Elective Impoverishment: Creativity Through Constraint for the Twenty First Century Musician

By

Joshua Moult-Bennett

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Abstract

This is a practice-as-research study that explores the relationship between technology and music composition. The computer is at the heart of modern music production, owing to its flexibility and ubiquity. Nonetheless, I have been questioning my relationship with this technology, and asking if the luxuries it affords are truly enabling creativity in the way I feel it was presented to me in my musical education. Having established desirable attributes of music composition, I have been investigating how elective impoverishment of technology helps encourage these attributes. Using only cassette tapes as a means of recording, I have been composing music without the aid of the digital audio workstation.

The project is grounded in reflective practice, but is also auto-ethnographic in nature. As a young musician I have grown up in a world where composing with computers is the norm. I have always struggled finding inspiration and satisfaction when working digitally, and many of the issues I struggled with were seemingly shared by my peers too. Starting with an idea then deleting it, getting stuck for things to add to existing ideas, collections of unfinished and uninspiring projects that will never see the light of day - my own stories are similar to the stories of so many others. Writing music without a computer, using tape for audio and paper for notation and arrangement has granted me freedom from the obstacle of choice.

Whilst this is a musical project, it is informed by psychology research. Research concerned with the structure of creativity has provided insight into what musicians might describe in vague and romanticised language. Taking note of this, I have been composing music not with the limitless digital canvas but by leaning into problem-solving mechanics of creativity psychology.

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Chapter 1: Introduction

This is a practice-as-research project concerning music composition. With the advent of digital technology, the world of music composition and recording has pursued unlimited freedom, creating technology that increasingly allows us ever greater control over or work. The technology and methods of the past are viewed as inadequate, that they imposed limitations that held back our creative expressions. By attaining almost absolute freedom, we are able to embrace a seemingly unimpeded outpouring of creativity to realise our wildest imaginations. The computer has become central to the composition and recording process in the 21st Century, much as it has in other aspects modern life. The recording fidelity, the flexibility, and the quantity of audio that can be recorded and manipulated in modern music making has made software a staple of recording and composition. Sawyer (2012) provides an analogy that helps portray how technology has changed our creative world:

> Have you ever used a digital camera? Do you take pictures differently now that you know you can immediately delete a photo that doesn't look good?
> (Sawyer, 2012)

The computer allows us to manipulate our work using a plethora of tools, and this has greatly changed the process of making music in the modern world. As a musician and composer in my late twenties I, like many others, have grown up and learned my craft in the digital world. Much of my music education through the 2000s and into the early 2010s was spent in computer rooms, sat before a desk, inputting notes on a screen with a MIDI keyboard (a musical keyboard that has keys like a piano but instead of making any noise, it sends data that tells the computer what is being played for it to be rendered in appropriate software), and

as I have grown up, I began recording audio on computer too. Editing parts I play, cutting them up, manipulating them, copy and pasting them like text in a document - I was able to turn whatever I played into whatever I wanted it to be once it was in the computer. Yet despite living my entire life in this way, despite wholly understanding the breadth of possibilities provided to me by this way of working, I have always struggled finding inspiration and satisfaction when working digitally, and many of the issues I struggled with were seemingly shared by my peers too. Starting an idea only to abandon it, getting stuck for ways to develop existing ideas, collections of unfinished and uninspiring projects that will never see the light of day - my own stories are similar to the stories of so many others.

In the past, many artists have strived to use limitations and obstacles to their advantage. Before the world of powerfully flexible software, artists fought against the limitations of their materials, and some artists built processes to turn the focus of their working methods on to tasks that created music as a consequence - for example, in chapter 3 I will discuss composer John Cage and his use of chance operations to construct compositions for him. Many of these important artists provide a valuable insight into the benefits of having obstacles to overcome. Furthermore, the field of psychology plays host to research that studies the function of creativity, and provides a window into how human beings go from *nothing* to *something.* Behind the subject specific terminology, the phenomenon described in these studies echoes what many artists have to say about their working experiences, and much of this knowledge helps define what artists and musicians already describe using vague and romanticised language. Across the differing models of creativity function, one operation remains in common: problem finding and solving. In direct contrast to the ideology of modern music technology, psychology paints a picture of minds that need defined tasks to be creative. To produce our most creative work, we need to turn vague tasks into defined problems to solve.

This project sees me abandoning the computer that was so central to the way I worked, and switching to a recording technology of the past: the four-track cassette recorder. By removing the freedom of composing and recording with software, I have had to learn music making all over again, relying on paper notes and notation, learning and rehearsing my own written parts, and learning to capture the expressive narrative that I have always struggled to convey in my pre-composed work. To overcome the obstacles presented by the tape recorder, I devised a creative process rooted in desirable attributes of music composition that I established at the beginning of the project. The challenges I faced throughout my time working in this way disrupted my usual composing methods, and in doing so conversed with the way I used to

work: by removing the freedom of the digital workstation, I liberated myself from the obstacle of choice.

The project uses a methodology that prioritises “proximity over objectivity” (Conquergood, 2002). The project is practice-as-research: I have been making music in order to learn about the making of music, and music created during this project is presented as part of this thesis to demonstrate how these interventions have influenced my working. By nature, this project is also grounded in reflective practice. I am a musician and have been for most of my life. I am experienced in making and performing music, and so my expertise in the field lives in my actions whilst practicing my practice, and reflections upon those actions reveal the knowledge presented here. Finally, the project is autoethnographic in nature. I am a musician and I am, in particular, a *young* musician who has only ever known a world where the computer is at the centre of composition. My experiences through my life as a musician are not unique, I learned with many peers in school, college, and university. We all had similar experiences, we all had similar knowledge, we all approached working in a similar way. Autoethnography allows me to present my research using a more narrative method: this thesis is the story of my working on this project. It refers to my past as a child of the digital age, it refers to my career so far as a musician who finds the most inspiration in improvisation and performing, and it tells a story of the conflict between who I am as a musician and the way I believed I was *supposed* to be making music.

These three methodologies together allow me to present research that is relevant and approachable to an audience outside of academia, and certainly outside of the field of psychology. The psychology research is empirical enough if one wishes to see hard data, and many before me have told much about the use of limitations to inspire creativity. This project is about my own journey confronting my creative process, informed by artists, but also by the insights provided by psychology. It is presented here as my own narrative, which I intend to be all the more insightful for fellow musicians or artists seeking clarity on these vague feelings we have regarding the nature of creativity.

Thesis Structure

Following the overview presented here in chapter one, the structure of the rest of this thesis is as follows:

Chapter two

Chapter two will detail the methodology and will discuss in detail the priority of proximity over objectivity. The project is a practice-as-research project because it allows me to practice my profession as a means of research; I am a musician and my area of expertise is as a musician, so it makes sense that my research should be conducted through music. I will use Schön's concept reflective practice to argue the value of my day-to-day experience of being a practicing musician. At this point in my late twenties, I have been performing and making music for around twenty years. Throughout this time, I have moved between different instruments, written plenty of music, performed with multiple bands and even made money doing so. I have also studied music for much of this time, and so the majority of my life has revolved around music; increasingly so in the past ten years where I have taken it seriously. With this in mind, I have a great wealth of knowledge concerning my practice, and a sizeable portion of that knowledge is gained not only from my education, but from every different circumstance in which I have found obstacles, especially over the past ten years of regular performing, writing, and studying at university and beyond.

The project's autoethnographic approach will also be explained. I am a musician who grew up learning music composition in the late 2000s and early 2010s. I have grown up in a world where the computer is the central point of popular music composition, and as a keyboardist I find myself in a world with even deeper integration with this technology. I learned to work in this world in classes at school and college. Everyone played different instruments, but we all sat before the computer on the desk with the MIDI keyboard. As we have grown up, and as I explore the world around me, filled with other people who shared similar experiences, most of us share some issues with the technology we have been taught to use to varying degrees. Some of us might work digitally and explain that our issues are just part and parcel of the process. Others might express a disinterest in any writing or recording, those kinds of people typically play at home as hobbyists. I have always had the sense however that there are shared dissatisfactions with the way we typically compose as popular music musicians, and this research is aimed at those people. It is presented from my point of view, as a narrative of my own experience confronting my particular problems with digital composition. I expect plenty of my peers will find what I express in this research relatable. Because they find it relatable, it is hoped that they will also find it approachable, as I break down the more complex, empirical research deciphering the structure of creativity into plainer chunks.

This research took place during the 2020 to 2021 coronavirus pandemic, and this chapter will also reference this. My original plans for this research involved a cassette-based composition and recording workshop, hosted or participants. This intervention would have lent the research an action research angle, but with the pandemic at its height during that period, plans involving groups of other people had to be scrapped. Whilst this was disappointing, I have come to believe that it was for the best: I believe that the research I have conducted by myself has established a set of stronger principles than those I would have entered into those workshops with, and that I have been able to create something more grounded and substantial by focusing entirely on my own work.

Chapter three

Chapter three will explain the context surrounding the research, split up into four themes. The first is “Limitations”, which will discuss the concept of using obstacles to inspire. I will begin by introducing Stravinsky and his *Poetics of Music* lectures. Stravinsky’s musings on the freedom granted by obstacles succinctly describe the aims of this research. I will discuss the writings of Stephen Nachmanovitch, who explains how we must surrender in some way to make art. The materials we use, the physical forms of our materials, tools and our own bodies all change the form of our art. The second section is titled “Writing and Play” and focuses on composition, and examines the importance of process. Keyboardist Joe Zawinul explained how he records vast quantities of improvised music and picks out ideas to use. John Cage is covered, explaining how he used operations of chance to dictate his compositions and free himself from his own tastes. Brian Eno’s *Oblique Strategies* flash cards are discussed and offer up a middle ground between Cage’s rigorously dictated methods and total freedom. The props of the cards also provide the important metaphor “gardening, not architecture” (Albiez and Pattie, 2006) which I will use to describe exactly how my working methods changed as a result of this research. This section also draws comparisons to Surrealism, particularly surrealist automatism, and surrealist games, played as a means of generating new ideas. I explain the importance of playfulness in generating creative ideas.

The third section will look at the field of psychology and the nature of creativity. It will compare these studies with what the practitioners previously discussed have said about their practice and will begin to build a picture of how this empirical study relates to the functioning of artists. The psychology research I have covered concerning creativity, all share the concept of problem finding, constructing, and solving as a core component of creativity. Our minds need defined tasks with problems to solve to properly, and much of the discussion throughout the

contextual chapter points towards artists using obstacles and devising processes. I argue that these obstacle and processes define these artistic tasks in the way described in the psychology studies I reference, and this is an important component of this research - that much of what sounds vague and romanticised is actually this problem constructing and solving in action.

Finally, I will discuss the cassette-tape's resurgence in popularity. In both music making and consumption, the cassette has become increasingly popular in recent years. It has found a home particularly among artists who seek to make use of its characteristics to impart a particular aesthetic on to their music. Given this rise in modern, mainstream popularity, I will briefly discuss the cassette revival and lo-fi and discuss the similarities and differences to my own work on this project.

Chapter four

Chapter four presents my composing method devised during this project and demonstrates it in action by following the composition of a single piece of music. The chapter begins by explaining the function and quirks of cassette recording. How audio cassettes work, their limitations and quirks will be outlined, and comparisons will be drawn to computer-based recording, explaining how cassettes necessitate changes in recording process.

Once the nature of cassette recording has been established, the process I used to overcome these obstacles will be introduced. I devised a four-step process that originated in my original plans to run workshops for participants. However, once the cover pandemic rendered these workshops impossible, I took on the instructions I had drafted, and made use of them as a sequential set of instructions form my own practice. The four steps are: *Commitment,* an improvisational stage for generating ideas; *Immediacy,* a time of consideration where the improvised material is appraised and developed; *Malleable,* where individual ideas deemed valuable are pieced to gather to determine the arrangement for the final composition; and *Fruition* where, using the *Malleable* work as a guide, the final piece is recorded. To illustrate how each step of this process works, this chapter also contains links to musical examples, following the composition of a piece of music.

Chapter five

Chapter five is the conclusion. I provide a brief overview, before detailing five specific principles which I took away from my time working with cassettes, in light of the contextual research that also informed the work. The intention is that these principles will highlight what I believe are the reasons I was able to find inspiration from obstacles and working with cassettes. The five principles I discuss are the following. *Play* refers to playfulness in music making. Comparing my process when working with cassettes to my process when working on computer, I came to the realisation that I spent time playing for the sake of playing once I was away from the computer. This was part of my process to overcome the obstacles I had placed, but it also mirrored how I would play music for fun outside of deliberately composing. I came to the conclusion that music composition can take whatever form we wish. Many part-time, hobbyist musicians might shy away from the label of "composition" due to its connotations with a computer-based labour, whilst happily sitting down each evening and making up new music on the spot as the doodle on their instruments for fun.

The *Problem Solving* section looks at how the psychology research concerning creativity fits with the work I have conducted for this research. I found that the process I devised to overcome the obstacles placed by cassettes broke down the whole "write some music" task into a series of individual exercises. By focusing on these exercises, and leaving the music to grow itself as a by-product of following my own instructions, the process of making music was transformed into a series of problems to solve: "sit down and play some music in one go, no editing", "in how many different ways can this idea be recreated?" and "how can these ideas be arranged to make a single piece of music?". I argue that this process fits the way psychologists have described the creative process working, and that other practitioners examined in chapter three do the same.

Gardening, not Architecture returns to Brian Eno's gardening metaphor, and examines how I grew my music instead of building it piece by piece. My old methods of composing would see me continually adding sounds on top of one another, like building a wall, like architecture. Instead, my new process saw me growing individual ideas, independently of each other. As they matured, I would eventually bring them together. I was never in *total* control; I can only nurture as a gardener does. I might plan to place things roughly somewhere, or I might have some idea of what I wish to do, but I surrender to how these things grow and develop as time goes on. I work more like a gardener than an architect.

Application to the Digital Workstation is the section where I will explain how I believe my conclusion apply to computer-based composition. This project does not aim to remove the computer from composition, and my conclusion is not that the computer is a bad thing. Rather, I conclude that the computer is a *good thing.* Much of my time spent recording without the computer was spent rehearsing parts, playing them over and over until I could play them well and get through a take without making an error. Even then, mistakes still happened, and a lot of time was spent starting again as I could not fix these mistakes when using cassettes. I instead conclude that the issues I have with computer-based composition are that I lacked any process previously, that I knew how to use the tools, but not how to generate ideas to work with.

Learning to Compose, or Learning Technology? is the final section, following on from the previous section and rounding of my conclusions. I ultimately conclude that my education through school and college taught me how to use the tools on the computer, but not necessarily how to compose music. The computer isn't removing creativity, and the cassette isn't magically returning it. Rather, by using the cassettes I have had to develop a process to overcome the limitations, and it is this process that engages with the psychology I discuss, and so I am able to be more creative. There is nothing stopping me using this process on the computer, and the only thing holding me back prior to this research was that I had no process through which to be creative, I knew only to choose a key, choose a tempo, and begin layering things one on top of the other, as I had been taught in my younger years through popular music education.

Audio Recordings Information

This project is a practice-as-research project and as a result, most of my work takes the form of the music I wrote and recorded throughout. In chapter 4 I will narrate the creation of a piece of music, demonstrating the process of music composition that was devised to overcome the challenges presented by working with cassette tapes. Along with the written narrative I have included a series of recordings that demonstrate the journey of ideas being devised and developed, through to creation of a final singular piece of music. They were recorded on cassettes that have been digitised and select pieces of music have been included to demonstrate what I have been working on. Below is a hyperlink that links to the whole portfolio of work included in the discussion throughout this thesis.

> Music Portfolio <

The audio is hosted on Soundcloud. Specific examples will be linked throughout the document as they are relevant and clicking on those links will take you to the exact piece of music I am referencing.

Chapter 2: Methodology

This project incorporates three qualitative methodologies: *practice-as-research*, *reflective practice* and *autoethnography*. These methodologies have been chosen to reflect the project's intention to alter practice and to acknowledge the project's origins in my own experiences as a composer. All three methodologies allow me to make my practice my research and make allowance for conversing with my professional experience both past and present, as I journey through the project. It allows the work to exist within its natural context (music research disseminated as music) and allows me to explain my research using my professional knowledge. Originally, the project also had an *action-research* component in the form of workshops hosted for participants. Though these were scrapped in light of the 2020 to 2021 coronavirus pandemic (making it impossible to gather the groups of people required for such a venture), there were some conclusions drawn in hindsight of the changes made, so these scrapped plans will still warrant some discussion later in this chapter.

Reflective Practice and Practice-as-Research

This is a practice-as-research project. As the project concerns music composition, it makes sense that the composition of music be the core of the research method. The resulting music represents the main body of the work undertaken, demonstrating the interventions I have made on my own practice, and so this music also represents the findings of the research. Robin Nelson explains that inquiry into practical knowledge is best practiced and demonstrated, rather than presented solely in abstract as a written thesis. Practice-as-research is ideal when...

> ...The proposed inquiry necessarily entailed practical knowledge which might primarily be demonstrated in practice - that is, knowledge which is a matter of doing than abstractly conceived and thus able to be articulated by way of traditional thesis in words alone.
> (Nelson, 2013)

This project concerns music, and so the results of the research informs changes made in music. I can write about my experience (which is an important component to be discussed shortly) but the main substance of this work is the music I made during this project, and so it is the music that should be presented to demonstrate the work I have been doing. By allowing myself to practice my profession as my research output, I am able present my work in the context which it lives rather than in the abstract presentation Nelson describes. This method also allows make use of my expertise in my practice to present the findings with greater nuance, as the work inherits my knowledge of my practice. In practicing our professions, we are constantly learning, routinely exercising and expanding our knowledge in a subject as we encounter, adapt, and overcome unique situations on a daily basis. What we know from this process often manifests in way which we might not be able to describe or even notice, as explained by Donald A. Schön:

> When we go about the spontaneous, intuitive performance of the actions of everyday life we show ourselves to be knowledgable in a special way. Often we cannot say what it is that we know. When we try to describe it we may find ourselves at a loss, or we produce descriptions that are obviously inappropriate.
> (Schön, 1983)

I cannot evaluate changes to my music making without *making music,* and in describing these changes, there may only be so far I can explain myself without the music being present. In researching through music composition, I am testing and analysing a practical, non-written medium. I can write about my experiences, but my life as a performer and composer lives in the music I make. My working habits prior to this project were largely taught and inspired by the technology I learned, and the music presented as part of this thesis demonstrates me unpicking these habits, and the process of learning this new way of working. By making music and presenting it as research I am able to demonstrate my findings within the field in which I am a practitioner. Alongside this implicit knowledge, I will notice things whilst practicing, and I will consider my actions afterwards - it is both intentional and natural. In this sense practice-as-research is reflective in nature, and Schön explains that it is these reflections, both during and afterwards, that offer insight into this implicit knowledge we harbour.

> …Both ordinary people and professional practitioners often think about what they are doing, sometimes even while doing it. […] Usually reflection on the stuff at hand. There is some puzzling, or troubling, or interesting phenomenon with which the individual is trying to deal. As he tries to make sense of it, he also reflects on the understandings which he surfaces, criticizes, restructures and embodies in further action.
> (Schön, 1983)

This uses reflective practice to consider the effects of the interventions I have made, and the mechanics of my explorations consist of my own reflections both during and after the act of composing. Throughout the project multiple compositions were made as I refined my process or launched specific inquiries. This is in part due to the project taking place during the coronavirus pandemic, but this will be discussed separately and shortly. These compositions progressively built the principles which I lay out in my conclusion, but also recorded me learning *how* I was going to conduct my practice. In this sense, the project becomes a narrative story about my time working through the project in isolation, as well narrating my confrontation with the processes I had learned before embarking upon this project, and how the results of my work here have changed my creative process. In this sense, the project begins to take on an autoethnographic theme.

Autoethnography

Adams, Jones, and Ellis offer a succinct introduction to autoethnography:

> Autoethnography is a *qualitative* research method - it offers nuanced, complex, and specific knowledge about *particular* lives, experiences, and relationships rather than *general* information about large groups of people.
> (Adams, Jones & Ellis, 2015)

Autoethnography is the study of culture through the lens of one living *in* said culture and disseminates findings through the medium of storytelling. In light of my explanations regarding professional knowledge, reflection, and narrative, the project starts to fit the autoethnography mould, and this allows me to present my research in the ways I imagined would be most beneficial to society. The dissemination taking the form of storytelling allows the actual, lived experience of individuals to be presented, accepting the bias and with an understanding that there is value in the everyday actions, much like Schön's reflective practice, autoethnography accommodates the value in my day-to-day experience as a musician - it allows me to insert myself into the research. "Proximity, not objectivity" (Conquergood, 2002) is the priority, and me being a composer, engaging with my closeness to the topic rather than attempting to detach myself, offers a relatable viewpoint from which to present my work. People from my particular group, being younger musicians who grew up with the computer being the norm, are frustrated with something that exists in this world, and so am I - I disseminate the work I have completed myself, as one of those people, presenting it as my own take on our collective experience, rather than distance myself from the group I am part of, as described by Goodall:

> I was clinically aloof, dry all the way down to my calcium skeleton, but nevertheless omniscient, objective, argumentative, and supposedly rational. I had attained the rarified status of the third person singular and found myself writing as if I were proud to be so damned distanced from others. My words, my point of view, could have been authored by an academic anyone.
>
> I now understood my problem. Saw it clearly.
>
> I have written *myself* out of my life.
>
> (Goodall, 2007)

This project is so rooted in my own life so far, that to remove that would be to remove a good portion of why it exists in the first place. It is the conflict between my past experience and what I am now learning that is valuable in light of what I set out to achieve at the beginning of this project. I am a keyboardist who works in a high technology environment, and throughout my musical career the computer has been the centre of music composition. This has been something my peers and I have struggled with to varying degrees, sharing similar experiences of creative blocks, countless unfinished projects, and unsatisfying results. This project is rooted in these experiences and tells the story of my journey confronting this past through the project**.** Rather than collecting the opinions of participants following a set of activities, I instead focused my time and efforts on my own work, following principles I proposed at the beginning of the project. As a result, this project tells my story. This is a story of my time working on the project, but I will also discuss the time before. I am a performer and a composer, so I play in front of people, and I write and record. How I learned to do these things and how I have practiced these things have determined how I conduct myself in my practice. Some of these influences inspired me, whilst others ingrained shortcomings which I have forever been fighting. And so, this project tells the story of me confronting these personal experiences.

Original Plans and Action Research

As I mentioned earlier, this project was completed during the coronavirus pandemic. This altered the project a great deal: the original plan saw me hosting cassette-tape-based composing workshops, seeing participants take part in a number of exercises that both exemplified the characteristics of cassette-based recording; these exercises would also teach the functions and quirks of the technology for those who were unfamiliar with the medium. Following these workshops there would have been interviews where the experiences of the participants were discussed: what they found difficult or easy, enjoyable or frustrating, inhibiting or liberating, whether they felt the experience was even worthwhile at all - all would have been opened for discussion. The intention was that the views of these participants would

inform further composition work by myself. The finished dissemination of the project would have looked similar: a written thesis accompanied by music.

These interventions introduced to such a group of people would have lent this project an action-research element. There is a proposed problem: “musicians seem to dislike computer-based composition,” and there is a proposed intervention: “replace the computer with a cassette recorder.” The workshops would have us collectively (researcher and participant) embark upon an inquiry into this problem. As the activities I proposed were carried out, there would have been feedback, and this feedback would have informed any changes to the ongoing process. This dialogue would allow us collectively to decide the conclusions to the method, providing a problem-intervention-diagnosis cycle that would eventually form a collection of qualitative ideas that would have been presented here, as well as my own further study and composition work.

Due to the coronavirus pandemic however, this plan could not happen. For a while it appeared as though life would attempt to return to normal soon, so after attaining ethical approval for this version of the project, I bided my time composing by myself to the instructions I intended to give to the participants. We now know, of course, that the apparent imminent re-opening following the initial wave of the virus would not come, and so the project remained a solo venture and the original plans were eventually scrapped. Ultimately I believe this was for the best. Much of what I set out in the beginning was arbitrary. I now believe that the version of the project I intended to undertake would have been much weaker when measured by the desires I had setting out on this investigation. As described when I discussed autoethnography, this project is about and my music composition. It is about my past and my experiences, and it is about the people I learned with, worked with, and encountered along the way. I initially denied myself a dialogue with those components to this project. However, I now believe that these experiences, and my experience working on the project solo has provided a far more focused and nuanced project.

I can take the principles elsewhere of course. I could now rewrite the workshops following completion of this project and deliver what I believe would be a much stronger and more rigorously grounded set of activities that would provide a more valuable and genuine insight for both myself and the those who would take part.

Chapter 3: Context

Limitations

This project concerns the use of elective impoverishment to stimulate creativity, namely the use of self-imposed limitations. The pursuit of ultimate freedom to achieve whatever we can imagine is not a new ideal. Composer Igor Stravinsky spoke out against this pursuit of freedom in his *Poetics of Music* lectures.

> This sort of heresy is uniformly widespread because it is imagined that art is outside the bounds of ordinary activity. Well, in art as in everything else, one can only build upon a resisting foundation: whatever constantly gives way to pressure constantly renders movement impossible.
> (Stravinsky, 1942)

Even today, Stravinsky's proclamation rings true: much of the modern, digital world of music composition and recording idealises limitless freedom. This digital foundation, as in Stravinsky's theory, constantly gives in to pressure - any way in which we may wish to go, anything we may wish to do, the software capitulates. Stravinsky continues to elaborate his meaning and proposes that we can, instead, find genuine freedom within a space we afford to ourselves, that it frees us to focus all our efforts within a finite scope.

> My freedom will be so much greater and more meaningful the more narrowly I limit my field of action and the more I surround myself with obstacles […] the more constraints one imposes, the more one frees one's self from the chains that shackle the spirit.
> (Stravinsky, 1942)

As we restrain ourselves, we limit the range of options open to us. And as we define our options and limit which of those is available to us, it becomes easier to choose which path to take - by limiting ourselves, we are able to focus on the finite choices afforded to us. The first mark on a canvas, the first word written, or the first sound played - the possibilities can be paralysing. *Anything* could happen, which of these infinite choices do we wish to choose? Stravinsky begins to poetically touch on these internal struggles of the artist, and whilst here it is being discussed in a very flowery and romanticised way, the statements he makes here regarding the "chains that shackle the spirit", along with his further discussion concerning the mobilisation of creativity through limitations, begin to echo concepts that have since been established in studies of creativity which will round off this chapter. So, instead, I will focus on the concept of self-imposed limitations. One of the obvious ways of inserting obstacles is to establish rules that dictate what is composed. Composer John Cage is a prolific figure in the

world of process-led composition, owing to his use of the Chinese divination text *I-Ching* to steer his work using operations of chance. Cage explained the freedom that comes from this surrender:

> It is thus possible to make a musical composition the continuity of which is free from individual taste and memory (psychology) and also of the literature and "traditions" of the art. The sounds enter time-space entered within themselves, unimpeded by service to any abstraction, their 360 degrees of circumference free for an infinite play of interpenetration.
> (Cage, 1968)

Cage continues Stravinsky's "freedom" metaphor, but this time explaining how surrender can be an avenue to free us from our personal tastes and prejudices. If we can find a method to remove ourselves from the pursuit of creating something to fit a pre-existing context and rather make an amount of music that simply exists for its own sake, we can free ourselves to explore more by allowing ourselves less control. Part of the "chains that shackle the spirit" might be preconceived notions of what we *should* be making and how - I know much of my own music education focused on these very considerations. If we can shed those shackles, we can start to explore more novel ideas - once again being more creative by restricting ourselves. Cage's works are undoubtedly avant-garde, but the principles he developed provide important lessons in devising a compositional process. His writings in *Silence* would be an important influence on Brian Eno (Albiez & Pattie, 2016) who would go on to make use of the "control and surrender" aspects of the creative process.

> Control and surrender have to be kept in balance. […] In the last few thousand years, we've become incredibly adept technically. We've treasured the taking control part of ourselves and neglected the surrounding part… I want to rethink surrender as an active verb.
> (qtd in Jeffries , 2010, in Albiez & Pattie, 2016)

In the documentary *Imaginary Landscapes* Eno highlighted the "emphasis by manufacturers was on increasing the number of options available to musicians" (Cardazzo & Ward, 1989, in Albiez & Pattie, 2016). If modern music making idealises control, whilst certain avant-garde ideals push for surrender, a middle ground can be sought to actively engage in the stimulating aspects of both. Eno did so by developing a set of flash cards to break down creative blocks. The cards, which have since been published under the name *Oblique Strategies,* were first mentioned when discussing the recording of the album *Taking Tiger Mountain*:

> There are maybe sixty-four cards, whenever I was stuck for a decision in the studios I'd simply refer to these cards whatever card I picked up I would act on. I wouldn't choose one lightly, because the point was I had to observe it, and what it did was for me to try something out even if it had no chance of working.
> (Jones, 1974, in Albiez & Pattie, 2016)

Eno's use of these cards was about limiting options, forcing a course of action and relinquishing control. They provided an intervention that shifted the focus of the music making from the making of music, to solving the intervening problem. As Stravinsky suggested regarding limiting freedom, the focus is sharpened to a more specific point, allowing all our efforts to be intensified upon one, defined task. The artist carries out a series of tasks which, in turn, create material from which the finished art can be shaped. This heuristic, "follow a process and the art will create itself" concept is explained by a metaphor written upon one of Eno's original *Oblique Strategies* cards: "gardening, not architecture".

> A gardener establishes and tends to a system. The gardener cannot determine exactly how the plants will spread to cover the ground; however, he or she can blend the various growth patterns into a whole.
> (Albiez & Pattie, 2016)

Rather than build music piece by piece arbitrarily, I spent my time on this project growing my music. A process was devised that saw me working on smaller tasks that, in time, would grow the final piece as I cultivated each individual idea in this metaphorical, musical garden. The way I was taught to use a computer was not this method. We would start a fresh project in the software. We would typically decide a key and a tempo, and would then play until something presented itself: a melody, bass line, chord progression or percussion rhythm. Then we would record that idea, typically only a few bars long, before returning to the beginning to restart the process, except to find something that would fit this, now existing, part. Music was written from beginning to end sequentially, laying parts until we deemed that we had met the criteria for a "song". This whole process seems at odds with the discussion so far which seems more focused on explorations. Ultimately the existence or imposition of limits or rules on composition necessitates a change of strategy: that the composition focuses on solving problems, rather than ever expanding arbitrarily.

German electronic band Kraftwerk were pioneers of electronic music and became synonymous with the progression of music technology. Despite this reputation, Karl Bratos (who was with the group from 1974 to 1990) commented on how the computer removed the obstacles from composition, and compromised the creative process:

> "A computer has nothing to do with creativity, it's just a tool, but we outsourced creativity to the computer. We forgot about the centre of what we were. We lost our physical feeling, no longer looking each other in the eye, only staring at the monitor. At the time, I thought innovation and progress were synonyms. I can't be so sure anymore."
> (Wray, 2022)

Bratos points out similar themes to Stravinsky. The computer has become central to music composition and recording because it is so flexible and free, and these freedoms are, mistakenly according to some, to the detriment of creativity. I am not working against the use of computers and digital technology here, rather highlighting that, as Bratos suggests, creativity has been "outsourced to the computer". Rather than learn to make music, I learnt to use software, and that knowing how to use the computer and the tools it provided would create the music, a far cry from the growing of a musical garden through process. Bratos explains that despite the reliance on technology Kraftwerk exercised, much of their practice was as an "analogue band":

> They were pushing the limits of primitive technology to its absolute limit, and for Bartos, these limitations sparked innovation. But when presented with endless options, there wasn't anything to rub up against, only a limitless horizon. "We stopped being creative because we were solving problems," he says.
> (Wray, 2022)

Stravinsky is echoed again here, with the proposed concept of resistances. Bratos' "solving problems" comment is important because it highlights what the processes introduced into composition do: provide problems to solve. We focus our efforts on smaller, bite-size tasks, and as a result the music is formed.

Writing and Play

This conventional wisdom has led us down a path where we approach music in a rational and logical way. We learn our tools, we anticipate a structure, and build patterns that fit within our pre-determined reasoning. This is what we were taught whilst I was learning, and it seems correct on the face of it. It wasn't until much later that I began to realise that my discomfort in working in this manner wasn't unusual, and that my inclination towards improvisation and the pleasure I found in "jamming" was quite normal. This project sees me using improvisation and "jamming" ideas to compose, rather than creating something to fit a predetermined slot. Jazz keyboardist Joe Zawinul described using improvisation to compose:

> I don't do much thinking at all, it's just what's coming out. What the hell. When I improvise there's no mind. I'm just there. I fiddled around. It's like a painter would do, just fantasise a little bit. I'm not thinking about this shit, it's just something I do. The mind messes everything up. When inspiration starts, rational thinking stops. (Tingen, 2003)

Zawinul came to use *Hybrid Arts* for Atari computers, a software launched in 1988 that records MIDI data (A recording of the notes played on a MIDI keyboard). In a BBC documentary (Kidel, 2004), he demonstrates how the computer prints his scores once he has finished playing. "I used to sit for days outside and write down cassettes" he explains, "I have at least 7000 cassettes full of improvised music." The process Zawinul used bares resemblance to the process I would come to use during this project, though it differs in a key aspect: that Zawinul was using cassettes at a time when the cassette recorder was the mainstay of the home studio. The differences highlighted between recording the notes played digitally versus audio recording the music and reviewing it demonstrates how the process is influenced by the materials used. Recording improvisations with cassettes requires listening back to manually write the score, whilst recording the MIDI data on software has the computer automatically generate the score which can then be read over in a much more streamlined process. Zawinul made use of MIDI using a similar, yet more efficient process to which he used with cassette tapes. From his perspective, the computer would have only ever aided the process of making music. However, if the tapes didn't establish that process, would such a process have come about? I use cassettes in this project to intervene in my own habits, forcing me to develop the process I detail later in chapter four - a process that I did not need until I came to compose without the aid of my computer. Zawinul's idea that "the mind messes everything up" contradicts the mindful control that is endorsed on the back of the computer's flexibility. The improvising to tape and review process that I similarly came to rest upon was indeed the same performance mind-set that Zawinul echoes, because I couldn't control the music in the same way, I had to just play to keep the ideas flowing, the flexibility of time and what I played is not afforded with cassette tape.

The materials used to capture audio and the rejection of digital technology drastically shaped the process I used to create music in this project, as well as shaping the music itself. Stephen Nachmanovitch writes about how materials can dictate design, and proposes that we "surrender" to these limitations, as "without them, art is not possible" (Nachmanovitch, 1990). Nachmanovitch discusses a scene from the novel *A High Wind in Jamaica* where a child stowed away aboard a ship, envisions imaginary scenes imposed upon the woodgrain of the vessel's walls, imagining faces and shapes in the patterns of the wood. "The wood grain […]

educes, or draws out of the child, something related to what the child knows, but that is also more or different than what the child knows" Nachmanovitch explains, and continues to discuss how the materials we use to make art shape our internal visions to create something truly unique:

> The artist has his training, his style, habits, personality, which might be graceful and interesting but are nevertheless somewhat set and predictable. When, however, he has to match the patterning outside him with the patterning he brings from within his own organism, the crossing or marriage of the two patterns results in something never before seen.
> (Nachmanovitch 1990)

These patterns outside of us might manifest in the music world as the instruments we play, the technology we use to capture them, or the limbs we must use to interact with them. Nachmanovitch almost echoes Stravinsky here, stating that an artist's inner patterning is somewhat predictable. In which case, the artists individual voice may be limited, *chained down* almost. Stravinsky proposes self-imposed limitations, Nachmanovitch implores us to "surrender." Either way, they both advocate for us to allow a feedback to steer us in order to create something truly novel.

Another aspect of Zawinul's process is a phenomenon he describes, that will be familiar to musicians who improvise. He explained the lack of thinking when playing, and describes a lack of awareness in the space once he finds inspiration to play with. To play for the sake of playing is a different kind of mindset compared to *trying* to find something that fits with an established pattern. As Nachmanovitch (1990) describes: "any time we perform an activity for an outcome, even if it's a very high, noble, or admirable end, we are not totally *in* that activity." In my own experience, both personally and concerning encounters amongst my peers, this kind of playing is seemingly regarded as different to composition - It isn't seen as serious or productive. Composing requires chasing the outcome Nachmanovitch refers to, and to play without pursuing an end is merely playing - not in the musical sense, but in the childish or game-like sense. Yet Zawinul is an accomplished composer who uses improvisation as a tool to generate his compositions. This mindless playing comes without any rationale, and is produced as spontaneously as spoken word. Zawinul explains as such:

> When I hear a sound I like to play with, the way the key feels, the way the sounds feels, then I modulate that sound to the point where it really rings like it is my voice, like it is my language.
> (Tingen, 2003)

We don't necessarily think about what we are going to say in everyday life. We may prepare for something that is already scripted but most of what we ever say comes to us without thinking. In music it can be much the same. A musician fluent on an instrument could, especially if they are experienced with improvisation, play sound from the instrument much in the same way they speak. This is still making sound… record it, and you have created a piece of recorded music: you have composed. Zawinul composed by recording MIDI data, I recorded sound and wrote notes and notation. These are pieces of music that didn't exist, but we're composed and recorded - just because it didn't seem like work, doesn't make it any less legitimate.

The concept that the materials shape the art, and that we must surrender to that idea, is something composer John Cage has discussed in the past. Cage proposes the idea that no matter the precautions, there will *always* be sound, and that notated silences merely open the door for these other sounds to be heard. He demonstrates his meaning by making comparison to other, visual arts.

> This openness exists in the fields of modern sculpture and architecture. The glass houses of Mies van der Rohe reflect their environment, presenting to the eye images of moulds, trees, or grass, according to the situation. And while looking at the constructions in wire of the sculptor Richard Lippold, it is inevitable that one will see other things, and people too, if they happen to be there at the same time, through the network of wires.
> (Cage, 1968)

Cage goes on to discuss his experience in an anechoic room (engineered to be a silent as possible) and explains the experience of being able to hear his own blood pumping and the sounds of his nervous system as explained by the hosting engineer. With this, Cage ultimately declares that there will *always* be sound. And so, the idea of surrendering to these outside patternings as proposed by Nachmanovitch seems inevitable - that no matter the precaution, we will *always* have some kind of compromise, we will *always* need to surrender in some way or another. Cage argues that once we find "fearlessness" in this surrender, we become content to see music in its natural context.

> This psychological turning leads to the world of nature, where, gradually or suddenly, one sees that humanity and nature, not separate, are in this world together; that nothing was lost when everything was given away. In fact, everything is gained. In musical terms, any sounds may occur in any combination and in any continuity.

(Cage, 1968)

Conventional recording attempts to control the sounds we are making. It is made up of practices intended to keep recording as flexible and as clean as possible, and strives to achieve so by deconstructing and isolating individual parts. David Byrne discusses the principle of "deconstruct and isolate" as a means to control sound when recording, and the paradoxes of the ideology.

> The goal was to get as pristine a sound as possible, and even before multitrack recording became ubiquitous, it was typical to try to remove or avoid all ambient sounds - not only the sounds of birds, traffic, and conversations in other rooms, but all of the room ambience as well. […] Without this ambience, it was explained, the sound would be more malleable after the recording had been made. You'd keep your options open as longs as possible, in other words. Dead, characterless sound was held up as the ideal, and often still is.
> (Byrne, 2012)

Byrne elaborates on the "crazy system", explaining how these ambiences are replaced artificially after the recording has been made. He uses film soundtrack as an example: where artificial "foley" sounds are used to create a convincing impression of an environment, despite the manufactured ambience often being a caricature or exaggeration of the environment it is supposed to represent. Byrne also recalls working in this way when recording with the band Talking Heads and describes the difficulties of working in this way. He highlights the loss of interplay between musicians due to the isolation. More-so, he also describes a disconnect between how he felt hearing recordings versus "conventional wisdom". The conventional wisdom being that what was played back was exactly what was played, but the ears saying that *something* was different. If a we play a part exactly how we always play it and record the playing, conventional wisdom dictates that what is captured *is* what is being played. I argue that this "conventional wisdom" has developed over time. We understand that the computer is most practical from many different perspectives, but I still *feel* that it's not right. Byrne explains that he has persisted and gotten used to this conflict but claim to not be proud of it, and I felt much the same coming to this project - the notion that there is the sensible and practical way of working, and that I should persist and get used to it.

Talking Heads would go on to work with producer and composer Brian Eno, and began to shed these rules in an attempt to capture a more natural representation of the band. Their third album, *Fear of Music* (Byrne, Harrison, Weymouth, Frantz, 1979), was recorded in

bassist Tina Weymouth and drummer Chris Frantz's home, using a trailer studio used for live events as a control room.

> I'm not sure why, but it sounded far better than the messy lo-fi sound one would expect to find from recording outside of the pristine studio environment. We were finally beginning to capture what we sounded like live! Stepping outside of the acoustically isolated recording-studio environment wasn't, it turned out, as catastrophic as it was made to sounds. Hmmm. Maybe those rules of recording weren't as true as we'd thought.
> (Byrne, 2012)

Talking Heads were chasing the sound that they heard when they performed their music. The isolation of recording removed the influence and artefacts of the outside world that made up what they heard when they heard themselves, and so when this was removed they no longer recognised the sounds they were hearing. The sounds, the messiness of all the instruments competing in the same space, the interplay between the people in the room together all had parts to play in making Talking Heads sound like Talking Heads. As Cage discussed, there are things that just happen to be in the environment at the same time as the art, and these things add to the experience of a piece. And as Nachmanovitch discussed, the art is shaped by the materials and limitations: the way the performance changed because it was a collective endeavour, shaped the recording as a result. It is an openness that exists in other art forms, but is something that is shied away from in music - owing to our "conventional wisdom". Brian Eno has worked with many artist aside from Talking Heads. Even further removed from the conventional studio environment, Eno describes working with Ghanaian band Edikanfo in Africa:

> I worked with an engineer there in a little studio that was a joke by Western terms. He had a really random bundle of microphones. One of them from a Sony cassette recorder […] but he used it brilliantly. He put it over the drum kit and got a really vibrant, lively sound from it. If you'd shown that setup to a Western engineer they would have laughed at you.
> (Spice, 2015)

Many of the ideals of the modern recording environment are painted as requirement to achieve a good results. The studio itself is set up to capture pristine recordings, designed to make them as malleable as possible, and modern technology has provided us with equipment that allows us to aspire to such quality in our own homes, with the mundane computer offering resources that exceed those found in recording studios of the past. But these such requirements seem redundant compared to our ability to *use* things to make music, a chase

and focus on the recording of music and using the technology, rather than a focus on the making of music itself.

German improving group Can used incredibly basic setups early in their career. Recalling a humorous moment whilst remastering old work, Irmin Schmidt recalled spending studio time agonising over frequencies within a particular vocal take, only to remember *how* that original recording was made, and the music that went on the release album:

> We recorded the bass and drums and then did the guitar, the organ and the vocals as an overdub. We put the guitar cabinet facing the organ cabinet, with a gap in the middle of about a metre. Then we taped together two microphones and Malcom sang into the microphones and we just turned up the other two instruments loud enough to get the balance. That's how basic it was sometimes. (Young, Rob & Schmmidt, Irmin; 2018)

The limited resources did not stop Can from creating and releasing music. The band made do with the resources that they had on hand, sourcing discarded reels of tape to record to. Can's focus was playing music. They would record vast quantities of audio and take parts to turn into the named, curated compositions that appear on albums. As Stravinsky explained: as we limit ourselves we can focus all our efforts on the making of the music, rather than chasing never ending possibilities.

Limits on recording of course place more emphasis on the playing of the music. In this project I make use of my improvisational background to twist the focus of recording into something more like a performance. Practised musicians know their instruments, and know how and what to play without too much thinking in the same way we know what to speak. In recording we can edit what has been played, much like how we may alter what we write. I liken it to a knowledgeable public speaker giving a looser and more interactive talk. They may have point they aim to deliver, but they can be confident in interacting with an audience: pausing for questions, explaining things in different ways, dipping into relevant tangents. They will be able to deliver content that is engaging and flowing, whilst steering the delivery to account for whatever happens in the room. This is the kind of musical playing I am aiming to reproduce. There may not be an audience in my process, but the playing seeks to meander, follow tangents and explore interesting things that crop up. In a live setting, we may feed of the energy the audience brings to the performance. A quieter show might bring out a considerate and contemplative performance, a rowdier show might give us energy and bring out a faster, messier but more excited performance. I might not have an audience when I compose, but I

aim to *perform* nonetheless. David Byrne explains the differences between something that is artificially constructed versus performed:

> My own playing isn't always rock steady, so I like that those distracting flubs and rhythmic hiccups can be edited out. The software facilitates all of this. But, admittedly, something gets lost in the process. I'm just now learning how to listen, value, and accommodate some of my musical instincts that don't always adhere to the grid. It makes things a little more complicated, as I still use the software, but I sense that the music breathes little more as a result of me not always bending to what software makes easiest.
>
> (David Byrne, 2012)

It is important to note that I am not aiming to remove the computer from composition *forever*. Its removal in the context of this research is a means to an end, a way to intervene in my practice and investigate how my working changes. Byrne explains how just because we *can* achieve perfection, doesn't mean we have to do so. This doesn't mean we must never edit our recordings, that we must live with rough or sloppy takes in music which we intend to present. Rather, we can be conservative with how much of this utility we use, using it to streamline the process of making music, but also allowing ourselves room to perform as the musicians we are, embracing the slight imperfections that allows the music to "breathe". In a live setting, imperfections can come from two places. The first is that a live performance is the product of many moving parts. Instruments and other devices responsible for making the sounds we play, the place in which we play them. These things may work against us in many ways: we might be limited in our resources, things might break, something crucial may be forgotten or lost, a venue might have its own quirks that affect the sounds of the performance. As well, there are mistakes, or at least, miscalculations. The more improvisational the setting, the more the music is in flux. We must listen, and play what we know will work, or rather, express the thing we want to express. Sometimes this might not play out as we expect, but instead of being shunned or stopped, these moments offer a shift or collision around which we can choose to pivot. Often, if we embrace what we may have slipped into, we can conclude a musical venture that has presented itself to us organically.

The use of process to steer direction, the surrender to the materials dictating the design, these topics mirror themes in the world outside of music. Particularly the use of process and the idea of art existing for its own sake, steers us towards a comparison to the world of Surrealism. Surrealism came about in in the 1920s as a development from the Dada movement. It sought to break the dominance of rationality, reason and the conscious mind in order to express the

unconscious and primitive. Surrealist automatism refers to a creative process where conscious thought is suppressed as a means of expressing the unconscious. This automatism took various forms: Max Ernst used rubbings of textures in a process called Frottage (West, 1996); André Breton describes automatic writing experiments in his *Surrealist Manifesto* (Breton, 1969), Joan Miró recreated sleep-deprived hallucinations (Picon, 1977) and, notably, the Parisian surrealists would play the game *cadavré exquis,* whereby each individual in a group would take turns adding a words to a folded piece of paper, revealing a random text at the end (Caws, 2004). In surrealism the surrender to creating without a defined goal is a key mechanism for creating. I described how "jamming" might be seen as something too playful to be considered serious composition in light of how the modern composition process has become a desk based, computer based activity, with a goal to labour towards. However, this playfulness is something that the surrealists made use of.

> The role of games in Surrealism is crucial to every moment of its development. In no sense were they considered trivial or frivolous diversions - they were always played seriously, as open-ended investigations of possibility.
> (Caws, 2004)

This project sees me using improvisation and "jamming" to create ideas for use in composing, and "open-ended investigations" is exactly how I perceived the process. Nachmanovitch described how if we pursue an activity to produce an end, then we are not totally *in* the activity, and perhaps I agree.

I believe however that the automatic creation of art is not the whole picture. The over-arching theme through the discussion of limitations, overcoming obstacles and playing games, is *process*. Joan Miró's "dream-paintings" were presented as hallucinations and dreams represented on canvas, but it appears that Miró had an element of planning before producing his final work:

> In Joan Miró's "dream-painting" *The Birth of the World*, for example, the dripped and overlaid background of irregularly drawn geometric forms give the impression of an untutored hand, reminiscent of child art, graffiti, or prehistoric cave paintings. In fact, Miró had careful worked out the precise composition before producing the final image, a factor borne out of the artist's sketchbook.
> (O'Mahony in Kemp, 2000)

Inspiration and ideas can certainly come from spontaneous creation, but the everything I have discussed ultimately overlaps in the presence of some kind of process that creates the work

as a result of carrying out some kind of activity. If I can be allowed to lose myself in playing for the sake of playing, then the music writes itself. As long as I capture what I do, I can continue my typical music making for pleasure, and have a wealth of ideas to take forward into a composition once an amount of time has elapsed. Joan Miró talks about taking time to ponder and progress his collection of works over a lengthy time. He explains habits that echo the sentiment of allowing the work to flourish, and ultimately uses gardening as a metaphor, circling us back round to Eno's own sentiments:

> I think of my studio as a kitchen garden. Here, there are artichokes. There, potatoes. Leaves must be cut so the fruit can grow. At the right moment, I must prune.
>
> I work like a gardener or a winemaker. Things come slowly. My vocabulary of forms, for example - I didn't discover it all at once. It formed itself almost in spite of me.
>
> Things follow their natural course. They grow, they ripen, I must graft. I must water, as with lettuce. Ripening goes on in my mind. So I'm always working at a great many things at the same time. And even in different fields: painting, engraving, lithography, sculpture, ceramics.
>
> (Miró, 1963)

We take care of the "plants" to create the garden. Each individual plant is a separate entity to be nurtured, and in this nurturing the garden as a whole takes shape. We can look after the individual parts but, as discussed before, we cannot control the whole of the garden, we can only graft to cultivate the individual pieces and wait to see how the whole creation turns out.

Nature of Creativity

It appear, from these discussions of limitations, of process and surrendering control, that when we are embarking upon a creative venture, we must work to define *what* we are going to be doing. We don't need an end goal, but instead we should seek ways of turning a task that is vague and free, into an instruction or problem to solve. These are things that have been discussed already in romanticised and poetic language: I began discussing Stravinsky and Nachmanovitch, both discussing limitations in the arts. Stravinsky uses a phrase that is particularly important and telling: "the arbitrariness serves only to obtain the precision of the execution." Nachmanovitch also spent a time discussing patternings, about how our internal ideas clash with external influences to create the truly unique. I have discussed how Zawinul improvises vast quantities of music like rattling off spoken word. All of these things are creative people talking about creativity. Sawyer (2012) describes how one common consensus is that

creativity is a “mysterious force that will forever resist scientific explanation.” However, it has in fact attracted an amount of empirical study in the field of psychology - research that, through the jargon and academic sensibilities, sounds incredibly familiar to the many of the things I have already discussed.

Whilst many different models of creativity have been proposed, the one way in which they are all similar is that they begin with a fist step where a problem is recognised, identified, and constructed (Reiter-Palmon & Robson, 2009). When Stravinsky discusses the freedom that comes with the arbitrary limits, or when Nachmanovitch discusses how external influences shape our ideas, the mysterious and romanticised discussion of inspiration suddenly begins to shape something all the more defined. The seminal study by Csikszentmihalyi and Getzels (1971) was an early foray into empirical creativity research regarding problem finding which established the concept of creative tasks being “discovered problem-solving” tasks.

> At one end of the continuum there are presented problems, that is, situations where the problem, the method, and the solution are already known, the problem solver needs only adopt the “correct” procedural steps to drive at the satisfactory conclusion. At the other end, there are discovered problems, that is, situations where the problem itself has not yet been formulated but must be identified and the appropriate method for reaching a solution and the nature of the satisfactory solution are unknown.
> (Csikszentmihalyi & Getzels, 1971)

If creativity has a problem-solving component that is integral to success, then the freedom that Stravinsky finds from arbitrary limitations, and the patterning influence that Nachmanovitch discusses, neatly fits into this idea. It also explains the *feeling* Byrne explained conflicted with the so-called “conventional wisdom”, along with Eno’s recording ventures outside of the conventional recording studio environment. If we need some kind of problem to solve, then anything we do to build one to engage with, must direct us towards more creative results. Csikszentmihalyi and Getzels' study used still life drawing to observe the relationship between problem-finding behaviour and the creativity of the resulting drawings.

> Observations of "discovery-orientated" behavior were recorded for each subject from the time he began organizing the still-life object until he completed the actual drawing. [....] A positive relationship was found between discovery-orientated behavior at the problem-formulation stage and the originality (but not he craftsmanship) of the creative product.
> (Csikszentmihalyi & Getzels, 1971)

The more time someone spends preparing and engaging with a creative task before undertaking the task, the more creative the result. More so, those who were most creative were those who continued to be creative 18 years into the future (Csikszentmihalyi, 1990) - a correlation that supports these measure of creativity. Csikszentmihalyi and Getzels' study found the link between discovery-orientated behaviour and originality, but not craftsmanship. However, a study by Reiter-Palmon and colleagues suggested ability to construct problems was related to the quality of the solutions:

> Results indicated that problem construction ability was related to higher quality solutions as well has solutions rated as more original. Problem construction ability also interacted with cue consistency such that individuals with high problem construction ability produced solutions of higher quality and originality faced with inconsistent cues.
> (Reiter-Palmon et al, 1997)

The “cues” mentioned here refer to particular aspects of a particular problem. It is explained that when presented with a problem, we refer to our past experiences to assess the best course of action for the problem before us. However, this process relies on the “cues” being consistent with what we have encountered in the past. Thus, what is being explained here, is that in the event that such “cues” are inconsistent with our expectations, then the ability to construct a problem also enables us to reframe our perception of the task to achieve a fore successful outcome. Schön makes very similar claims in *The Reflective Practitioner* that has already come up in the methodology chapter.

> What I propose is this: The practitioner has already built up a *repertoire* of examples, images, understandings, and actions. […] A practitioner’s repertoire includes the whole of his experience insofar as it is accessible to him for understanding and action.
>
> When a practitioner makes sense of a situation he perceives to be unique, he *sees* it *as* something already present in his repertoire. To see *this* site as *that* one is not to subsume the first under a familiar category or rule. It is, rather, to see the unfamiliar, unique situation as both similar to and different from the familiar one, without at first being able to say similar to different with respect to what.
> (Schön, 1983)

Schön presents *The Reflective Practitioner* as an inquiry that seeks to identify what makes the best practitioners able to identify and work problems beyond the textbook application of taught knowledge. He explains, as I have already discussed, how professionals exercise a knowledge beyond what can be straight forwardly explained, and here in this chapter we begin to see the defining of these unexplainable things. Rostan conducted study concerning the

problem constructing habits of critically acclaimed artists and scientists, and found that those who were beyond merely professional competent displayed different behaviour in approaching their tasks.

> Critically acclaimed professional producers in art and science differed from the professionally competent artists and scientists. The critically acclaimed professional producers devoted a larger proportion of their total response time to finding a problem in a decontextualised task and utilised a large proportion of abstract functions on a sorting task.
> (Rostan, 1994)

Here we see the bare mechanics of what Schön proposes. The best professionals approach problems in a way that opens a dialogue with the unique situation, rather than applying textbook knowledge. Creative tasks do not provide us with a specific path to the outcome we desire - we may not even know *what* we desire before embarking. Thus, we must take the time to engage with the task in order to frame it in such a way that we can focus our efforts to achieve what we want - how we approach a vague task changes the outcome, so it is important to take time to frame it in a way to achieve the results we desire. Kaufman (2016) provides a mundane example to demonstrate:

> Let's say you are a bit of a slob and you are tired of people coming into your apartment and telling you how messy you are. You would proceed quite differently if you decide the problem "I need to be neater" as opposed to "My friends are all insensitive jerks."
>
> (Kaufman, 2016)

What we do to frame our task, shapes the outcome. The "cues" that surround us can be applied to the various limitations that have been discussed previously, and the whole process of us taking time to engage with our tasks to "reframe" them as Schön explains fits to the concept of us needing to frame and construct a problem to solve in order to see the greatest success. With all of this in mind, the return to the limitless and infinitely malleable world of computer-based composition seems jarring. Its existence makes sense in light of Byrne's "conventional wisdom," but the extent to which it has become so prevalent and championed as a great and obligatory privilege stands in direct conflict with so much of what we know of how human beings go from *nothing* to *something.* The generally accepted narrative for creativity "*suggests that the classical composer gets a strange look in his or her eye and begins furiously scribbling a fully realised composition"* (Byrne, 2012), but the research suggests anything but. This concept suggests that it is all in our heads, that we need the

medium to facilitate without resistance is a commonplace assumption. But it is that idea that distracts us from doing the things that actually *do* provide us with the inspiration we think we have.

> The field's focus on divergent thinking, A J. Cropley argues, may come from our wish for "effortless creativity" - to have brilliance erupt from our heads like Athena bursting from Zeus, ready with sword and shield in hand. Much less sexy is the idea of "effortful creativity," which requires task appropriateness, as well as knowledge, expertise, and even making creativity a habitual routine
>
> (Kaufman, 2016; Cropley, 2006; Glăveanu, 2012)

Divergent thinking here refers to Guilford's concepts of "divergent" and "convergent thinking" (Guilford, 1950, 1967). The principle being that there is an ideas generation process (divergent thinking) and then an idea consideration and selection process (convergent thinking). Cropley's argument here mirrors so much of what has been discussed - that creativity isn't an outward outpouring from some divine inner spark. Instead, it is imposed by the materials, grown by process, and curated in a thoughtful manner. Conventional wisdom, as Byrne described it, would certainly give us the idea that to have the ability to make *anything* would give the ultimate creative environment. However, the infinite whatever-you-can-imagine scope of the DAW based process I was taught and worked with through most of my musical career stands in stark contrast to both the practice of established professionals and the science of creativity itself.

> Free production of variability through un-fettered divergent thinking holds out the seductive promise of effortless creativity but runs the risk of generating only quasi creativity or pseudocreativity if it is not adapted to reality. Therefore, creative thinking seems to involve 2 components: generation of novelty (via divergent thinking) and evaluation of the novelty (via convergent thinking).
>
> (Cropley, 2006)

The digital workstation is built around providing freedom for the user. As Eno suggested, the technology strives to open up as many options as possible, whilst perhaps it is fewer, more deliberate options that offer the stimulation necessary for creativity to flourish. Stravinsky highlighted the perception of the arts being ultimately free, unlike the rest of life, and described this notions as "heresy". This perception appears to be something that has not faded over the decades, and now this "heresy" Stravinsky describes is the steering ideology of music production. Byrne used the phrase "conventional wisdom" and it could be used to explain the

way we idealise this freedom: that if we can do whatever we want, then we might jump to the conclusion that with this we can easily create whatever we wish - but this is not the case.

As I began working on my own composition work for this project, I used methods that can trace influence back to everything discussed here. Embracing obstacles, surrendering to my materials and creating process; thinking ahead, planning and choosing the best options from a number of possibilities. I began to change the way I worked, and I began to engage more with my music.

The Cassette-tape revival and Lo-fi

This project concerns the use of limitations to inspire creativity and I have used a four-track cassette recorder to achieve this. Though my use of the device is solely a means to an end, the cassette-tape has seen a resurgence of popularity in recent years both in music creation and consumption. My own work focuses creative process, but the technology I am using and the aesthetics of the music I have created lead to inescapable ties to this resurgence in the use of cassettes.

In its heyday, the cassette was a popular means of portable audio listening. It was also one of the first mediums created that enabled consumer participation, with blank cassettes and consumer recording devices allowing users to record their own audio or make copies of other recordings (Demers, 2017). In these functions the cassette was eventually surpassed by digital media and the medium fell into obsolescence. In recent times however, the cassette-tape has been seeing a resurgence in mainstream popularity. In music consumption, the Official Charts Company reported record cassette sales in 2022 with 195,000 sales, a 5.2% year-on-year increase (Smith, 2023). This surge in music sales for the medium is matched in the music production world also as Reverb, an online music equipment marketplace, has seen the value of second-hand 4-track cassette recorders steadily rise (Handley, 2020), showing more than a hunger for just listening to the medium. Given that this is a music composition focused project, I will focus on the ways in which cassettes have become part of modern music composition and production.

One of the most distinct characteristics of cassette-tapes is the aesthetic of recordings made using them. These aesthetics: the tape-hiss, warbling, distortion and so on, are all hallmarks of the “lo-fi” genre umbrella. Today, the term lo-fi seems self-explanatory. In the 21st century, technological

advancements have allowed for faithful reproduction of recorded sound, even in the hands of amateurs. Thus, lo-fi conjures a vision of recordings which are either old, or of deliberate poor quality. These assumptions however have not always been the case. Harper (2014) explains the probable origins of the term lo-fi as the natural negative inverse of high-fidelity, a term originating in the 20th Century to describe accurate and transparent reproduction of recorded audio. Despite its history, "lo-fi" as a genre descriptor as one might perceive it today is a relatively recent development. Harper explains how perceptions of lo-fi's aesthetics have changed over time in the discourse of lo-fi music.

> …where sound quality was mentioned at all, poor sound quality was criticised and good sound quality was praised. Then, attempting to find some historical basis for the near-ubiquitous contemporary idea that the scratchiness of old recordings has a special evocative charm, I turned to the reception of folk recordings during the 1950s and 1960s. In almost every case, as far as sound quality was concerned, only the best was acceptable.
> (Harper, 2014)

Imperfections in a recording which might have been undesirable or poorly received in the past, may now be seen as something realist or nostalgic. There are a mix of imperfections from both recording and playback that effect the sound. A sufficiently old recording, an amateur recording or a "demo" recording might have been created using antiquated or more affordable equipment, in a space less than ideal for capturing sound. The medium it is recorded to (typically tape or cassette-tape in the context of this discussion) imparts its own aesthetics on the recording. On top of that, the playback of this recording is "coloured" by the medium or the equipment used to play it. A portable, consumer cassette player exposed to moisture, temperature changes and dirt all affect the playback equipment and the cassette itself, forming a conglomerate of factors that impart aesthetics on the audio as it is played back.

In the past these aesthetics would just be part of the recording or playing audio - they were undesirable as Harper highlights, but accepted as part of the medium. Today, these aesthetics are reminiscent of the time when they were prominent, and so the presence of these aesthetics imparts a context on the music, unique to the modern day perspective. In modern lo-fi music, these aesthetics are often chosen to deliberately imply such a context and become part of the composition itself. Music that is recorded or released on cassette will inevitably have qualities imparted upon it by the medium, and these qualities attach era or practice-specific connotations to the music, whether it is authentic or not. Winston and Saywood (2019) hypothesise that modern lo-fi uses paradoxes in generating meaning for listener, engaging "both with hyper-specific memories of popular media which may have been

consumed during, or at least associated with, a listener's childhood, and, simultaneously, with a vague, abstract longing for a past which the listener is fully aware never existed; its impossibility is accepted, even cherished, and is valued in its own right." Much of the lo-fi music made today is not decades old, nor is it necessarily an amateur or primitive production. the aesthetics imply a context that doesn't exist, and this fabricated reality is very much part of the modern lo-fi movement.

The lo-fi aesthetic, in the past, came from antiquated recordings or amateurs recording on amateur equipment. During this time the imperfections imparted by the technology and, perhaps, lack of experience, were deemed undesirable. Today, these aesthetics are reminiscent of these old recordings, and so impart a context upon a recording within which they are present - they become part of the composition itself. Jones (2014) studied process-orientated aesthetics of hip-hop and alternative rock in the 90s and provided five common meanings portrayed by "alternative music trends" which align closely with the lo-fi aesthetics discussed here: empowerment, experimentation, communality, honesty, and nonchalance. Ultimately, lo-fi gives a sense of outsider art, a sense of community, and a sense of sincerity. Music made today which wears the lo-fi aesthetics is music which rejects the ideals which have been adopted by modern music production - it invites listeners to enjoy it on its compositional merit, rather than how *well* it has been produced. Jones (2014) proposes that this acceptance cultivates a feeling of exclusivity through an "imagined community" of listeners, individuals who are accepting and embracing of the aesthetics. The most relevant links to my own work in this project are the concepts of honesty and nonchalance.

> An artist who breaks from accepted modes of musical production in an idiosyncratic artistic act conveys a sense of honesty - as being one who eschews commercial forces in order to follow his or her artistic instincts. […] The unfinished roughness of a process-orientated aesthetic can also convey a sense of naturalness.
>
> (Jones, 2014)

In this project I am not rejecting commercial forces, but I am rejecting outside influences that shaped my creative process prior to this project. The music I have made for this project does however bear the "process-orientated" aesthetics Jones articulates, and the music made, despite its "unfinished roughness", is perhaps the closest I have come to achieving my personal expression in pre-composed work. The nonchalance in my work would refer to my improvisational background, and the improvising elements in the work presented in this thesis. This is where I believe I am truest to myself as a musician. It might not necessarily be the tidiest or best presented, but it is this element of expression

which I have been seeking to achieve in my composed music. Despite these similarities, my own work is not aiming to create meaning through its aesthetics. The process of composing which I disseminate later in the thesis was necessitated by recording to cassette, but the reasoning was *process* not *aesthetics.* My conclusions at the end of the thesis discuss how my creative process changed and the potential to take this process away from the four-track recorder, which removes the lo-fi element.

Cassette tapes have found other ways into modern music aside from being a recording medium. Italian electronic musician Alessandro Cortini is well known for his work with industrial band Nine Inch Nails and is one of the prominent users of a 4-track as an instrument. Explaining in a video interview for Sonicstate, he explained the origins of his 4-track use:

> Somehow for the song hurt, I decided to make a Logic session where the chords that are in the chorus, I could cut them so I would have four chords with four different tracks, looped forever... and then I transferred those to cassette. In order to have each one of those chords in one of the channels. […] It sounded so interesting and so cool on its own that once I started putting effects on it and I started realising that I could just make some My Bloody Valentine-ish pitch changes just by barely touching the pitch wheel while it was playing and it just all of a sudden, it made a part that was, you know, more static earlier, but still with a lot of personality.
>
> (Cortini, 2014)

Cortini's use of the four-track isn't about limitations, nor is it about creating a faux-context for the listener. Cortini makes use of the aesthetics of the cassette and leans into the ways in which cassettes change the timbre of the audio recorded to them. Whilst a wealth of modern artists lean into the nostalgia for the medium, Cortini leans into the fragility of the medium, and uses the four-track to provide a more interactive backing track in a live scenario, a backing track with "a lot of personality" as he explained. Furthering Cortini's implementation of cassettes, ambient and drone guitarist Randall Taylor, going by the stage name Amulets, uses a four track in a similar way:

> On YouTube, you know, trying to be inspired, and I watched a rig rundown of Alessandro Cortini and he showed how he used his 4-track as an instrument to play a chord progression. […] He was doing a twenty-minute session to record each track... he was using the entire tape! I was doing that, I was like "fuck, this is taking way too long! I don't want to sit and record a G chord for twenty minutes".

(Taylor, 2020)

Amulets' use of the four track makes use of another cassette tape modification: tape loops. Splicing a small loop of tape inside the cassettes case, replacing the large length of tape wound between the two spools, allows for a short length of sound to be recorded and played over and over. Amulets' explains that he uses two four tracks in his setup: one for drones or sustained chords, and another for field recordings, melodies, or anything else that might be part of the piece he is performing. Amulets creates ambient and drone-based soundscapes for his work, and uses the four track to play soundscapes or melodies which could not play played separately. Both Cortini and Amulets demonstrate how that, now technology allows for some things to be done easier or more efficiently, the use of cassettes become something experimental and "fun". We know that the computer could do what we envision, but sometimes working with physical media, or working in a way which is different to our normal working methods can change what we create. It is this exploratory approach that I sought, and despite using the cassette in its intended fashion, the intervention provided a vessel through which I could examine my practice.

This project isn't about lo-fi, nor is it about cassettes - it concerns music composition and explores how I have come to make music, having grown up in a digital age. I do have similarities to the lo-fi movement: I am making music that accepts imperfections, makes use of a vintage medium and amateur equipment, and is presented in an honest and nonchalant way akin to what Jones described. However, the use of the technology is a temporary intervention which is providing a means to examine my practice for the purpose of this project. It is this examination of my practice which also differentiated my work from others'. Many modern musicians are working with cassettes for a variety of reasons, but they seldom ever explicitly express *what* it is they gain from working in this way. My own practice is informed by the contextual research outlined above, and I will begin to describe what is going on in my practice and will point to specifics as the thesis progresses. The conclusions I draw at the end of this thesis don't require a four-track recorder to be implemented, instead I settle of a series of abstract ideas concerning my relationship with music composition.

Chapter 4: Composition Process

The method of my research was practice-based: I wrote music to explore my relationship with music technology, and this chapter narrates this process. It will lay out the process I

established to effectively overcome the obstacles presented by using cassette tapes, explaining the function and origins of each step. To demonstrate how this all functions in practice, this chapter will also follow the composition of a piece of music from the beginning, using recordings I have made along the way as examples to show how my materials dictated my process and in turn, how this process influenced my music.

Audio-cassette Recording

To interrupt my established working habits, I chose to replace my computer with a four-track cassette recorder. Created by electronics company Phillips, the audiocassette consists of magnetic tape wound on to two small spools, sealed within a plastic case (Jorgensen, 1995). These were, for a time, a mainstream consumer-grade medium for listening to, and recording audio. Compact, durable, and cheap, cassettes allowed for portable listening, as well as allowing home-recording. Since the advent of digital technology however, cassettes have fallen into obsolescence as the Compact Disc, and eventually digital downloads and streaming, offered much greater portability with equally greater reproduction fidelity and durability.

The audio cassette was primarily a domestic medium, but the mechanics of the device can be taken advantage of for home recording of musical projects: the four-track cassette recorder can record up to four layers of sound, or “tracks”, on to a standard audiocassette. In typical consumer use, a cassette tape has two sides, A and B. Each side exists on the tape as two pairs of lanes, four in total, which carry the left and right audio pairing for each side, running in directions opposite to each other and thus, allowing for the tape to be flipped around, doubling the length of the audio recording capacity. Instead of using the tape in this way, a four-track recorder uses all of the tape running in the same direction. This halves the capacity for recording, but allows each lane, or “track” to be recorded on separately, providing up to four layers of sound. Of course, each single track is just a mono sound source (as the domestic standard uses the two tracks for *left* and *right* respectively), and so one must make use of two tracks in order to achieve a stereo recording. Figure 4.1 shows a diagram that demonstrates how all this looks in practice.

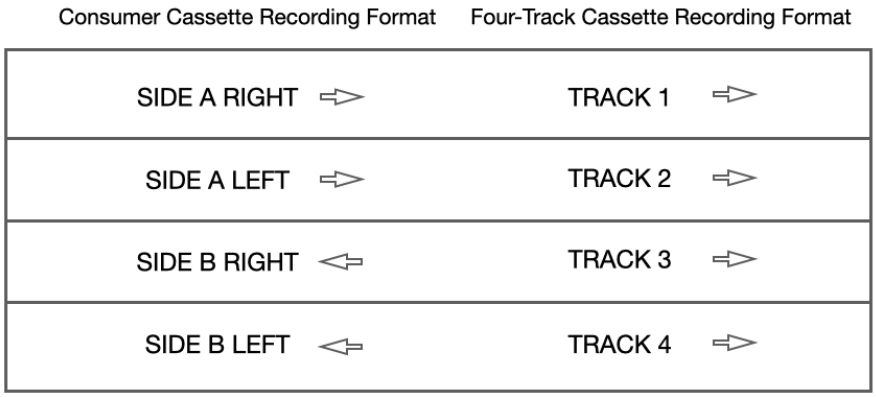

Fig 4.1

Recording on cassette tape poses certain difficulties due to quirks of the medium - quirks that are both due to the tape, but also due to the small and sealed nature of the cassette. Immediately noticeable is the fidelity of cassette tape. Recordings made to cassette contains a considerable amount of tape-hiss, an underlying background noise that comes both from the tape itself and the technology used to record and play the recording. To overcome this, it is desirable to record to the tape as loud as possible without overloading the tape and causing distortion. Cassette tapes also compress audio significantly. The gap in volume between the quietest sounds and loudest sounds is artificially shrunk, changing the dynamics of a recording: quiet sounds might sound much louder when played back, and a mix of sounds played at once might audibly step on each other's toes in unexpected ways. Ultimately, the cassette changes how something sounds once it is recorded, both in timbre and in dynamics. There are changes depending on the quality of the recording machine and the material used to make the tape, but there are always limits on quality.

Another significant obstacle, the one which brought me to use cassettes in the first place, is that editing is nigh on impossible. With a reel-to-reel (or open wheel) tape machine, editing takes the form of splicing. Splicing is a process whereby the tape itself is cut into separate pieces, and then reassembled however desired. However, in order to know *where* in the recording we are cutting, it is necessary to run the tape past the play head on a tape machine and mark for cutting (Howe, 1975). With a reel-to-reel machine, this is a simple task of guiding the tape by hand, off the reel and through the open mechanism, as the "open-reel" name suggests. Cassette tapes however are sealed devices, and the mechanism for play back is an automated device contained within the machine. Thus, whilst splicing of cassette tape is technically possible, it is prohibitively impractical. - there is no way to know *exactly* where we are recording. It *is* possible to overwrite recording on an audiocassette - one can record over something that has already been recorded, or drop in at a point in an attempt to correct a

mistake. This is a difficult process, because we still can't see where we are on the tape. Also, there are audible artefacts from recording dropping in and out making it discernible that there are different takes occurring. Such things are unavoidable, so I found it was best practice to limit such activities.

Ultimately, cassettes are limited in their fidelity, with a handicap on *how good* it is possible to sound. They also make it almost impossible to make edits, meaning that we must play our parts fully through without mistakes. I came to choose the cassette or this project following my previous experience working with them. I first used them as a tamper-proof recording device in previous studies, studies which focused on instrumentation rather than the technology focus of this project. I found that the limits on fidelity meant I couldn't spend time "properly" setting up, because there was nothing for me to do - I couldn't set anything up to achieve a pristine recording, and anything I did wouldn't yield and better results. Furthermore, the inability to edit changed how I approached my playing: I began playing with a more performance mindset, and mindset that I had to *just play,* that anything that went wrong would just be, and that there wasn't anything that could be done about it. If I made a mistake, I could not undo the mistake without destroying the take, which might lose an otherwise good performance.

I found myself focusing on the playing of instruments, rather than doing battle with the technology that I was recording with. It was this that made me question how these changes were interrupting my working, and this project saw me confront this. The cassette offered borders to my canvas. They were a material that dictated the designs, and they were a foundation that resisted. I could no longer instantly create whatever first came to mind and manipulate it at my will, I would need to consider *how* I could achieve a manifestation of my ideas using this totally different technology. In the beginning of the project, I defined three ideal attributes of music composition. They would initially be intended as instructions for participants, but eventually became steps in a process I would use to mobilise my efforts in overcoming the obstacle that was cassette-based recording.

My Composing Process

This project saw me making sense of my relationship with the technology I have grown up with. using the four-track recorder instead of the flexible software I was accustomed to using drastically inhibited my usual working methods. This intervention served as a vessel through which I reflected on my composition habits up to that point and prompted me to confront certain ideals I have ingrained in my working. The conclusions I drew from this exercise are born from

the process I developed to overcome my imposed obstacles and lean into things I have deemed valuable in composition. The result of the necessities of working with cassette created a drafting process, whereby I make some music, then make more based on those ideas and so on, using paper to write notations and take notes alongside. The process uses three phases of composition that refer to ideals I established in my initial contextual research and musical considerations. A final fourth phase takes the composition that is written through this process, and offers an opportunity to re-record that piece, creating a presentable and finished piece of music. All four of these phases are as follows:

Commitment - An improvisational idea-generation phase.

Immediacy - A phase for considering the ideas and manipulating them individually.

Malleable - A phase where the ideas are pieced together to create a draft composition

Fruition - The draft composition is re-recorded to create a presentable piece of music.

These terms were highlighted early in the project. They encompass specific themes I kept returning to in descriptions of music creation - be it pre-composed or improvised. They were to be instructions for each step of the composing workshops I initially devised. Participants were to slowly be introduced to cassette tape recording through these instructions, with each both highlighting a component of composition, but also acting as a tutorial for the technology and quirks. Following the covid outbreak, this plan was put on hold and eventually scrapped after the pandemic persisted. I took these instructions and began to work with them myself, spending the time to experiment and evolve the process. The result was a process that was set in stone, and two compositions that were created as I worked through my own instructions. These two preliminary pieces are available to listen to in the appendices. Once I had my principles, I set out to create one larger piece, originally aiming to fill a 45-minute cassette. My ambition based around the maximum length of a standard C90 cassette when it is used in my four-track recorder, owing to the use of only a single side. The piece of music presented in this chapter was an experiment to see how far I could push my process. If I simply kept on working through my exercises, could I fill a cassette with music by the end of it, provided that I spent enough time working? Ultimately the pieces would end up being 22 minutes instead,

but exactly why will be explained in my conclusions in chapter 5. This chapter explains my creative process, but also presents a narrative of this work, along with recordings of the ideas which would come together to make the music.

Initially I set up these as a set of sequential instructions. I would engage with each one in order and progressed through each one as an exercise to complete, the intention being that this heuristic approach would become a method by which music was produced as a result of me following these rules in each individual activity - much like Eno's "gardening, not architecture" and similar to Cage's process led composition. However, as I repeated this process across multiple compositions, I began returning to different phases to rerun some of the process using influence from the progression of the music. For example, if I would have an apparent gap for something more, or if something felt missing, I might re-tread my steps to fill in the space. In the end, I have come to view these steps as a set of philosophies with an implied direction. The compositions I created whilst formulating my process are available in an appendix on page 71. They are not discussed any further but are available for reference, nonetheless.

Commitment

Through my contextual research and reflections on my past practices, I had come to realise that I lacked any commitment in the playing of the music I was writing and recording. When I use the term *commitment,* I refer to the way I invest myself in the playing of the music I am creating. When working in a digital manner, everything can be done again, edited, or fixed. Long parts can be assembled, and small parts can be arranged and rearranged as much as I could ever want or need. Most of my efforts composing in the past were spent tinkering with sounds in software, stemming from the educational exercises prescribed in school and college. I would typically stumble around the music, trying a melody, trying a bass line, trying some percussion. The music would be tinkered with, bits moved, edited and deleted over a lengthy period of time - these parts could be worked in whichever way was needed. This stood in stark contrast to how I personally make most of my music as a performer: when playing shows, everything played is just played once. There are no second takes, revisions or assembly.

Performing manifests musically as a leap of faith, to commit in the moment to the sounds we make, and for ourselves and our audience to enjoy the music as a unique performance shaped by the context of the show. A portion of my practice is also dedicated to improvisation, and performing in an improvisational setting - it is in this setting where my concept of commitment

is most prominent. I was fortunate enough to play a show alongside improvisational drummer Chris Corsano, who explained that his draw to improvisation was that if the music needs a change, this change must be committed to. In a studio and compositional setting, we may create one idea, and then try something else. We might compare the two and choose one, or merge the two ideas - we are free to engage in trial and error, without ever *committing.* However, when this feeling of a needed change arises in an improvisation, we have no opportunity to test this change before we enact it. The change is enacted for the good of the music, to move the music onwards and continue the progression of the performance. We must live with whatever this change is, especially if we are performing for an audience. However it transpires and whatever manifests as a result of this leap of faith mum be committed to, and this is what I consider *commitment*.

These moments in performance often lead to some of our most exciting pieces of music. When the music *must* keep going, we explore our ideas, meandering from one to the next, settling into good feelings and taking the time to enjoy ourselves in those moments. It is also often the case that we remember feeling the successes of a performance, but remember little of what we played. Even in the performance we may attempt a reprise, only to find an alternative version of a previous idea that is long gone. I dwell on the live performance setting, this phenomenon also happens away from an audience too. We may doodle for our own entertainment and whittle away hours enjoying fruitful music-making, only to forget the very thing we were so invested in. As Joe Zawinul explained: “when inspiration starts, rational thinking stops”.

When we play at home, we may spend an amount of time playing for pleasure. We may sit and play for fun, either losing ourselves in our own little world, or merely doodling whilst distracted by something else. In my own experiences, this is not seen as music composition. In fact, I have regularly encountered hobbyist musicians who may exclusively engage in this kind of playing, never recording or performing. They often portray the idea that to compose is to turn play into work, that they play instruments to escape from that kind of obligation, and so to pick up an instrument to create new music with it, is something they purposely shy away from. But, they *do* create new music, all the time. In sitting down, playing around simple ideas, or doodling for fun, we make new ideas - the only thing missing is recording these ideas.

Returning to my own past and the discussion of the psychology of creativity: I am guilty of this feeling. Deciding that this playing is for fun, so I shan’t spend any time preparing, recording,

or taking notes. Then I find something I enjoy, only for it to be lost forever. I believe that in my own life this is due to, again, the way in which composition has been presented to me as I have grown up as a musician in this digital world. I have an image of composing music in my head and it isn't sitting down with an instrument and playing it. It's the process I have already explained multiple times, and it's something I don't really enjoy, so I have shied away from it. But that isn't exclusively what composition is. I am also composing when I improvise on piano for a couple of hours. If I record what I play I have a recording of all the ideas I explored, archived for me to pick from. In recording everything, I simply need to play the way I would anyway, the music goes on to write itself. One difficulty with doing this with a computer was always that the computer would either require some kind of trouble shooting before functioning, or that the software would invite intervention: the temptation to quickly fix something, only to be sucked into constructing something wholly artificially, or an idea crops up and suddenly I can stop to add to it, rather than just carry on. The temptation, perhaps even the conditioning that comes from how I have used the technology through my whole career, gets in the way.

This is where my choice of cassette tapes becomes relevant - one of the defining characteristics of cassette recording is the inability to edit. I have mentioned that I first used cassettes in the past as a tamper-proof notepad. Here they function in the same way, but this time it is deliberate. I play, and keep playing, without stopping. Regardless of what I end up playing, perhaps I slip up and stop for a moment… perhaps I play "wrong" notes, or spend a while feeling around in the same spot to find something I can hear but can't quite play out loud. I keep recording, until I feel an idea has been played out. Perhaps even I simply record a brief part that has sprung to mind, to save it for later. The point is that the stream of conscious that is fun, playful, and ironically non-committal, is recorded to create a library of ideas to make use of in the future.

Here I will begin to present the musical examples from the practical element of this research. At the end of this chapter, I will present a finished piece of music. Between here and there I will present smaller, rough pieces of music which highlight the individual ideas which form part of the final piece. Each piece of music presented as the chapter progresses either *is* or *contains* an idea which will go on to form part of the finished, final piece presented at the end. These pieces are presented in chronological order, and so listening to each in the order they appear plays out the formation of a composition as the ideas are initially improvised and

captured at the beginning of the process, and worked into the final, whole form throughout the rest of the chapter.

> Commitment 1 - Synth Intro <

The first *commitment* example here is a piece of music created using a Moog synthesiser and a string synthesiser. The two are reminiscent of the earlier days of synthesis in the mid twentieth century, and so the two together implies are certain timbre and mood which puts images of vintage science fiction in my mind. String synthesisers are not as common in the modern world, and these instruments have a their own unique way of imitating orchestral sounds, giving the other worldly sound heard in this example. This piece begins with the Moog running an arpeggiated bass line, whilst the string synthesiser provides other worldly strings and a loose melody nestled amongst them. As this part stays its welcome until 5:10, where I manipulate the strings to provide something more hollow sounding and less all encompassing. I stop the Moog bass line and quickly shift its settings to give me a soft, woodwinds lead sound and I begin playing a solo melody over the a sustained chord. The first half of this piece was briefly figured out. I spent a few minutes playing to settle on that basic idea, pressed record and then improvised around that idea. Rather than stop, I chose to carry on recording as I changed the sounds and began something else - this is an example of the commitment I have been discussing: the element of committing to a piece of music. I could have ended once I decided the first section was finished. Yet, had I done so, the second part wouldn't exist. Perhaps without the transition I wouldn't have found this example so interesting - an arpeggio looped isn't entirely exciting, I find the strings and the melodies I play alongside them to be the main factor that draws me to it.

> Commitment 2 - Piano Riff <

The next piece is a piano piece. This piece provides another important demonstration of commitment, but is also an example of the value in our everyday playing. I meander and doodle, creating nothing I really value but enjoying myself nonetheless. In chapter three I examined the importance of playing for the sake of playing for the sake of playing, how it can be an enjoyable exploration of ideas. As long as we play for the sake of playing, the music will write itself, and that is what happened here. At 3:34, I launch into a melody out of nowhere. I don't remember thinking of playing it, nor did I gradually move towards it. I just decide to move the music and launch into something completely different. Even though I am not particularly interested not pleased with the rest of the playing on this recording, the valuable riff is saved, and will become a leitmotif throughout the final piece. I would not have remembered this riff

had I not recorded this piano piece. I wasn't really taking this playing seriously, and I didn't feel as though I particularly created anything important once I stopped recording. However, because I *had* recorded it, I find my riff in amongst the rest of the playing once I listened back. I committed to launching into the riff, which again demonstrates what I mean when I use the phrase *commitment,* but I believe this piece also shows how just playing for the sake of playing *can be* composition. We don't need to sit down with the intention of adding to something, or sit at out computer and work on a project, we just need to record ourselves making music, whenever we make music, and however we wish to record ourselves.

> Commitment 3 - First Bars <

Whilst playfully looking or new starting points to improvise from, I stumbled upon an arpeggio progression I like. Realising that I would probably forget it quickly enough, I click record and make this little two minute piece of music. I found that it is important to record *everything,* as I can come back to make use of things later. I don't need to worry if the thing I record is a decent rendition of an idea, I just need something to take note of my thoughts. No one needs to hear my raw, thinking-out-loud ideas, so I shouldn't be afraid to commit them to a recording, regardless of how rough they might be. This little piece has me trip up a few times and make some mistakes, but that doesn't matter - this simply exists so I don't forget it if I want it later. This progression would go on to serve as the intro to the final piece, and we will hear it in subsequent examples of music, as I experiment with different iterations using instrumentation.

> Commitment 4 - Unused Bleeps <

As the name suggests, "Unused Bleeps" will eventually be abandoned. I felt that it dictated too much: it was a melody and a rhythm, and the delay effect that I used to achieve the bouncing effect (an echo of what was played is repeated a number of times in an increasingly decaying volume) filled out the audible space too much. I liked how it sounded by itself, but I was never happy with any application with other ideas. I will however return in a future example, so I have included it here to show where this piece of music came from.

> Commitment 5 - Guitar Looper <

The final commitment part is this guitar chord progression. It was created whilst experimenting with a loop pedal and an acoustic guitar. I was also using up old, used cassettes that I have collected for free whilst out and about, so the recording quality is significantly worse than much of the other recordings. I can no longer remember what this progression actually was; I was in an alternate tuning and I never found exactly what I was playing here. I enjoyed the joyous

feel compared to the other themes I have created here, and felt it could be some kind of reprieve from the eeriness of the rest of the sounds. A loop pedal is a foot operated device that can be used to record and loop a brief musical phrase. I record and loop the two chord progression, and move on to playing more melodic things around 30 seconds in, starting at first on guitar, but eventually moving soon to synth as well at 1:25. I switch throughout, and by 2:50 I am trying with playing both at the same time in some parts, plucking open strings with one hand whilst playing the synthesiser with another. This piece changed the most: the guitar makes a section in the final piece for the reprieve I intended, but it is electric guitar accompanied by 12 string acoustic - I believe the chords are different, though they sound similar enough. There is no way this would have been recalled if I hadn't recorded it. Despite being able to play it back, I am still not entirely sure what I was playing and I had to recreate something that sounds *like* it afterwards.

These pieces demonstrate how the concept of *commitment* manifests in my playing. As an improviser, I will reach a point where the music has exhausted what it has to offer. I will move the music, and play whatever comes to mind. It might be good, or it might not. I might trip up, or play something inexplicably articulate. Nonetheless, I will make music without thinking, I will enjoy it, and then I will forget everything afterwards, with little notion of how long I have been playing, just as Zawinul explained. These ideas would not exists any other way, this is how I work and how I play. No matter the rationalisation, I cannot recreate this outside of working in this manner, and accommodating this playing by recording *everything,* playing for the sake of playing, is exact how to capture the moments that would otherwise be lost.

Immediacy

The second stage of my composing process considered the time it takes to manipulate our ideas after recording. Following the *commitment* process, I have a considerable amount of improvised music and musical ideas to work with. If I were working digitally, I would *immediately* be able to edit these ideas almost infinitely. Pitch and rhythm could be edited, the tempo could be altered, effects can be added afterwards to alter the timbre and sound of the recording. Using MIDI based recording, the parts played and recorded can also moved from instrument to instrument.

However, when I am working with cassettes, these options are not open to me. The recordings are static on the tape, they cannot be changed, I certainly cannot move them between different instruments... and on the machine I used for this project I could also not add effects afterwards.

Because of these limitations, working my ideas requires a much lengthier process. I would listen back to the ideas, and take note of anything that I considered to be worth working on. These ideas were often noted down using music manuscript paper, with the help of a small keyboard for reference.

This stage echoes Guilford's (1950, 1967) Divergent and Convergent thinking concept. I have my ideas generated from the previous exercise, and now I sift through them and consider which ideas are workable. Rather than the "conventional wisdom" that I can just keep creating and creating, I make a plethora of ideas, then work whittle them down to the specific, valuable ideas. The task of making music changes at this point, becoming increasingly structured. I change the infinite and vague "whatever comes to mind" task and turn it into a task of "which of these and how?" task, building music from a set of fixed pieces that further confine my process beyond just the technological limitations. To try ideas in different keys, I have to play them again in a different key. To try them with different instruments, I have to play them on different instruments - it seems obvious, but it's not always a consideration one must make when composing today.

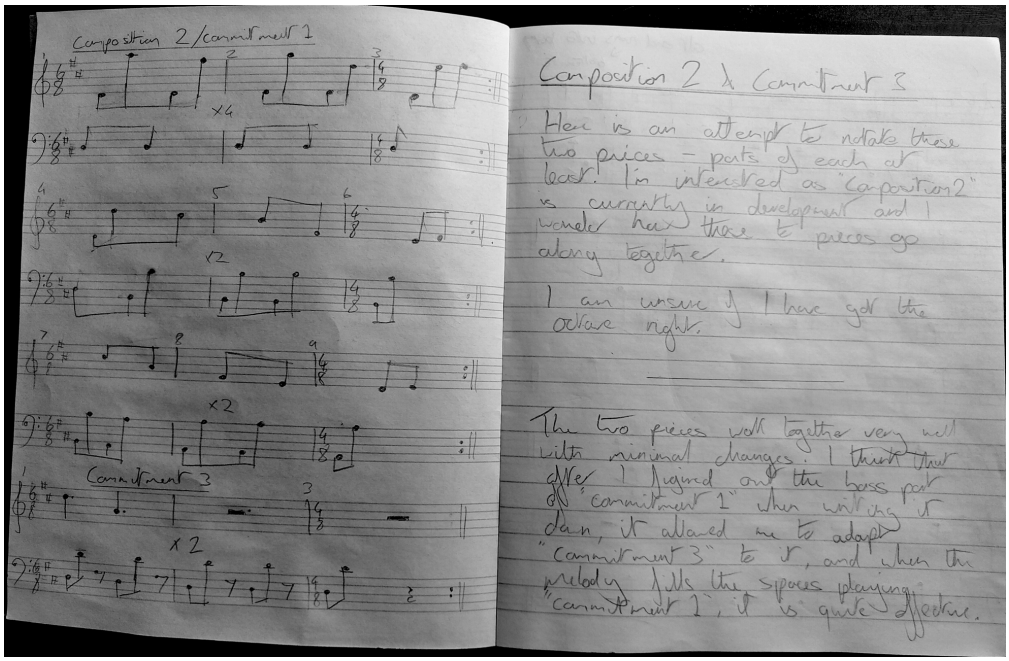

Fig 4.2

Earlier in the project I endeavoured to accurately notate these ideas, and figure 4.1 shows my earlier attempts at working this way. Though I am not completely fluent in written music, I

believed that the intensive process would help me engage with my ideas, to consider the rhythm, key and progression of each idea. After a time of committing to this process, I came to grow weary of the challenge, and began less accurate notation - still using the stave and clef, but I neglected accurate rhythm and key. I felt, and do feel, that this was still as engaging as full, accurate notation, but took much less time in both writing and reading. If I was more fluent this may have transpired differently, and I maintain my belief that it was a worthwhile exercise.

With the detachment of the idea from the recorded music, I can begin to work with the music in abstract. I can achieve the manipulations of pitch and rhythm I would normally exercise digitally, and I can move ideas around instrument, by physically playing the parts on them to try such ideas. I can also begin to consider how my ideas fit together. Ideas that are in the same key of course comfortably sit next to one another. Ideas in different keys require attention to transpose, other ideas might not fit thematically, and require some working to have them accommodate the themes of the other parts I wish to use in my composition.

> Immediacy 1 - Intro Synth Guitar <

This first recording is a recreation of the first example in the *Commitment*, the piece that I explained gave me images of vintage science fiction in my head. There are no strings this time. Instead, the synth bass line is roughly recreated, and I am playing the melody on a distorted electric guitar to see how I feel about it. Here we can see the purpose of this stage in action: I take my ideas from *Commitment*, and begin to work them in different ways. The next example is this same piece recreated again, with the introductory arpeggio progression added on to the beginning, recorded with different instruments.

> Immediacy 2 - Intro Section Acoustic <

This second recording is the introductory arpeggio I introduced earlier, going into the “sci-fi” section. The parts have been recreated using piano, electric guitar and acoustic guitar. I run trough the arpeggio once on piano and then, at 0:34, I continue into what I imagined would be the first section: the synth-based sci-fi sounding section. This time however, there are no synthesisers present. Instead, I use piano for the bass line, and electric guitar for the melody. Accompanying these two are plucked strings of an acoustic guitar, playing a melody that compliments the arpeggiated bass line played by the piano. These two pieces show how I would recreate my ideas, working them in different ways to find how I wish to use them in the final piece I am constructing.

> Immediacy 3 - Bass Line for Piano Riff <

My first recording here is something unique among my work throughout this project. Here I experimented with writing a part entirely on paper before ever hearing it - the intention being that I wanted some bass accompaniment tot he piano riff I had stumbled upon earlier. I heard something I imagined in my head, and wrote it down. This recording is me playing it, and trying out a rhythm I imagined using. It is the same all the way through, and I would have used this to play along to, toying with different ideas over the top.

> Immediacy 4 - Trying Parts Together <

This is an example of me trying out different pieces of music in juxtaposition. “Unused Bleeps” was chosen as an intro and I attempted to place my bass line underneath it, using the bas guitar that starts at 0:54. My intention was something polyrhythmic (where the two rhythms are of different length, and drift in and out of sync with one another) but I clearly struggled to fit it together in practice. It is sloppy playing, but the purpose is not for it to be listened to, it is an exploratory recording, like I am thinking out loud, but in musical form. At 4:03 the sci-fi synth section makes its return. This time, I have returned to the original instrumentation of the Moog synthesiser doing bass, with the string synth providing strings and lead melody. I begin playing bas guitar again, except this time I modify the bass line and play something much slower. I didn’t find success playing the part I had written with my other ideas, so I retain the concept of ascending phrases, but changed the phrases and rhythm to better fit the other ideas I had. The synthesisers end at 7:20 and the bass guitar continues to the end by itself - this would have allowed me to play other things over the top of it to continue my experiments.

> Immediacy 5 - Written Bass Jam <

Finding my original written bass part wasn’t fitting as nicely as I had hoped, I changed it in the previous example. Following some playing over the bass guitar recorded at the end of the last example, I developed some smaller pieces that explored how I might merge my ideas together. This example, along with the next, demonstrate how different instrumentation and rhythm can change the same idea. Here, the bass line is played on electric guitar over a simple drum beat. I use synthesiser for a descending chord progression, and another synthesiser for a lead melody. I Loop the bass line, chords and drums over and over whilst I improvise melodic ideas

over the top, keeping in mind the melodies that have already come up so far amongst my collection of musical ideas.

> Immediacy 6 - Written Bass Jam 2 <

This is the same idea again but sped up. This time, the bass line is played by a light, percussive synth sound, and electric guitar doubles up this bass line. I alternate between "bubbly" sound effects and lead melody on another synthesiser, manipulating the controls of the instrument in real time as I perform. At 2:17, I join in with the melody using guitar, reinforcing the riff that has become the leitmotif.

Malleable

Arranging a piece of music digitally is similar to writing a text document. We can copy and paste, cut and change to our hearts content. Blocks of audio that make up each part can be move around in time and, as discussed just before, even move to different instruments. This is a visual process that is infinitely flexible. To repeat a chorus, we can simple copy the entire "chunk" that is the chorus and place it where in time we wish for the chorus to be repeated. On cassette tape however, this is not possible. To repeat a chorus, we must physically perform all the chorus parts again, repeating the same recording process. We must play all of these parts in the order we wish for them to appear on the recording in real-time, and this is were the performance aspect of composition returns. Once again considering *committing* to ideas, I must make a choice to jump on something if I have an idea to change things. As the work comes together, options open for me to add further ornamentation to the piece.

The *malleable* process is a process of piecing together the full composition. I cannot begin to work on the full composition until I know what order in which the parts will come. Using the selected and revised parts from the *immediacy* stage, I would begin to form a preliminary structure for the music, writing it down once again on paper, this time also taking note of perspective track allocation. As my recording device is limited to four tracks, I must consider what I wish to achieve, both musically and audibly. For example: acoustic piano sounds best in stereo, and so that takes two of the four tracks. A bass line can be mono, two melodies might be played at the same time on one track, but they will be in the same mono channel. This process requires two considerations: The first being what am I going to be able to physically play? I can play two things at the same time, but *what* I play will be influenced by my ability to physically perform those parts together. The second consideration is instrumentation. I need to know what I am going to play so I know what it requires: If it requires

stereo then it will require two tracks. Some parts might appear sequentially with the same instrument. Could I carry on playing and capture both of these parts in a single take?

The performance aspect of the *malleable* process is important. I have already established the limitations of cassette tape recording, so editing and manipulating the recording after it has be captured is not possible. I was required to rehears the parts I was going to record, and I needed to approach the process like a live show. I needed to know what I was playing, when, and for how long. If there was a mistake, do I record over the top of the previous recording and attempt something better? The dilemma being that there *might* be a mistake, but does it detract from the music enough to warrant the destruction of the capture performance? What if the performance I have recorded is a rendition that is engaging and exciting… What if I can record another, tidier take, but it just isn't as exciting or engaging?

> Malleable 1 - First Rendition <

This recording is the first time I begin working on my arrangement for the final piece. It starts with the introductory arpeggio, going into the sci-fi section at 1:18. I have chosen to play both of these parts on synthesiser this time around, but I have decided to still experiment. A croaky violin plays in the background. It is a poor-quality instrument, and I cannot play violin anyway - I took the opportunity to see if I could make *actual* strings work in place of the string synth. Knowing that I won't be able to play a whole string section by myself, I instead decide to make eerie noises in the background instead. There is a brief moment where this section stops at 3:05, and the acoustic guitar reprieve makes an appearance. Along with the guitar, I am playing the melody on synthesiser, and keeping a rhythm on a drum I am tapping with my hands. The acoustic guitar finished at 5:15, and the synth plays on in an open space. Here I am developing the transition between the acoustic guitar section, and the return of the sci-fi section. Because I have just been playing the Moog synth for the melody, I quickly change the settings in anticipation of the bass line coming up but get it wrong, resulting in the strikingly different timbre to the bass line at the beginning of this example.

> Malleable 2 - Malleable Draft <

This is a draft of the final piece. At this point the composition could be considered complete, and this recording is used as reference when recording the final version that will be presented shortly. The introductory arpeggio runs through twice, and is accompanied by synthesised strings. On the second run through, at 1:15, the arpeggio is joined by a synth melody playing a soft, expressive lead, and piano as well. At 2:48 the introduction ends and it launches into

the sci-fi section. The piano ends, but the synthesiser melody stays, soloing through this section until its end at 6:07. Here, a middle section based on the written bass line has been created. It is a merger of the two ideas: I make use of the descending synth chords of the first attempt, except now they are played on electric piano and alternate between a “verse” and “chorus” like structure. Meanwhile, it is faster like the second attempt at this idea. Synthesiser plays what was originally the bass line, and another synthesiser plays the expressive melody that continues through this section.

As this section draws to a close at 12:16, a metronome click makes an appearance. This was recorded to the tape to facilitate a smooth transition into the tempo of the next section, which will be the acoustic guitar reprieve, it is left audible here to show some of the considerations that must be made when recording to tape. I needed this click to keep my rhythm steady, but playing the metronome out loud would be audible in the guitar’s microphone. I needed to record the click to the tape so that I could hear it in my headphones, but not out loud like I had been doing for other parts. In the meantime I might also need the track it was recorded on to record another part. In this recording this track was left unused so the click remained in the recording, though I could have muted it if I wanted to play this as a finished piece of music.

At 17:00 the guitar section ends, and the solo synth melody carries on with the eerie transition, this time accompanied by the string synth, preparing to introduce the sci-fi section to finish the piece. The strings morph their timbre from 18:00 to 18:10, and the final section begins. Knowing my arrangement and what I was going to play, I didn’t finish this piece. The final section has no melody over the top so it plays out by itself. I am sitting at the tape machine, imagining in my head what I will play as this section records, but I don’t return to finish it.

> Malleable 3 - Immediacy Return <

This is an example of my process becoming more a philosophy than a hard set of rules. I return to an *immediacy* stage to try again at making the intro. This time, I return to my piano rendition, and am much happier with the result. Back in the actual *Immediacy* phase, I created the whole first section with piano and guitar. This time I play the introduction on piano, but switch to synthesisers for the sci-fi section. This middle ground between my flip lopping between all piano or all synth will be how it appears in the final piece. As I piece things together in this malleable phase, I begin to reconsider what I might be aiming for, and so things are open to change right up until the very end.

This openness to change is an important note. I have made comment about my working from notes and notation, working with the music in an abstract form rather than working on the music itself. Because of this, I can easily decide if I wish to change something even quite drastic whenever I wish - as the final piece hasn't been recorded, everything is malleable until it is finally set in stone. The way I would work before, I would continually add to sounds that existed all in the same project. Just like a text document, there comes a point where the work is established and has its own identity, and to make any drastic change becomes increasingly difficult as the amount of work that needs to be moved around, changed or discarded increases. I believe that this would be a contributing factor to the lack of inspiration I might feel when working digitally: if something isn't working out, I cannot simply have another go with different instruments, with a different structure, with a different feel entirely. It breeds the feeling of hopelessness in the face of a project that is far advanced yet not coming to fruition. In contrast, when working with tape my work never came to fruition until it was absolutely finished. Nothing was sacred and nothing was established, and so I could easily and happily spend a little while trying different ideas together and in different ways.

Fruition

To make final use of the gardening metaphors, the final stage is named *Fruition*, after Stravinsky's final comments regarding composing with the use of limitations:

> By its fruit we judge the tree. Judge the tree by its fruit then, and do not meddle with the roots. Function justifies an organ, no matter how strange the organ may appear in the eyes of those who are not accustomed to see it functioning.
> (Stravinsky, 1942)

Following the *Malleable* phase of assembly, I will then take the rough sketch and re-record the piece, presenting a tidier and better crafted version. This *Fruition* phase is the opportunity for me to recreate what I have already created, but anticipating the challenges of realising

whatever I have created. I can use the *Malleable* recordings to plot out my arrangement, and decide which tracks each part might take up. I can recall choices made when recording that I might wish to change: effects, volume and equalisation can now be considered - after all, I now have a good idea of how the sounds all interact with one another.

The challenge of this stage is rehearsing and performing once more. I must endeavour to achieve the best performance I can, and so I practise my parts to make sure I can play them without much difficulty, and I must be able to navigate through the piece to ensure cohesive transitions between parts. Most of this involves playing the parts over and over again, but I also took to recording a metronome track to record alongside. This allowed me to count my way through parts to ensure everything was the right length and in its right place.

> Fruition - Final Piece <

This is the final piece, the piece of music that has been constructed over the previous three stages of idea generation and development. It follows the draft created by the *Malleable* phase, and so it is also around 22 minutes long. The introduction opens with the arpeggio played on piano, accompanied the first time round by theremin in place of the synthesiser melody creating floaty and eerie whistles in the background. The second time round the progression, distorted guitar joins to play a melody, progressing and the arpeggio progresses. This into finished and the sci-fi section starts at 3:11. String synth and synth bass are here as usual, but the melody over the top is played on piano. The piano is coming from an electric keyboard rather than an actual acoustic piano, so this enabled me to connect it to the string synth by MIDI. Thanks to this, whichever keys I play on the piano also triggers corresponding string sounds on the string synth. In the background from 4:40, heavily effected guitar can be heard in the background. I am using lots of reverb and delay to drown the sound in echoes, and playing the guitar with a slide (a tube slid on a finger, held on to the strings, to slide smoothly up and down pitch) to create these ethereal background sounds. At 7:20 the piano launches into version of the leitmotif as this section comes to a close, and as the bass line ends, the electric piano of the middle, “written bass line” section, begins. Other the small interlude where I doodle briefly on the piano, this section is largely the same as the draft version, The stabs that start this section off at 9:45 have distorted electric guitar accompanying the piano, providing the extra power behind the stabs. The guitar doesn’t continue, and the synth lead returns from the draft version. When this section ends at 14:10, the “acoustic guitar reprieve” section begins, and this version is quite different from the draft. Electric guitar takes the lead chord progression, and it is panned slightly right. At 14:32, it is accompanied by 12

string acoustic guitar which is playing exactly the same thing, but panned to the left. There are two synth leads similarly panned: the lead on the left plays parts throughout, and is built using square waves, giving it the “hollow” texture. The lead on the right only plays during what could be described as a “chorus”, and is made up of sawtooth waves which give it a “brassy” texture - it is also connected by MIDI to the string synthesiser, adding some subtle strings underneath it. It is hard to make out in the mix, but adds to the timbre. The Synth leads end at 17:46 and the guitars continue. The acoustic 12 string drops out, and then the electric, leaving the eerie solo synth with strings at 18:13 to play a brief interlude. This interlude flows into the sci-fi section at 18:59, and continues until the end. The piano melody returns to play over the synthesised bass and strings, playing a short solo melody before playing the leitmotif at 20:44 to play the piece out to the end.

This whole process is lengthy, and until this stage, none of the work is carried out on *the* final piece. Digitally, this process is redundant. I could play anything I wanted and record it to the software. I can cut, edit and manipulate to my heart’s content and spend all of my time and effort immediately on *the* final piece. I’d have more control over the sounds I make, and I can change the after the fact. Recordings I make would be of much higher fidelity. It seems counter-productive to throw these freedoms away, but all that actually matters is the end product. I need obstacles to work around, ways to define the great vague task of “write a song”. This piece is something I couldn’t have written any other way. I could be easily created on a computer, much easier than the methods I used here. But everything I have created was born from a process of curation, consideration, and planning. I engaged in tasks where the music was a product of exercises, rather than expecting the music to come from nowhere like some romanticised outpouring of expression. It was grown, not built.

As I progressed through the project creating multiple compositions, each step became more flexible in its existence within the process. Moments that occur within the immediacy and malleable steps might influence further exercises in commitment or immediacy steps. I might find a combination when arranging in the malleable section that tempts me back to commitment or immediacy as I explore the ideas.

Chapter 5: Conclusion

Approaching music composition without the computer has been enlightening. It appears to me that the difficulties I explained I have experiences derived from a lack of process. Following

my studies of musicians, of visual artists, and of psychology, my view of making music has fundamentally changed. I have found much that conflicts with how I had been led to understand music composition, and the resulting project has significantly changed my views on this topic - to the extent where I now do not believe I never really learned how to compose music at all. All the practitioners I referenced in my discussions share one thing in common: the were practicing before the computer was central to composition. They all have some kind of process, some kind of method that was developed prior to the rise of digital recording, and those process continued to see function in the digital word - Zawinul for example, switched from cassette recording to MIDI recording, but continued to use the same process. That is not to say that the likes of Cage's *I-Ching* operations of chance or Eno's flash cards are required to make music. Rather, that the focus of computer-based composition being on the ability to do *anything,* we can lose sight of the music making. I realise now that the way cassette recording changed my working is that it forced me to focus on writing music first, and recording music second.

The computer allows both tasks to take place in tandem, and it is easy to become distracted by production elements or arrangement before the ideas that will make up a piece of music even exists. I even believe I was taught this way, because I spent my years in education demonstrating I could use specific functions of software, or that I understood specific part of music theory. I knew how to pick chords from a key, I knew how to use the tools in the software to manipulate those chords, I knew that songs should typically have a verse, a chorus, a bridge of some kind, perhaps some kind of solo. It was never that I had musical ideas that formed this work, rather I filled in the blanks to demonstrate I could make music, and the habits stuck. I knew how to use the technology, and I certainly knew how to record. I could choose appropriate means of recording something and manipulate it in appropriate ways to deliver something that could be considered presentable, but I don't believe I ever actually learned how to write music. That is to say that away from the technology, I don't believe I had ever considered making music as writing a thing that has a start, middle, and end - I certainly never achieved any kind of satisfying expression or narrative.

I have come to some conclusion regarding what I have found to be important in music composition following my journey and have split them up into their own separate discussions. They paint a picture of a process that is less serious and committal to the sounds we make, to an understanding of creativity that actually exists beyond our own vague and romanticised ideals, and the concept of growing music much like gardening, akin to Eno and Miró's ideas.

Aside from this general realisation, I have also settled on a number of themes that recurred throughout the project that I believe are important aspects of making music. They paint a picture of a process that is less serious and committal to the sounds we make, an understanding that creativity is a thing that exists beyond our own vague and romanticised ideas, and the concept of growing music much like gardening, akin to Eno and Miró's analogies.

Play

Making sound is the first step to making music. In popular music, particularly in popular music orientated education, music composition has been presented as a desk based, computer orientated task. In my years being taught music in school and college, composition was taught in computer rooms, sat at desks with a computer to work on. All the while, many part time, hobbyist musicians might make music away from such a scenario without even considering it. The unwinding after work on a Friday evening, the doodling on the guitar whilst watching television. Plenty of us conduct these day to day activities and play wherever our minds take us, yet many shy away from every committing to labelling such activities as "writing" or "composing". However, these things *are* composition.

Making music was presented to me in the classroom as a "one foot in front of the other" activity, a digital labour that functioned much like the other tasks assigned in school and college: writing essays, answering questions, we start at the beginning and work our way through until we are finished. You dedicate time to sit down and work on *the* project, making more and more until you decide it is suitably complete, treating it as a contained task that is separate from the *playing* of music that we practiced along side and outside of education. As I result, I believe that this has swayed the impression of what making music is in the modern world, at least to myself and many of my peers.

An important method of overcoming the restrictions imposed my cassettes was allowing myself to label what I would usually believe to be disposable doodling as "composing". Sitting down, and improvising, or playing around ideas I already had, was much like how I would enjoy music in my own time anyway, but by recording everything of note, I created a huge quantity of material with which to work. To recall a description of the Surrealists games by Caws (2004), my playful doodling was taken seriously, viewed as "open-ended investigations

of possibility". This conclusion is important, because I believe it breaks down an implied barrier that holds some people back.

We play music to achieve a plethora of different outcomes, but it seems to *write* songs has a specific connotation that implies the sequential and focused task that I believe modern musicians have become accustomed to, which leaves a vast swathe of people in a position where they don't feel like they could, or want to, write their own music. But how many of these would happily sit down and play an instrument for fun? If music is made that didn't exist before, then that is composition. It is an obvious conclusion to draw that is more an observation, but I feel it is required to point this out. Just like the surrealist games, like Zawinul's improvisation sessions, or like Can's dedication to lengthy, wholly recorded jams, making music can be playful, it can be non-committal.

The computer isn't required for making music; it remains an incredibly recent change in our world, whilst music has existed for as long as humans have been even remotely civilised. If we wish to *write* music, then we simply need only do whatever it is we do to make the noises we make to be musicians. A guitarist doodling for fun off the top of their head is writing music, a child plonking keys on a piano because they find a little melody they like is writing music. If the music didn't exist, but is then created and thrown out into the world, then composition has happened. If we refer to composition as to the recording of music in some form, then we can merely choose how that works for us. We don't need to have a computer based home studio setup to make music. Not that we need to all learn notation and write it by hand, but rather, as long as some record of what was played exists, *however* it exists, then composition has been achieved.

Problem Solving

One of the most important components of this research is that creativity is a known entity, and that creating something from nothing isn't as mysterious as we might envision it. The world of psychology has endeavoured to define how creativity functions and, even though different models might differ in some aspects, problem solving is a core component across the board. As Stravinsky proposed, there is freedom in a limited scope, and by creating obstacles we create problems to solve, and free ourselves from "the chains that shackle the spirit" (Stravinsky, 1942). Though these spiritual chains are more a metaphor. In reality, without problem solving, our minds are not able to engage effectively.

Computer based composition offers up an almost infinite blank slate, with a huge variety of tools at our disposal to facilitate whatever we wish to achieve. It is easy to see this toolset and envision that this must be how we achieve our most creative work because we are so free to do as we wish. Despite this, an immediate flaw in this assumption is that our minds don't create instantly from nothing, and that the vision of an effortless creative outpouring is inaccurate. We need defined tasks to be creative, and the less defined a task is, the more we need to proactively construct our own problems to solve. The computer is free and flexible, yes, but it won't provide us with the ideas to place within its infinite space - we must work to create that part ourselves.

With this in mind, the use of the four-track in this project was a means to an end. I used it in the past, noticed interesting changes in my working and wanted to confront my creative process. It offered me some problems to solve, and I solved these problems by embracing process, which is ultimately that is what we need. I created my process as a way to deal with the obstacles I placed in my path. I couldn't edit, so I spent more time capturing *everything* to find something worthwhile, and spent more time developing and rehearsing parts than I would have normally. I was limited by the fidelity of cassette tapes so I couldn't be distracted by production and recording, and as a result, the majority of my efforts turned to playing music instead. I was occupied by these smaller tasks: improvise some ideas, write some pieces based around this melody, piece these parts together to arrange a larger piece. In doing so, the music was created almost like a by-product.

Psychology concerning the structure of creativity research suggests that the most creative people are those who engage with a task first, consider potential routes and test, reflect, and consider. We are ultimately more creative, the more we must engage with some kind of problem solving, and so we must turn the vague task of "write music" into something more defined for our minds to engage with. We cannot sit and expect ourselves to just *make* music. We can, but we won't be creating something as creative as we could be, the piecing of ideas one on top of another in software is not conducive to the way our minds work. This ties back to the playful aspect, and also echoes Nachmanovitch's warning against creating for a purpose in mind. I used process to create music by generating many ideas over time, playing much in the way I would be playing for fun anyway. Turing existing ideas into a single piece of music changes the objective from "write a piece of music" into "assemble a piece of music using these ideas". Then, as I worked on each idea with this in mind, I was further refining my objective down to "recreate this piece of music in the style of this other piece of music". These

tasks, repeated, grew the music in a way I will comment on very shortly, but it also turned the work into a very defined and engaging set of smaller tasks. The hand written element changed this even further - recalling notation, writing music in an abstract form without audio, or perhaps only reference of pitch from a toy keyboard, completely alters the perception of the music I wrote. It became about fitting keys and rhythms together, considering length and repetition.

Gardening, not Architecture

Process is at the heart of this project, both in practice and in the contextual surroundings of artists who have been discussed earlier in this thesis. It is not a matter of block after block, but rather about building a process that writes music as a side effect of the main activity - as Nachmanovitch proposed: if you undertake a task with the intention of an end goal, you are not totally *in* the activity. Obstacles, problems to solve, all create individual tasks to overcome, to focus us on making music rather than the building of a song. Much like a gardener nurtures individual plants and the plants as a whole make the garden, we must allow ourselves to make music more music's sake, and the compositions will write themselves.

Process is at the heart of this project, throughout contextual discussion and the making of my music itself. The limitations require a process to overcome, and the way our minds create something from nothing, require us to use process in some form to help define what we are trying to do. I feel that music composition, in the form it was presented throughout my education and growing up with the computer, was very much a case of not being the forest for the trees - or perhaps not seeing the trees for the forest is more accurate. The computer enables us to achieve the end goal of "making music" without the steps required to go from *nothing* to *something.* We bypass the "effortual creativity" (Kaufman, 2016) and jump straight to the immediate manifestation of an art-piece. It is understandable as to why this happens: it is possible and easy to do so, and as is a recurring theme through the discussions here, the prospect of effortless creativity is seductive. The idea that we have a means of making and producing effortlessly and endlessly seems like the obvious way to create what we imagine, but this is not the case.

I even found difficulty the length of time it took to see what could be called “results”. By chasing individual parts, allowing myself the freedom to explore and allowing myself inconsequential time to play with my music, I spent most of my working time without even thinking about the final piece of music. On the contrary, to write something on a computer I would open a new project on the software, and that project would be *the* piece. That is to say, much of the music I have composed began and finished on the same project, grown from start to finish. Because of this, my perception of “progress” was challenged. IN the software I can see the music coming along. Music I create can be seen to add to the project, and I can sketch out or begin to assemble the structure visual, so that I have some reference as to how it is going to look, and a goal to aim for. None of this is present when working with tape, and my own process meant that I dint even *start* the final piece until the last stage of the process.

The use of process changes the shape of the task that is composing music. There is the psychological function of this process, but just to make it clear, the “gardening, not architecture” metaphor of Eno’s fits perfectly, again, accompanied nicely by Nachmanovitch’s idea that we should not endeavour to meet a goal, but play for the sake of play, and the goal will meet itself. By breaking down our work into smaller tasks, and with those tasks not aiming to complete the song in any capacity, we can focus on merely playing - both in the musical sense, but also in the game-like, childish sense. By allowing ourselves the freedom to explore inconsequentially, we can *actually* find ideas to nurture, rather than trying to find something that fits another, arbitrarily chosen starting point. Rather than chose an idea on impulse, then dedicate time to layering new parts that fit this, we can focus our efforts on playing for the sake of playing, then nurturing each idea independently. As these ideas accumulate we will gather enough to build our music from, and these ideas flourish together to form the whole thing, like a gardener tending to a garden.

Application to the Digital Workstation

This project used the four-track cassette recorder as a means to an end. Its was chosen in the beginning in response to the experiences I had when toying with the medium in the past, and it allowed me to focus on the specifics which were different in comparison to the way I used to work. It allowed me to pinpoint the obvious observations when each part of my usual creative process faltered; it allowed me to see that I was working the technology, and not the music itself.

With this in mind, the cassettes are not *necessary* to apply this project's conclusions to practice. The core principles I arrived at are not tied to technology, but rather steer attention towards the making of music, and the use of our abilities as musicians. The focus on performance, allowing ourselves to take leaps of faith using our abilities, concentrating first and foremost on playing sounds and capturing them as a process that is separate from the production of a finished piece. For myself, a valuable aspect is allowing the music to exist abstractly: a composition that isn't recorded, perhaps exists on paper in as an idea, allows for ease and flexibility in arrangement. To work on a piece without ever playing a sound on *the* final, presented piece, whether it be the cassette I would use for this project, or the new project file created on software, allows a focus on exploration.

It is here I can discuss the drawbacks of working with cassettes, and how this work applies to working digitally. My original aim for the piece I composed throughout chapter 4 was to fill a 45 minute cassette with a large piece. My intention was that, if I followed my process and my process worked, then surely the process would make the music for me as I have been describing, and I could merely keep going until the cassette is full. In the end, this was not the case, and a number or reasons come to mind, which prevailed throughout my composing for this project before coming to compose this piece. A huge obstacle in my mind is *how much time* everything takes. The selected pieces demonstrating the process prior to even beginning the final recording accumulate to make 1 hour and 40 minutes of audio. These are selected pieces from a pile of cassettes full of recordings, most of which were unused in the end. It is part and parcel of the process, but is both time consuming and discouraging. I spent a considerable amount of time generating new ideas through improvisation, selecting them and developing them, and piecing them together. I would make a few versions of the same piece in the *Malleable* stage of my process before I settled on a final structure. Only then was I free to move on to record the final version of my *Fruition* piece, which would be the recording I would actually present as the finished piece of music. To spend such a long time, working so much, and to not have been started on *the* piece that will be the final presented work is difficult to sustain. I suppose this can come down to the instant gratification of working on the computer; the project I open is the project I will present, and I am constantly growing *the* thing. When I feel that I have finished composing, I have the piece ready to go, whilst with my cassette based process, I finished composing the whole piece, only to then *begin* work on the piece I finally presented here.

Because of this, the final piece, *Fruition,* is only half as long as I anticipated, and I feel it could have been stronger if I had focused all that time on a smaller piece. This is where the computer comes in. The goal of this project was never to abandon digital technology. Instead, it created some principles which I believe have a life separate from the technology that brought about their existence. I have never felt that music being rough was a goal of this project - I am not seeking to remove the perfection completely. However, so much time of my creative process was spent practising and playing parts, and having to repeatedly try and try again to achieve a take that was both a good performance, and without error. This engagement is valuable to an extent: the continued working of the material gave rise to developments in the parts, it became part of the composition process. But a lot of time was merely taken up by attempts to record a take that worked, and having to completely re-record a take when I slipped up, often in such a way that would be inconsequential if I had been working digitally. To recall Byrne explaining the balance he observes between performance and perfection, the computer has the tools to easily and quickly fix any little mistakes that might compromise an otherwise good take.

Now that I have established my new methods of working, I no longer feel the need to continue relying on the cassettes or recording. The principles I have devised are applicable regardless of the technology, and I can now return to digital composing, knowing how to focus my efforts to help myself be more creative, yet free to make use of the comforts of modern, digital recording. The four steps will remain in some kind of philosophy in my own practice, and perhaps I will find some alternative device for recording audio away from the computer - I will especially keep using paper notes and notation as a means of processing my ideas. This can work for anyone else too: recording ideas doesn't mean setting up a project on a computer, it doesn't mean declaring a writing session in a workspace set up for such things. As long as there is a means of taking record of what was played, then we can move our work forwards. Focus on playing for the sake of it as Nachmanovitch proposes, nurture ideas like Miró and our musical garden will form itself over time as Eno's *Oblique Strategies* suggests.

Learning to compose or learning technology?

A conclusion I would like to draw is that I don't believe I have ever been truly taught to compose. On the one hand, many people may simple play their instruments and begin piecing together songs by themselves without any musical education at all. But what I am referring to is the focus on learning technology in lessons that should teach us how to go from *nothing* to *something.*

A personal conclusion I would like to draw from this project is that I was taught how to use technology, not how to compose music. The priority was demonstrating our ability to use each tool available on the software: quantising, looping, effects and panning, for example. We were taught about MIDI and basic keyboard skills that were absolutely necessary for composing, because that's how you compose: you play a keyboard into a computer. The ideas I worked off were the first things that came to my head, and it felt that the limits were my knowledge of the software, or perhaps my playing ability, or maybe that there was just something *different* about anyone who could actually write songs, because sitting at a desk with a keyboard, and later, sitting with an interface and instruments with the intention of making something, never felt all that productive or inspiring.

It is now I realise that really, I just hadn't figured out how to get from nothing to something, and that I was lacking any kind of definition to my working methods. I don't necessarily believe that everyone needs to follow my exact blueprint for my creative process, but I do believe that process is requires. That the computer is no doubt the most capable and most sensible option for recording music, but it doesn't serve as a creative playground in the way it seems to be presented: it is a tool for facilitating what we already have, and it is incapable of making it for us. As Bratos explained warned, we shouldn't outsource creativity to the computer, it is merely a tool. In my case, I have found value in taking it away completely. I spent time working on overcoming obstacles and developing processes as I have discussed, but I also feel I learnt how to compose… at least, a method of composing for myself that works with the way I like to work.

Now I am approaching making music from a "for the sake of it" angle, as Nachmanovitch recommends. In doing so, I am creating and collecting a whole host of ideas that can go wherever they wish. I can change instrumentation and try again, move keys, rhythms and tempo, all by playing the parts over and over. By the time I have been working this process for a while, I have a decent idea of what is going to go where, and how I would like it to sound. Then I can begin sowing things together, making alterations to fit the surrounding parts. I developed a process, and now I can write music a whole lot better than before: I find it easier to achieve the kind of expressive and narrative kinds of sounds that I like to play with away from composition, because I have allowed myself to accept that composition is whatever makes music exists, rather than confide it to the computer-based kind that I perceived it to be.

Returning to the title of this research, I feel that I can conclude success in the use of limitations as a means of inspiring creativity. I have used the intervention elective impoverishment to reveal deficiencies in my methods of practice, and I believe that these were sure to how I was taught to compose in my musical education, and the culture surrounding computer-based composition and recording in the modern, popular music orientated world. I was shown how to use the tools in software and I was taught textbook methods of making music - not to express myself, but to tick boxes that demonstrated I knew how to work the technology. As I have grown up, I have encountered the idea that because the computer provides so much freedom, and because of the quality of the recording in such a convenient package, that these box-ticking exercises clearly *are* the ways we should be composing and recording. I disagree. The tools of the computer are incredibly capable of removing many of the problems and obstructions that might arise when making music, but they cannot create for us. Composition is a separate entity that is reliant off processes, resistances, and materials that interfere with our working. I have comets believe that music composition in the modern world, particularly in the world of popular music, has decentralised the actual creative process of making music in favour of a focus on software and flexibility. As a result of this research, I have found myself equipped with new methods that I didn't know were necessary, and I believe that my generation and those of us who come after should endeavour to take the time to learn what it is to make music, away from the seemingly limitless scope of the computer workstation.

Appendix

Preliminary Compositions

These pieces of music were created in order to work out my creative process.

Composition 1

Composition 2

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