From Sound to Score

A search for a post-genre compositional process

Jörgen Häll

Music Performance, master's level (120 credits)
2018

Luleå University of Technology
Department of Arts, Communication and Education
Abstract

In this thesis, the author explored an alternative way of composing contemporary western art music, being inspired by thoughts regarding post-genre. The composition method incorporated the use of the Digital Audio Workstation (DAW) software Cubase. Musical gestures were recorded with two musicians which where used as samples in the DAW to compose the piece *Lines*. The role of the score was shifted by moving it’s realisation to after the aural result was completed. The process was inspiring and was perceived to work well for a textural piece of music. Using a DAW when composing contemporary western art music is something that could be explored by classically trained composers in favour of working solely in a notation software. The result was the digitally made recording of Lines and two scores; one aimed to reproduce the recorded version (where only violin and violoncello where used) and another where adjustments where made, mainly in the instrumentation, to facilitate live performances by string orchestras.

Keywords: Post-genre, Digital Audio Workstation, DAW, Composition, Post-modernism, Sample library, Electroacoustic music, MIDI, Interpretation
Acknowledgements

I would like to thank Jan Sandström and Fredrik Högberg for all the valuable insights they have given me on music, life lessons and the support they have given me while writing this thesis. I am eternally grateful for all the opportunities with which they have entrusted me.

Additionally, I would like to thank Sanna Lundberg and Kajsa Nyquist for participating as musicians for the main work for this thesis, *Lines*. Without their cooperation this work would not have been possible.
Preface

Early in 2016, I put the thesis on hold, when I got the opportunity to assist my professor, Jan Sandström, with the opera *Rokokomaskineriet*. This work took up all of my time for the spring semester, leaving no possibility to complete the thesis. In the autumn of 2016 I started working half-time as university teacher at the School of Music in Piteå. The aim was then to complete the thesis in the spring of 2017. But since I only had had some small experience in teaching, it was a tough year and I had to prolong the thesis even more. It has been a prolonged process and it’s safe to say that, now that the work for the thesis is complete, the focus of it changed. Somewhere along the way I found some kind of reassurance about my music. A not so small part of this was finding out about other composers that seemed to have had similar thoughts.

This thesis has gained momentum from the concept of post-genre but it nevertheless only reaches a circumferential connection to it. In late March, 2018, I was accepted into a composition course over the internet with William Brittelle, who is mentioned in this thesis and is one of the founders of New Amsterdam Records - a sort of hub for post-genre composers. At that time, the thesis was nearly completed and I unfortunately could not tie it together with those lectures. Going forward, it will be exciting to see where all of this leads. Maybe the term Post-genre will be supplanted by another term, or maybe the movement grows into something else. Only future will tell.
Contents

List of Figures vi

1 Introduction 1
  1.1 Background .................................................. 1
  1.2 The recording process in different fields .................. 2
  1.3 First thoughts ................................................ 3
  1.4 Thoughts and observations on genre and post-genre ...... 4
  1.5 The use of genres in polystylistic post-modernism ....... 8
  1.6 Inspiration from post-genre composers .................... 9
  1.7 Post-genre compositional processes ....................... 11
  1.8 Choices and the role of emotion in the artistic process . 13
  1.9 Some ideas inspired by sample libraries .................. 14

2 Aim 16

3 Method 17

4 Description of working process 19
  4.1 “FluteFields” - An initial trial ............................ 19
  4.2 The compositional process of Temporal Tactility .......... 20
    4.2.1 Using Cubase for Temporal Tactility ................ 21
4.3 The compositional process of Lines .......................... 25
  4.3.1 The violin ........................................ 27
  4.3.2 The cello ......................................... 28
  4.3.3 The use of electronics .............................. 29
  4.3.4 The musical gestures of Lines ...................... 30
  4.3.5 The compositional process of Lines in Cubase ...... 30
4.4 The post-recording notational process of Lines ............ 33
  4.4.1 The performance score ............................. 34

5 Reflections 36
  5.1 The initial outlook .................................... 36
  5.2 Why no electronics? ................................... 37
  5.3 Composition in Cubase ................................. 37

6 Discussion 39
  6.1 Aspects of technology in the artistic process .......... 40
  6.2 What are the benefits and problems with using a DAW as a compositional tool? ................................. 43
  6.3 How can the tools in a DAW be used to realise an artistic expression? ............................................ 45
6.4 In what ways can the workflow in using a DAW affect my compositional decisions compared to using conventional methods such as sketching on manuscript paper and/or writing in a notation software? 46

6.5 Thoughts on the finished piece 48
   6.5.1 The performability of Lines 49

6.6 Some final musings 50

6.7 Expected significance 51

A Appendices 58

B Score of Lines - Studio Version 58
B Score of Lines - Performance Version 94
B Violin Sketch for Lines 130
B Cello Sketch for Lines 132

List of Figures

1 The mapping editor of Kontakt 5 19
2 Cubase Key Editor - Temporal Tactility - Violin - bar 37-40 23
3 Temporal Tactility - Violin - bar 38-40 24
4 Temporal Tactility - Violin and Cello - Bar 13-14 24
5 Cubase Key Editor - Temporal Tactility - Violin - Bar 13-14 25
6 Model of working process 27
7 Violin - Gesture 1a ........................................ 30
8 Violin - Gesture 2 ........................................ 31
9 Lines - Violoncello 2 - Bar 18 ............................ 32
10 Cello gestures organised with colours in Cubase ........ 33
11 "Post-it composition", inspired by working on Lines in Cubase. 38
1 Introduction

1.1 Background

I have written pop songs since my teenage years and often I also record and produce them. I still write pop songs from time to time and in that field I seldom use traditional notation to sketch these ideas. They usually come about by improvising with my voice and a guitar or piano, and then I often use a DAW\textsuperscript{1}, such as Cubase, to further develop the songs. Often the composition and production processes are tied together in a symbiotic relationship.

During my composition studies in the field of contemporary western art music\textsuperscript{2}, though, I have not used the same approach when composing and/or recording music. These two processes are often clearly separated. Here, the matter is reversed. I have often worked directly in the notation software after having an initial musical idea. Sometimes these ideas come from improvising at a piano, but they can just as well come from my imagination. Before a recording session begins, you have usually decided on and notated most of the musical parameters that will be performed by the musician. The differences between the traditions of popular and classical music, concerning recordings, seemed interesting to look into.

In my bachelor thesis I was thinking of ways how to weave together my influences from pop music and contemporary western art music. This resulted in the piece FLUX (Häll, 2014). One of the methods I used was to experiment with the use of “slash notation“ (commonly used as a notational device in Popular music) for classically trained musicians. I saw this as a way to share the artistic expression with the performers that gave them a different kind of responsibility often seen in the context of Popular music where musicians perform within a stylistic boundary of a song. The idea of letting the the\textsuperscript{1} Digital audio workstation.
\textsuperscript{2} This is the term I will use for new music coming out of the classical tradition
notational practices between the fields meet was a way for me to develop new ways of thinking. Finding new ways to give musicians more freedom can be an interesting project, but I also wanted to explore other ways for the different musical fields to meet.

I have come to ask myself if the conventional way of composing music - as in writing a piece, declaring it finished and having it rehearsed and performed by musicians during a concert - is the only possibility for a composer of contemporary western art music. I do not wish to discard it completely but rather explore possible alternatives that can provide possible alternatives of the compositional process, when the need would arise.

1.2 The recording process in different fields

There are various ways to go about searching for alternative compositional methods, and many composers likely have their own “secret sauce”, perhaps some subconscious and other theoretically elaborate. It was logical for me to focus on the aspect of recording music, due to my history in other fields than contemporary western art music.

The process of recording music in the classical tradition often differs from how it is done in popular music (Greig, 2009). In the classical sphere the recording’s purpose often lies in being a “faithful” representation of a live performance. By contrast the field of popular music concerns itself with the creative aspects of recording techniques which are used to manipulate the recorded sounds. Pop music groups such as The Beatles and The Beach Boys experimented with recording technology and started a trend that is still current in which the producer (whom today can also be the artist) uses sounds as part of the song’s arrangement.

In the field of classical music, the score has sometimes been considered an in itself finished and indisputable work; the moment a composer puts down his pen the work is considered finished. If the music ever is performed is a
minor issue since the concept of the music exists eternally in the manuscript. But one could also look at the score as an incomplete work of art in itself, and more like a stepping-stone towards the sounding art form that is music. The notation can of course be brimming with potential to be translated into music through a performer’s expertise. But only when this actually happens, and it has reached a listener, will the composer’s communication with the world be fulfilled.

But what would happen if the composer’s focus were to be shifted from the notated score to the sounding aspect of a piece of music? That is the question that I want to explore further.

1.3 First thoughts

At the very beginning of the work with this thesis, I felt disillusioned about my music. There was no specific direction I wanted to go in, artistically. Every door had been opened, so it seemed, and which door I chose would not matter. I have always been somewhat eclectic in my taste and so being confronted with all these possibilities made it hard for me to determine what I wanted to do. If you can do anything, how do you determine what to do? I felt a need to explore what was me, in order to proceed. I was preoccupied with the idea of exploring ways to merge the stylistic traits of pop, sound art and contemporary western art music. I wanted to explore the possibilities of stylistic permutation within the span of a piece, from pop to art music for example. This sort of permutation was an idea I reflected upon in my bachelor thesis, where I thought the form of the piece I had written could be seen as a progression from art music to pop.

I searched for articles (both research articles, newspapers and blogs) regarding genre-mixing, polystylism, eclecticism and post-modernism. Through this search I discovered the term post-genre which seemed to have gained a particular foothold in the US. This led me to the standpoint that it was neither constructive or meaningful for me to think in terms of styles or genres,
at least regarding my own music. If a person has an individual style based on their past experiences and cultural background, the aesthetic interest does not seem to lie in what or how something’s done in terms of style and genre but in matters concerning the actual work at hand.

1.4 Thoughts and observations on genre and post-genre

Through an internet search for young contemporary composers, I discovered that some had already used the studio environment as a central part of their work in the sphere of western contemporary art music.

Three of those composers, William Brittelle, Judd Greenstein and Sarah Kirkland Snider, started the record company New Amsterdam Records which is focused on what is called post-genre music.

Greenstein, in an interview says they’re “looking for artists whose work is a reflection of truly integrated musical influences. In other words, we don’t want classical-goes-rock or electronic-music-with-some-violins – we want music where people are being as personal and honest as they can be, while opening themselves up fully to all the music that they love” (Israel, 2009).

The term post-genre seems easy to misunderstand and many find it problematic, but for me it was reassuring to find out about the post-genre movement and realising that there’s this growing movement that is related to my own thoughts and feelings. I have perceived a sort of “every man for himself“ kind of mentality among composers, and the idea of a community for composers is an appealing notion. It’s not unreasonable to wonder if there’s a cultural norm for composers to sometimes look for an antagonistic standpoint. The tales of composer’s dismissals and rejections by modernists, are sometimes undeniable (Billing, 1993) but I cannot help but wonder if it’s sometimes a case of having a mandatory underdog. The concept of post-genre can be (and has been for me) something constructive but it’s also worth pointing out that, like any other artistic idea, it could be misused and turned
into an aesthetic hegemony. I sincerely hope it does not.

In the illuminating and thought-provoking article *Is the post- in post-identity the post- in post-genre?*, the author points out that “some kinds of diversity are better than others... If it does not feel like the overcoming of obsolete commitments to purity, diversity is perceived, ironically, as evidence of homogeneity and inflexibility.” The article also draws parallels between post-genre and ‘omnivorous consumption’, which refers to having “...an increased breadth of cultural taste and a willingness to cross established hierarchical cultural genre boundaries. In other words, the concept refers to a taste profile that includes both highbrow and lowbrow genres“ (Hazir, 2015). The term was introduced in the early 1990s, which could mean the idea of post-genre now has been growing steadily since at least the 1980s (Peterson, 1992).

The title of a review of a concert pinpoints what could be seen as a misunderstanding of the idea behind post-genre; *The Genre of Post-Genre* (Hajdu, 2018). While Hajdu is positive in his review, it’s possible someone might want to point out the term’s inherent paradox and how the music might just sound like 'this or that'. I find these remarks as nonconstructive, in discussions regarding what post-genre is, as pointing out the absurdity in having an era called modernism or post-modernism. I believe we are better served to understand the concept if we consider questions like 'What does post-genre music stand for?' or 'What is the motivation behind it?'

The music of Brittelle is highlighted as post-genre electroacoustic music. In an interview he states, “I feel like, at this point, using genre information to understand certain kinds of music is misleading and ineffective“ (McNee, 2015). He sees similarities with the the post-gender movement, as “resisting the urge to use shorthand or past experiences to come to the table with certain biases or expectations“. Brittelle is not denying that there are shades of different genres in his music but adds, “I don’t think the story of the music are those shades, the story is something more personal, more emotional“.

The Irish composer Ann Cleare (b. 1983) is described as being influ-
enced by indie rock bands such as Arcade Fire and The Pixies (Armitage, 2017). When listening to her music, for example the piece "Dorchadas", one might think that her music, on the surface, doesn’t have any obvious stylistic connection to indie rock. In an interview, she explains that a certain type of energy and physicality, that she often feels is missing in contemporary western art music, exist in that type of pop music. (Wilmoth, 2009).

In the chapter Translating Music, of Luciano Berio’s book Remembering the Future, the composer states that Bela Bartók “rather than transcribing folk melodies, transcribes their inherent, implicit meaning” (Berio, 2006). This could be interpreted as something similar to the above ideas of Cleare.

After reading Berio’s interpretation of Bartók and the articles about Cleare, the perceived possibilities with genres expanded for me at the same time as I began to question my idea of fusing my styles together. What I wanted was to find my own voice and my own personal approach to composition, and focusing on aspects such as the style of specific genres and stylistic mixture began feeling as a superficial idea that would only scratch on the outer layers of something. It seemed interesting to instead examine other aspects that appeared worthwhile, such as the energy and physicality in indie rock, to use Cleare’s thoughts as an example.

In Popular music, it’s common that songs are composed (‘produced”) in the studio from, for example, a beat or a song phrase. The idea of this kind of compositional process was something that could be interesting to explore through composing a piece in the genre of contemporary western art music. I was interested in an approach of not letting the compositional process begin and end with the notation but moving a large part of the work into the studio, and delay the process of notating the piece as long as possible.

Dalhaus argues that the fact that a piece of music belongs under the term entertainment and has simple structures, has no connection with whether the music is poorly composed or not. He addresses the problems with the concept of “well” and “poorly” composed music and that, since the 19th century,
they have lost significance. He also argues that well composed music is not a guarantee that the music can be bland (Dalhaus, 1992).

I believe what Dalhaus says is an important point for understanding post-genre music as being works of art. The circumstances surrounding a piece of music are important. While Popular music is often used to entertain the listener in some way, it’s purpose can sometimes also be art. The techniques themselves of Popular music, such as harmonic devices, rhythmical structure, instrumentation, etc, does not imply the music is not art. There are many artists of Popular music, particularly in it’s sub-genres, whose music, while still also giving some form of entertainment, could be appreciated as art. Arguing that art can have other values than pleasure and entertainment, does not exclude pleasure as an important factor (Gordon, 2000). An extended discussion of aesthetics is out of scope for this thesis, but post-genre music that draws inspiration heavily from Pop might be better understood by looking past connotations of stylistic traits and instead focusing on the artistic statement.

In the Echtzeit-scene of Berlin, many artists are more interested in the audible result than in how that result was reached (Beins, et al. 2011). This way of thinking was an inspiration for me, and became almost like a mantra that I would have to tell myself repeatedly when I was unsure if the method of using a studio was a good idea, to avoid letting my thoughts function as a harsh critic. A statement by John Chage, from an interview, had a liberating effect on my way of thinking regarding this; “The best criticism will be, you see, the doing of your own work. Rather than using your time to denounce what someone else has done you should rather, if your feelings are critical, reply with a work of your own” (Kostelanetz, 1968). This gave me a constructive way of dealing with self-doubt and the anxiety of what other people might think of my music. If someone does not care for a piece of mine and devote their time talking about that with their friends, I could, instead of loosing sleep over it, grieve that these people do not spend their time on more constructive activities.
1.5 The use of genres in polystylistic post-modernism

Some contemporary western art music from the 1980s and 1990s (and possibly the beginning of the twenty-first century) that often is branded as post-modern, had references to various genres - conceivably either as a rhetorical device, a way to “manifest the now”, or perhaps just as a love declaration for that music. A piece that comes to mind is Michael Torke’s *Adjustable Wrench*, which begins with a phrase so similar to the hit song *Jump* by the group Van Halen that it’s easy to draw the conclusion that it was Torke’s source of inspiration (Torke, 1990). However, in an interview, Torke states that he had not heard Van Halen at that time and actually based it on an “obscure song” (Charlton, 1996). In any case it’s possible to observe a compositional technique that explores stylistic references.

An example of the thinking behind this technique of stylistic references is Sven-David Sandström, who in the 1980s said that the composer has the whole range of styles in his palette to use as they wish for rhetorical or associative use (Tillman, 2001). It seems to me, that the statement regarding the open range of styles is correct; there are no rules to limit the use of styles - presumable the only limiting factor is cultural norms, which might be highly influential. This way of utilising genres and styles to make a kind of rhetorical statement may have been more relevant then than it seems to be now. Using references stylistically is related to the concept of crossover (and the more or less interchangeable term, fusion), which can be described as “music that crosses over in style, occasionally sharing attributes with several musical styles“ (Dictionary.com, 2018). Nico Muhly, a composer who is one of the proponents of post-genre music, criticises the focus on “such phrases as ’genre-bending’ or ’genre-hopping’” (Muhly, 2007). He seems to rather want to think of it as a form of communication. He brings up an example of how the artist Björk used a Chinese pipa player juxtaposed with electronic beats and a brass choir (Björk, 2007). This occurrence, he argues, should not be understood as “east-meets-west ’fusion’ anything“, but as “Björk’s compositional agenda“. 

8
Maybe the concept of crossover as an artistic device has run its course? I believe it’s not a big stretch to view the post-genre movement as a continuation and outcome of the polystylistic as much as a result of music’s digitally borderless state in the contemporary society.

I’ve never thought “in references” in my own compositional work, and in line with Muhly’s statement, I think my music is unsuited to analyse and understand in terms of genres and styles. With the possible exception of FLUX, my music is not expressive through eclectic or polystylistic devices. For me, the result of a reconciliation with genres and styles, and the notion of post-genre, leads to a possibility to invigorate the compositional working process and open paths to new ideas.

An interesting question is if the fundamental concept of post-genre really is something new. We have historic examples such as Gershwin’s Rhapsody in Blue, basically everything by Charles Ives, and a multitude of composers during the eighties. I believe this might be related to the debate surrounding the Early music movement, where it seems most has settled on the explanation that it’s an expression of our time, not the past. So, in the same vein, how come we start talking about post-genre now and not a hundred years ago? I believe that could be a good point of entry into exploring if post-genre is just a modern re-dressing of an age-old plight of artists transcending boundaries (personally, I believe it’s something more).

1.6 Inspiration from post-genre composers

An interesting contrast to Brittelle’s thinking is the way Sven-David Sandström were talking about genres in the 1980s. Sandström was also after something emotional, but his wording suggests a line of thinking more of appropriating the traits of a genre to achieve a certain result. Calling it exploitation seems close at hand, but I think that would be straying too far into ideological territory. It’s not a big step to look back at history and condemn a line of thinking that might’ve been a wide spread contemporary notion,
which in turn set events in motion that led to where we are today (the long list of composers who wrote nationalistic music during the interwar period can be easy targets for condemnation).

Brittelle, in another interview, says “I’m allowed to do whatever I want to do”. This kind of statement in general, is often what comes after the premise “everything is already done”, mentioned earlier. The idea that everything already has been done, partly could be thought of as coming from thinking from the perspective of genres, delimited by some sort of psychological fences. And the validity of being allowed to do what one want is not determined by whether or not everything has been done or not.

The background for Brittelle’s statement also comes from something else; “I remember getting in an argument (about Chambered Nautilus) with a programmer for NPR who said, ‘We can’t program this because it’s just pop music.’ And it was a string quartet piece” (Strainchamps, 2017). Later in the interview he mentions the moment that lead to a sort of revelation; “I was on a subway and I remember how cathartic it was to think, ‘I’m just going do whatever the hell I want to now’.”

My professor, Jan Sandström, has described a very similar revelation, in the late 1980s. In his teaching methods, he emphasises the nurturing of each individual’s musical style (often indirectly, by avoiding to impose opinions on students). Since I’ve studied for him, I see him as a very important precursor that helped me develop my own kind of post-genre thinking of music. He often talked about the composition programme as being genre-free, which is very similar to the idea that Brittelle has.

Many of the post-genre composers I observed have roots in minimalism and post-minimalism, which was not surprising since many of them come from the United States. The origins of the term post-genre seems to come from New York, but the phenomenon does not seem to be exclusive of composers from the USA.
Many impulses and ideas came by listening to some of this music, which guided me somewhat in what I wanted to do. Two of the most inspiring findings for me was Missy Mazzoli and Valgeir Sigurðsson.

Mazzoli’s work Vespers for a New Dark Age, contains elements from contemporary art music but is also clear that her indie pop influences are present. I was searching for this kind of seamless fusion of influences in my Bachelor thesis.

Sigurðsson has created contemporary western art music by using the music studio as a tool, in a way that will be explained in the next section.

1.7 Post-genre compositional processes

To produce contemporary western art music in the studio, with the intention that the recording will be the final art work (as opposed to a live performance being the final realisation of the art work), is a method that can be said to be used by composers today. Some composers have used the studio in unconventional ways when it comes to recording contemporary western art music and, for some reason, Icelandic composers seem to be at the forefront of this endeavour; for example Daníel Bjarnason, Valgeir Sigurðsson and Anna Thorvaldsdóttir.

Sigurðsson is described as “a composer/musician/producer whomoves easily between the worlds of experimental, pop, and contemporary music (Margasak, 2017). In an interview regarding the piece Dissonance, he explains his process; recording a small number of string players, and then layering them to get the effect of a 40 people orchestra in a multi-tracking approach, like, as he says, “it was rock music or pop music“ (Studarus, 2017). He states some benefits are that you get more control and can focus on details on what every player is doing, while the downside is that it is time consuming, but he states he had collaborators that could help him share that workload. Another mentioned benefit is that you “can alter the experience of the listener“ which
expands the traditional acoustic experience. He resembles it with being able to walk around in the concert hall during a performance and getting closer to the sound that one finds interesting.

Daníel Bjarnason, another Icelandic composer, has also used the studio as a compositional tool (while collaborating with Sigurðsson), for the work *Over Light Earth*. Techniques as close-miking and multi-tracking are cited to have been used, which is claimed “sets this recording radically apart from that of conventional orchestral recordings” (Bjarnason, 2013).

Since they employ similar processes, the end results of Dissonance and Over Light Earth are worth comparing. In the latter, it may at first not be evident that the multi-tracking technique has been used. The use of close-miking is more easily identified, but this recording technique is often used when recording chamber music in concert halls and does not at first strike me as something unusual. After a few minutes into listening one can start to discern that the soundscape has a different but subtle quality - which could be explained by the fact that multi-tracking was used.

In Dissonance, the soundscape has a certain quality that I would describe as otherworldly and unfamiliar and it has a slightly artificial sheen that makes the piece stand out. The recordings of a few soloists performances layered on top of each other seems to create this unfamiliar soundscape. The performances of one player superimposed seem to create a sort of interesting musical anomaly, that likely is due to the fact that the performances have a common denominator in the one performer’s individual playing style. This clear personality of the performer could be an interesting topic for a performance oriented study related to this kind of music.

In January 2017 the composer, Molly Joyce, released her debut single *Lean Back and Release* which includes works for violin and electronics, where a violinist were recorded performing a number of parts, and the mixing was used to position the different parts in the mix. The electronics consists of samples made from the violin. She explains that she’s interested in processes
and form; and the piece transitions from a high register to a low (Lanman). Her process has similarities with how Sigurðsson worked in the studio, but she expands her palette by also manipulating samples from the instrument, which interestingly earns the term electronics. This suggests that composing music with recorded samples (from instruments) that are not heavily processed, retains the essence of music being of that instrument while deforming the samples moves it into the realm of electroacoustic music, although, strictly technically, both are.

1.8 Choices and the role of emotion in the artistic process

In her Master thesis in musical composition, the Icelandic composer Anna Thorvaldsdottir proposes a model for explaining emotions as a part of our choices in compositional processes. She says that the choices we make are based on a will to achieve something and a belief that the choice will in fact achieve that (Thorvaldsdottir, 2008). An example of how I understand this follows.

Let’s say that I want my music in a particular piece to be expressive of a jungle full of life. Based on what I have learned about micropolyphony (and all of the implied knowledge regarding music that led up to learning about it), and having heard examples of it (in pieces such as György Ligeti’s Atmosphères), I might reasonably believe that using micropolyphony in a symphony orchestra would result in a musical texture resembling the idea of a “jungle full of life”. Therefore it would be probable that I will act in a way that I believe leads to what I want.

Coming back to the artist Björk, she said in an interview that she wants her brain and intuition to coexist but that she prefers if the intuition is guiding the brain; "The brain is a better servant than a ruler, I think" (Fahl, 2015). But considering Thorvaldsdottir’s ideas, maybe there is not such a clear dis-
tinction. I could describe my own experience of the sensation of creativity as a blurred state of being with clear thoughts and feeling intermingling in a healthy hotchpotch.

This kind of model could possibly be used to analyse and explain one’s ideas, especially in context of music that contains a wide array of influences. Perhaps the need for this kind of model comes from a desire to explain our actions and meaning in an existence where the abundance of cultural expression and relentless information flow can seem daunting.

1.9 Some ideas inspired by sample libraries

The company Spitfire Audio creates sample libraries, and their products involve samples from orchestral instruments, synthesisers and various sound objects. Some of their products involves longer samples that change over time, for example a string section transitioning slowly from playing sul ponticello to sul tasto. The company calls some of these long transitional samples “Episodic“, like the “Trem Shudders Pont” in the product Symphonic Strings Evolutions (Spitfire). All of these come without notation and are meant to be played on the keyboard in a DAW and seem more aimed towards composers working in some field of music production. The notion of episodic phrases was inspiring and led me to compose the longer gestures for the work, Lines.

The term gesture seems to be commonly used by composers, myself included. One way of describing a musical gesture is “a relatively small musical idea, much like a motive, having a distinct melodic or rhythmic identity“ (Baur, 1985, p. 256). In the case of this work there was often neither any meaningful melodic or rhythmic identity to speak of in my gestures. But “a relatively small musical idea“ fits, and relatively is a keyword here, since my gestures can be around one minute long. Just omitting melodic and rhythmic from the explanation would suffice; “a relatively small musical idea, having a distinct identity“. That will be my intended meaning of “gesture“.
In an alleged interview, the film composer Hans Zimmer says that he does not understand why people does not create their own samples, because he said he can easily hear what sample library has been used, since he’s so accustomed to them (stevelindsay, 2012). With this in mind, although the quote was presumably mainly directed towards film composers, I find there is much to be gained for a composer in any field in sampling sounds and gestures, which can become very personal recordings. In my experience I have found that both myself and other composers do often record sounds, although it’s then often a matter of sound art field recordings of non-musical sources.
2 Aim

The aim was to explore an alternative compositional process by composing the piece Lines with the help of the DAW Cubase, influenced by my way of composing music in other genres. Musical gestures were composed and recorded with two musicians separately in a studio. These gestures were then used as samples\(^3\) as the basis for the compositional process in Cubase, where the gestures could be positioned in a timeline and edited in various ways. When the composition was finished, it was transcribed into traditional notation using Sibelius.

*Research questions*

- What are the benefits and problems with using a DAW as a compositional tool?
- How can the tools in a DAW be used to realise an artistic expression?
- In what ways can the workflow in using a DAW affect my compositional decisions compared to using conventional methods such as sketching on manuscript paper and/or writing in a notation software?

\(^3\)The term sample is used here to mean simply a recorded sound that has been digitized.
3 Method

I briefly searched for books and news articles that touched on the subject of post-genre. I did not find much academic material regarding the recent development of the concept, apart from a critical article (James, 2017) and a master thesis focused on the performance of such music (Welch, 2016). There was, however, many articles featuring concepts such as genre blending (Lahire, 2008) and fusion (Garratt, 1996).

News articles and blogs, however, have already referred to post-genre. NewMusic USA (https://www.newmusicusa.org/) stands out as a good source for articles with post-genre as their theme.

During the summer 2017 I listened to some of the music featured on the blog a closer listen, which highlights experimental music, much of which I thought could be described as post-genre (https://acloserlisten.com/).

A first composition, Flute Fields, was composed as an initial attempt to explore the use of recorded instrumental sounds and the audio processing of these.

An, for this thesis, ancillary work, Temporal Tactility, was composed by using Cubase, mainly with professional sample libraries\(^4\) and continuously transcribing the music to Sibelius\(^5\). Cubase was used as a creative tool and indirectly to simulate the final result and Sibelius only as tool to finalise the notation.

The third, work Lines, the central part of this thesis, was composed in three major stages.

\(^4\)I used Vienna Symphonic Library and UVI IRCAM Solo Instruments, but I also recorded some samples on my own with the effect of dragging a superball mallet on the strings of a grand piano.

\(^5\)Cubase has built in notation support but it lacks many advanced features needed for professional composers.
• The first part was to compose and record gestures for violin and violoncello. The recording were done in collaboration with the violinist Sanna Lundberg and the cellist Kajsa Nyquist at two separate occasions in 2016 and 2017. These were four to sixteen bars long. Each gesture was cut out as separate audio files.

• The recorded gestures were used and organised in various ways into a finished piece in the software Cubase 8.5. Six respective tracks were used for the two instruments, and each track was thought of as a single musician. The sounds were spatially placed in the mix to simulate different positions.

• The final result from working in Cubase was then notated in the notation software Sibelius as two versions; one representing the recording, and another where the parts were changed to fit the instruments of a chamber string orchestra.
4 Description of working process

4.1 "FluteFields" - An initial trial

For a first experiment I used a short recording of a flute technique, which constituted of a half step trill from g⁴, combined with overblowing to an octave while simultaneously singing the original pitch one octave below. I transferred the audio clip (sample) to the sampling program Kontakt 5. This software (as many samplers do) has as one of it’s features a relatively easy-to-use method to instantly transpose a sound over several pitches represented by a keyboard (see Figure 1). As is common with samplers, the sound is slowed down in order to match the pitch of lower notes, and sped up for higher ones. In the extreme registers the sound is barely, if at all, recognisable. This can result in a new type of sound that can be of use as a sound object.

![Figure 1: The mapping editor of Kontakt 5](image)

Below are links to examples of how this flute trill effect can sound. With this sample, a very low note results in a thick, pulsating sound and a very high note results in a squeaky, fluttering sound.
• **Sound example of “flute trill” in it’s original form.**

• **Sound example of “flute trill” in extremely low register.**

• **Sound example of “flute trill” in extremely high register.**

Additional flute samples were recorded in a second session in my home studio. These recordings were done in a casual manner, since at this stage I just wanted to see what might be possible. The quality of the recording was of little concern to me at this point. This was partly inspired by the Echtzeit movement to focus on the end result of the sound, and since I intended to distort the samples in various ways so that their sound would be indiscernible, it was less critical to have pristine samples. One could also draw parallels to the genre of grunge, which I listened to frequently in my teens and early adulthood, where low sound quality often was a part of the expression (Mudhoney, 1988).

This resulted in a short sketch-like composition, which I call FluteFields. In FluteFields I used the sounds in Kontakt together with pitch shifting, reversed reverb and some panning. This kind of electro-acoustical soundscape made from instruments were an idea I wished to explore further, and this led me to develop the piece Lines.

• **Sound example of demo of FluteFields.**

### 4.2 The compositional process of Temporal Tactility

During the autumn of 2017, I was accepted to participate in the workshop <incubating 001> in Seoul, South Korea between December 20-24 the same year. For the workshop I was asked to write a piece for the New York City based Ensemble MISE-EN, which performed the pieces of the workshop distributed over two concerts on December 23 and 24. My contribution was the piece Temporal Tactility, which was not written with the intention of
being included in this thesis, but the process behind it has some features in common with the aim of this thesis.

I used a method of composing, that was not as straight-forward as I was used to. I began making a sketch by hand and then transferred it into the notation software Sibelius. With this initial idea, I couldn’t seem to “get off the ground”, so to speak. I felt bored looking at the computer screen in search of how to develop the material further.

I remembered that a former fellow student - my friend, and colleague Jonas Olofsson - on some occasion told me that he used Cubase when composing a piece of chamber music for the ensemble Norrbotten NEO, and then transcribed the result in Sibelius. I had once or twice tried that approach briefly for sketches but never on an actual project.

I started up Cubase and created tracks for all the instruments’ playing techniques. The flute, for example, had separate tracks for sustained sound, staccato sound, breath sound, etc. Most sample libraries has so called keyswitches, which lets you have one track and easily change playing technique by pressing a designated key on the midi keyboard. Personally, I rather have separate tracks so that when I select a track I always know what sample will be played when I start playing. This seems to be a matter of preference and even some professional film composers prefer this type of workflow.

4.2.1 Using Cubase for Temporal Tactility

I can see pitfalls with using sample libraries in the composition process in a DAW. It’s important not to rely too much on the playback when using samples. I had an experience of falling into this trap, during a composition summer course in Glasgow, Scotland in August 2016. I had composed a piece in Sibelius using samples from Vienna Symphonic Library, and being influenced by the exactness of the pizzicatos in the string samples led me to compose in such a way that these pizzicato gestures were exposed and of
high importance. I realised during rehearsals that I had made a piece that basically stood or fell with the exactness of the execution of the pizzicatos. Naturally, the musician’s, being humans, didn’t perform it that mechanically and I ended up disappointed with this composition.

Another problem for a composer of contemporary western art music that wants to use sample libraries is that many extended techniques aren’t included in most commercial sample libraries. One exception is the UVI IR-CAM Solo Instruments, but it’s samples never go farther than what I would call the staples of contemporary extended techniques that are used in the scene of contemporary western art music. For this reason I find it important to rely on the inner listening and to think of what I want to achieve in my music.

It struck me during the process of writing Temporal Tactility that while I used modern technology, I was simultaneously using more and more of the well-tried tools of pencil and paper, for sketching. I found how intuitive the process was to realise a proportional notation in Cubase (by recording a performance of the notation with a MIDI keyboard), and vice versa, how effortlessly something that has been improvised in Cubase can be sketched down as a proportional score. In a notation program (such as Sibelius in my case) on the other hand, it takes a longer time to produce the graphical representation and it’s generally unable to create a sounding demo to relate to.

Proportional notation and a DAW was a good match, but I found that music that was to be regularly notated worked similarly well. An example of this was when I in my DAW composed some trill gestures for the violin, bar 31-40 in the finished score. The time it took to come up with and record the trill idea with my MIDI-keyboard felt short and very immediate (figure 2).

The process afterwards of transcribing that same passage to the notation software was more time consuming and took me roughly thirty minutes to notate (figure 3).
It’s possible to link Cubase (and most other DAWs) with Sibelius with the software interface ReWire (I used this for my Bachelor thesis). It’s a great tool when, for example, combining traditional notation with electroacoustic elements, but for this project I wanted to keep the work in the DAW separate from the notation software. Sometimes I did not even start Sibelius during composition sessions in Cubase. At first I was worried that this would be a big disadvantage, having to do a lot of extra work, but I discovered that it had positive effects on my process.

Going back and forth between composing the music in Cubase, and then working separately with the notation, meant that each of these phases became more focused in their purpose. Worrying about the notational aspect, as well as dedicating some thought to how to get the notation to look like you want can take some focus from the purely compositional part of the work. I am
proficient in Sibelius so that this is no longer such a big issue, but this way of working in Cubase and Sibelius made it apparent that it’s always somewhat present.

Another side effect was that the notation phase became more a matter of problem solving, which could be said to be the main purpose of notation (solving how to get musicians to achieve your idea).

The bars between rehearsal mark A and C in the violin and cello parts in Temporal Tactility, is an example of this (figure 4 and 5). The dynamics and pitch bends were detailed and working it out into an understandable notation took more effort than it had to compose it in Cubase.

Figure 3: Temporal Tactility - Violin - bar 38-40

Figure 4: Temporal Tactility - Violin and Cello - Bar 13-14
4.3 The compositional process of Lines

The workflow for a composer in the classical tradition can in detail be very individual and different, and sometimes it’s a very creative process in itself. With that said, one could say that the most archetypal course for a work’s conception in broad strokes could be described as follows:

- The composer has a musical idea and writes a score.
- Musicians interpret the score, and performs it during a concert (or in a recording).
- An audience receives the auditive result.
• The composer is (sometimes) in some way made aware of the audience’s reactions.

This model of how a musical work’s life span is shown as a graphical representation in Hän mot en ljudkonst, p. 190, fig. 24 (Anderberg, 1961). In such a model, the compositional process transitions from notation to sounding result. It is a simplified explanation that can be elaborated upon by taking into account the cultural aspects surrounding music. Valkare has a more complex model, describing something similar to that of Anderberg, but expanding it into a complex of problems regarding the music’s journey from the composer to the audience (Valkare, 1997). But for the sake of this thesis, the simplified version laid forth by Anderberg is sufficient, since the present focus lies on the compositional process.

In practice there are of course a great number of possible variations of how a musical work comes about (you may not even need a proclaimed composer). As a simple example, the composer may have a workshop with the ensemble, which could lead to rewriting parts of the music in response to how it sounds during the rehearsal. But even today it’s still conceivable that the performance (or recording) in some cases is a result from an uninterrupted transmission from the composer’s initial idea to the interpretation of the score. That is to say that the composer and the performers may have had no contact and discussion regarding the work.

Composers and musicians are used to the traditional process of working (explained earlier) and while I’m not opposing it, it seemed interesting to explore an alternative compositional process. I had an idea to try a process of working that involved modifying the model described so that the compositional process does not end before the musician is involved. This was a core idea for the process of Lines.

The idea is that the composition process and the performer’s interpretation are intertwined and together create the sounding result, which then is translated into a conventional score, see figure 6.
The way I decided to apply this model was through notating short musical gestures and then record musicians performing them, which would then be used in a creative process with the recorded material while working within a DAW. This way of working would hopefully allow me as a composer to come closer to the sounding material earlier in the process, similar to the compositional approach I’ve experienced in writing popular music.

This model could enable a composer to work without a defined ensemble and having instruments added when necessary, until the composer deems the work finished. I decided to limit myself to a violin and violoncello for this thesis.

4.3.1 The violin

I composed a sketch for violin with five ideas that was recorded in one session on March 13, 2016 with the violinist Sanna Lundberg. To make the process of recording the gestures as easy as possible, regular notation was used to mediate the idea to the musician in an effective (and conventional) way, and the gestures were gathered into one part where every gesture could be interpreted as very short movements. The score for this sketch is included in the appendix.
Five gestures were recorded, and four of those (gesture 1a, 1b, 2 and 4) consisted of material that could be described as long uninterrupted lines. The remaining gesture 3, contained short notes and I realised it was so different from the other four that it did not fit in the final piece. In the end I also did not use gesture 4. This was due to the fact that I changed the tempo which would’ve made the rhythms unnecessarily complex to notate and gesture 1b was so similar but notated with unmeasured tremolos so I decided to use that instead. The recorded material were cut and organised by naming them with their initial pitch and playing technique, such as “f# senza vib-grottesco vib” for a gesture starting on F sharp without vibrato and slowly progressing to a very wide, “grotesque”, vibrato.

After organising the samples I composed a two minute long preliminary test with the recorded material in the DAW Logic X\(^6\). I decided to simulate a number of violinists’ positioning on a virtual stage with the use of the software plug-in Virtual Sound Stage 2. I placed the gestures (as sound files) on different tracks and automated the volume to create some variation in their phrasing.

### 4.3.2 The cello

I found myself pleasantly surprised by the results of the small test I did in Logic with the violin samples, and I thought I was on to something. But if I were to compose a piece without using greatly transformed versions of the gestures, I realised I would need more material. I wished to expand on the same idea of long lines, but with a different timbre, so a second sketch with similar gestures for Violoncello was recorded in November 2017 with the cellist Kajsa Nyquist.

These gestures were notated (and recorded) in another tempo. The reason that I used Logic here instead of Cubase was merely that I, at the time, did not have with me the USB dongle with the software license required to start Cubase, which is not necessary with Logic.
sons were that I was worried that the music would become too square since I was planning the piece to be textural, with little sense of pulse in it’s ordinary meaning. I thought that by shifting tempo this might not become an issue, and I also had an idea that different tempi might create two interesting contrapuntal layers in the music.

4.3.3 The use of electronics

After creating the FluteFields sketch, my idea had been to use the recordings of the violin and cello to create something in the same manner, by processing the recordings into warped versions, but after listening to the initial experiment of the violin, I started to reconsider this idea and by the time I was recording the cello gestures (one and a half year later), I had decided to attempt a piece using studio tools to achieve a realistic sounding composition that could be possible to realise with live performers.

I chose to limit the work I was going to do in the DAW to that which would result in a piece that would be possible to realise with a string orchestra. I did not have any specific set of rules, but instinctively it resulted in these restrictions:

- The recordings would not be manipulated to the extent that they become sound objects, or impossible for a live musician to realise.
- Synthesizers and sound objects were not to be used.

Using the full possibilities of processing the audio would have brought me into the realm of electroacoustic music, which in it self is not problematic. However, since I wanted to approach this as a way of composing purely acoustic music, entering into the electroacoustic sphere would have worked against this purpose.
4.3.4 The musical gestures of Lines

The first gesture (figure 7) for the violin was made up of fourteen bars of a long note which is animated through dynamics and pitch. The dynamic animation consists of a large scale dynamic envelope consisting of six bars of attack time, two bars of sustain and six bars of decay time. The pitch is made increasingly unstable through the use of vibrato, which follows the same envelope as the dynamics. The pitch is additionally changed through raising it a quarter note in bar 8.

The violin’s second gesture (figure 8) combines glissandi up and down between $d\#$ and $b^1$, tremolo and undulating dynamic between fortissimo and piano. The timbre is also modified with the sul ponticello instruction.

4.3.5 The compositional process of Lines in Cubase

The first work done in the Cubase project file was to construct a logical organisation of the tracks. I decided to think of each track as one of the musician’s in a fictional ensemble. For example, Violinist 1 could play a gesture while the second comes in a few seconds later with the same gesture.

\[\text{\textsuperscript{7}}\text{I am using the terms Attack, Decay, Sustain and Release from the terminology commonly used regarding sounds and electronic music}\]

---

**Figure 7: Violin - Gesture 1a**

---

---
If I instead had chosen to use one track per gesture, I might have ended up with less manageably overview of the piece.

I made six tracks for violins and six for cellos. The tracks of each group were put in separate folders inside Cubase, which can be expanded or contracted depending on of which instruments I would need a more detailed view.

Each track was assigned an instance of the plugin Virtual Sound Stage (VSS), which is a tool to simulate the seating of an ensemble or orchestra in, for example, a concert hall. I placed the violins to the left and the cellos to the right, to maximise the use of the stereo field. I knew that I could experiment with placing the instruments in any fashion around the virtual microphone pair in VSS but I wanted to begin with a more conventional setup and revisit this later in the process if I felt a need for it.

A reverb channel was added with the Convolution reverb from Vienna Suite, which I generally use for the sound of a realistic hall. The reverb setting I decided to use was modelled after Vienna Konzerthaus (using the built in Impulse Response from that hall). The violin and cello channels were all given this reverb channel as a send effect.
Adding a recorded sample to a project in Cubase is a more or less straightforward procedure; one can “drag and drop” the sound file into the track’s lane. This makes it very easy to get started, and after having VSS and the reverb in place on all tracks, it was possible to instantly listen to the samples as if they were being played in a concert hall. The different experiences of listening to the unedited recording and the same, but mixed with reverb, is distinct. Adding space makes the recordings sound closer to how one is accustomed to hear a violin or cello during a concert.

It was inspiring to imagine that I was somehow listening to Sanna and Kajsa performing in the Vienna Konzerthaus. This digital simulation could never substitute a real occurrence of such an event, but it’s also not the intention.

I had to modify some of the gestures slightly Some gestures were modified to fit the musical ideas that cropped up during the process in Cubase. An example is bar 18 in the score of Lines, where cello 2 and 6 plays the beginning of Gesture 2a from the recording session but is faded out around/just before the second bar (figure 9).

![Figure 9: Lines - Violoncello 2 - Bar 18](image)

To structure the work, I aimed to maintain consistent naming of the audio files and the tracks. Often when I’m working, I can get compositional spur-of-the-moment episodes where I work chaotically leaving it up to myself to later on clean up the mess.

One effective way for structuring the work was to use the built in color coding function on each gesture type, which made clear the overall structure
of the music. Using colors to structure material is not uncommon in compositional processes, and color coding the tracks in a DAW is common with music production in general, it’s benefits for composing contemporary western art music, does not come as a surprise but it’s effectiveness was apparent (figure 10).

![Figure 10: Cello gestures organised with colours in Cubase](image)

### 4.4 The post-recording notational process of Lines

When the compositional process in Cubase was nearing it’s end I started transcribing the piece in Sibelius. Since I had the gestures notated from the preparations for the recordings, it was not as difficult as I had initially feared.

When working in Cubase, I chose the tempo of 60 bpm for quarter notes. The violin gesture was notated in 70 bpm and the cello at 48 bpm, meaning they had different ratios to the final tempo in the Cubase project. The idea is that the different tempos can give the piece a sense of different temporal planes, and I thought using “seconds” (60bpm) could function as a sort of ruler for the other tempi.

The piece begins with Gesture 1a in the first violoncello, and I began translating the notation to 60bpm, a process which was simplified by having the timecode for any given selection in the music shown at the bottom of Sibelius. This makes it easy to translate anything from one tempo to another.

After the first gesture was notated in the new tempo, it was not necessary to renotate the same gesture when it reappeared later in the piece (the first part focuses on this gesture in the celli). The copy and paste functions in Sibelius works well and all that was needed was to clean up the notation if
it was shifted in the bars in relation to it’s original appearance (on the first beat).

In the Cubase process, as was mentioned above, Gesture 2a were shortened in bar 18. This was problematic to renotate due to the inexact nature of the glissando, and some kind of simplification was needed. Since the ending pitch was somewhat arbitrary it did not take too much time to find a solution.

4.4.1 The performance score

Since the notation in the studio version is a close realisation of the final recording, performing it is theoretically possible. However, the type of setting (six violins and six cellos) might not be practical from a concert programmer’s point of view. Even before the notation process, I had realized that a separate performance version would likely be needed for the piece to be performable. Since two out of four instrument types had been used from a conventional string orchestra, adding the other two seemed appropriate since it would make it possible for string orchestras to perform.

The size of the string orchestra was a concern, since the size of string orchestras can vary greatly. I decided on a smaller chamber size, of 5 violins, 4 violas, 2 cellos and 1 double bass for a total of 12 musicians. The fact that I had a total of 12 parts in the studio version naturally played an important role in the decision.

In this performance version I divided the instruments as such:

- Violin 1-5 and Cello 4-5 of the studio version were generally left untouched.
- Violin 6 and Cello 1-3 were made into Viola parts.
- Cello 6 was made into a Contrabass part.
The Contrabass part was transposed down an octave and after looking through the part I felt the Cello ideas would likely be transferred well. In some ways I thought the added variation in timbre also would work well.

Up until bar 36, the viola parts worked, but at this point a low F sharp comes in studio version’s Cello 3 which in the performance edition became Viola 4. I realised here that I could move the whole gesture between bar 36-53 to Cello 2 (formerly Cello 6) so that it would not need to be transposed. However, the glissando gestures between bar 39-61 in the violas had many notes out of range so I decided to transpose them up an octave. Another solution could have been to only modify the pitches that were out of range, but I thought the overall lines were more important in the context of this work. Since the cello and viola have the same string tuning, separated by one octave, I thought this kind of translation was suitable since one could argue that the instruments have relatively matching timbres for a given gesture when transposed up in the viola. It’s possible to use the same string positions, and so on.

Between bars 63-73, the cello’s gesture 5b begins and these occurrences were also transposed up. Interestingly, when gesture 5a comes in at bar 147, even though the F sharp was within the viola’s range, I had to transpose it to maintain the timbral change which comes from changing string and octave on the instrument. The change from E to F sharp would otherwise not have been as distinct as I wanted it.

Gesture 3 for Cello between bars 88-102 were another example were I had to transpose, but here it was not a problem because I thought that the transposition of the viola parts would result in a more heterogeneous texture, more in line what I wanted to achieve with the disjointed dynamical bursts.
5 Reflections

5.1 The initial outlook

The literature I examined led me to decide not to pursue the notions of mixing genres but instead trust that my influences together constitute my artistic expression. This meant I could then focus on the compositional method itself.

The term “mock-up” is used in film and game music for a virtual demo that is given to producers and directors for approval, before (and if) the music is to be recorded with real instruments. These virtual demos often use synthesizers or sampled musical instruments. So what exactly is the difference between that kind of mock-up and this project?

That I recorded the samples myself is an aspect is not unheard of in the “genre” of mock-ups, but the focus when doing mock-ups is often to quickly get something that sounds good, that can be presented to a producer or director. Hans Zimmer, for example, is said to have sampled a whole orchestra for his own use, which implies he most likely reuses those samples for different projects.

After finishing this project I could reuse the gestures in a future piece, although reusability was not the intention when conceiving and recording them. I composed Lines without notation as a tool, which is often the case with many composers of film and game music. The question here is how often this happens with classically trained composers. What happens when not relying on eyeing the notation as a contemporary composer?
5.2 Why no electronics?

As was mentioned in the description of the working process, I had three unwritten rules, which occurred intuitively, that I followed when I composed Lines. These rules occurred instinctively and were not set up just for the sake of the thesis. The reasoning for these restrictions was that, while the act of creating music (the audible aspect of it) with a computer is technically a type of electroacoustic music (EAM), that term is closely connected to the traditions coming from the electronic music developed in the 1950s (for example at the electronic music studios in Paris and Cologne by Schaeffer and Stockhausen, respectively).

It would be misleading to describe Lines as a work in the genre of EAM. A key aspect of this thesis was the idea to reverse the compositional process, moving the notation to the end of the work, so you could say that the process is using electroacoustic means to reach a notation that aims for an acoustical performance.

If I decide to use this method in the future, which is likely, I will not plan to impose this kind of dogmatic method on my creativity. Instead I will try to follow where the music seems to lead me.

5.3 Composition in Cubase

Working with audio files in Cubase as a compositional process could be likened to having post-it notes with parts of a story scattered between them and trying to stick them to the wall in an order that results in a cohesive narrative. This way of working felt intuitive and inspired me, for another project, to actually make small colour coded cards with expressive ideas and putting them on an empty manuscript page, as a way of brainstorming (figure 9).
Figure 11: 'Post-it composition’, inspired by working on Lines in Cubase.
6 Discussion

For this work I first searched for other means to bridge the genres of popular music (with regards to my own personal style) and contemporary western art music. My thoughts were focused on the stylistic aspects and it felt like a relief to take a step away from that and use what I would call a post-genre inspired approach which meant acknowledging that I have many kinds of influences and trusting that they will permeate my works even if I consciously do not think of them. It began to feel neither constructive or meaningful for me to think in terms of genres and styles in a technical manner. Realising that there are other ways, in my view more fruitful, to think about genres and styles were a great catalyst for me. Instead of worrying of how I will show my influences to grunge music, I could take my idea of what the spirit of grunge is and create a sort of response to it through the music I compose. Using grunge-like melodies or chord progressions, just for the sake of using them in contemporary western art music would feel dishonest and shallow. All of these standpoints are of a personal nature and are not meant to disparage anyone who would happen to use the above example.

The idea for this project came from two directions. One half came after discussing the relatively common notion of the composer’s score as the Work, while performers sometime are seen as mere automatons that realise the music. The other key to this project was the differences of how music often is recorded in a Classical and Popular music context.

My aim was not to completely abandon the above-mentioned notion of the Work. My intention to move the notational process last was to find new possibilities in the process, and the different recording traditions and the view of the Work was an inspirational starting point.

In a project like this, I believe the musician’s role should be discussed. Maybe there are interpretative concerns regarding recording a musician and then using the recorded material freely as compositional building blocks? The
musician has no control over the final result, which uses their performance.

In concert music, the musician normally stands for the performance and the composer for what is being performed and interpreted. In the studio-based model that I’ve explored, the composer becomes indirectly involved in the performance and the musician less so. Can the musician still be considered interpreting the music or are they doing something else? Since they were aware of what the recordings were going to be used for, it could be said that they were performing the music authentically. If I had cut out parts from a pre-existing recording, the musician’s on it would not have performed the music with the same intention. The act of sampling pre-existing music is common, but I believe that way of composing is inherently different from what I have done here. One could say that instead of quoting another person’s music, I am in a way referring back to myself.

6.1 Aspects of technology in the artistic process

The Finnish composer, Kaija Saariaho, said in an interview that she doesn’t like when people say “they use the computer because it makes things go quicker”, and she believes we must take our time in creating art.

One could possibly object that it’s not inherently bad that something takes a short amount of time to do. In fact, it might be a common idea in our contemporary society, that quicker means better. A fast computer processes data for us in a shorter amount of time, and a fast train could enable us to visit our families living on the other side of the country more often.

But speed is not always a good thing. If we attempted to drive a car at 200 km/h in the middle of a big city, the likelihood of an accident would be high and we would risk injuring both our self and others.

So where does art and the artist’s process fit in here? Is it hurting or
enabling creativity if you have a sample library of a complete symphonic orchestra at your fingertips? The answer is probably different for every person.

Going back to what Saariaho said, one could also ask if this is a generational matter. The computer is a natural tool for young composers, who perhaps never truly mastered writing music properly by hand. A big advantage for us "youngsters" is that when faced with adding a bar into our score, it takes five keystrokes in a few seconds rather than hours redrawing the page with a fountain pen and ruler. You can say that this would be time saved that you could spend better on some other part of the process.

This argument is flawed because the work flow when working by hand often involve a lot of sketching and in the above example one could just make a comment like "add a bar here" and leave the labour of a finished notation until the work would be complete.

I recall a masterclass with Salvatore Sciarrino in Piteå during the New Directions festival in 2014, which I attended as a passive participant. Sciarrino mentioned how he thought young composers seemed to have less time to compose due to the fact that they can expect faster results from computer software.

What he meant was that instead of beginning to work with a piece a year in advance, they might think about the piece from time to time, but without composing much of the actual music until there’s a month left until the deadline. This would leave them with less time to reflect on the music that’s being written. Our tools have gotten faster and more powerful but our mental thought process is (presumably) still at the same speed as before.

I’ve had personal experience with this on several occasions, but I truly realised the negative influence it had on my artistic work with the piece I wrote for the summer course in Glasgow, mentioned earlier.

An interesting relationship appears between composing using notation software, DAW and writing by hand. If I, within a few minutes in a DAW,
compose a passage of music consisting of gestures made of trills, dynamic envelopes and quarter tone glissandos which in a notation software would take at least an hour to fully notate, one could with the above in mind argue that the notation software is the better option because it takes a longer time, so you are allowed to think over things more.

But in the DAW I can allow myself to improvise around the idea of a passage until it’s what I want and then go in and shape each note and phrase with various controls and tools. This can result in a detailed work to get the sounding representation that is sought.

And even though it can be faster to create sounding material in a DAW, there is also the time involved in transcribing it to readable notation. My experience while composing Temporal Tactility was that I often encountered situations where I wanted to change something while working on the notation, which led me to go back into the DAW and make the change there. If that would sound better I would go back into the notation software and continue working.

When adding to this, the process of sketching ideas by hand and then trying them out in Cubase, another element appears that takes time and allows the composer to contemplate their ideas back and forth to a greater extent. I found that the use of a DAW made the creative process playful and intuitive.

I do not believe this process would work for everyone (and for every situation, e.g. if you are pressed on time) but there is something beneficial there that all composers could consider.

I will now try to address the research questions I set up in the aim of this thesis.
6.2 What are the benefits and problems with using a DAW as a compositional tool?

Composing the two pieces Temporal Tactility and Lines in Cubase with different approaches has given me a broader understanding of the role a DAW can have.

In the process of composing Temporal Tactility I generally had more fun composing than I normally have. The process felt more hands-on when improvising forth the parts with the keyboard. In general it was more time consuming to compose in Cubase than directly into Sibelius. This can be a disadvantage, but if one is given a reasonable time frame, it can be manageable (as was the case with this piece). That said, the process was still effective, when improvising a minute of music and then going back and analyse and edit the MIDI performance before notating it.

Using audio samples in Cubase was an effective way to compose, at least for Lines. It is a work with textural focus and other kinds of music might not work as well with this kind of process. The amount of samples that are available limits the musical palette. If I do a similar project in the future I will make sure to record several more variants of a gesture and also record it at different pitches.

A well thought out structure has to be laid out before the recording is made so that the material does not go unused, like what happened with some of the ideas I recorded with the violin.

I end up composing in different manners when using Cubase or Sibelius. The process in Sibelius becomes more focused on the graphical aspects (perhaps the search for graphical beauty in scores is something on which composers should reflect critically) while using Cubase makes me more concentrated on the sounding result and the improvisational aspect of composing.

When composing contemporary western art music I can see a benefit in
working with both these programs simultaneously. In that way you could get both the aural and the graphical perspective.

A common issue with composing in a DAW is that it supposedly alters the way you compose, in a negative sense. Does it make you write 'for the samples' rather than the real musicians? It’s a very complex question and I can only say that in my case, the live performance of Temporal Tactility sounded as I wanted. It actually worked better than it usually has done for me when writing directly into Sibelius. A possible reason I can think is that when I was composing in Cubase, I was constantly shaping the gestures with my hands using midi controllers. Having studied composition for a while now, I’m glad that my knowledge of the balance of instruments and the realistic boundaries of their dynamic ranges, as a part of the craft of instrumentation, seems to be close to on the spot. Working with every sound required me to always be mindful of the dynamic levels and the balance between them.

I remember one occasion when I was considering using whistle tones on the flute, a technique that barely can achieve a piano dynamic, together with plucked high piano strings, bowed vibraphone and string harmonics (the end result of this passage can be found at rehearsal mark, L). I almost kept it but I finally had to be honest with myself and accept that it would not be possible to hear it since the other instruments were playing. It was not a problem to adjust the levels in Cubase, but my knowledge of how the instruments would work influenced my decision. Also, in having almost ten years of experience with the use of sample libraries, I have a good grasp of how to tweak them to sound as good as possible.

It’s easy to make the mistake, when composing with sample libraries, to mix the levels so that a generally loud instrument, a trumpet for example, sounds softer than a soft instrument, like a flute, but it’s just as easy to compose a poorly orchestrated piece regardless of the composing tools that are used. It comes down to not blindly trusting your tools, and remembering to use the musical skills obtained through one’s studies.
But for some reason this fear of composing in DAWs lingers. But the use of notation software can also have it’s downsides - which were likely up for debate when they started to emerge. I would say the same applies as above; remembering to use one’s skills and not relying too much on the tool. If a phrase can be written in five seconds, one can still chose to pause and think it over a bit before going on to the next phrase.

6.3 How can the tools in a DAW be used to realise an artistic expression?

Cubase has many tools that I found suitable for working with Temporal Tactility and Lines. Pitch shifting and dynamic variations with the Expression controller\(^8\) feels surprisingly effective and useful when coming from a notation software where it’s clunkier and less intuitive to create the kind of dynamic envelopes shown earlier in figure 3 and 4.

In Lines (and indirectly Temporal Tactility) I limited myself to less creative uses of the DAW than those that are regularly used in the sphere of electroacoustic music. A ”basic taxonomy of effects” for transforming a sound, can be one hundred items spread over the headings (some of which are more arcane than others); signal mixing, re-recording, reverse and inverse, amplitude (dynamic range) processing, pitch processing, time-domain spectrum filters, spectrum processing in the frequency domain, sonographical transformations, dictionary-based atomic transformations, time delay processing, granulation, convolution, spatialization, reverberation, modulations and distortions, waveset operations and concatenations (Roads, 2015). It might be understandable why I refrained from opening that Pandora’s box.

In retrospect, it could have been interesting to at least somewhat blur the line (pun intended) between the recorded version of Lines and electroacoustic music, by using some of the ideas I tried in FluteFields, even though it

\(^8\)Control Change 11 is a MIDI message that controls the Expression parameter, which is used to create a sense of phrasing through modulations of the volume
was a valuable experience to limit myself in this regard. When I create electroacoustic music I often end up thinking that I process the audio so much that the source sound becomes irrelevant. If that matters or not is a topic for aesthetical discussions but it has been interesting to explore an different alternative.

The working progress in Lines opens up possibilities to modularly add more instrumental parts to an idea. With, for example, thirty minute long recording sessions with sixteen instrumentalists one could end up with an orchestration of Mahlerian proportions.

6.4 In what ways can the workflow in using a DAW affect my compositional decisions compared to using conventional methods such as sketching on manuscript paper and/or writing in a notation software?

In *Det audiografiska fältet*, Gunnar Valkare describes how composers’ in the twentieth century placed an emphasis on what is graphically beautiful to look at (Valkare, 1997). Stockhausen thought, during the 1950s, that the graphical beauty of a score was more or less equivalent with a satisfying sounding result. A piece could be judged, even from a distance, based on the graphical properties.

The audio-graphical field is a concept that Valkare coined, which could be summarised as the relation between the auditive and the text. This idea can create a slight sense of embarrassment when realising that composer’s place a high value on the graphical aspects in a composition. This manifests itself artistically but also in other cultural aspects, such as composition contests. A telling joke that I once heard; you either win competitions or you get commissions. This cheeky one-liner implies is that you win competitions with music that looks complex, regardless of other aspects.
A contrived example of this kind of audio-graphical thinking; imagine a few bars with whole notes with only an initial dynamic. This looks subjectively boring, and therefore it would sound boring, one concludes. But that leaves a lot of aspects out of the equation. Our ears will not experience boring ‘whole notes’, they will hear, moment to moment, a musician interpreting a long line. Enabling the composer to take a small step from the audio-graphical world of composing, into (shockingly) a more aural world, is perhaps a good side effect of using a DAW.

Composing in a DAW can easily become more oriented around how the music sounds and the process in the software allows working more with trying out gestures and form. Sometimes this can result in complex notations and sometimes in less so. This approach can prevent notions like ’complex’ or ’boring’ notation to influence the compositional process, and instead opens up a more nuanced thought process.

DAWs and notation software are tools and they give enormous benefits for the composer, but it can be a good idea to stop for a moment every now and then and make sure that you are in control of the tool, and not the other way around.

It’s interesting that using a DAW made me feel closer to the music, and having more respect for each individual note, than exclusively using a notation software. In some ways, using a DAW has more in common with traditionally writing music with pencil since adding every little detail can take a bit more time, which made me, at least, take a more nourishing attitude towards the material in the compositional process.

Using a DAW to compose contemporary western art music did not necessarily lead me to simple notation. Some sections even became laborious to realise in notation.

A common feature in current notation software is the ability to select a passage, cut it out and paste it some place else. This lets the composer play
with the material, but you are often bound by beats and bars. In DAWs, on the other hand, you can move a selection in any way you want, you do not even need to care about the beats or their subdivisions, if that’s not wished for. This is all common knowledge for those who use DAWs, but approaching them from this angle has let me appreciate it’s implications further (it does not just have to be about humanising a MIDI-performance).

6.5 Thoughts on the finished piece

The final sounding result of Lines was more nuanced than I would have thought possible. With few elements (the gestures), I was still able to compose this ten minute long piece. I had expected to make more invasive editing of the gestures than I did; at most I pitch shifted and shortened the gestures to only incorporate parts of it. That said, while I did record about three takes on every gesture, some gestures sometimes became a bit repetitive and it would have been a good idea to record even more takes for each sound.

Creating the scores was time consuming, more so than the actual work of composing the piece, and mostly consisted of working against the notation software. I could spend an hour just dragging glissando lines to get them in the right position. At first glance this could be seen as a poor way of working, but I have started to reevaluate my composition technique. Since I found the process of notating the music so frustrating, does composing using the software affect us more than we realise? ‘Going by ear’ has begun to seem to me like the best and most straightforward way of composing.

There’s a prevalent idea that a composer should write down what comes to their imagination, even using a piano can sometimes be looked upon. This idea is the starting point which resulted in my inspiration from the post-genre. I realised I do not have to be a slave to the regular model for what the compositional process should be. Post-genre is a concept that is relatively new and it has been interesting to explore how it can relate to the actual process of composing. The piece Lines might not sound like the music that
is typically referred to as post-genre, but I believe that post-genre should not be just the sound, but also the philosophy behind it and the possibilities that it opens up in our minds.

But in some ways I also think it is a good thing that composers ‘just’ imagines music. Composer’s relying on orchestral sample libraries write music that sounds good with those libraries and they might, if unaware, miss out on a rich world of not only extended techniques but also subtle musical expressive options (in a few hundred years, will the historians sit and wonder why composers seldomly used portato?). I think it’s in a composer’s best interest to be aware of these things as much as possible. But in the end we’re all just humans, and I’m could not fault someone, even myself, for not knowing, for example, all of the arcane techniques used in Helmut Lachenmann’s music. When I composed the gestures I was mostly writing them based on my ideas. But these ideas have to come from somewhere, and that somewhere is often a sound source. So this issue of using aural tools or not not is not as clear cut as it might first appear. When I had the gestures as samples I could rely on my ears when composing. The process, perhaps unsurprisingly, felt similar to when I work with music that is not notation based.

One method of working that could be used to simplify the notation process would be to notate the gestures with aleatoric box notation (à la Lutosławski) which then could easily be transferred from the recording sketch to a score. This leaves the composer with less control, which may or may not be an issue. If I use this kind of working process in the future I will likely use a mix of that kind of notation as well as traditionally notated music.

6.5.1 The performability of Lines

Since Lines has, at the time of writing this, not been performed I can only speculate on how a live performance would work. Being a reasonably experienced composer, I trust my experience and knowledge in this matter - which
was also strengthened by the experience of composing Temporal Tactility primarily in Cubase and realising how close the digital version came to the live performance at the premiere. A live performance of Lines would most likely give a more visceral experience than the recorded version, just as a live performance of a rock concert does in relation to the listening experience of the record.

Since the instruments are recorded with microphones close to the instruments, the recording gives a more intimate impression than a live performance would be able to. Due to this fact, I have considered if the instruments should be close-miked for a live performance. This brings up practical problems such as the ensemble requiring a sound engineer and the equipment (speakers, specialized microphones, cables, mixer board). I want to be as practical as possible so that my works are not ruled out due to complicated steps in the execution. I believe the work might work best if the string orchestra is amplified, but I would not want to rule out that a purely acoustical performance might be different but equally satisfying.

6.6 Some final musings

Taruskin interestingly prophesies that when a majority of composers "fix their works digitally and reproduce them via synthesizer or via MIDI... the postliterate age will have arrived" (Taruskin, 2009). He continues to speculate that maybe reading music will become "a rare specialised skill". Zorn is described by Taruskin as a "harbinger" of a postliterate future with "nonanalytical thinking" about music. But media, he continues, has already prepared us for it and he concludes that, "postliterate listening as well as postliterate composition is already upon us".

Valkare calls our current time for the fourth era, following after the ('audio-graphical') third era. He says, "with sound technology, the situation and concept of music has changed radically" (Valkare, 2016).
Will there come a time when no one can play classical instruments anymore? Perhaps we will someday have computer software applying Itzhak Perlman’s style on our MIDI notes (We already have sample libraries made with recordings of famous players, such as the Joshua Bell Violin\(^9\)). The thought wanders to an episode of *Star Trek - The Next Generation* where the android character, Data, is performing Mozart’s Eine Kleine Nachtmusik with a string quartet, while emulating the performance of the historical violinist Jascha Heifetz and the fictional Trenka Bronken\(^10\).

### 6.7 Expected significance

Using a DAW to compose is nothing new. Many composers of film and game music use DAWs as their main tool, maybe even without any knowledge of how to notate or read music. Composers of contemporary western art music does not use it as often in their process. Exploring using DAWs in that territory can hopefully give ideas for similar projects.

The hoped outcome was to find creative possibilities in using an approach for contemporary classical music regarding composition and mixing from popular music and adapting it to that field. One expectation was to highlight different advantages and disadvantages in the compositional process.

Some composers, such as Sigurðsson, has used the studio as a compositional tool in making contemporary western art music. I have tried to shed at least a little bit of light on that kind of process and I will likely continue to explore this method of composing.

Other composers will hopefully find it somewhat useful for further experimenting involving the use of recorded material. I also anticipate some practical problems may arise during the process that I might be able to suggest possible solutions to, which could benefit projects involving studio

\(^9\)https://www.embertone.com/

\(^10\)The episode is called The Ensigns of Command
recordings.

Not forgetting the real musician is for me a valuable goal, and incorporating them in the work for Lines gave me a way to work in a DAW with the finished mix intended as the final product but also incorporate musicians. Creating predetermined parts and then replacing them with real musicians is also a possibility but that still means a score is made beforehand, either with traditional notation or in a more abstract form as the midi information in the DAW.
References


References of musical works


JÖRGEN HÄLL

LINES

FOR SIX VIOLINS AND SIX CELLOS

STUDIO VERSION
INSTRUMENTATION

6 Violin
6 Violoncello

If possible, this work should be performed with the instruments amplified through speakers.

This work was realised by first composing small gestures, which were recorded with two instrumentalists;
Sanna Lundberg, violin
Kaja Nyquist, violoncello

The recordings were then used as samples a basis for the main compositional work (true to the word's meaning "putting together") in a DAW (Digital Audio Workstation).
The final result was then notated into the score you have in front of you.

This piece exists in two versions

Studio version - reflects the recording put together from the sampled gestures, for 6 violins and 6 cellos.
Performance version - a modified version which is intended to be more practical to perform by a chamber string orchestra.
\[ Vln. 1 \]
\[ Vln. 2 \]
\[ Vln. 3 \]
\[ Vln. 4 \] \( \text{pp} \)
\[ Vln. 5 \] \( \text{p.a.p. s.v.} \) \( \text{poco vib.} \) \( \text{s.v.} \) \( \text{ppp} \)
\[ Vln. 6 \] \( \text{p.a.p. s.v.} \) \( \text{poco vib.} \) \( \text{s.v.} \) \( \text{ppp} \)

\[ Vc. 1 \] \( \text{f} \)
\[ Vc. 2 \] \( \text{m.s.p.} \) \( \text{pp cresc.} \)
\[ Vc. 3 \] \( \text{m.s.p.} \) \( \text{pp cresc.} \)
\[ Vc. 4 \] \( \text{m.s.p.} \) \( \text{pp cresc.} \)
\[ Vc. 5 \] \( \text{pp cresc.} \)
\[ Vc. 6 \] \( \text{pp cresc.} \)
JÖRGEN HÄLL

LINES

FOR CHAMBER STRING ORCHESTRA

PERFORMANCE VERSION
INSTRUMENTATION
5 Violin
4 Viola
2 Violoncello
1 Contrabass

If possible, this work should be performed with the instruments amplified through speakers.

This work was realised by first composing small gestures, which were recorded with two instrumentalists;
Sanna Lundberg, violin
Kajsa Nyquist, violoncello

The recordings were then used as samples a basis for the main compositional work (true to the word's meaning "putting together") in a DAW (Digital Audio Workstation).
The final result was then notated into the score you have in front of you.

This piece exists in two versions
Studio version - reflects the recording put together from the sampled gestures, for 6 violins and 6 cellos.
Performance version - a modified version which is intended to be more practical to perform by a chamber string orchestra.
Solo Violin

Lines

*sketches for electroacoustical work*

Jörgen Häll

**Gesture 1a**

\[ \text{\(\frac{\mathbf{\text{c}}}{\mathbf{\text{f}}\text{=70}}\) } \]

 senza vib. * p.a.p. molto vib. (molto vib.) vib. grottesco

\[ \text{\(\frac{\mathbf{\text{ppp}}}{\mathbf{\text{(pp)}}\text{--})} \quad \text{(mf)} \quad \text{ff} \text{--})} \]

* = change bow direction as seamless as possible

8 vib. grottesco p.a.p. senza vib. (poco vib.) senza vib.

\[ \text{\(\frac{\mathbf{\text{ff}}}{\mathbf{\text{(mf)}}\text{--})} \quad \text{ppp} \text{--})} \]

**Gesture 1b**

\[ \text{\(\frac{\mathbf{\text{c}}}{\mathbf{\text{f}}\text{=70}}\) } \]

 Sul G senza vib. p.a.p. molto vib. (molto vib.) vib. grottesco

\[ \text{\(\frac{\mathbf{\text{ppp}}}{\mathbf{\text{(pp)}}\text{--})} \quad \text{(mf)} \quad \text{ff} \text{--})} \]

8 vib. grottesco p.a.p. senza vib. (poco vib.) senza vib.

\[ \text{\(\frac{\mathbf{\text{ff}}}{\mathbf{\text{(mf)}}\text{--})} \quad \text{ppp} \text{--})} \]

**Gesture 2**

\[ \text{\(\frac{\mathbf{\text{c}}}{\mathbf{\text{f}}\text{=70}}\) } \]

 sul G sul pont. even gliss.

\[ \text{\(\frac{\mathbf{\text{ff}}}{\mathbf{\text{p--})} \quad \text{ff} \text{--})} \quad \text{p--})} \quad \text{ff} \text{--})} \]

6

\[ \text{\(\frac{\mathbf{\text{p--})} \quad \text{ff} \text{--})} \quad \text{p--})} \quad \text{ff} \text{--})} \quad \text{p--})} \]

11

\[ \text{\(\frac{\mathbf{\text{ff}}}{\mathbf{\text{p--})} \quad \text{ff} \text{--})} \quad \text{p--})} \quad \text{ff} \text{--})} \quad \text{p--})} \]
Solo Violoncello

**Lines**

*motifs for post-recording electro-acoustic composition*

All gestures in $\frac{3}{4} = 48$

---

**Gesture 1a**

\[ \text{sul G senza vib.} \quad \because \quad \text{p.a.p. molto vib.} \quad \text{molto vib.} \quad \text{molto vib.} \quad \text{vib. grottesco} \]

\[
\begin{array}{c}
\text{ppp} \\
\text{(vib. grottesco)} \\
\text{(ff)}
\end{array}
\]

---

**Gesture 1b**

\[ \text{susa. senza vib.} \quad \text{p.a.p. molto vib.} \quad \text{molto vib.} \quad \text{vib. grottesco} \]

\[
\begin{array}{c}
\text{ppp} \\
\text{(vib. grottesco)} \\
\text{(ff)}
\end{array}
\]

---

* Rebow as necessary but as seamless as possible.
Gesture 2a

sul C
molto sul pont.
even gliss.

Gesture 2b

sul D
molto sul pont. → molto sul tasto, ad lib.

Gesture 3

sul C
molto sul pont.
senza vib.
**Gesture 4a**
con sord.
molto flautando, molto sul tasto (rebow as necessary)

**Gesture 4b**
con sord.
molto flautando, molto sul tasto (rebow as necessary)

**Gesture 5a**
molto sul tasto
approx. bowing rhythm *

**Gesture 5b**
molto sul pont.
approx. bowing rhythm *(accel. sempre)  (rit. sempre)*

* Rebow according to the graphical representation under/above the long note.
Bowing in this case should be perceptible but not accentuated.