



MALMÖ
ACADEMY
OF MUSIC

Artistic research part of Degree project, 30 credits,
For the achievement of the degree Master in Music, *composition*.

Ia Erlandsson
Spring term 2020

Creating Energy in Music

Investigating how the sense of drive can be created in the musical composition

Supervisor: *Michael Edgerton*

Abstract

Author: Ia Erlandsson

Supervisor: Michael Edgerton

Title: Creating energy in music. Investigating how the sense of drive can be created in the musical composition.

This thesis investigates how the sense drive is created in music and how these techniques can be used as compositional tools. Three methods were used to find this result. First method was to do an interpretative analysis of four songs in the metal genre, drawing a curve describing how the drive was experienced to progress throughout each song. Second method was perceptual examinations, asking participants to rate their experienced perception of the progression of drive at certain points in time throughout these songs. Third method to look at what was taking place in some of the most fundamental parameters of music (harmony, rhythm, timbre, density, loudness) when a change in drive was occurring. Finally this thesis discusses which compositional methods appear to be relevant for creating this sense of drive in the musical composition.

Keywords: drive, force, energy, art music, metal music, rock music, compositional technique, compositional tools

1. Introduction	4
1.1 Background	4
1.2 Aim	6
1.3 Research question	6
2. Literature review	7
3. Methods	9
4. Results.....	12
5. Discussion I.....	15
6. Discussion II	22
References.....	26

1. Introduction

As a composer of art music I am often looking at genres other than art music to be inspired and influenced from. After several years of studying composition at music academies I find it common that there is a large focus on the tradition of classical music, or contemporary classical music. Less time is spent on looking at other genres and music traditions, and how these genres can be incorporated for inspiration and influence when composing art music. From my experience there can in some cases be a trend to assume that a composer who composes art music also should find inspiration from, and be mainly influenced by, music from that tradition. In today's society, where we are more able than ever to share different traditions of music with each other, other genres will for many composers have a very important role as a source of both inspiration and influence. A composer could have started out playing in a band at a young age, or really got into music because of a connection and enjoyment of listening to another genre. This could then later on lead to a developed interest for the craftsmanship in the heritage of classical music, which in turn could be why a composer chooses to begin studies at a higher level. A genre which I for many years have listened the most to, and have a strong connection to, is metal. Part of my musical background is also in playing keyboard in metalbands. What is typically known as a characteristic of this genre is the sense of what could be called drive, energy or force. This sense of drive is something I strive to incorporate in my music. Through this study I aim to figure out what creates this sense of drive, and to see how this can be use as a compositional tool.

1.1 Background

For a composer it seems practically impossible to not be affected by the music in the surroundings. It is affecting our auditory imaginary and is a base from which we learn to create music through craftsmanship. The levels of craftsmanship are defined by works of previous composers and the study of previous works is a fundamental part of most education within musical composition. In my experience of studying at music academies the focus on the heritage within art music can be at the expense of leaving out a vast

treasure of musical possibilities presented by music of other genres, and that can also leave out possibilities to investigate how different genres which coexist in the same time influence each other.

Important terms used in this study:

Inspiration

Inspiration can be defined as something which initiates a composer's creative process. This could be pictures, musical pieces, political issues, etc. This triggers the composer to express their own perception of it, and leads on to the creative process of composing music which expresses the composer's point of view.

Influence

This can be defined as music which the composer listens to and from which the composer can choose to use ideas and materials for their own compositions. This could be harmonic progressions, instrumentation, use of rhythm and dynamic, etc. The important difference between inspiration and influence is that influence affects how the music might actually sound, consequently an influence can often be heard in a composer's music. Inspiration, on the other hand, does not necessarily have an effect on how the music sounds, but it is instead used to start and further the creative process itself.

Drive

Drive could also be named with other similar words, such as energy or force. Its meaning is the intensity in the music and how the music inhabits a sense of striving forward. Metal music is often described as having a high energy, being very loud and with a lot of expression, often also an aggressive expression. Although it is worth pointing out that these attributes are not by far incorporated in all metal music, they are all very common characteristics of the genre as a whole. Therefore, this study will look closer at how different musical parameters such as harmony, loudness/dynamic, timbre of instruments and vocals and the use of rhythmic intensity can be used to achieve this sense of drive.

Musical element

This could for example be a rhythmic pattern, a certain timbre, a melody or a particular chord. It can be quite short, even just an interval could be considered a musical element, or

it can be something like a longer rhythmic pattern which could last for several bars. The defining factor would be that it is occurring on several occasions throughout a piece, and that it is usually part of what signifies a piece.

1.2 Aim

The purpose is to be better able to understand what creates a sense of drive in music, and to see how this can be used in the process of musical composition.

1.3 Research question

What creates a sense of drive in music? How can this be used in a creative process?

2. Literature Review

Not much has been studied regarding this topic previously, and in some ways the term of “drive” had to be invented and defined for this thesis. Other word which might also be appropriate to use could be energy, intensity or force. In the simplest way drive would, in my opinion, be described as a feeling. It is the sense of intensity and energy in the music, and perhaps some would even describe it as aggression, especially when looking at examples in the metal genre.

Quite a bit of literature concerning elements related to the term of drive can be found, as well as studies about musical parameters with a connection to the different ways drive could possibly be created. Research has also been done to investigate what affect the characteristics of sound in general, and also metal music in particular, might have on the listener. The affect of the musical parameters such as the distorted timbres in both instruments and vocals (which can be connected to evoking feelings of fear, tension and anger) has previously been investigated (Ollivier, Goupil, Liuni & Aucouturier 2018). Previous research concerning how musical parameters, such as harmony, rhythm, timbre, density and loudness, impact on the experience of the music has been carried out in previous studies (Osborn 2017). Furthermore, much literature is available on how expressivity is created in music, and what parameters are to be considered relevant to achieve this expressivity (Lewys 1970).

Particularly the parameter of tension can closely be related to drive. I would, in the context of this thesis, suggest that drive relates to a larger period within a piece of music. Tension would perhaps best be considered a sort of micro-perspective of drive, being a sense of how one chord leads to the next (a common example of this would be the harmonic progression of V-I, in other words the dominant leading to the tonic) or how a suspension strives for its resolution. This could indeed be considered to be another form of drive. For this thesis the focus has been on larger sections within pieces of music, with longer duration than the more minor shifts from one chord to another or one note to another. With regards to musical tension there is some previous research done. During previous studies it has been

investigated and discussed how manipulating pitch direction, pitch register, loudness and tempo in a melodic sequence can affect the participants' perception of musical tension. (Granot & Eitan 2010).

3. Methods

The methods for this project are categorized into three parts, from here on named as methods A, B and C. Method A was an interpretative analysis by myself of four songs in the metal genre. The analysis consisted of listening to the songs while drawing a curve of how the drive was experienced to progress throughout them. Method B was perceptual examinations. Participants were asked to perform this perceptual examination in order to collect data about how others would be experiencing the perception of drive to be progressing in these four songs. Method C was to do an analysis of the musical elements occurring during each section of the songs when changes in drive had been noted to take place. Each section was analyzed according to the following musical elements: harmony, rhythm, density, timbre and loudness. The analysis was written in a document where each location of each song was analyzed according to the musical parameters mentioned above.

Starting out with method A, four songs from the metal genre were interpreted to see how the sense of drive was progressing throughout these songs. The drawing of a curve was used to note the interpretation of how drive progressed throughout each song,

The four songs chosen to be analyzed was:

Helix - Amaranthe

Eden - Battle Beast

Raise Your Banner - Within Temptation

Drag Me To Hell - Lord Of The Lost

Two songs were selected on basis that they were fairly new to me and I could therefore acknowledge that from early on listening to them the sense of drive was immediate. All songs were chosen on the basis of being music that I would consider listening to alongside the process of composing my music, and it would be music that I would look to for inspiration and influences for the music I would currently be composing.

The first song to be analyzed was *Raise Your Banner* by Within Temptation. This song was chosen because it was used a lot for inspiration a few months earlier when creating my piece *Infra*, commissioned by Helsingborg Symphony Orchestra. In that compositional process I had found elements in *Raise Your Banner*, in particular in the percussion part, which I worked with using in my own music and therefore this song was a natural choice for this study.

The first approach to interpreting drive in this song was to draw a graphic curve on paper, marking the times of when I experienced a shift in drive. This curve was according to my experience of the drive in the music, and the shape of the curve was in proportion to the varying sense of drive. When this curve was first drawn it was with a minimal amount of pauses, however, a few pauses were necessary to make sure that what was written down was written on the right point in time of the song. I then listened to the song a second time to see if I still found the graphic curve accurate to my experience and to make sure times were noted accurately.

The second song to be analyzed in this way was *Drag Me To Hell* by Lord Of The Lost. This song was added to my playlist about seven months prior to analyzing. The same method was used; first listen through the song with minimal amount of pauses while drawing a graphic curve and notating times for shifts in experienced drive. Then I listened to the song for a second time to make sure it was accurate to my experience.

The third song was *Helix* by Amaranthe, which was one of the songs that were quite new to me at the time of analyzing. It was added to my playlist less than two month prior. The same methods of analyzing as for the previous songs were applied.

Eden by Battle Beast was the fourth song. Although this song had been added to my playlist just short of eight months prior to the time of analyzing, it still felt quite new to me at the time. Same method of analyzing as mentioned above was used.

This was then followed by method B, which was to perform a perceptual examination in order to gather data of how others would experience the progression of the drive in these analyzed songs. Participants were asked to make interpretations regarding the intensity of drive at specified points in time, identified as “minute.second”. The points in time of each

song were chosen based on where change had been experienced in method A. The changes could either be drastic ones, very subtle ones or otherwise considered interesting when looking in the interpretative analyzes. The aim of this was to furthermore be able to figure out what in the music could possibly be creating that experienced change in drive. As for *Raise Your Banner*, *Drag Me To Hell* and *Helix* only parts of the songs were chosen, all starting from the beginning of the songs (00.00). The exception to this was *Eden*, in which case the participants got to listen to and rate the drive throughout the whole song. This was in part because it would be of value to see if the transposition of the last chorus were affecting the experience of the drive. Having the drive rated throughout a full song could also possibly provide some other interesting information for the study.

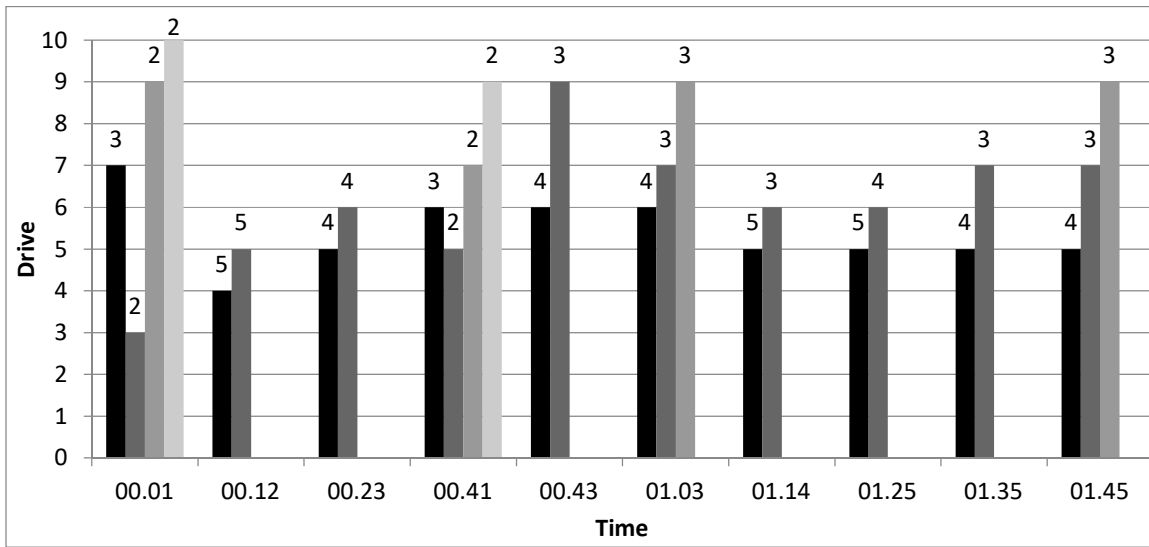
Participants were asked to rate from 0-10 how they perceived the intensity of drive changed at the given locations in the songs. The excerpt from each song, or the full song, was played only once. Before the study started the participants got to listen to a few short examples of what could be considered low drive versus high drive. All music, both the examples and the songs which were to be rated, was being played through Spotify. The examples chosen were Sofia Karlsson – *Balladen om briggen Blue Bird av Hull* (folk music, 00.00-00.10 low drive, 02.01-02.19 high drive), Hans Zimmer – *At Wit's End* (film music, 00.00-00.15 low drive), Klaus Badelt – *Barbossa Is Hungry* (film music, 03.30-04.06 high drive), Daughtry – *Baptized* (pop, 02.23-02.30 low drive, 02.37-02.53 high drive) and Dynazty - *Presence of Mind* (hard rock/metal, 00.00-00.10 low drive, 03.14-03.34 high drive). These were purposefully examples from different genres in order to give a varied perspective of the term drive.

Next step, method C, was the interpretative analysis consisting of looking at what was taking place in some fundamental parameters in the music at the times when drive was noted to increase or decrease. In a document it was written down what was changing in the music at these different points in time when a shift in drive was experienced. The main focus in this analysis was on the musical parameters of harmony, rhythm, timbre, density and loudness.

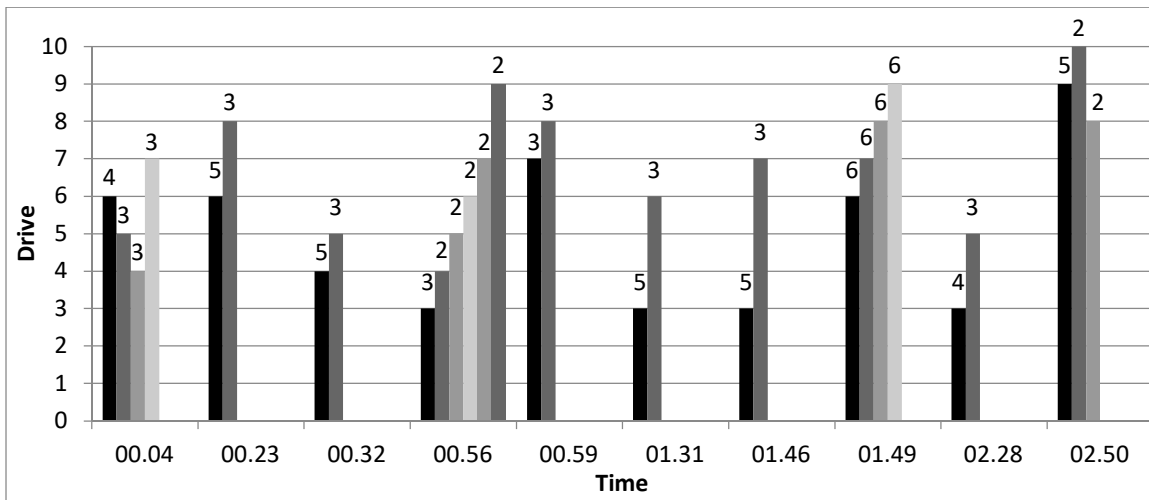
4. Results

An important reason for starting with the interpretative analysis, method A, was to get a grasp of which locations in the songs could be of interest when performing method B. Having narrowed it down to a few, precise locations for the participants to rate would make the result from method B clearer when analyzing them. Also, it would give better directions to the participants compared to asking them to draw a curve while listening, therefore making method B more solid to derive results from. From method A it was interesting to find locations in different song which might at first seem very similar with regards to drive, but when doing the interpretative analysis there was clear differences noted in the experience of the drive. One of those locations was the last chorus of *Raise Your Banner* at 04.10 compared to last chorus of *Eden* at 03.20. In *Eden* I perceived the last chorus to have a significant increasing drive compared to the ones before, in *Raise Your Banner* every chorus had about the same perceived drive. The results from the study, method B, showed an increase in drive for all choruses in *Eden*, compared to other parts of the song, and a slightly higher drive for the last chorus compared to the previous ones. This difference was however slight, the most commonly reported level of drive at the start of each chorus was always 7. The result from these perceptual examinations, method B, is described in the following charts. What is shown is the most commonly noted levels of drive for each location in each song. The number above the stems in the charts states the number of participants who reported this level of drive. For each location the two most common levels of drive were chosen. Exception to this is when there in some cases were two or more levels of drive which were reported by an equal number of participants. These charts help with subtracting the deviant results reported by a very small number of participants. An obvious pattern from these charts is that there is still a lot of variation amongst the participants between what the levels of drive are reported to be. Time is shown on x-axis and the levels of drive on y-axis.

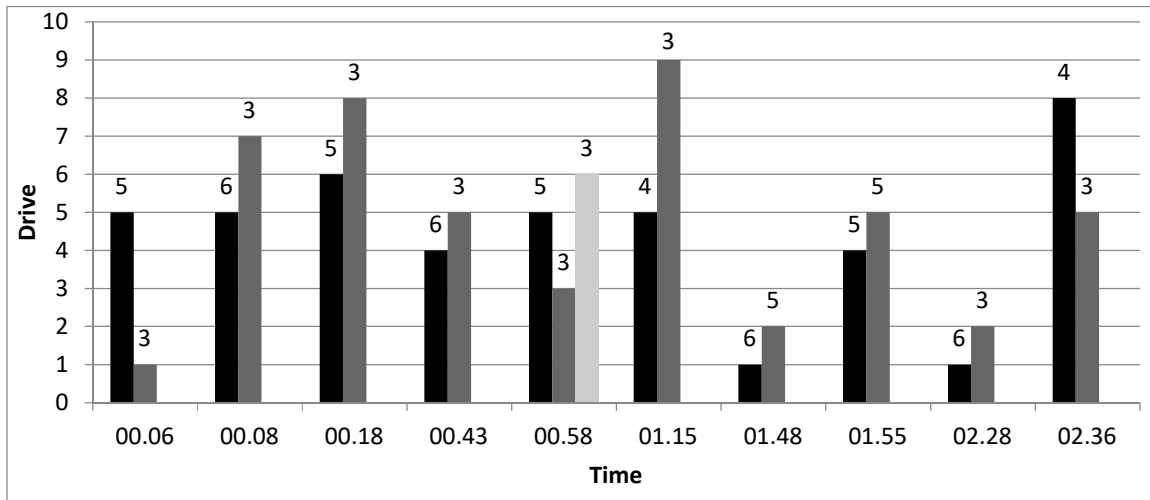
Amaranthe – *Helix*



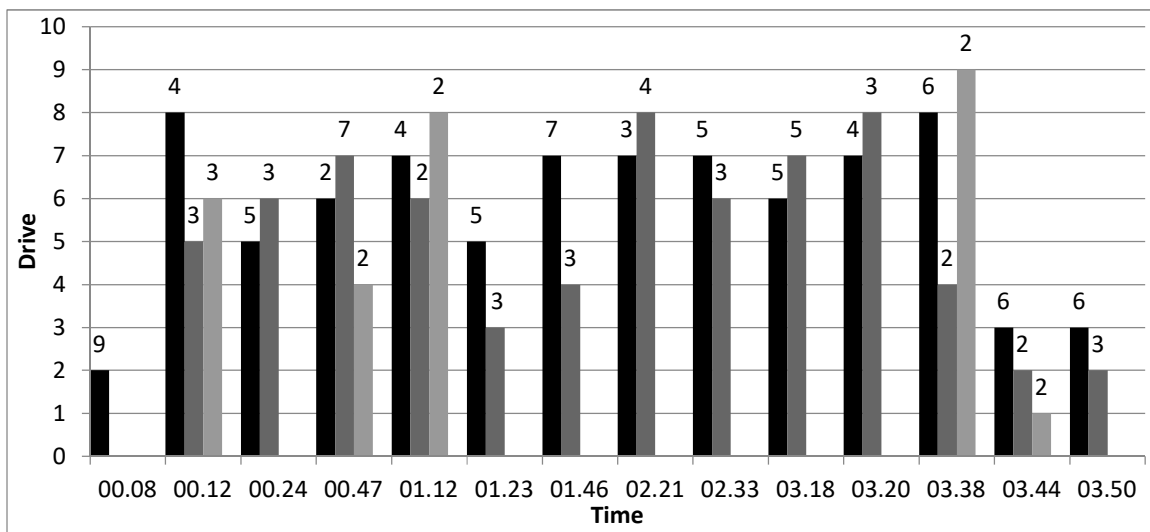
Lord Of The Lost – *Drag Me To Hell*



Within Temptation – *Raise Your Banner*



Battle Beast – *Eden*



The worth of zero (no drive) was never reported by any of the participants in any of the songs.

5. Discussion I

The number of participants in this study was too small to gather meaningful statistical analyses, but nevertheless some trends were seen suggesting that future studies around this subject might be valuable. When looking at the result of how all the participants had experienced the drive it is shown that the participants seemed to agree on the general trajectories of drive. In some cases a very small amount of the participants reported an experienced drive extremely different from what the other participants did. This might be because they did not note the drive exactly on the intended point in time, but instead shortly before or after that point. In many cases the points in time were chosen because they mark a clear change in the music, e.g. going from chorus to verse, and if a participant were to mark too early or too late the result could therefore be very different from what would be if marked on the right point in time. The interesting part of looking at the result of all of the participants is to be able to see not only the progression of drive according to each participant, but to get an overview of the experience of the group. The charts shown here above are a more graspable and relevant graphic of the results from the study, when the focus is on the experiences of drive which are the most commonly reported.

The first song played in this study was *Helix* and for this song the results reported by the participants were clearly more scattered and less coherent than for the other songs. This might be because this song became to some extent a test for the participants to see how the study would actually work.

Another noteworthy factor is that different participants might have a different idea of at what level of drive a song would be starting at. Since the songs were rated during the first time listening to them, the participants would not know how much the drive would increase or decrease in comparison to how the song first begins. The participants could also have different ideas of how the varying steps would compare to each other. This was also something mentioned by some participants when the study was performed.

To look at how drive is created it is worth looking at how the progression of drive is related to some fundamental parameters in music. The most fundamental ones to consider

would be loudness, timbre, density and harmony. Rhythm is of course also important, because it is found to be strongly connected to several of the above mentioned parameters it will be discussed as part of these parameters.

Loudness

A crescendo can be associated with something moving closer. Especially the rapid crescendos lasting a very short period of time can be connected to something approaching very fast. This sudden, rapid and unexpected change can to the human being be associated with something that happens in the surrounding physical environment and therefore grasp our attention and trigger an emotional and even physical response. If this is created with a distorted sound, which is common in metal music, it can be associated with a threat and therefore be something humans tend to pay more attention to compared to a sound without that distortion (Ollivier, Goupil, Liuni & Aucouturier 2018, pp. 4-6). This can translate to my own compositions in art music by using compositional techniques in ways that are quite similar to those in the metal genre, some modifications might however be necessary. I feel that the crescendos needs a bit more time when the music is to be performed acoustically, as in my piece *Arcus*, commissioned by Norrköping Symphony Orchestra. Electronic sounds were on several occasions used to create these rapid crescendos in the songs which were analyzed, for example in *Helix* at 00.00-00.01. It is of course possible to do something very similar to these rapid and electronically orchestrated crescendos, even when composing for a symphony orchestra. This could be interesting to investigate during various compositional processes, since the result here suggests that drive could be created by this method of very rapid crescendos. *Arcus* has some fairly rapid crescendos (measure 44), but it still no way near the examples in *Helix* 00.00-00.01 and *Raise Your Banner* 02.36-02.37). The size of the orchestra and the acoustic qualities of the concert hall might also be of importance when it comes to how these compositional techniques will work in performance.

Timbre

The distorted sound which is characteristic for metal can be another factor for the creation of drive, since these types of sounds might be associated to something threatening (e.g. growls or screams) or a sound which is very loud and therefore has a more distorted timbre. A very relevant question when doing analyzes in the metal genre is to see if the timbre of the distorted instruments could be affecting the drive. In *Raise Your Banner* the distortion of the guitar is present in choruses but not in verses. At 01.55, compared to the previous location 01.48, there is a slightly more distorted sound, based on sounds from a synthesizer, and at this point the drive is also noted to be increased. At 02.28 drive is reported to be very low, and no distortion is present here. After this, at 02.36, there is a significant increase in drive. At this location in the song a chorus starts and distortion is again increased. In *Drag Me To Hell* distortion is present more or less throughout the whole song. Still, it is quite clearly more predominant in choruses than it is in verses, and here the results show that the drive is reported to be higher at the choruses and lower at the verses. The sound at first location 00.04 is already with a distorted timbre, when looking at the next location at 00.23 the full band is now playing and the sound of the distorted guitars is very predominant. At 00.23 compared to 00.04 drive is reported to have increased. Loudness can be perceived to increase at this point as well, especially because of the added number of instruments playing but also because of how the added amount of different musical layers adds complexity to this part. When the verse starts at 01.31 drive is shown to decrease drastically, and this part also has an absence of distortion when being compared to the choruses. At 02.28 a very low in drive is reported, and this location only has a very slight amount distorted sound. That part is followed by a crescendo leading to the instrumental chorus starting at 02.50. The location at 02.50, an instrumental chorus, is reported to have a significantly higher drive, and here distortion is also a very present timbre. A very significant difference between these two locations, 02.28 and 02.50, is how the perception of loudness is increase due to the increasing number of instruments playing. The addition of the distorted guitars, along with the distorted timbre from the added percussions, is very clearly noticeable as instruments are added at 02.50. In *Eden* there is a clear increase in drive from 00.08 to 00.12. What happens there is that at 00.08 only piano

and strings are playing, and at 00.12 the full band also starts playing. This makes loudness increase, and the distortion is added with the guitars. At the verses in *Eden* guitars with distortion are playing, but they only play occasional accents and they have mostly pauses. During the choruses they instead provide an added constant timbre to the sound by playing a more intense and frequent rhythm. Through the guitar solo the drive is reported fairly unchanged in comparison to the previous locations, and distortion and loudness is also fairly unchanged in the music here. Right before the chorus at location 03.18 there is no distortion, and lower drive is also reported. When the full band starts playing, with addition of the timbre of distortion, at the chorus 03.20 drive is again shown to increase. After that the drive remains fairly unchanged until the outro starts at 03.44. Here is once more an absence of distortion, along with a drastically decreased number of instruments to only piano and strings with slight electronic sounds. Location 00.01 of *Helix* starts with the full band playing, and with that the distorted guitars. Along with this a high drive is reported. At 00.12 the verse starts, and now drive is drastically lower. During this location the instruments are fewer and the sound less distorted since it is without distorted guitars. When new vocals enter at 00.23 so does distorted guitars and more percussion. Here drive is shown to increase, even though this is still the verse. Interesting to note is at 00.41, which basically is a short break right before the chorus when there are only vocals, here is an reported higher drive than the previous 00.23. Once the chorus starts with the full band and the distortion at 00.43 drive is slightly more increased again. The next verse at 01.14 has a lower drive, when comparing the instrumentation to the verse before the bass is now noticeable and it has a slight distortion to its sound. At 01.25, which is very similar to 00.23, there is not, like in the previous verse, an increase in drive but instead the drive now is reported to be fairly the same as at the location before. The chorus at 01.45 is the next clear increase in drive, and like in the case of previous chorus this is with the full band playing and additions of distorted timbre.

Density

Density with regards to the songs analyzed concerns how simple versus complex a song can be. During choruses when higher level of drive is experienced there are typically several musical layers going on at the same time. This contrast to e.g. verses or breaks,

such as the break at 01.48 in *Raise Your Banner*, when few musical layers are being used and the drive is noted to be lower. A musical layer could be a guitar riff, rhythmic patterns in different percussion instruments, vocal lines, chord progressions played on synthesizers, etc. The layers create a more complex and dense soundscape. A higher number of layers does in this way provide more information for the listener to process. Having more instruments playing, creating these layers, also gives an impression of that the dynamic should be higher, even if it does not necessary has to be that way. When *Arcus* was commissioned one of the first ideas I started out with was composing with an arch-shape as a basic form of the piece. In *Arcus*, just like in the metal songs I analyzed, the method of adding more instruments and more musical layers were used to increase the energy of the music. *Arcus* has two highlight-points which are very similar to each other and they are based on the same musical materials. During these points in the piece there are several musical layers going on at the same time, almost all instruments are playing, dynamic is *forte* and a wide register is used. This is very similar to how the choruses have been treated in the song analyzed.

Noted from the analyzes was also how after a sound had rapidly grown louder, the next part would have a huge increase in number of instruments, register, dynamic and the number of musical layers compared to the part before the crescendo. This gives a new soundscape with significantly more information to be processed by the listener. In some of my previous pieces, e.g. *Alae* (2018) and *Infra* (2019), this is a method which is used frequently. In this new piece a main idea was working with composing in an arch-shaped form and with a flowing nature to the music. Therefore this method does not present itself that clearly, but still it is not left out entirely. When comparing the first measures to the ones at the highlight-point it is obvious that the highlights are, in the case of *Arcus*, highlights because they have more layers, stronger dynamic, wider register and more instruments playing.

When looking at the analyzes of *Raise Your Banner* and *Eden* it was noted that in *Eden* every chorus had small additions when it came to the instrumentation. The second chorus had added a line of strings in higher register, and in the third and last chorus this line of higher strings had a fuller sound compared to chorus two. I also found the guitar to be

slightly more predominant. The drive was about the same for chorus one and two, chorus three was noticeably higher, in the analysis of the song more changes were noted from chorus two to three than one to two. In *Raise Your Banner* all choruses were about the same with regards to instrumentation, dynamic, etc. and did not have this sort of additions to them. The participants reported a quite even level of drive for all choruses in *Raise Your Banner*.

Harmony

When looking in particular at the harmony in relation to the progression of drive one question would be if drive is increased when harmony is V (dominant chord), and if drive then is decreased on I (tonic). This question is relevant because the V-I is a very strong factor for how the music is driven forward in any musical genre using harmony. In the study the participants reported an increased drive whenever a chorus starts, compared to the other parts in the form of each song. All choruses start on I (tonic). However, so do all of the verses, and they are reported to have lower drive. Absence of harmony is in some instances used, at 00.56 in *Drag Me To Hell* there is a pause, before this pause there is a IV. After this, at 00.59, the chorus starts on I. In *Helix* at 00.41 is a similar part where there is a pause in the harmony at 00.41 followed by the chorus at 00.43 starting on I. The last chord before 00.41 would be a G major, I being an A minor chord. A similar pause in the harmony can be found before the chorus at 01.45 in *Helix*, this chorus also starts with I. The bridge leading to this chorus, at 01.35, is one of the few parts in any of these songs which begins on anything else than I, in this case IV. The only other example in these four songs when anything other than I is at the beginning of a new part is in *Eden* at 02.21. *Eden* is in E minor and the chord at 02.21 is an A minor (IV). This part in *Eden* is during the instrumental part of the chorus and at this point in time the participants reported a sense of higher drive compared to the point before, at 01.46, when the chorus is on I. At 03.18 in *Eden* an Eb major chord can be found, which leads to a F minor chord (the new I, since this song now has been transposed up a minor second) in the following chorus at 03.20. The next point in time is 03.38, interesting because the participant reported an increase in drive compared to 03.20. The harmony at 03.38 is Bb major leading to Db major, same as what is occurring in previous choruses, except now in the key of F minor instead of E

minor. In previous choruses these points in time were not rated in this study, so it is possible that it would be a similar result there as well. The reason for choosing only this last chorus to rate that point was because of my own perception that drive increased here, possibly because of how the timbre and loudness was analyzed to be changing at this point. Therefore it was interesting to see how others would experience the drive at this particular part of the song.

When looking at the parameter of harmony there is no obvious connection between drive and a specific harmonic function. An expected connection might be that drive would increase on V and decrease on I, because in any musical genre using harmony that is the way harmony is fundamentally being used. In these songs the harmonic function of V is rarely used, instead VII seems to precede I quite often. If the songs were from another genre that result might look different, and such a study could be valuable to perform to take a closer look at this. Most of the chords in this song are simple triads, or it could even be that the chords only consists of the interval of a perfect fifth, something very much used in *Drag Me To Hell*. The dominant seventh chord (V7) is not used in these songs. If the V7 was used this could in particular be considered affecting the drive. Again, such a study on another genre where this occurs would be of interest. One example in *Helix* of a progression of C – C/B is occurring right before I (A minor) at 01.03. 01.03 is then, when looking at charts of which drive is most commonly reported among the participants, reported as higher than the point before at 00.43. The difference however is slight and some participants reported a clear decrease in drive instead.

A very interesting factor for creating drive appeared in the last chorus of *Eden*, where drive seemed to increase noticeably when a transposition occurs (F minor instead of the previous E minor).

6. Discussion II

As a final step I will look at how this was used in my compositional process of a piece for symphony orchestra, and how this information derived from this study can be used as a compositional tool in general. Partially this has already been mentioned in *Discussion I* in relation to each specific parameter. Some literature on the subject of what techniques can be used to create expressivity in music raises interesting questions regarding what might be necessary to consider in this discussion.

Compositional Technique and Musical Expressivity, p.4

The important aesthetic consideration is not the immediate response especially of relatively inexperienced listeners, but the range and intensity of continuing responses.... How does this music get to be expressive if not through its organization its formal processes, and the technical means of composition?

Compositional Technique and Musical Expressivity, p.5

This approach will not separate skill and expression, but will show their interrelation; it will ask not only what the music seems to express, but what there is in the music that evokes these responses.

Compositional Technique and Musical Expressivity, p.12

The expressive aspects of the phrase derive directly from this construction. The motivic character of the melodic line gives it a sense of direction, even an urgency, and the chromaticism creates a sense of mobility. The phrase, clearly heard as a phrase, is left unfinished and is, just as clearly, felt as unfinished.

Electroacoustic composition portfolio : Energy, movement and direction in electroacoustic music, p. 106

...the compositional process by necessity has been and is based around repetitive listening.

... The timing of events, when to present new ideas, sustain, repeat or vary existing ideas is an issue for the composer of any musics.

On Sonic Art, p.129

...studies of behaviour and aural physiology would suggest that our mental apparatus is predisposed to allocate sounds to their source. We can see in a very crude way how this ability was essential for our survival in the period before our species came to dominate the entire planet.

This literature raised, among else, questions regarding whether drive is created in music by creating musical material which can be associated to actual objects by the use of their timbre, e.g. distortion, and also by use of their movement and sense of direction. When the parameter of timbre was analyzed there appeared to be a clear connection between drive and distortion. This could of course also be related to the parameter of loudness, since loudness often is a result of adding more instruments, especially distorted guitars since they are well known for being quite loud. When taking into consideration what has been studied in previous literature it seems relevant to consider that it might be that drive is perceived to increase because it is linked to increased emotional energy in the music, e.g. aggression which is an emotion which could be interpreted by higher amount of distortion. This effect can be produced in the symphony orchestra by various techniques, e.g. by the use of tremolo or flutter-tonguing. The brass section, timpani and percussions all have good abilities to explore these types of more distorted sounds.

When looking at the analyzes of the songs it was a very clear that the importance of the small changes in a composition is important to consider. In *Arcus* the same method was used as was used in e.g. *Eden* to increase intensity of the different choruses by adding musical layers, hence increasing both density and loudness. The instrumentation of the

highlight-point in *Arcus* was, just as that last chorus, orchestrated with more layers and the method of transposition was also used. The idea of small changes to similar parts in a piece is a basic principle to use in composition. In the songs analyzed it was clear why when comparing *Eden* to *Raise Your Banner*, where *Eden* had that noticeably increased drive in its last chorus. Addition of instruments often also opens up the possibility of increased register, yet another way to increase the perceived density and loudness. With regards to harmony the use of transposition in *Eden*'s last chorus gives another clear method, since it is creating this new sense in the music while still preserving the musical material. It adds an element of the unexpected which could be benefiting for creating drive, since the result show that in parts following after breaks drive was reported to increase. This effect on drive could in some instances, as in *Drag Me To Hell* 02.28 compared to 02.50, be quite drastic.

The above mentioned use of transposition is a very common technique to give a part a slightly different sound, even though the part itself might still be created with the same musical material as when it was presented earlier. The increase of a minor second that is used in *Eden* is perhaps one of the most common ones, since it is very frequently used in pop songs. In the case of *Arcus* the choice was instead to use mediant relations. The increase of a minor second has a clear tendency to increase the effect of a part, making it sound a bit "more" or "higher" than when presented in its previous lower key. The mediant relation to the original key signature used in my piece does not have quite this heightening effect, in my opinion, but it still gives the effect of making the part sound different and therefore prevents boredom for the listener.

Looking at the analyzes of the songs one of the most interesting aspects is how much energy that can be built up in a short amount of time (e.g. *Helix* 00.00-00.01 and *Raise Your Banner* 02.36-02.37). First off the sound rapidly grows louder, this is then followed by a huge increase in number of instruments, and thereby also a large increase in register, dynamic and different musical layers. These layers suddenly make the soundscape contain much more information to be processed by the listener. Here several parameters are used. Harmony, density and loudness all play a very significant role to create this rapid and notable effect.

From method C it appears that many of these parameters are related to each other, and might even be part of each other, e.g. the connection of loudness to both density and timbre. When composing it can be valuable to keep in mind not only how to use each musical parameter, but that they are also affecting and dependant on each other.

References

- Granot, R. & Eitan, Z. (2010) *Musical Tension and the Interaction of Dynamic Auditory Parameters* In Cuddy, L. (Ed.) *Music Perception: An Interdisciplinary Journal*, Vol. s2 No. 3(pp. 219-246) Berkeley: University of California Press
- Lewys, E. (1970). *Compositional Techniques and Musical Expressivity*. Yeshiva University/New York: Sage Publications
- Ollivier, R. Goupil, L. Liuni, M. & Aucouturier, J (2018). *Enjoy The Violence: Is Appreciation for Extreme Music the Result of Cognitive Control Over the Threat Response System?* Paris: IRCAM/CNRS/Sorbonne Université
- Osborn, B. (2017). *Everything in its Right Place: Analyzing Radiohead*. New York: Oxford University Press
- Stancey Woolley, J. (2011). *Electroacoustic composition portfolio: Energy, movement and direction in electroacoustic music*. Manchester: Manchester Metropolitan University
- Wishart, T. (1996). *On Sonic Art*. Amsterdam: Harwood Academic Publishers GmbH