a structured track in a compositional way. You're pulling in ideas.

Murray: So we've just done that sitting in the same room sat next to each other, but what do think it would be like if you were at home, I was here, and Guy was at home?

Axtell: I don't think it would be very different because I'm looking at my screens, and I think the same with music. If I'm playing with someone, I suppose the only thing that's missing is eye contact, and that kind of like [*Axtell imitates looking at other musicians in a live instrument performance*] "yeah, that sounds good". But, you know, maybe there's a different way of making that connection. So if I'm in one place and you're in another place and we're jamming on this thing I suppose distinctly knowing what sound is coming from you and what sound is coming from me. So if I've got the drums and the bass, and you've got strings and vocals it's going to be very clear and possibly easier to feel that remotely.

Murray: And so is that differentiation from each of the clients not particularly apparent how the client segments are currently built up? Do you think there needs to be more definition between each client's role?

Axtell: Yeah, a little bit maybe. Because I think we're musically minded so we can, you know, dig beneath the surface and hear what's going on, but for someone that's just using the app' you feel that you're doing this and every bit has it's own space. Because I think you'll get someone that just wants beats. You know what I mean – and then you've almost got a band. But how many musicians go in to a booth and don't see anyone. People make music like that. It's not like you have to have that eye contact. The eye contact in this scenario was helpful, because when we got to a point where we didn't know who was doing what there's that almost agreement that "oh, this is cool" but I think that can be replaced with "oh right, there's a chorus happening" and everyone comes together and you're just hearing it and feel it that way.

Murray: So having two clients each. Do you think that's an advantage? having one in each

hand, or do you think that it complicated it compared to if thee was three or four of us each with one client each?

Axtell: The only disadvantage to having a client in each had was, if I wanted to hold on to something n the right hand and I start focussing on the left hand then the right hand drifts. As long as I remember to have one eye on each – like one of those helicopter pilots – but that was also a little bit that you've just got to get better at it. It's not a fault. I can imagine that if you get that down, then it actually feels quite intuitive.

Murray: SO originally it was going to be one client each – which it still can be – whenever any of us are playing an acoustic instrument it's always at least two-hand coordination.

Axtell: Also, if you've just got that one device, I think that it could be a little boring possibly. You know, you've got the musical level to enjoy and you've also got the interactive level and if they're both happening then that's wicked. So if you've only got the musical level, let's say you've only got one client, I think it could loose interest quicker because it would be like "right, next one". If a use only has one client then you need to be clicking stuff, whereas all of a sudden with two clients it immediately takes it somewhere else. It's like those games where you have the ball in the maze..

Murray: Which is exactly what the idea for the GUI was built on.

Axtell: Yeah, I think it's really cool.

Murray: So in those recording we weren't actually saying a word in terms of deciding where to go whereas if we were playing a gig together, we'd be like "chorus in four" or "head" and then everyone would have a signal that there was going to be a change. I'd be interested in us doing it again with us actually vocalising changes.

Axtell: I think to do that we need to know the parts or there needs to be a visual guide. Lets say the nine squares are separated in to sets of three; the first three are yellow, second three

are blue, last three are red, something like that. It could be first row are verse and break type, second row chorus type stuff, third row are break type stuff. You don't need to know what it is, but you know we're going to go to a break. Someone drops out, someone goes to that section. It could be doable. Otherwise I think you need to know all the parts, how long the segments are and all that stuff. Shorter segments feel better, because you want to move.

Murray: That's a good point. At the moment there's actually very few samples on each client that are the same length. So if you're on a client and play square one, and then immediately go to square nine, it's going to play the entire segment of square one before moving to square nine. So maybe if they were predictable lengths?

Axtell: Well, if they were all the same length it might become a little bit...I mean it would still be cool. But if they're different lengths then it becomes more about the music, it's more "this sound last this long", whatever. But if the music is distinctive enough on each client that that would be really easy to hear. So for example if there's a vocal hook, you're going to instinctively feel when it ends. So if you can hear that then it becomes a lot easier. Like JB's vocal was difficult because it could have been two bars, it could have been eight bars, whereas if it was someone singing hooks it could be one phrase per square. Same with the instrumentation, you could have the first two squares of each row as seven bars, and the last square as one bar so you know you have a different last bar. You know, stuff like that. Is it possible to interrupt the segments?

Murray: At the moment in FMOD I've got it so that it says – they're all looped – but you can have it so that they only play one. So you go to square one and it just plays square one once though and then silence. The thing about different bar length is that if you imagine you have a five bar drum beat and you have a three bar synth pattern on another client, you can have more potential variation because that three bar synth pattern is going to repeat on bar four of the five bar drum pattern, and so they don't align. But maybe that degree of difference is confusing?

Axtell: I don't think so. You could have a whole ambient thing going on and that would work brilliantly because it would seem to be infinitely different. If you want to create more of a track, a song, then maybe it needs to be more uniform. But I tell you what, what I wanted to do but I couldn't. So you've got [*simulating using a single client*] "d-ga d-ga d-ga d-ga" [theme one] and you've got "chi-ga chi-ga chi-ga chi-ga" [theme two], I wanted to go "d-ga d-ga chi-ga chi-ga d-ga chi-ga".

Murray: So you wanted to interrupt the segments?

Axtell: Yeah, there was one bit, one drum break.

Murray: Right, okay, that takes me back to a conversation we were having before we started recording. Having one client with vocal beginnings and one client with vocal endings.

Axtell: Yeah.

Murray: So what you're saying I could do. As long as, you tell it in FMOD 'I want you to transition at segment end, on the beat, or on the bar'. So if you've got a two bar loop you can interrupt it half way through to move to the next segment. But what you then have to do, is you have to make sure that all of your segments are transition-able half way through. So if you've got a segment that's seven bars long, in the composition you need to make sure that it transitions musically at three and a half bars. You see what I mean?

Axtell: Yeah, it's in the composition of it. That's really very interesting. That's like technology creating a new limitation, a new form of composition. Just like when you need to compose music for games that will change you know? You could mix it up. You could have maybe square one is going to hit the sample, let it play to the end and then stop. Maybe square two will only play when you're on there. So each compositional element can be forced by where "right, there's this sweeping sound effect that lasts a few bars and I never what that sound to be interrupted, so as soon as that square gets hit, that sound will always build". You know, so there's a drum track that you can switch on and off and flick

to something else. That way it's a bit like being on stage with Ableton, “right, coming up to the break, coming up to the drop. Bang!” Dropping in a whole eight bars of drums and then going and playing over it.

Murray: yeah, so you can do that. You can each segment its own specific set of rules.

Axtell: Would they play over each other?

Murray: No.

Axtell: But whatever it is that it allows or doesn't allow, that's like the blueprint for the composer.

Murray: This is it. This is the whole kind of concept. There's this idea called Procedural Authorship. So in a video game, the person that's written the code for the video game is the procedural author and they have created this world, and nothing can exist outside of this world, outside the rules of the game. So they create the rules for the game and this blueprint for how things are going to interact. But, within that procedural authorship there's an infinite number of possibilities of how it can play out. Like an online role-play, the person that wrote the code doesn't need to know every eventuality.

Axtell: Yeah, but they created every eventuality

Murray: Yeah, so the author of the code wants to leave it as open as possible. Well I do anyway. We worked out that if every segment on there was a 4/4 one bar sample using four clients, in the space of four minutes there's more possibilities of sonic outcome than there are atoms in the universe. It's eighty five to the power of one hundred and twenty four. It sounds ridiculous but that's the idea of procedural authorship. You come up with this rule, but the outcomes are essentially infinite.

Axtell: You can prepare and compose something like that that is almost infinite and yet,

never wrong. You know, it's possible to create a piece of music and there'll never be a wrong note in the wrong place, it's all just one key or whatever, right. Or you can have changes that happen. If you've got changes that happen, there's got to be a way that people can read each other, in a way that *[imitates normal ensemble interpersonal non-verbal communication*].

Murray: Yeah, so you're giving some “back to head” or “ four to the chorus” or whatever.

Axtell: Yeah, now obviously, if everyone's in a different place, it's like how do you do that? Because you maybe don't only want to make like ambient music, so how do you get people to sort of agree that they're going to change the vibe of the track. Could there be something on the screen that you see where other people are going or .a bit like you could almost see a ghost ball.

Murray: That's very interesting because we actually though about that idea.

Axtell: Or everyone can see each other's camera?

Murray: So one of the main ideas behind this is the idea of the open work that Umberto Eco talks about, where the composer hands over power, whoever it is that creates this original piece of music gives it to people in a way that they are allowed to interpret it. So one of the classics in this style was Stockhausen's Klavierstücke XI which was made up of a series of piano parts that the performer could choose the order of. So that was open because the performer could choose what they do.

Axtell: Maybe, as one person goes to one segment, it triggers the ability or inability to go to other squares. So if you like go to segment three, suddenly segments nine and four disappear on my phone, they're not options. An then what is on my phone works in a certain way with what you're doing, and vice versa. If I then go to one of my available segments then that affects what is available to the other players. That could get mental because everyone's changing and things are flicking on and off. Something you were just

saying made me think. We've known recordings, you know, you can buy a recording and play it in your home and listen to it. It's unalterable, that's the track, that's the recording. But before that it was sheet music being sold, with people sitting at their piano playing it. And that's open to interpretation. You can get a sheet of music and that's how it is, but you can re-harmonise it, you can just play it wrong, you could put your own vibe, change the speed. So in a way this is going back to delivering music that people can re-interpret.

Murray: Absolutely, which is kind of the whole point. So Barthes says that 'text' – and by text I mean musical notation as well – is just a "tissue of quotations" and you can actually rearrange that in any way you want to make something else. So nothing that we say is 'original', we're just stringing things together that we're already heard previously in a different way to give it a different meaning. And you could say the same thing about music. To kind of simplify it, everything's a rip off.

Axtell: Yeah totally. You need an input...

Murray: ...To have an output. And going back to this idea of interpreting sheet music which I think is what Beck did quite recently – I think he released it as sheet music only? - "you want to hear my album, you have to play my album". So normally in a musical setting you've got a composer who may or may not be present, a performer who will be present, and an audience who will be present in some way – be that listening to a CD or whatever. You have those three categories of people. Sometimes everyones the same person, and sometimes everyone's a different person. So one of the ideas behind this application was to have the audience as the performer as well.

Axtell: It's kind of like what help do you give that performer. If it's purely reacting off sound, reacting off what other people are doing, or "ah, my screens changed colour", that means something so I can react to that. You want enough repetition that it's really easy to grab hold of, but yeah, those odd bar lengths in certain types of music would really give it that feeling of complete randomness yet you're in complete control of it. That would really work with the ambient side of stuff. Because the ambient stuff is so much more open...or is

it. You take something like 'So What', it's just two chords. Why can't that openness be in every genre of music? Well it can I suppose. You could have the whole folk vibe, it just has to be carefully, skilfully composed so people don't allow themselves to not have a good time.

Murray: Okay, so when we were doing those performances, we did three different takes of each track. Do you think they sounded at all different?

Axtell: Yeah, definitely. There were different moments in each of the takes. There were definitely moments when it was like “ah, that was a bit of a song” and then there was other moments when it was like “what? What's going on?”. With Ableton, when I'm using that on stage it's really easy easy to forget how long I've made different loops because I have so many. So I've got some drums for two bars, I've got a sequence for four bars. Those two bar drums are going to loop so I can just hit everything...go. But because they're different lengths, I can forget how long something goes on for...panic....right, just start it again just in case I've got it in the wrong place, just making silly mistakes. But, what Ableton does really nicely is when you hit play on a sample, there's a little progress bar. It's like “ah, right, I don't have to remember that this was a...I can see that it's getting towards the end of the sample. That would be cool, if you've got different lengths, an indication of when the segment is going to loop back because then you can prepare in a sort of live improvisation/composition way.

Murray: So, some way of tracking progress?

Axtell: Yeah, like maybe a colour on a square could build up and a hundred per cent is the end and then it goes back down. Or something like that. I don't know how doable that is, but that would take away a lot of the mystery, not mystery, unpredictable-ness, bad unpredictable-ness, you know, so you can kind of see what's going on.

Murray: Would that change, let's say we're doing a three client track and I'm solely responsible for the content of client one, you're solely responsible for the content in client

two, Tano for client three, and so you know every bit of the content. Would that be different? Do you think you knowing the exact content.

Axtell: The length or the content?

Murray: Content and length. So you know that if you roll on square one you're in a two bar seven groove and you know what the outcome is going to be when you go on each segment, would that be different?

Axtell: No, I think that it would be the same, I think that it would just change how you discover it, because if we sat there long enough we're going to know what all the squares are and we'll be in that position.

Murray: But you still won't, in the actual moment of using it, you want to know where you are in that segment?

Axtell: Yeah, and the reason I say that is because I wanted to drop out at the end of some JB vocals, but I didn't know when the vocals were going to end, I didn't know if he was going to keep going.

Murray: I get it. I see what you mean.

Axtell: That's simply avoided by just knowing and hearing it first, but I think it's fun to hear it as it's happening for the first time and still know.

Murray: And so one way of doing that is to make it so that, so you can transition to segment five which is silence, on every bar.

Axtell: Yeah.

Murray: No that isn't right is it, because you've got the actual dynamics of the sample.

Axtell: I don't think you need an empty square...actually maybe you do. So I'd make the silent square one of the corners, because I wouldn't have to balance it, I can just roll the ball over to the corner. I was like "I want to drop out, but it's right in the middle" [*imitates not being able to balance properly on square five*] so maybe Boom, mute, then back on.

Murray: Interesting. Square five is actually a hang-up from the original idea that I was working on. It was originally going to be a three-dimensional cube, three grids of what we're just seen on each client. Now, square five of the middle grid was going to be silent. That was going to be because the accelerometer on a second device, if you physically lifted the device up the ball would go to the top grid and if you went down it would go to the bottom grid and then you would need square five to navigate between the three grids. But, the accelerometers weren't predictable enough going up and down – to do with gravity I believe – to be able to time it perfectly. Square five just stayed.

Axtell: But you need that silent square because you can't, there's no other way of silencing it.

Murray: There's no other way of silencing it. It's using FMOD in an unconventional way. If you want silence you actually have to play a sample of silence.

Axtell: Yeah, it's also just knowing the lengths and being able to flick between them more efficiently. Although, if I can see the length the I can wait knowing.

Murray: Do you think that you would realistically be able to do that on two devices? Do think you could say "right, I'm going to go...I can see that segment two – that's three bars, square five – that's four bars", do you think that by the time you've looked over there you're still going to know.

Axtell: Yeah, because, with Ableton there's a lot of visual contrast, so you don't have to think about it, you can just see that it's nearly over, the sand is running.

Appendix 9: Email exchange with Julian Brown

16th February 2015

Hi JB, nice one for the text, and saying that you might be up for doing something. Massively appreciate it, and it might be really interesting I think. Right, think I need to explain a little before we go any further. Basically, my work is looking at interactivity in music, and primarily looking at how I can create music that can be 'played' in the same kind of way as a video game. I've made an app (android) that links 4 mobile phones together over the internet and allows my music to be interactively played with in real-time. Imagine this: on your phone screen you have a 3x3 grid of squares, and using the phone's accelerometer, you roll a ball around this grid. Whenever the ball rolls in to one of the nine squares on the phone, it plays a musical chunk/sample/whatever. Now, each phone has nine different chunks/sample in it, and it's all time-coded up so that all users can hear what everyone else is doing- in time, and can explore the music in the same way that a multi-player video game does. So, you have a piece of music divided up into chunks spread between 4 phones, and the players/users can arrange the music however they want. The app works, but it's quite fiddly and needs some work under the hood- so I'm not sure it's work me sending it to you at this stage if you get my drift.

What I was thinking was that it might be really cool to get some text from someone such as yourself that could be used in some of the pieces. There's this artistic/musical style called Open Form or 'chance music', which basically presents the performer with a set of possible ways that a piece can be performed, and it's up to the performer/player to stitch the music together as they wish. Generally a bit more complicated than that, but that's essentially what they do (look at piano piece XI by Stockhausen and you'll see what I mean a little better http://de.wikipedia.org/wiki/Klavierst%C3%BCcke_%28Stockhausen%29#Klavierst.C3.BCck_X)

I don't know how possible this is with poetry/spoken word but what I was thinking was that it would be wicked to get a piece from you that consisted of 8 separate lines/verses/paragraphs that can be read in any order. I have no idea how possible this is - I've only ever done it with music, but I think that it could end up being very very interesting, and as far as I'm aware, nobody seems to have done this before...like this

anyway.

Sound at all interesting?

Hope to speak soon

Sam

17th February 2015

Yes I think I get it! Heart n Soul, an arts organisation who work with people with learning difficulties based in Deptford, I think do something similar at their events. Interactive live music, check this link: http://www.heartnsoul.co.uk/category/artists/details/dean_rodney
I think my style of poetry/rap writing could actually suit what you're trying to achieve, interchangeable bits of verse that still seem to make sense no matter what order they are in. Know you said you cant really send me a beat to write to, but perhaps you can email me a section, like the control/default bit of music the track falls back on? Because I will need something as a guide, mostly for BPM/tempo, so I know im on the right track (forgive the pun lol). Depends what it is really. If its a mid-tempo hip hop tempo I may already have something that might work. If you want a more free-form style of word-art/poetry, I'd still need some kind of initial beat/track to write to, as I say mainly for BPM/Tempo/Speed, but also to get the mood/feel of the piece.

Maybe you can send me something?

Where are you based? Do you have access to recording studio as I dont at the moment?

Best,

Julian

17th February 2015

Hi Julian

That's funny, one of the original ideas behind the app actually stemmed from wanting to create something that could be used as a kind of coordination exploration device for people (mainly kids) with severe dyspraxia - I used to teach some kids that I thought could benefit from that kind of thing.

That's wicked news man, really glad you think it's a cool idea. I've actually got Tano coming over tomorrow to work on a track that I'm thinking of sending over to you as a a

work in progress, so should be able to send you something tomorrow or Thursday at the latest. I've got a studio so it's all good to record vocals and whatever else over here....in sunny Croydon. Where are based? I could maybe swing over to have a chat about it if that would be of any benefit?

Nice one

Sam

17th February 2015

Hi Sam,

Very interesting! Didnt realise thats what you initially had in mind! Maybe you could check out what Heart n Soul do and try and improve on it? You never know there could be some money in it!

Ok, I look forward to hearing what you send so I can get started. Whats the brief writing-wise? I mean, do you prefer Rap-style lyrics, or more Free-form poetry? Also, is there a specific subject matter? Or am I free to write about whatever I want?

Croydon's not too far from me, I'm in Forest Hill. Great that you've got recording set up! I may have enough with your brief and the music, but if youre planning to come neaarby Forest Hill at some point, holla at me and if I'm in you can pass through...

Say Hi to Tano for me, whats his alias these days? It was Astral Satellites before but I think he's changed it now lol

Julian

18th February 2015

Hi Julian

Yeah, it was just from teaching that the idea came to me really, and then it just kind of took on a life of its own - I was meant to be doing a PhD in something completely different but this just kind of took over. Really the brief is in keeping with the whole vibe of the app, which is to allow each contributing artist to decide what they feel works best. In my head I was hearing more free-form poetry, but that's just what was in my head. Musically, the app is driven by cycles within cycles within cycles if you see what I mean, but you might get a totally different trip from it. Really it's just taking the material that you hear, and

interpreting it your own way - then this in turn will prompt me to change the core musical material, *ad infinitum..*

This guy from the Oulipo movement was one of my original inspirations (http://en.wikipedia.org/wiki/Hundred_Thousand_Billion_Poems) very cool idea. Got me thinking about how I/we could add yet another layer to it by having any first half of a line/verse/paragraph could be swapped with any second half of any line/verse/paragraph...if you see what I mean....Anyway, I'm running away with myself a bit now. I can think about this stuff too much. Basically, I don't want you to think that anything has to be stuck to. If you think that in places you want multiple things being said simultaneously/big spaces left/whatever, it's over to you.

You're just down the road! I work at a sixth form college in Deptford so I go through your area a couple of times a day to and from work. I work just opposite Deptford market, so easy to hookup.

Right, here's a little idea me and Tano were looking at today. Sending it to you rough rough rough, but wanted to give you a vibe as soon as possible. We were going for a strange electro vibe, but with loads of conflicting/contrasting timings to try and loose the start of each bar if you get what I mean. Have a listen and let me know what you're thinking.

Yeah, Astral Satellites - never very keen on that name! I convinced them to change it, so we're now working under the name Whitebox. Got a proper Ltd company and everything....alarmingly grown up....Just had to do our first corporation tax return. I never realised the value of a good accountant until 2 months ago....

Let me know what you're thinking.

Take it easy

Sam

21st February 2015

Sounds good. Thanks Sam.

But its hard for me to 'get in the vibe' of it enough to write as it's so short. Is there any chance you could send me a version where the section with drums is looped for longer, say 2-3 mins at least. That way, I can just let it play and vibe to it.

Do you have a timeframe/deadline for this?

22nd February 2015

Hi Julian

Okay, again rough as and a little stripped back, but I've done a 4 minute version for you to work with which will hopefully be a little easier. Let me know if you want any elements re-arranged to make things any easier and I'll get on to it.

Speak soon

Sam

23rd February 2015

Thanks Sam,

Will have to wait until later tonight when I get back home to download it and have a listen. Im sure it'll be fine. I'll get on it as soon as. Did you give me a guide re: subject matter/theme, or an I free to interpret as I like?

Best,

Julian

24th February 2015

Hi Julian

I think that in keeping with the idea behind the app, you should feel completely open to interpret it as you wish....no barriers.....

Sam

25th February 2015

on that very theme.. "no barriers..." i think i may have something that could work

when are you free for me to put a vocal down?

weekend or next week maybe?

26th February 2015

Hi Julian

Sorry, I was out on a college trip all day. In terms of me being around, my timetable is

basically free every night from about 7.30pm every day during the week really, but, if that doesn't work for you, then I can re-arrange things. I could take a day off school next week if during the day works better for you? If you let me know a few times over the next 7-10 days that are ideal for you, I think that I'll definitely be able to sort at least one of them out at my end.

Creatively, one thing that it's probably worth me mentioning is that when I do the 9 audio chunks of music, I generally leave 1 silent. This is just so that the 'player' can choose not to play anything at that particular point if that makes sense? Might not be relevant to what you have in mind, but thought I'd mention it...

Looking forward to it

Sam

Appendix 10: *Because There Are Things* session transcription

Iozzi: Are we going to try one? How long do we play for?

Murray: That's up to us

Variation 1
Left to Right: Tano Iozzi (client 4), Sam Murray (clients 1 and 2), Dan Axtell (client 4)

Axtell: That was interesting. It was like, um, kind of knowing it wasn't helpful. You've just got to play it and experience it, and get a real sense of it.

Iozzi: I was looking at it, but I was really just rolling the ball around. I think I finished at one point but then everyone carried on.

Axtell: I was counting it wrong, I was going "1, 2, 3, 4" but then I've got to wait 7 bars, and that's when I was getting lost and going "shit, is this half-way through?"

Iozzi: I thought it was interesting. There was a couple of bits in it I really liked.

Axtell: Yeah, I cracked up at one point, because it just went quiet.

Iozzi: I think we all decided to make it play something really quiet, and I think I tried to end it before you guys wanted to end it.

Variation 2 is performed

Axtell: I think we're getting more familiar with the material now.

Murray: Yeah, I think it's obvious from the first one then to the second one that the

familiarity is starting to build up.

Axtell: Square 1 says that it's 4 bars but it appears to be 8. Is that possible?
Murray: Shit. That's wrong. It should say 5 bars!

Axtell: I was like "what's going on here?"

Murray: So let's do another one with no planning or instructions.

[*Murray places a copy of appendix 4 on the table to re-familiarise himself with the variation structure of clients 1 and 2*]

Iozzi: So if I wanted to I could just choose not to play?

Murray: Yep

Variation 3 with addition of appendix 4

Iozzi: Interesting

Axtell: That one didn't have the magic like before, there was a lot more like empty spaces. That's interesting.

Iozzi: Should we maybe do a planned one this time?

Axtell: So how do you want to plan it?

Iozzi: Will it be a case of who starts it and that sort of stuff? I wouldn't mind doing one where it starts just with the music, and then the dialogue comes in a bit later.

Axtell: Why don't we go you [*Iozzi*], me [*Axtell*], you [*Murray*]

Iozzi: Yeah, and then maybe when you drop out [*Murray*], you drop out the voices, and

then maybe we drop out. I don't know.

Axtell: It's going to be pretty difficult to go "right, let build to a climax", I know that I would need to be much more familiar with the music.

Iozzi: This one [*Client 4*] is quite simple because it kind of builds, it gets more complex as you move up [*numerically up the square numbers*], so that would be a climax, and that's simple. So this one I can flip between, I know it's going to be simple there and I know that it's going to be bigger there.

Axtell: I've just remembered that it's hitting variations as well.

TI: Yeah, so you're not quite [*pause*] this one's kind of more complex with what it's doing.

[*Murray hands Iozzi and Axtell copies of the wave form graphic notation (appendix 8)]*

Axtell: Aha! Right, with that now we can go "right, quiet/loud". Alright.

Iozzi: Right, that makes more sense. I really like that as a guide. I think that all musicians from now on in orchestras should be forced to read waveforms. I read waveforms. I'm very fluid in it.

Axtell: Right, that helpful. That's more helpful than probably anything else.

Murray: Do you think the waveforms is more helpful than the bar length?

Axtell: Having the number of bars written down is helpful. Oh no, it's written on the other one anyway.

Axtell: Okay, so let's say Guy [*Iozzi*] starts with the drums, I'll come in with something kind of soft…

Iozzi: Yeah, that's sort of what I tried last time I think.

Axtell: Then when your dialogue comes in…

Iozzi: Can you do [*pause*] do they [*client 1 and client 2*] have to be at the same time or can you just have one on silent and just do one for a bit?

Murray: Yeah

Iozzi: Maybe try that, and then bring the other one in. Should we just try it? I don't know.

[*Murray familiarises himself with the content of clients 1 and 2 squares 6 and 8*]

Iozzi: Why don't we start with the music, so drums, then Dan, then you [*Murray*] can

bring in these [*clients 1 and 2*], and then at some point we'll drop out the music and you [*Murray*] can finish on a vocal. I think that might be better than finishing on the music.

Axtell: It might be nice to put in a little break. So we [*Axtell and Iozzi*] drop out and you [*Murray*] stay in.

Iozzi: Maybe I'll nod at you and we can both go to silent yeah? This should be interesting.

Axtell: Sorry, how are we finishing?

Iozzi: Just the vocals.

Axtell: So we drop out in the middle, come back in, then drop out at the end?

Iozzi: We do two big drop outs basically, yeah.

Murray: Tano, give me a nod for the vocals

Variation 4 with addition of appendix 6

Axtell: Interesting. That was kind of cool? It kind of worked.

Iozzi: Yeah, I mean we sort of did what we said we were going to do. The breaks maybe not.

Axtell: I was on a nine bar loop.

Iozzi: So it would make more sense for you [*Axtell*] to drop out, then I can hear you drop out and then I can drop out.

Axtell: So I'll give you the nod.

Iozzi: Give me the nod, then I can hear, and then maybe I'll go to a really minimal drum.

Axtell: So in that drop out, shall we come back in in the same way? So I'll come back in, and then you drop the drums back in. For the end, I think I'm going to stay on a minimal square a bit longer so it's not loads of vocals on their own.

Iozzi: I went down to a minimal drum. So should we do the same thing?

Axtell: Yeah, same thing.

Variation 5 is performed

Iozzi: That was the best one.

Axtell: Fucking nailed it.

Iozzi: That was good.

Axtell: That was really good.

Iozzi: That was really interesting. It was definitely like the best one.

Murray: So what did we do there?

Iozzi: Well, we arranged it [*pause*] sort of.

Axtell: And we were a bit more familiar, and we practiced, we rehearsed.

Iozzi: Now I know where to roll the ball to make it do the things I want it to do, and we worked out the pauses better.

Axtell: And I find myself going "right, there's three loops I really like, that I know".

Iozzi: I like square 4 because it drops stuff out but keeps it quite melodic. It's just getting familiar with what it is.

Iozzi: I've got one suggestion. Maybe drop out the vocals here and there, even during it.

Murray: I think that's a really good idea. In that case I think what we should do is maybe do a longer one [*drop out*], because the vocals squares are so long. Actually, what I'll do is do a vocal square then drop out. Then do another vocal square, then drop out, so it's alternate.

Axtell: How about this though. We start as we were and then we drop out as we were, so I'll drop out, then you [*Iozzi*] drop out, and leave just vocals. Then as soon as we get there, [*Murray*] go to your silence so that when we [*Axtell and Iozzi*] come back in the vocals have more or less dropped out.

Iozzi: So that will be the point that you can drop out? So when the music starts dropping out, you [*Murray*] drop out because it's going to take 22 seconds.
Murray: So the music drops out and I use that as my last vocal square, and then even if it ends up the vocal square finishes and then it comes back in, that's okay?

Axtell: So when your vocals come back in, we'll start dropping out.

Murray: How about when you come back in, come back in heavy

Iozzi: Yeah, after the break. Then end it. Shall we do quite a quick end after the drop out?

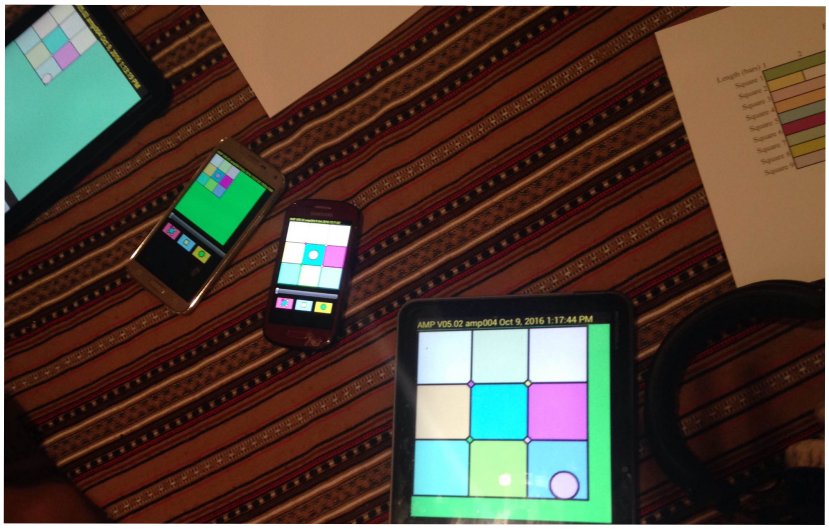
Axtell: Yeah. So Guy starts, I come in, you [*Murray*] come in, play for a bit, we [*Axtell and Iozzi*] drop out.

Murray: That's my last vocal.

Axtell: Then we come back in.

Iozzi: We have a musical break, your back in with the vocals, we do that for a bit and then we end.
(Axtell, Iozzi, and author, composition-performance session. 9th October 2016.)

Variation 6 is performed



AMP GUIs during 9th October 2016 session