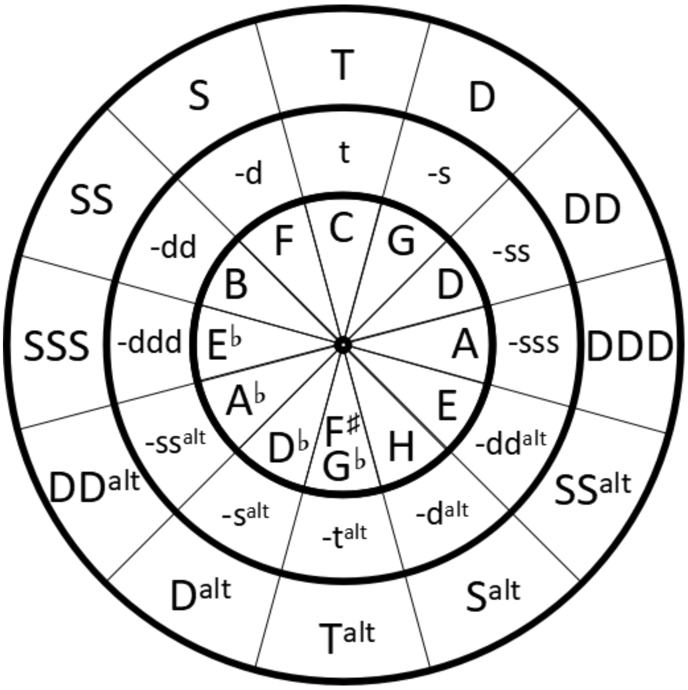
GÖTEBORGS UNIVERSITET

HÖGSKOLAN FÖR SCEN OCH MUSIK

Chromatic Function Analysis

An instrument for function analysis, improvisation and composition

Joel Bergström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Degree project, Bachelor of Music, with specialization in Church Music Performance

Spring Semester 2018

Degree Project, 15 education credits

Bachelor of Music, with specialization in Church Music Performance

Högskolan för scen och musik, Göteborgs Universitet

Spring Semester 2018

Author: Joel Bergström

Title: Chromatic Function analysis.

Subtitel: An instrument for function analysis, improvisation and composition.

Supervisor: Lecturer Dan Olsson

Examiner: Senior Lecturer Tilman Skowroneck

Key words: Chromatic, Function, Analysis, Improvisation, Composition, Negative Harmony, Harmonilära, Söderholm, Lär av Mästarna, Ingelf, A theory of Harmony, Levy, Romantikens Harmonik, Jersild, Coleman, Collier, Södergran, Nocturne, Stjärnorna, Bergström's Chromatic Function Analysis Circle

Abstract

The purpose of this investigation was to create a chromatic function analysis which can help to guide and give other viewpoints to harmonic relations and to be an instrument for supporting me in my artistic process of improvisation and composition.

The new model is based mostly on Riemann analysis but I have in addition incorporated different theorists, Söderholm, Ingelf, Levy and Jersild, adaptations of Riemann analysis. The new model is evaluated using different classical pieces. It is as well applied to two poems by Edith Södergran and one fuge, all composed by me.

Looking at my compositions the experience was that I felt more confident in my way of making music. With this confidence I dared to go further with my music and to express myself more. The chromatic function analysis instrument supports and enforces my artistic process in the arts of composition.

Acknowledgements

First and foremost, I want to thank my parents who have always encouraged me to continue with my music studies. They have patiently kept up with me, the many hours of me practising, and listening to my discussions like where a chord may land.

The combination of education in the three fields of instrument, music theory, conducting and choir have improved and developed my musical understanding and skills. I would like to take this opportunity to extend a vote of thanks to all my teachers at Gothenburg University who have especially helped me over the course of my studies and my explorations of music. I am very thankful to my instrument teachers Professor Karin Nelson and Senior lecturer Per Högberg in organ, Senior lecturer Joel Speerstra and Senior lecturer Tilman Skowroneck in Harpsichord, Senior lecturer Thomas Rydfeldt in piano and to my music theory teachers Senior lecturer Dag Hallberg and Senior lecturer Joel Eriksson and to my conducting and choir teacher Professor Jan Yngwe. Finally, thank you to my fellow students and friends.

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1. Introduction

The last piece of the puzzle that would lead me to explore and develop this thesis further was given to me before summer 2017.

I was out sailing with my friend and cantor Lars Söderlund, Kållered Church of Sweden, in the beautiful West Coast archipelago of Gothenburg. While bopping up and down in the boat he suddenly asked me ”*If I am in the key of C major and then play an A flat going to G and then to C, what is A flat?”*, see figure 1.1.

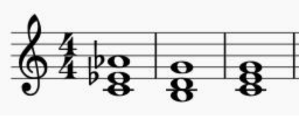

Figure 1.1: A progression to the tonic.

I took a few seconds and then before replying “it’s a dominant’s dominant tritone substitute” he continued, “it’s a dominant”, which is true, but I thought he could have been more specific in detailing the relationship to the tonality of C. It could have settled there but somehow this dialogue stuck itself in my mind. A week and some sleepless nights later I had a thought, that if I just have the tones and not the chords, how can A flat resolve to G? See figure 1.2.

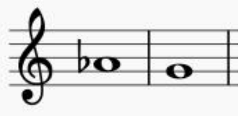

Figure 1.2: Lead tone resolution.

I started to think about other chords that A flat could be a part of that would resolve to G. This made me relating the different functions to the tonic and also questioning the functions if they actually helped to locate the tonic. I started by looking into leading tone resolution and the way a function continually aims for resolution. I experimented by comparing different tones and got intrigued, looking at tones at symmetrical distances. I got the realisation that I can approach the tonic from below and above. See figure 1.3.

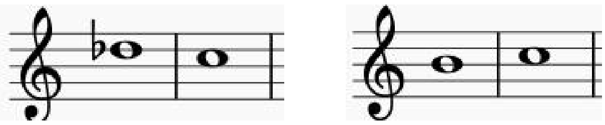

Figure 1.3: Lead tone resolution to the tonic.

There are two ways to reach the tonic and maybe there are functions that reflect each other in the way of reaching the tonic. If so then I can use my tonic as a line, separating mirroring functions. So the distance between C and A flat consists of a major third and therefore I can locate the tone E, mirroring the tone A flat but from the other side of the line I drew, see figure 1.4.

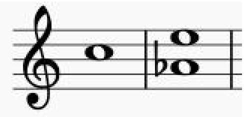

Figure 1.4: Symmetrical distance.

The interesting part is which relationship E and A flat share with C. What function in harmony will the tone E be a part of and how will the lead tone of E come to resolve. I have an idea that if A flat resolves down, then perhaps my E resolves the other way since I have this function mirrored, it will resolve to F, see figure 1.5.

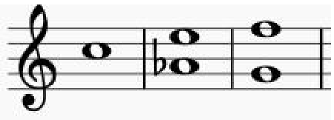

Figure 1.5: Symmetrical distance, mirrored resolution.

It could make sense of the G dominant chord resolving to C as the basic dominant function but not the F. I asked myself what does the tones G and F have in common with C? Well, they both surround the C by a fifth, see figure 1.6.

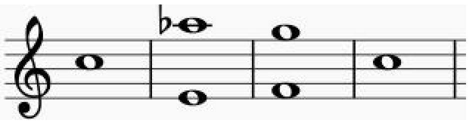

Figure 1.6: Symmetrical distance, the mirrored resolution to the tonic

Having heard of the theory of the undertone series and the overtone series, I could see that both tones shared the same location in its respective series.

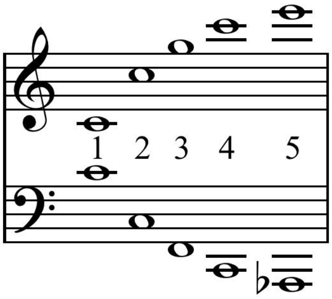

Figure 1.7: Overtone and undertone series.

Seeing this connection when I looked at E and A flat, it was still hard to find out more information about which chord they could be part of. It could be almost any chord. On the other hand, I could clearly see that I was moving away from the tonic on both sides on the circle of fifths and approaching the key centre from both sides. Somehow there is a force moving me towards the tonic C but from the other side on the circle of fifths. This is somehow a sub-dominant function but acting as a dominant chord. Wondering what chord this A flat could be a part of took me on a journey and I started searching for information and if someone else had had this experience.

After some time I came across the term *Negative harmony*[1] by music theorists Jacob Collier on YouTube. This concept is seemingly established. The idea of *Negative* h*armony* derives from the book *A Theory of Harmony*[2] although the author Ernst Levy does not refer to it by that name.

He describes this idea of polarity or a magnetizing force of a chord that resides on the sub-dominant side of the tonic but acts as a dominant chord. He calculated that by inverting a dominant chord around the axis of a fifth and then mirroring it, one will achieve the polarity of the dominant chord but the chord will be found on the sub-dominant side, see figure 1.8

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1. “Music Theory Interview: Jacob Collier (Part 1)”, YouTube, accessed August 10, 2017, https://www.youtube.com/watch?v=DnBr070vcNE.
2. Ernst Levy. *A Theory of Harmony* (Albany: State University of New York Press, 1985)

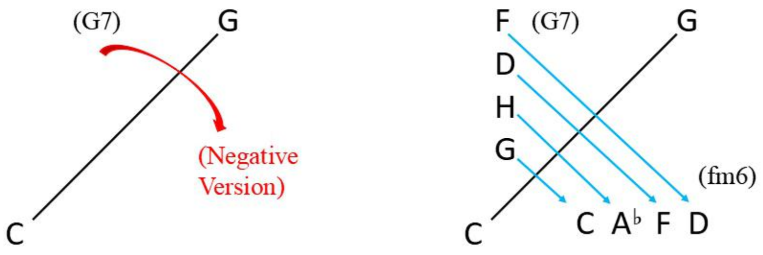

Figure 1.8: Example of inverting a dominant chord to a negative dominant chord.

The term *Negative harmony* comes from jazz. In jazz, the concept of negative harmony is mentioned by Steve Coleman[3], who talks about symmetry in music. Coleman tells us that this concept was a tradition handed down to him by his teacher and so forth. This might just be a nice story but what is interesting is really that Levy and Coleman share the same idea, although one works with classical music and the other one with jazz. This shows that people have had this idea surrounding music and a polar force to the dominant for quite some time. In jazz, negative harmony is considered a craft to enrich your music understanding and to use for improvisation.

By learning and studying music for most of my life, receiving inputs by living in the United States of America and studying numeral analysis, I started wondering how we use different systems to describe music. What makes function analysis so unique is its ability to firmly grip the direction of music that a position-based system is not designed to do. Position-based systems' task is to locate the given position of a chord. They do give a reference to the analyst to see patterns in musical structure but not why the patterns work. This quality, that the function analysis has is what makes it unique. I got intrigued how common function analysis can be modified to describe this polar dominant. I started looking at the base of our function harmony, that is, Riemann theory, and I was surprised at the extent we use neo-Riemannian theory. In Wikipedia neo-Riemannian theory is defined as:

“a loose collection of ideas present in the writings of music theorists such as David Lewin, Brian Hyer, Richard Cohn, and Henry Klumpenhouwer. What binds these ideas is a central commitment to relating harmonies directly to each other, without necessary reference to a tonic”[4].

I realized that the way function analysis is put together is by two co-joined structures. We have as a first structure all the main triads and their relation to the tonic. The other structure describes other chords in relation to the main triads. At this point, I understood that the second structure doesn't show a reference to the tonic. Could there be a way where I always can show a reference to the tonic? I then got the idea to create a fixed, chromatically designed function analysis, update it and find a way to describe this dominant phenomenon using my new updated function system.

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3. “Symmetrical Movement Concept by Steve Coleman”, m-base.com, accessed August 11, 2017, http://m-base.com/essays/symmetrical-movement-concept/
4. “Neo-Riemannian theory”, Wikipedia, accessed August 12, 2017, https://en.wikipedia.org/wiki/Neo-Riemannian_theory

2. Investigation

2.1. Purpose

The purpose of this investigation is to create a chromatic function analysis which can help to guide and give other viewpoints to harmonic relations and to be an instrument for supporting improvisation and composition. I will use this function analysis in investigating if it can support me in my artistic process of composition.

2.2. Questions

The research questions are as follows:

1. Is it possible to design a fixed chromatic function analysis model that enables a simple way of understanding advanced harmony?
2. Can I make a system that always shows the direction in harmony and keep a positioning system?
3. Can this system be used to offer other viewpoints in describing function harmony?
4. Will this system support my creativity as an artist in the process of composing?

2.3. Limitation

I limited this study by not addressing how the fixed chromatic function analysis model can support analysis of improvisation patterns and techniques, to be used in improving my own artistic improvisation skills. This subject will be addressed in my Master Thesis.

2.4. Material and methods

As material, I will use literature describing different harmony theories by acknowledged music theorists. As a method, I will go through the material and try to create an enhanced model.

The new function analysis will be based mostly on Riemann analysis but also incorporate different theorists' adaptations of Riemann analysis. The adaptations will include a basic concept of fixed functions in relation to the tonic. Theories with more modern thoughts surrounding harmony (i.e 20th century) will be included as a way to modernize and offer another viewpoint to function analysis. The idea of combining these systems and merge them will by thought make a simpler way of understanding advanced harmony and provide an updated, modern, yet a richly detailed system.

The new model will be tested on some well know part of pieces as *Die Walküre*, Richard Wagner, *Wanderers Nachtlied*, Franz Liszt, *Doctor Gradus ad Parnassum*, Debussy and Brahms to check its viability as a function analysis model.

I will use the newly created fixed chromatic function analysis model to analyse a previous composition I have done. The composition is based on one of Edith Södergrans poems and it's written for a cappella choir. I will also make a new composition for a cappella choir based on another poem of hers using the model from start. I will in addition write a chromatic fuge This will allow me to analyse how much support the new model gives me in composition.

2.5. How to read this thesis

This thesis is divided into several sections. In the first part I analyse four music theory books. Two of the books are widely used in Swedish music theory education. The third book has American origin and discusses new music theories and the fourth book has Danish origin. The second part discusses my creation of a chromatic function analysis and some proof of concepts where it is tested. The last part compares a composition done before creating the new analysis model with two compositions using the new model.

To easier understand the discussion, it can be of value to be familiar with Riemann analysis.

In the chapters discussing Sten Ingelf's and Ernst Levy's books, I use the English terminology of the tones B and Bflat, since that is the terminology that they use in their books. In Valdemar Söderholm's, Jörgen Jersild's chapters and my own system creation chapter, I use the German terminology of the tones H and B, since that is the terminology that they use in their books and my preferred choice.

3. Background and reflections

3.1. *Harmonilära*, Valdemar Söderholm

The book *Harmonilära*[5] by Valdemar Söderholm, 1909-1990, is in Sweden a core book to learn function harmony. The book has been heavily used in teaching music theory and function harmony. Söderholm was an organist and music theorist.

To study this book seems vital, regarding its impact on how we view function harmony in Sweden and how the book has influenced others to continue writing and continue an ongoing progression developing function harmony. In the book *Harmonilära*, Söderholm reflects upon function harmony and what he deems important in a function system. I will go through certain parts of his book leaving comments and questions I find interesting in this context.

The first section that is interesting concerns the use of function designation[6]. Here he goes through the minor chords in root position and first inversion. To tell us that we are in the minor mode, Söderholm introduces two symbols. He uses a little circle-shaped figure in front of the function to let us now that we are in the minor parallel, and a plus to show that a chord can be major. This is one way to show that functions that occur for example on the fifth scale degree can be both minor and major. The problem that occurs is that the fifth scale degree normally indicates the function being a dominant. What is characteristic for the dominant as a function is its ability to create a gravity that tends to resolve back to the tonic. By adding this circle-shaped symbol to the dominant makes the function obsolete. This minor chord does not have the same quality as that of a dominant. It has now no longer a function more than being just a chord in a fixed system. This chord does not show progression to the tonic and therefore the function will be excluded in my system. I agree that minor chords on the fifth scale step are possible and I understand that Söderholm wishes to differentiate the major and minor from each other. The problem is that he does not comment his own way of making this function and it could be that his intentions are to let the function with the circle in front be something completely different that has nothing to do with the dominant at all. To me, the function D, as in dominant, has always indicated a strong leading direction and it does not have to occur on the fifth scale degree. The dominant carries a quality that can be recognised by its aim to resolve. I would have wished Söderholm not to use the function D for anything else than that. We are left with some more questions. Should we view °D as a completely different sign than that of a D? From what I can read in his book, he has no topic regarding such minor functions. Söderholm contradicts himself using the term minor dominants since we know that dominant chords are major. I think the combination of the two signs °D can easily be misunderstood. The loss of the dominant quality alters the function to just being a position-based function. This is not a function I wish to use in my system. See the figure 3.1.

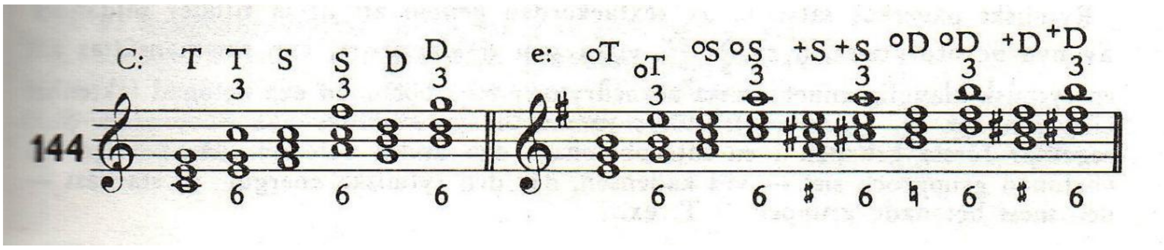

Figure 3.1: Main triads in major and minor

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5. Valdemar Söderholm, *Harmonilära* (Stockholm, AB Nordiska Musikförlaget: 1959).
6. Söderholm, *Harmonilära*, p 43.

In the chapter "*main triads in major"*[7] the function system is expanded by relating functions to each other. One way this idea has been developed and expanded is the ability to relate a chord to its relative minor. This is at first a logical idea since the scale material is the same and therefore it's possible to substitute the main major chords Tonic, Sub-dominant and the Dominant with each respective with its minor parallel. The problem, at a micro level, that is starting to occur is that the main focus has shifted from relating the chords to its tonic to relating them to its respective parallel by a third[8], see figure 3.2.

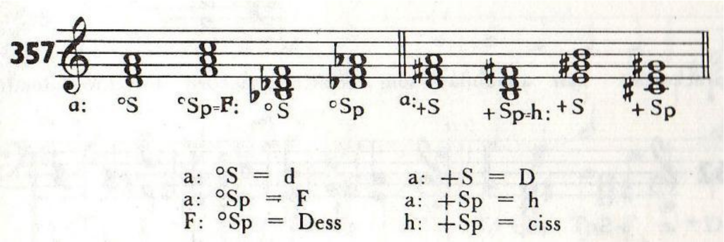


Figure 3.2: Parallels by thirds

This idea of relating chords by thirds, will later contradict the idea of relating chords by the fifth i.e the dominant as a structure to build on. The way of relating functions by thirds is expanded[9] , see figure 3.3, and I feel that the further we go with this relating system by thirds, we are undermining our foundation built on fifths, i.e. Dominant to tonic function. The functions to support relationships by a major third are not convincing. Listening to the resolution between a dominant chord to tonic counter makes me feel that the tonic counter parallel is further away from the tonic and acts more like a dominant. Let us be consequent and use one system of relations. Looking at the material I find the tonic parallel logical, possibly due to that it shares the same scale material as the tonic, but I would not use it since it shifts the focus from the tonic. The tonic counter on the other hand, which is part of another scale, does not let me feel like I am resolving; on the contrary, it wants to move. The functions do not serve their purpose of showing a direction to the tonic, their purpose is solely acting as position categories.

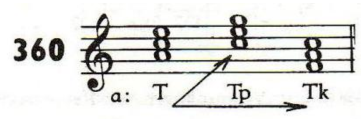
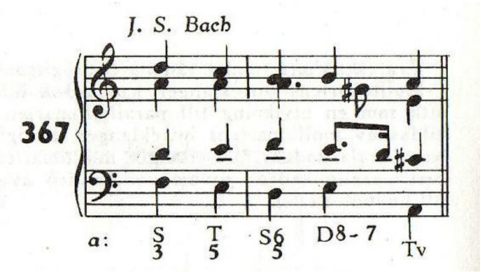


Figure 3.3: Gegenparalele

Further into the book the term Tv is used to describe Picardy thirds[10], see figure 3.4, ending a minor piece in major or vice versa ending a major piece in minor. Tv is used as a function, describing the variation of the tonic.



Figur 3.4: Picardy thirds

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[7] Söderholm, *Harmonilära*, p 95.
[8] Söderholm, *Harmonilära*, p 103.
[9] Söderholm, *Harmonilära*, p 103.
[10] Söderholm, *Harmonilära*, p 106.

The function is used only on ending chords as a variation of the tonic. I have no problems with this function, as long as it is used at the ending of a phrase or a piece as a tonic. Otherwise, it will be misused as a substitute for other chords. The example 368[11], see figure 3.5, in the book describing the Tv is wrong, since it does not act as a tonic but as a $^{6}_{4}$ chord resolving to the dominant. The example shown in the book is a special case since it also stimulates a minor chord leading to the dominant. This chord is not a tonic and to test this, we could stop the progression at this chord and we would notice that there is a flow that we break and therefore it's not a tonic but something that wants to progress. It acts as a dominant and I will explain, but later in my proof of concept, why that can be.

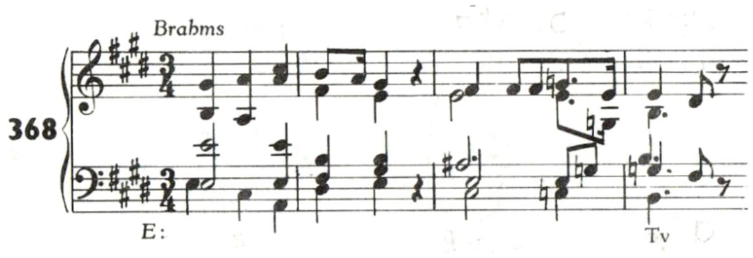

Figure 3.5: Example Brahms

Then Söderholm discusses altered chords and in particular tritone substitution[12]. In the first example 432, see figure 3.6. I agree that the chord is a dominant-seventh second inversion chord with no root in it.

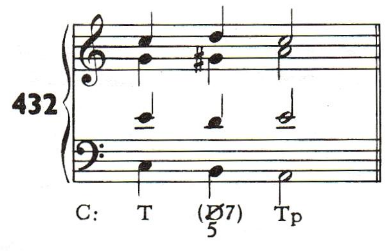

Figure 3.6: Dominant-seventh second inversion chord with no root

In the example 433[13], see figure 3.7, the dominant chord is a dominant-seventh chord built as a second inversion with no root but lowered fifth. This chord is spelt like a D7 chord with lowered fifth although it's altered so much that it could be respelled into a B flat seventh chord with no fifth.

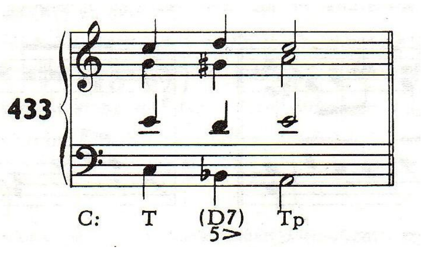

Figure 3.7: Tritone substitute

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[11] Söderholm, *Harmonilära*, p 106.
[12] Söderholm, *Harmonilära*, p 127.
[13] Söderholm, *Harmonilära*, p 127.

The point here is that although the harmony is the same, the function is different. E major and B flat major share a link at the tritone making them easy to change into the other one by alteration. Having the fifth as a foundation and then use alterations works, since the fifth is the main structure and we don't shift the focus from the tonic.Working with alteration it's important to state that an altered chord is usually used as a means to prolong the progression before the resolution.

In example 438[14], see figure 3.8, which is in the chapter tritone substitution, Söderholm introduces the Tristan chord suggesting that the chord may be explained to us as a tritone substitution. He does not, on the other hand, show us a function analysis of the progression.

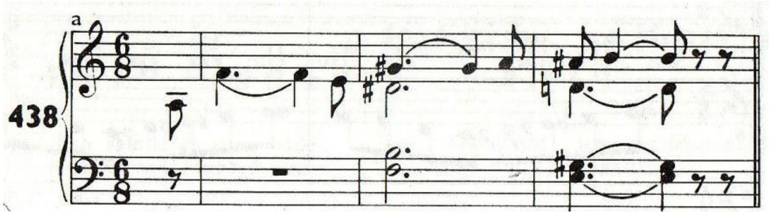

Figure 3.8: Tristan chord

In example 544[15] , see figure 3.9, Söderholm shows a list of the most common altered chords. Söderholm states:

"The most frequently occurring altered dominant and sub-dominant chords of ambiguity are shown in this figure"[16]

and he continues:

"... make these chords particularly suitable as rendering chords for harmonic modulation"[16]

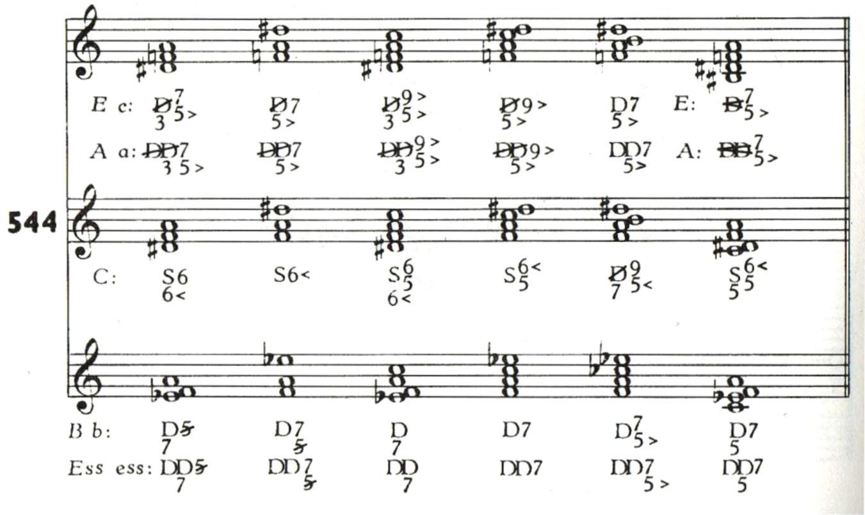

Figure 3.9: Most common altered chords.

It is interesting to note that Dominant and sub-dominant qualities merge in extreme alterations, making them interchangeable.

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14. Söderholm, Harmonilära. p 129.
15. Söderholm, Harmonilära. p 172.
16. Söderholm, Harmonilära, trans Joel Bergström. p 172.

3.2. *Lär av Mästarna*, Sten Ingelf

Sten Ingelf's book *Lär av Mästarna*[17] is a more recent book than Söderholm's that discusses the functions of harmony. The book is based on Söderholm but does a few changes to simplify functions and make it more modern. In the preface Ingelf talks about the changes he has made and what differs his system from Söderholm. It will be intresting to see what changes Ingelf does in his system. Just like before I am going to read through and bring up different sections of the book to comment and give an analytic reflection.

An interesting statement, see figure 3.10 from Ingelf is as follows:

"In C major, C and G7 are two very important accords. The C major chord is perceived as a resting chord while the G7 is perceived as a chord that strives against the C chord."[18]

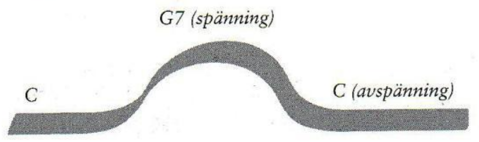


Figure 3.10: Chart of direct tension

The first chapter discusses the main triads[19]. The main triads are the Tonic, subdominant and the dominant. In this chapter, Ingelf explains that the dominant chord is always a major chord both in major keys as well as in minor keys. Ingelf also elaborates on the basic concept of what quality a dominant function constitutes. In his example 1 he tells us that the dominant is a major chord. This makes it interesting to see what function the chord on minor fifth scale degree will have. Söderholm chooses to write a circle in front indicating to have a lowered third making it minor and by it, losing the function's character as a dominant.

In chapter 2 Ingelf discusses position categories[20]. He describes indirect tension[21] , see figure 3.10.

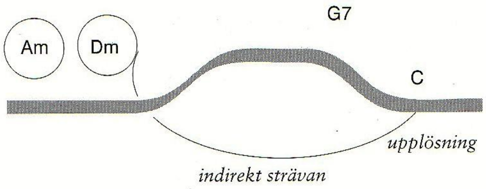
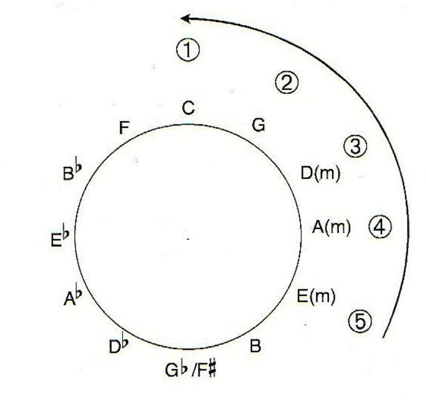


Figure 3.10: Chart of indirect tension

He shows a picture of the circle of fifths[22] , see figure 3.11, and it is explained that each step on the circle can be seen as a position with the desire for a resolution towards the tonic. It is interesting that the examples show the dominant in minor mode on the circle of fifths and in his example Ingelf makes it clear that a dominant always is major[23] and yet he does not explain what a minor chord built on the fifth is.

---

17. Sten Ingelf, *Lär av mästarna* (Lund, Grahns Boktryckeri: 2008).
18. Ingelf, *Lär av mästarna*, trans Joel Bergström. p 14.
19. Ingelf, *Lär av mästarna*. p 14.
20. Ingelf, *Lär av mästarna*. p 36.
21. Ingelf, *Lär av mästarna*. p 36.
22. Ingelf, *Lär av mästarna*. p 36.
23. Ingelf, *Lär av mästarna*. p 14.


①
②
③
④
⑤
C
G
D(m)
A(m)
E(m)
B
G♭/F♯
D♭
A♭
E♭
B♭
F

Kvintcirkeln med positionskategorier

Figure 3.11: Circle of fifths with position categories

Further on he introduces the minor dominant[24] , see figure 3.12, as a position in the system but how does this idea relate to earlier statement how he thinks a dominant should behave as suggested earlier in the chapter, page 14.

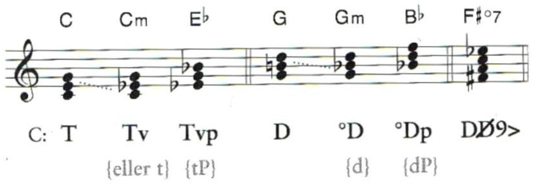

C
Cm
E♭
G
Gm
B♭
F♯°7
C: T
Tv
Tvp
D
°D
°Dp
DØ9>
{eller t}
{tP}
{d}
{dP}

Figure 3.12: Introduction of minor dominant

Ingelf introduces relationships of the third[25]. see figure 3.13[26].

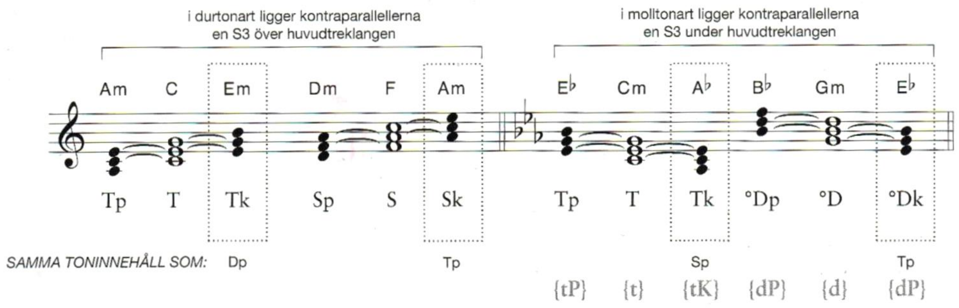

i durtonart ligger kontraparallellerna en S3 över huvudtreklangen
i molltonart ligger kontraparallellerna en S3 under huvudtreklangen
Am
C
Em
Dm
F
Am
E♭
Cm
A♭
B♭
Gm
E♭
Tp
T
Tk
Sp
S
Sk
Tp
T
Tk
°Dp
°D
°Dk
SAMMA TONINNEHÅLL SOM:
Dp
Tp
Sp
Tp
{tP}
{t}
{tK}
{dP}
{d}
{dP}

Figure 3.13: Gegenparalele

Ingelf just as Söderholm applies Grabner's[27] way of relating chords by thirds, gegenparalele. I am not convinced accepting the third as a structure to build on since it undermines the structure built on the quality of the fifth. The major functions of the Tonic, Sub-dominant and the Dominant are in this book replaceable with their respective minor parallel.

---

[24] Ingelf, *Lär av mästarna*. p 84

[25] Ingelf, *Lär av mästarna*. p 92.

[26] Ingelf, *Lär av mästarna*. p 93.

[27] Hermann Grabner, *Handbuch der Harmonielehre* (Regensburg, Gustav Bosse Verlag: 1944)

Ingelf continues explaining relationship by thirds and the different types of third relationships (mediants)[28] , see figure 3.14. In his following example 1 and 3 he shows us how to approach using function harmony.

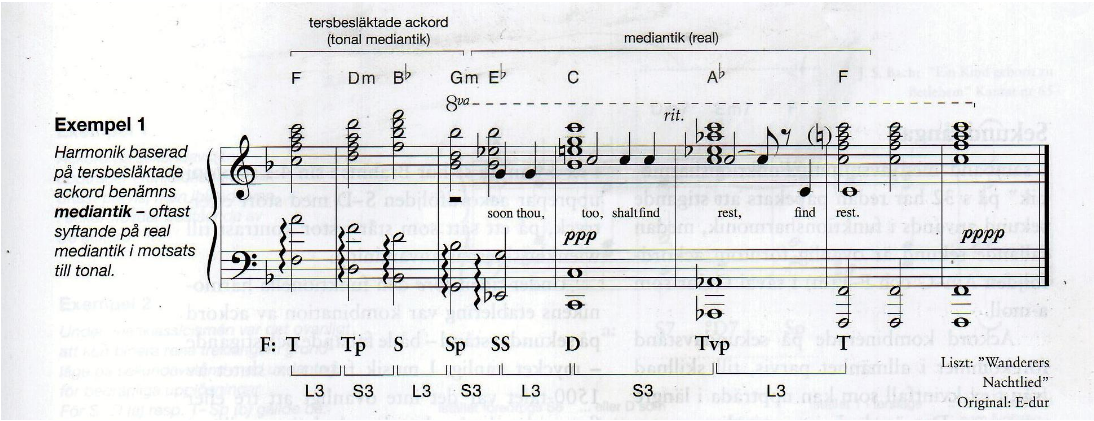

tersbesläktade ackord
(tonal mediantik)
mediantik (real)
F Dm B♭ Gm E♭ C A♭ F
8va
rit.
Exempel 1
Harmonik baserad på tersbesläktade ackord benämns mediantik – oftast syftande på real mediantik i motsats till tonal.
soon thou, too, shalt find rest, find rest.
ppp
pppp
F: T Tp S Sp SS D Tvp T
L3 S3 L3 S3 L3 S3 L3
Liszt: "Wanderers Nachtlied"
Original: E-dur

Figure 3.14: Mediants shown in Liszt "Wanderes Nachtlied"

He has solved the functions and related them by thirds according to common practice with function analysis. It works fairly badly since he loses the dominant progression that takes place in between the chords. Looking at the music, we see two progressions, where every second chord is related to one of the respective progressions. This dual progression is not difficult to describe, using function analysis but depending on what structure we use to describe the progression, it can be misinterpreted. Here Ingelf uses parallels to describe a dominant current and the result is that we neither see the general direction in harmony nor how the chords function together. The first progression can be seen in table 3.1.

T	skip	S	skip	SS	skip	Tvp

Table 3.1: First progression

They are moving in fifths F major going to B major and to E flat major and then to A flat major. What is not obvious is the other progression taking place in between this progression, i.e the skipped chords that carry the functions see table 3.2

Tp	skip	Sp	skip	D	skip	T

Table 3.2: Second progression

They are also moving in fifths: from d minor to g minor to C major and then F major. What we are starting to see is a dual progression taking place moving the circle of fifths and they take turns between each other when to move. Now we include a thought of progression/movement that is an ongoing direction that permeates the entire process from beginning to the end which Ingelf doesn't do.

If we choose between different position-based systems, function analysis is not the ideal one to use. The numeral analysis is much better, or thorough bass. What makes function analysis so unique is its ability to firmly grip the direction of music that a position-based system is not designed to do. The position-based system's only task is to locate a chord and place it within the system. The position-based system does give a reference for a reader to see patterns in musical structure but not why the patterns work.

---

[28] Ingelf, *Lär av mästarna*. p 95.

The other thing that bothers me is Ingelf's use of Tvp. Is this chord perceived as a tonic? Does it feel like the music could end at that moment? I am not so sure and in that case it’s not any form of tonic. He could have convinced me if he said that the first progression ends there so, therefore, it is in a way a tonic, but he does not. Listening to the result, which should always be the final judge, it does not appear as a tonic. We simply can’t end the piece there and Liszt does not. Then its either a dominant or a sub-dominant. Its located precisely in the zone between SSS and a DDDalt, see figure 3.15.

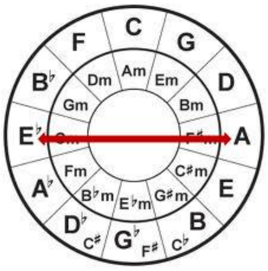


Figure 3.15: Circle of fifths, showing tritone substitution.

In this case, the C major chord before is the dominant to F major and the common tone is c which carries through the relationship fifth to tonic into the A flat chord, making a link between the two progressions at this chord. Liszt chooses here not to go on with the progression from the A flat to a D flat. The listening result is that A flat is perceived as a calm chord but still with little direction. It also ends the second progression. Therefore I would choose to give it a sub-dominant function from the two suggestions mentioned. The first progression is continued and the C major chord is resolved to F major.

It’s arguable that the A flat could be perceived as a form of dominant and it should be noticed that relationship between chords at major thirds makes a symmetry and can change direction from either Dominant to sub-dominant quality.

Looking at the location that C major and A flat major constitute we notice that we can find a third alternative on equal distance from A flat and C major and that is E major. Chords located at a symmetrical distance have a quality that they are interchangeable

I want the A flat to show both disclosure of the progression and to show the role it has in refluence to the tonic. In this case, I would choose to give it the A-flat an SSS quality. Nothing states that a chord is limited to one function. If we keep the progression purely separate, it is possible to write dominant chains within the progressions. This example still represents tonal music and therefore i can only consider one tonic in this example. Its possible to have several tonalities in progression and then having several tonics to disclose the separate tonalities. To describe what happens in such a dense musical texture, I would separate and write function analysis in different fields. I would give the different tonics names like T1, T2, t3. Big letter to tell that they are major and small for the minor.

I also want to demonstrate that even when music moves purely by thirds, the quality of the fifth as a foundation, still solves these types of structures, making relationships by thirds put to question. I will in my proof of concept, show the full analysis, using my system.

In the following example, see figure 3.16, Ingelf is analysing Debussy: *Doctor Gradus ad Parnassum*[29].

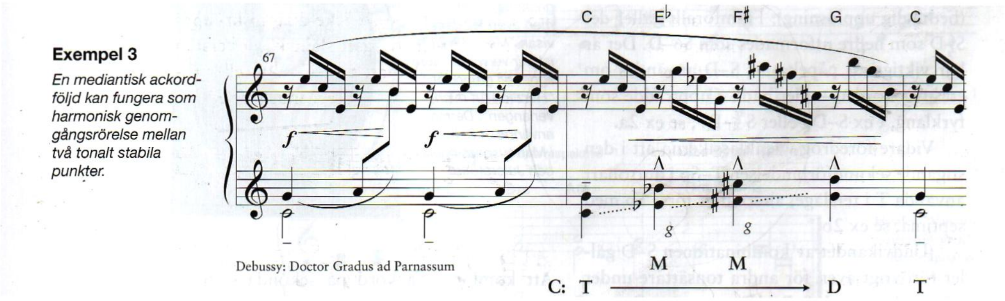

Exempel 3
En mediantisk ackordföljd kan fungera som harmonisk genomgångsrörelse mellan två tonalt stabila punkter.
67
C
E♭
F♯
G
C
f
f
g
g
M
M
C: T
D
T
Debussy: Doctor Gradus ad Parnassum

Figure 3.16: *Doctor Gradus ad Parnassum*, Debussy

Ingelf now introduces a term for all relationships by thirds and that is an M, that stands for mediant. I won't use it since mediants basically are either dominants or sub dominants of different types and I think it's better to be specific in detailing relationships than use a term to put everything under one roof. The term M does not explain how the progression is linked to the tonic, just that it is positioned a minor third away from the previous chord. Looking at the chords that M represents we can see that there is a progression moving by small thirds. Symmetrical movement is usually an indicator that the harmonic progression repeats the same function but in different inversions of itself. This means that the chords that are marked with an M probably have the same function but presented as different inversions. This example will be included in the proof of concept to show that it is better to show the functions of these chords that M stands for.

Ingelf shows examples of poly tonality or bi-tonality that are interesting to study. The example here is Bartók's "*Harvest song*" 44 duet's for two violins[30], see figure 3.17.

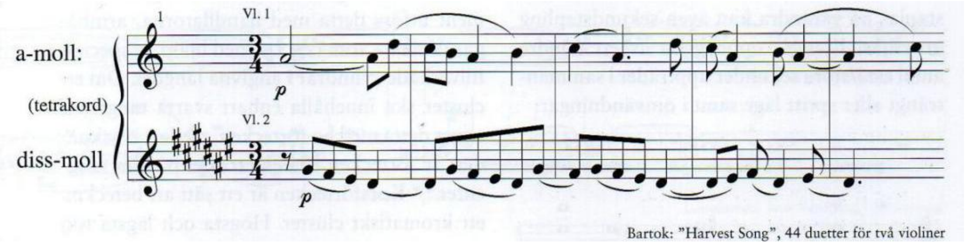

1
Vl. 1
a-moll:
(tetrakord)
Vl. 2
diss-moll
p
p
Bartók: "Harvest Song", 44 duetter för två violiner

Figure 3.17: Bartók "*Harvest song*" 44 duet's for two violins

Why it can work has to do with the mutual duality that the different keys a minor and d# minor share. Harmonically they are each other's tritone alteration and are linked by that thought, not as far as one would deem, see figure 3.18. This realisation of relating chord progression using alterations is useful in developing a chromatic function analysis.

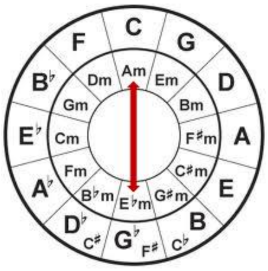

C
G
D
A
E
B
G♭
F♯
C♯
C♭
D♭
A♭
E♭
B♭
F
Am
Em
Bm
F♯m
C♯m
G♯m
E♭m
B♭m
Fm
Cm
Gm
Dm

Figure 3.18: Circle of fifths, showing tritone substitution.

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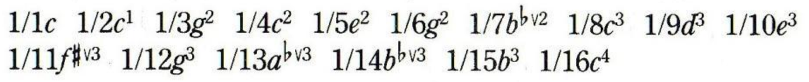
29. Ingelf, *Lär av mästarna*. p 95
30. Ingelf, *Lär av mästarna*. p 95

3.3. *A Theory of Harmony,* Ernst Levy

The book *A Theory of Harmony*[31] has recently become more popular and discussed on various forums such as YouTube channels by different music theorists. One of them is Jacob Collier who talks about one of the subjects discussed in Levy's book and that is *Negative Harmony*. A term I came across this summer when relating functions and afterwards I YouTubed this term and Collier's[32] YouTube clip showed up. In his book, Levy presents the essentials of a comprehensive, consistent theory of harmony, developed from tone structure.

Levy does not go through different functions but theories. It is interesting to follow Levy´s ideas, how he theorizes different topics through examples and thorough explanations, comes to a conclusion that makes one understand his view on the subject. This gives another view to examine a topic with someone else's eyes. I strongly suggest the reader to read through this book to be able to follow my comments.

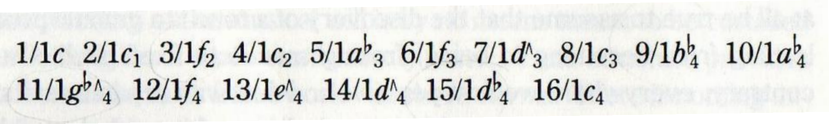
The foundation that Levy uses to bind these theories together is introduced in the first chapter of the book, tone structure. In that chapter, he shows us that by dividing a string by half we get a number of tones. These tones are close to the overtones series[33]. See figure 3.19.



$1/1c$ $1/2c^1$ $1/3g^2$ $1/4c^2$ $1/5e^2$ $1/6g^2$ $1/7b^{\flat\vee 2}$ $1/8c^3$ $1/9d^3$ $1/10e^3$
$1/11f^{\sharp\vee 3}$ $1/12g^3$ $1/13a^{\flat\vee 3}$ $1/14b^{\flat\vee 3}$ $1/15b^3$ $1/16c^4$

Figure 3.19: Overtones series

He then experiments by dividing and multiplying on different sides making the string double the length or half[34], see figure 3.20.



$1/1c$ $2/1c_1$ $3/1f_2$ $4/1c_2$ $5/1a^{\flat}_3$ $6/1f_3$ $7/1d^{\wedge}_3$ $8/1c_3$ $9/1b^{\flat}_4$ $10/1a^{\flat}_4$
$11/1g^{\flat\wedge}_4$ $12/1f_4$ $13/1e^{\wedge}_4$ $14/1d^{\wedge}_4$ $15/1d^{\flat}_4$ $16/1c_4$

Figure 3.20: Undertones series

The result is two series, as he states:

> *"The two series are reciprocal. Musically, reciprocation means reproducing an interval in the opposite direction - an operation clearly distinguished from inversion, which is the reproduction of a tone in the opposite direction. In inversion the interval changes, but the tone remains. In reciprocation, the interval remains, but one of the tones changes. A sub-dominant is the reciprocation of a dominant, though in a position of a fourth instead of a fifth"*[35]

This is further developed in his book and is of my main interest.

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[31] Levy. *A Theory of Harmony*

[32] "Music Theory Interview: Jacob Collier (Part 1)", YouTube, accessed August 10, 2017, https://www.youtube.com/watch?v=DnBr070vcNE.

[33] Levy. *A Theory of Harmony.* p5.

[34] Levy. *A Theory of Harmony.* p6

[35] Levy. *A Theory of Harmony.* p6

Levy shows us and explains that the first 6 ratios that we get from the series can be comprised and then forms two mutually reciprocal triads, one major, one minor. The link between these chords is that they both share the tone C. He states:

"The two series represent a stage in development of 'tone perspective' which we call linear. It is true that we chose to write the two series not on a straight line but at an angel of 90 degrees. That was done in a view of a further, planimetric development which shall now be described. Each tone of the two series can be thought of as a a generator of two new systems, analogous to the primary ones."[36]

Levy explains this with his own words:

"The interpolation may be carried out by either developing the undertones from the horizontal side of the angle, or the overtones from the vertical side. The latter method is somewhat easier."[37]

Further on he discusses two theories, the polarity theory and the turbidity theory, to explain the twofold form of the triad which is interesting.[38]

Then Levy draws a picture[39], see figure 3.21, showing the idea that is central in my work of creating a chromatic function analysis model.

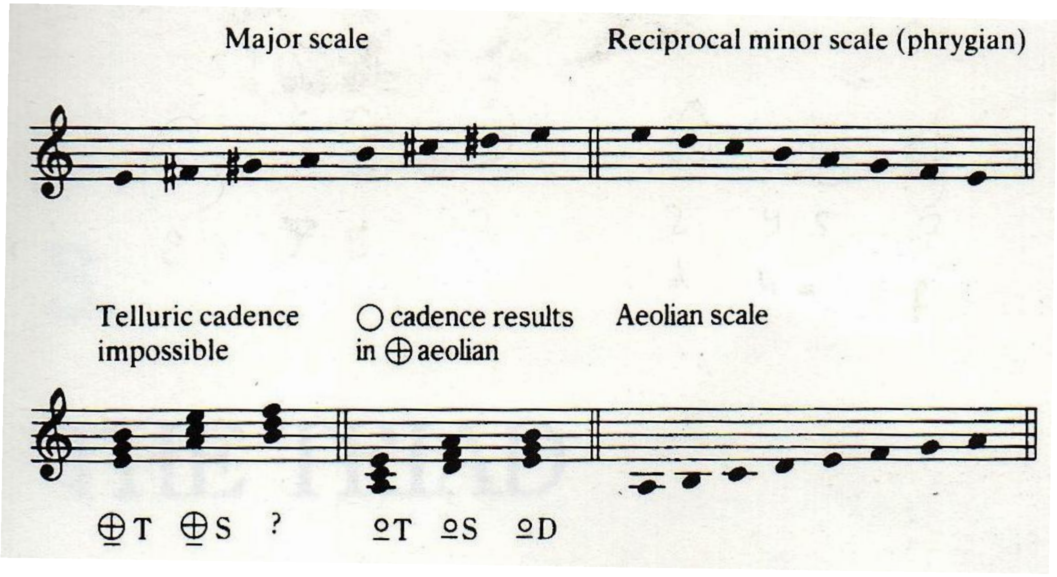
Major scale
Reciprocal minor scale (phrygian)
Telluric cadence impossible
○ cadence results in ⊕ aeolian
Aeolian scale
⊕T ⊕S ?
ºT ºS ºD

Figure 3.21: Reciprocal scales

Levy maybe never considered what an impact this topic would have and never gave this topic a name although now its referred to *Negative harmony*. It's a simple sketch and to clarify how it works I will go draw some own charts to show other ways to look at this concept so it will be easier to follow and understand. Looking at Levy's own chart, he depicts an ascending E major scale and draws a descending e Phrygian next to it. Levy is a symmetrist and the two scale are symmetrical and reciprocal to each other.

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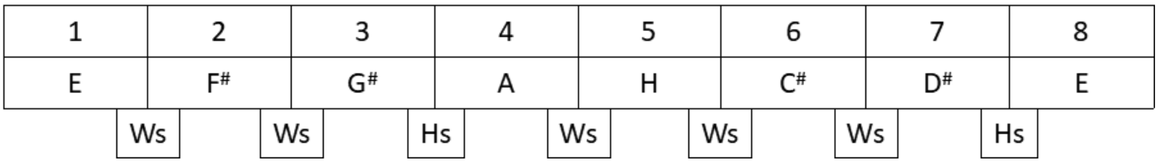
[36] *Levy. A Theory of Harmony.* p7

[37] Levy. *A Theory of Harmony.* p7

[38] *Levy. A Theory of Harmony. p13*

[39] *Levy. A Theory of Harmony. p17*

The E major scale consists of 5 whole steps, Ws, and 2 half steps, Hs, and the steps are placed in this order in a major scale, see figure 3.22. The major scale is constructed in such a way that the dominant is incorporated in the scale. The numbers 2,4,5 and 7 constitute a B major chord, that is E majors dominant.



1	2	3	4	5	6	7	8
E	F#	G#	A	H	C#	D#	E

Figure 3.22: E major scale

Levy uses the structure based on the steps and switches the structure from ascending to descending but keeps the order of the steps the same, see figure 3.23. Using the same structure, Levy keeps the dominant quality. Levy uses the structure as base and mirrors the steps. So instead of ascending, Levy descends but keeps the step's order as is pictured in the major scale.

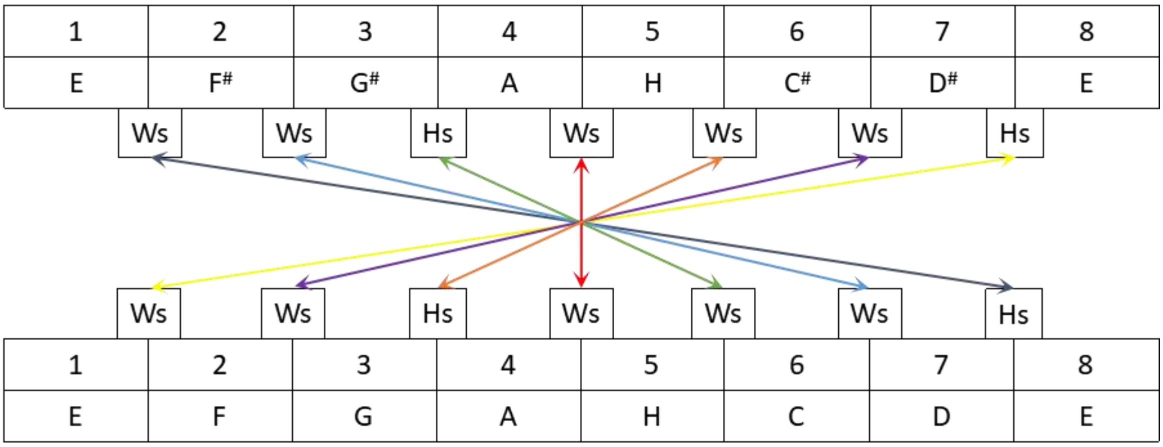


Figure 3.23: E major scale and reciprocal minor scale (Phrygian)

The scale material that we obtain then differs from the major scale and we get an E phrygian. This scale has no sharps or flats and is very close in tonality to a minor. We can now derive the dominant quality as we did in the E major scale. The numbers 2,4,5 and 7 applied to this scale constitute the tones F,A,H and D, together they form a Dm6 chord. This chord is constructed from the dominant and has a pull toward a minor.

This is Levy's way of depicting the procedure but with added charts. This way of presenting is not entirely satisfactory since it looks like one can alter the dominant quality to whatever fits the creators desire. There is an easier and more clear way to follow this procedure that shows why the dominant and the minor chords are connected and how the chords are linked to a tonic. These examples are not shown in Levy's book. This approach helps to provide a stronger case for this procedure. C major will be the tonic.

First we draw an axis between the tonic and the dominant. In this case between C-G. On one side of the drawn line we place the dominant chord G7. We want to know the negative version of the dominant since it has such an important character in music. The dominant chord has a negative inversion of itself on the other side of the drawn line, see figure 3.24

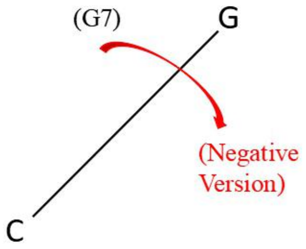


Figure 3.24: Example of inverting a dominant chord to a negative dominant chord.

The drawn line from C-G meet up halfway at the tones Eb and E. This can be the intercept point that separates chords from their respective negative version.The intercept point is coloured red. We can now put the G major chord on one side and obtain its negative version, see figure 3.25

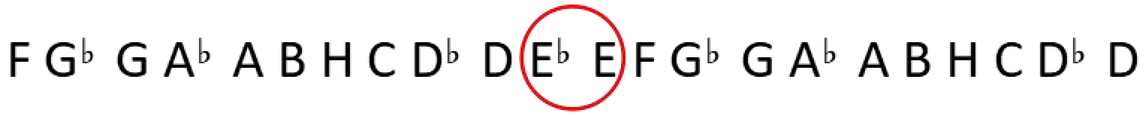


Figure 3.25: Intercept point between C-G

The G7 chord, contains the tones G, B, D and F, and they are placed to the right of our intercept point. The dominant chord is coloured to make it easy to find its respective negative version of itself on the other side of the intercept point. The distance for a tone to the intercept point is marked with a number, which makes it easy to find the equivalent tone on the negative side. Here we can see that the structure is symmetric and that the chord that we obtain as a negative version of G7 is a fm6 chord, see figure 3.26.

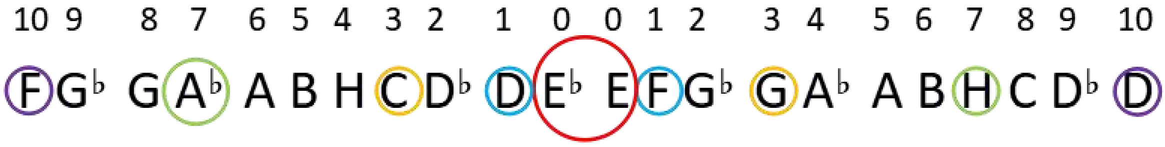


Figure 3.26: Intercept point with a dominant chord mirrored.

Since we used C as a tonic, the fm6 is its negative dominant, see figure 3.27.

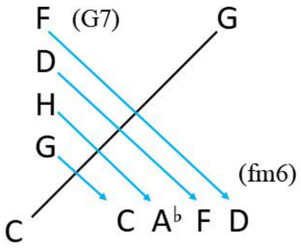
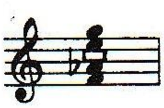


Figure 3.27: Example of inverting a dominant chord to a negative dominant chord.

In figure 3.28 Levy wants to show that we usually look at a chord from the root and not from above and down[40]. In this figure a chord is built ascending and descending from the tone C sprung from a generator: a major triad and a minor triad.



Figur 3.28: Generator

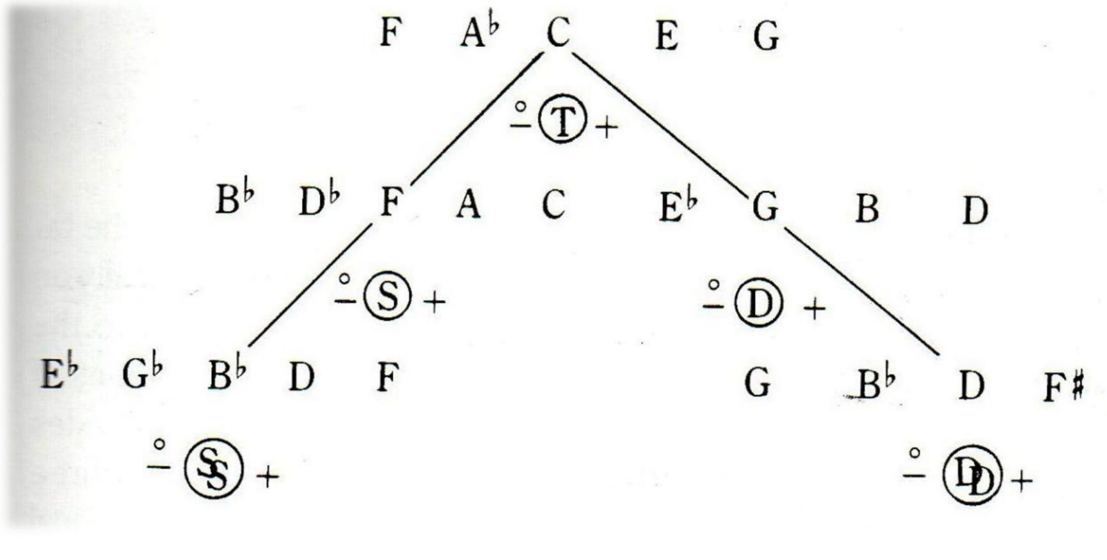
Levy writes:

"A unilateral realization will disrupt the balance and make the chord tend toward its complement. For instance, C major will tend toward F minor, and vice versa. Hence we may say: 'a major triad tends to become dominant; a minor triad, subdominant.'"[41]

Levy shows why the f minor chord has a desire to resolve back to C major.

A pyramid of hierarchy[42] is presented, see figure 3.29, and shows that we can move freely in both directions in the circle of fifths. Levy presents the functions in both absolute conception and telluric adaptation. Levy states that:

"It is to be noted that the term 'sub-dominant' is fallacious: In absolute conception there are only dominants!"[43]



Figur 3.29: The pyramid hierarchy

At the end of the book[44] the following comment is provided by Hugo Kaunder.

"In absolute conception, upper and lower dominants have exchanged their meanings. The term dominant and counter-dominant would be valid for both modes. D= ± V. CD= ± V."[45]

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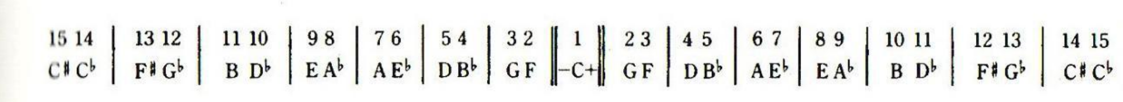
[40] Levy. *A Theory of Harmony.* p23
[41] Levy. *A Theory of Harmony.* p23
[42] Levy. *A Theory of Harmony.* p25
[43] Levy. *A Theory of Harmony.* p25
[44] Levy. *A Theory of Harmony.* p98
[45] Levy. *A Theory of Harmony.* p98

Levy makes a list of fifths[46] surrounding the tonic with both minor and major chords. There are two currents in opposite direction. He calls the first current for a centripetal, primary and it contains all the major triads of the major zone and minor triads of the minor zone. The other is centrifugal, secondary and it contains all major triads of the minor zone and minor triads of the major zone, see figure 3.30.

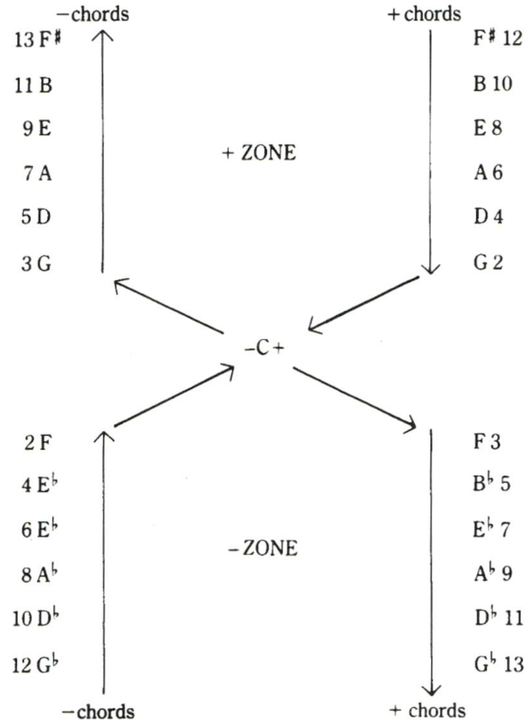


15 14	13 12	11 10	9 8	7 6	5 4	3 2	1	2 3	4 5	6 7	8 9	10 11	12 13	14 15
C♯ C♭	F♯ G♭	B D♭	E A♭	A E♭	D B♭	G F	–C+	G F	D B♭	A E♭	E A♭	B D♭	F♯ G♭	C♯ C♭

Figur 3.30: Series of major and minor triads.

Here we can see that all chords position in relation to the tonic

In figure 3.31 Levy presents the two current[47] with their progression to the tonic.


–chords
+ chords
13 F♯
11 B
9 E
7 A
5 D
3 G
F♯ 12
B 10
E 8
A 6
D 4
G 2
+ ZONE
–C+
2 F
4 E♭
6 E♭
8 A♭
10 D♭
12 G♭
F 3
B♭ 5
E♭ 7
A♭ 9
D♭ 11
G♭ 13
- ZONE
–chords
+ chords

Figur 3.31: Systematic exploration of cadences within dominant tonality

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[46] Levy. A *Theory of Harmony.* p27

[47] Levy. A *Theory of Harmony.* p28

3.4. *Romantikens Harmonik,* Jörgen Jersild

The book *Romantikens Harmonik*[48] by the Danish composer Jörgen Jersild provides a different approach to function harmony and how to describe a progression in harmony. *Romantikens Harmonik* is a study in the works of César Franck and Jersild describes the composition style of him. Jersild expresses why he choses to analyse César Franck's music:

"He is a typical exponent of the harmonious style of high romanticism; none of its chord innovations is strange to him: an extreme alteration technique, modulating chord sequences, often striking originality"[49]

To use this book as a reference is vital for understanding complex harmony, so what does Jörgen Jersild deem important explaining function harmony?

Jersild gives an introduction[50] how to structure music and how he listens to music. It is interesting to see what he deems important in structuring music:

"When we are able to perceive a musical process, not just as a temporary stream of tones but as an orderly consequence of musical impressions, it is because such a musical process is based on some basic patterns that we are familiar with in advance as in the case of vocabulary and syntax of a language. Not least, the vertical dimension of the music, the harmonic, shows such characteristic patterns, which have not only characterized the structure of the individual chords, but also manifest themselves in some norms for how harmonies are linked together and re-group in larger chord sequences."[51]

The cadence is what he deems the most important. He explains that understanding the construction of a cadence, the listener can compile a broader and longer pattern, equal to that of knowing a language with all its nuances. The listener can then structure the music in such away that it can group the music in pattern by cadences.

Jersild is working out a system that can be used to describe the structure of the complex romantic harmony[52]. He establishes a structure where we first need to find the tonic. The term position category has a different application in this context. In Jersild's analysis system we still use the German tradition of function harmony but depending on in what order the chords are in position from the tonic, the chords can be positioned how far away they are in the cadence progression to the tonic. The chords are then given position numbers depending on their location in progression. The tonic is given the position category 1 and the dominant position category 2 and the 3 position category can contain more different chords. Jersild also incorporates other functions such as subdominants and they too can take their place as a position category. Using a whole cadence as an example, it contains the three chords F major followed by a G major that is resolved to the tonic C major. In this example the C major would be the 1 position category, the dominant the 2 position category and the subdominant would take the 3 position category. Using the cadence as a structure from which he adds his use of position categories, he forms a table[53], see table 3.3, to use as a tool to describe romantic harmony.

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[48] Jörgen Jersild, *Romantikens Harmonik* (Köpenhamn, Wilhelm Hansen: 1970).

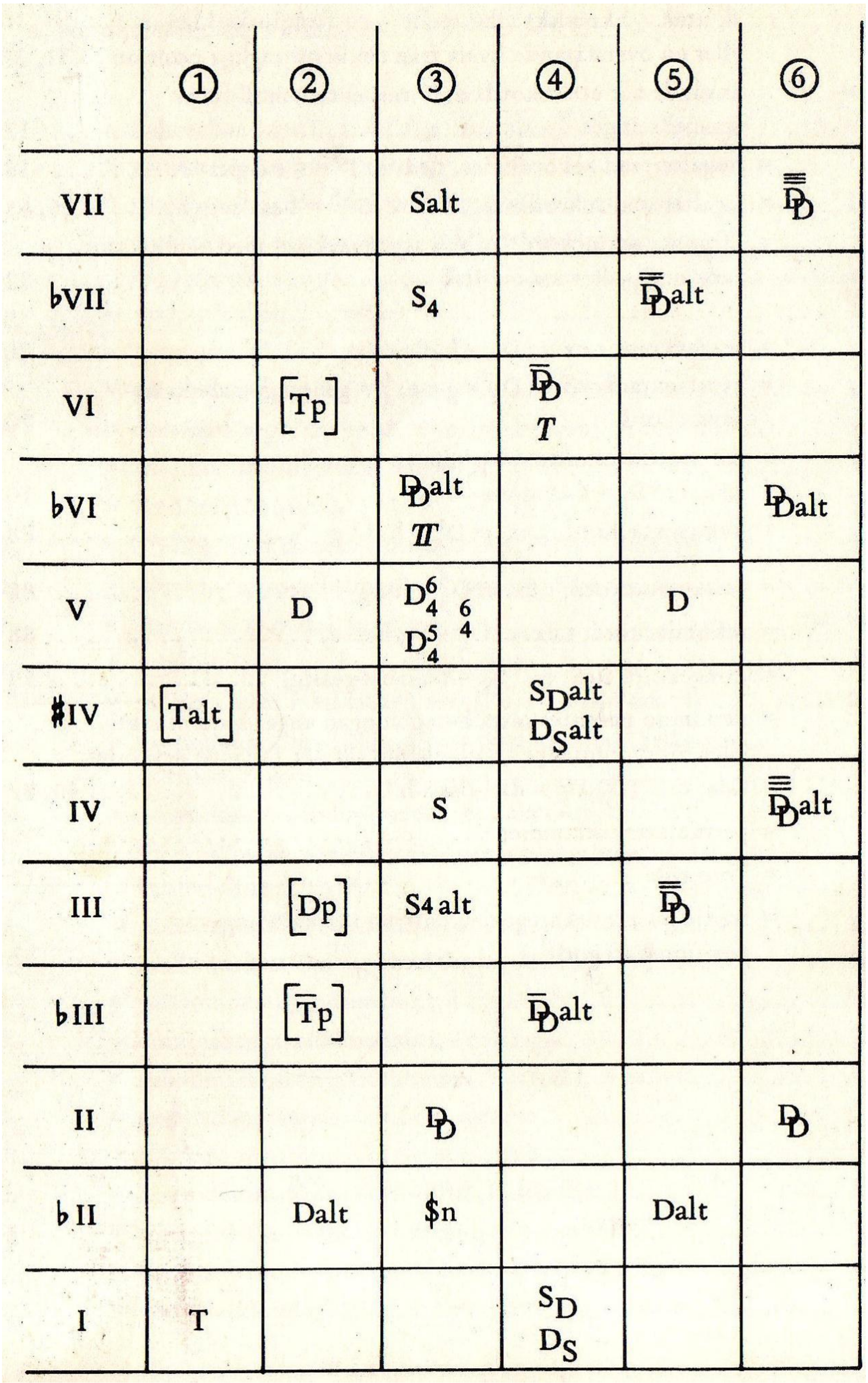
[49] Jersild. *Romantikens Harmonik*, trans Joel Bergström. p3

[50] Jersild. *Romantikens Harmonik*. p7

[51] Jersild. *Romantikens Harmonik*, trans Joel Bergström. p7

[52] Jersild. *Romantikens Harmonik*. p13

[53] Jersild. *Romantikens Harmonik*. p128



	①	②	③	④	⑤	⑥
VII			Salt			$\overset{\equiv}{\mathrm{DD}}$
♭VII			S_4		$\overset{=}{\mathrm{DD}}$alt	
VI		[Tp]		$\overline{\mathrm{DD}}$ *T*		
♭VI			DDalt *TT*			DDalt
V		D	D^6_4 $^6_4$ D^5_4		D	
♯IV	[Talt]			$S_D$alt $D_S$alt		
IV			S			$\overset{\equiv}{\mathrm{DD}}$alt
III		[Dp]	S4 alt		$\overset{=}{\mathrm{DD}}$	
♭III		[$\overline{\mathrm{T}}$p]		$\overline{\mathrm{DD}}$alt		
II			DD			DD
♭II		Dalt	$\not{S}$n		Dalt	
I	T			S_D D_S		

Table 3.3: Chord table

Jersild starts to go through different patterns and how to analyse relationships and indirectly answers questions by revealing his function designations. One of these patterns that I have had difficulties with is how to treat an A chord, either minor or major in relationship to C major. Whether it should be related as a parallel to C major or as an offset in harmonic progression. Jersild shows his solution[54] to this problem by actually letting it be stacked as one of the dominants:

4-3-2-4 or A-D-G-A

If we would give an attempt to write this with function harmony it could be like this

The 4 position =DDD The 3 position = DD The 2 position = D

but then the 4 position could either be: Tp or a ddd

This is smart since he now has introduced a numeral, expressing both functions Tp and ddd. It has always been an idea to express either one but nothing says both can't be intended. We learn that position categories can be delayed i.e 2-1 by instead moving up to the 4 position category 2-4.

Jersild says that the position 1 category[55] can only be one chord and that is the tonic. Going back to the position categories the A chord is a position 4 and Jersild chooses the structure ddd over Tp. He does not leave out the possibility of having a Tp.

In the chart we also realise that apart from the parallel chords this system only works with major chords.

Jersild introduces two new signs, regarding deceptive cadences[56]. The sign *T* is used when dominant G7 resolves to the tonic parallel a-minor. The other sign *TT* is used to describe the dominant G7 resolving to A-flat. Its noted that the two chords don't get their place in the 1 position in the table. The sign *T* is found on the 4 position and the sign *TT* is found on the 3 position category, see table 3.3.

Why introduce new signs that already have functions like the ones mentioned above? We know that that Jersild deems the cadence being the structure point in an analysis system and really works to put the cadence in centre. A guess could be that the new signs represent the cadence but also the concept that both ideas of having a Tp or a ddd is conjoined under one of new signs. In that case the A flat doesn't need to be described with either functions DDalt, sP,Tkp but just the new sign.

Another interesting aspect seen in the chart is that he actually does put a second chord in the tonic realm and that is the Talt although he does write it with a "permutations bracket" to indicate that it invokes a modulation. We cannot exclude that he has regarded this chord, although carefully displaced on the 1 position. He indirectly contradicts himself by earlier statement only saying that the position 1 category can only be one chord. We can argue how much a chord can morph until it takes the form of something, until it actually is something new or different. I think Jersild opens up the possibility of more than one tonic. I will incorporate this idea to my own model.

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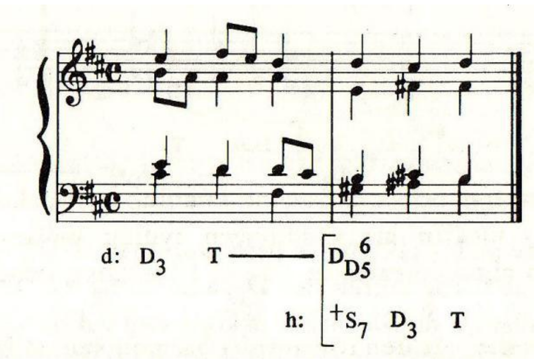
[54] Jersild. *Romantikens Harmonik*. p14

[55] Jersild. *Romantikens Harmonik*. p17

[56] Jersild. *Romantikens Harmonik*. p18

Jersild starts discussing the 2 position category[57] and that is the dominant. He talks about the treatment of augmented fifths and how this chord can resolve in its many ways[58]. The augmented fifth is not discussed at all in the 3 position category[59]. Jersild mentions that this chord "permutes"[60]. In that sense it underlines that this is a chord on the move and therefore it is perceived as a dominant.

Reading through these comments I find it interesting that many of the examples that are given show the flow from 3 position to the 2 position with a DD going to D. The 2 position cant be changed but can be redirected back in line. The 3 position can both be either dominant or subdominant and here it is possible to rewrite a dominant acting as a subdominant for in which to be followed by the 2 positions dominant. In the beginning we are shown the example 2 Johann Sebastian Bach *Herzlich lieb*[61],see figure 3.32.



Figur 3.32: *Herzlich lieb*, Johann Sebastian Bach

The last three chords that are presented are an E7- F#- h-minor

The piece is in D major but is modulating to h-minor. The chords in function analysis can be reinterpreted to match h-minor. In this case E7 which would have the function DD is reinterpreted as a subdominant to h-minor and in this case interesting to know that depending on how one listen, subdominants and dominants can be interchangeable. Thinking about this also raises the question if we really hear the E major as a subdominant before we know that we are going to land in the tonality of h-minor. It's when we get to h-minor that we can perceive the E major as a subdominant but for the moment when the chord is played not knowing that h-minor is the direction and having D major as the tonic realm we are unaware. It's first later, we can apprehend the course of progression and give it a function analysis.

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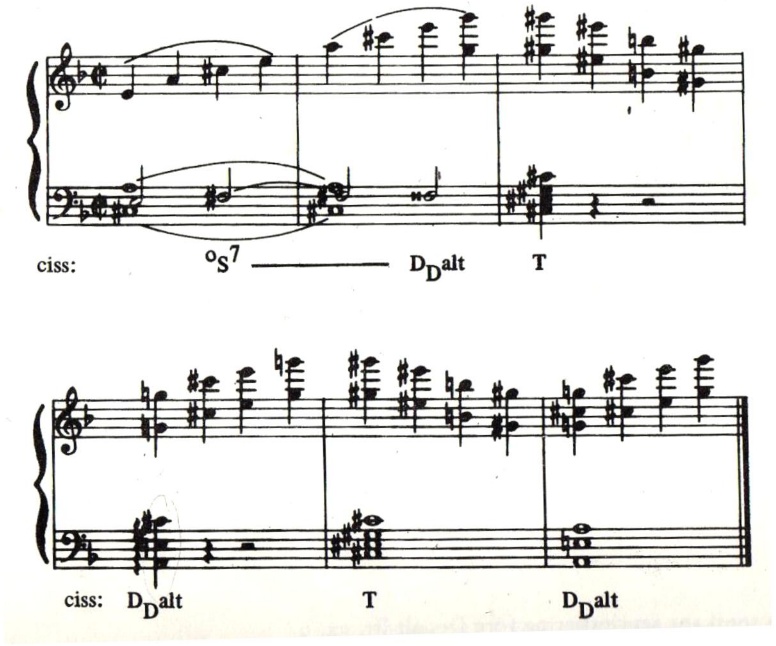
57. Jersild. *Romantikens Harmonik*. p19
58. Jersild. *Romantikens Harmonik*. p21
59. Jersild. *Romantikens Harmonik*. p24-40
60. Jersild. *Romantikens Harmonik*. p19-21
61. Jersild. *Romantikens Harmonik*. p11

Jersild show that its common in Franck's music to move directly from a DDalt to tonic[62].



Figur 3.33: *Symphonie pour Orchestre*, César Franck

The picture show a DDalt going straight to the Tonic. When music is this static, taking turn between these chords, it's hard to show a progression. The possibilitiy of having a system that can show dominant progression makes it possible not to change key. In this case it could make more sense to locate the two chords to d minor since that is the key the piece is written in and not c-sharp. In that case the chords could make more sense as being reinterpreted as a Dominant7 chord alternating to Salt, going back and forth suggesting a cadence to d minor. This idea is just taken in relating to this example.

Two interesting things Jersild mentions are:

"In the case of a chord belonging to position 4, the chord must naturally be followed by the basic chord: 3 + 2 + 1, but if a chord, corresponds to position 3, it will naturally be passed on with only two of the basic cadence chords, namely 2 + 1st This simple check shows us another important feature: Since each of the 3 position chords, regardless of structure, can naturally be followed by the 2-chord of the basic cadence, there is reason for the assumption that all chords of the same position category can be exchanged"[63]

and

" In the plagal cadence, the 2-position surpasses; The characteristic basic form of this cadence is the order S-T"[64]

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[62] Jersild. *Romantikens Harmonik*. p15

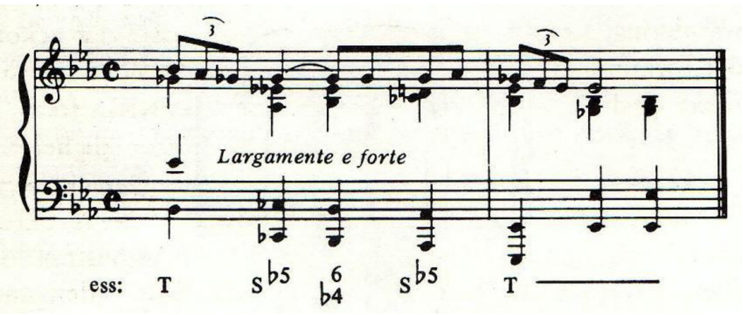
[63] Jersild. *Romantikens Harmonik*, transl Joel Bergström. p15

[64] Jersild. *Romantikens Harmonik*, transl Joel Bergström. p15

These exceptions are interesting since they provide possibilities to move away from the normal construction of the structure. Having the cadence as a structure to build a system is great but also means that there is a limitation to the system. The composer writes music and then the theory comes along. We have seen that in one of the examples above the composer doesn't limit himself to just the cadences Jersild is fond of using. The functions are altered, trying to convey the music in a limited system. When this occurs, music and functions don't match each other. The exceptions show that music develops and doesn't bind itself to just one approach.

Jersild is discussing the 3 position category[65] and he shows examples in which he applies his theory accompanied with function harmony. In example 14[66], see figure 3.34, he encounters some difficulties. Franck notates his music in a classical manner with a clear classical structure regarding cadences but he leaves a twist to the chords by using alterations. In this case Jersild spots the cadence type but also spots the alterations Franck has made. The third and the fourth beat are interesting. Franck has modified a pattern, in *Prelude, choral et Fugue*, that consists of

Sub flat5 - S6/flat4 - Sub flat 5



Figur 3.34: *Prelude, choral et Fugue*, César Franck

Well how does this sound then? Because here the cadence structure says one thing but the sounding result might be conceived as something else and this might be Franck's way to leave a twist in a mannered way.

First the third beat sounds like a +5 chord and therefore by Jersild's own thoughts it should be conceived as a dominant but that would ruin the cadence structure unless some composer like Franck knows how to get away with it. The problem that arises is that building a structure and then letting it be altered, makes the structure and the sounding result not matching.

Secondly the fourth beat is considered a minor subdominant with a lowered 5 and Jersild writes when this chord is respelled it is apprehended as a Dominant9 without root. We can assume that this is the chord and much speaks for it but it is not entirely correct since a Dominant chord built on B should consist of the tones B -F -D -A flat -H. If we look at the chord we will notice that neither B or F is represented and that we have to respell C-flat enharmonic to H. He is right in one aspect and that is that this chord has a dominant quality to it. Here Jersild chooses to put structure before the sounding perception of the music.

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[65] Jersild. *Romantikens Harmonik*. p26

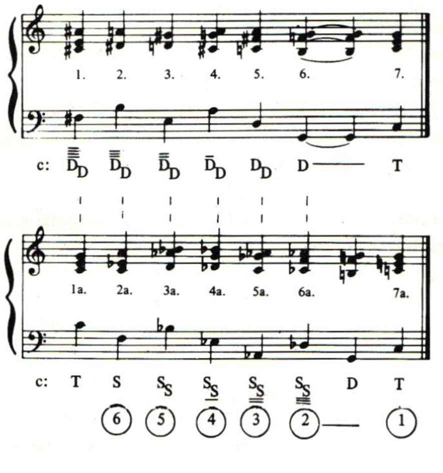
[66] Jersild. *Romantikens Harmonik*. p26

Composers have always been re-formulating rules in composition and Franck does it in a brilliant manner. As today, composers and musicians alike have done what they wanted to challenge the conventions of their time. The structure has been important but challenged as well. Musicians today and especially on the jazz line don't follow these conventions. Looking back it’s exciting how times change and structures too. This book was produced to analyse romantic music, not today's, and Franck brings this clear structure into a highpoint of romanticism and beginning impressionism. Here he merges a bridge between this sophisticated well developed romanticism and new dawning impressionism, still taking form. The other way to look at this chord, having read Levy’s book how he works with negative dominants. A possibility that presents itself, that is a great addition explaining this chord function is: This minor subdominant with a sixth is a mirrored inversion of the dominant chord and produces a dominant quality to it while being a subdominant. Here Levy’s theory would come in place and it does not interfere with the cadence structure either. The C-flat minor sixth chord is such a chord and resolves back to the tonic and this does not interfere with the functions. Out of the two solutions this one is optional to keep the structure and show direction in the progression.

Jersild even discusses this chord on the fourth beat and recognises the difficulty between altered chords both subdominant and dominants. He expresses[67] that this Sflat5 chord easily can be perceived as either a 3 or 2 position category. He tells us that 2 category which was intended for dominants can contain subdominant chords.

Jersild goes through the use of dominants[68] and he states that they usually have a major third but sometimes a minor third. This has been one of my main criticism to all the theorists except Levy. The dominant quality consists of having a major third otherwise that quality is lost and is only perceived as a position-based chord, taken out of harmonic context. By position-based system I refer to the analysis system being based on functions that just show a position. The qualities that is unique for each function in a progression is lost. If this quality is lost then the function doesn’t serve its purpose showing a progression any longer. The harmonic progression is severed.

Jersild writes a chart[69] , see figure 3.35, to see how the system can hold all fifths on both sides of the tonic and in this way he gets a function for all 12 step chromatically. This is close to my system since I also wanted to make a function for each step, making a chromatic function analysis. This is close but not entirely the same, since he has left out all the minor chords,since he can’t explain them in a Dominant progression.



Figur 3.35: Major Dominant progression

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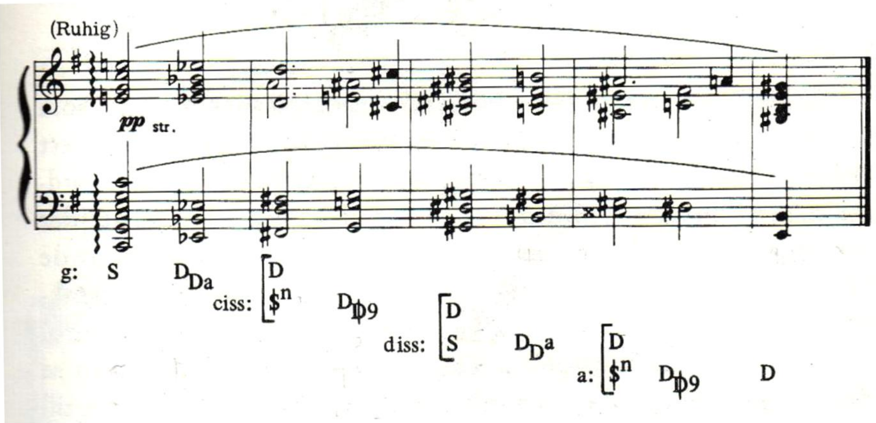
[67] Jersild. *Romantikens Harmonik*. p27
[68] Jersild. *Romantikens Harmonik*. p31
[69] Jersild. *Romantikens Harmonik*. p44

Jersild mentions:

> *"The altered forms of the subdominant trait correspond to unaltered forms in the dominant trait, on the other hand, the altered forms of dominant tract correspond to the unaltered forms of the subdominant trait"*[70]

With all 12 steps I thought Jersild was going to establish a possibility to have a tonic and relate all these functions to the tonic, but he does not. An interesting aspect is that he continues to change keys in the middle of pieces even though he has a system that is chromatic. It's not necessary to change key.

He has managed to create a function analysis that continues harmonic progression and can relate all functions to one tonic. As an example to see how Jersild and I differ between our systems, we will look at Jersild's own analysis of a few bars of Wagner's *Die Walküre*[71], see figure 3.36.



Figur 3.36: *Die Walküre*, Richard Wagner

Jersild states that it can seem that this structure is anti-functional and solves it in his function analysis by changing key for each bar. Do the listeners perceive these key changes for every bar? In Jersil's analysis we can see that Wagner puts together a harmonic motif and spreads it across the circle of fifths but in an select order. If we would persist in not changing the key, we could get a coherent harmonic progression from start to the end. In my proof of concept I will show that it's possible to use a single key.

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[70] Jersild. *Romantikens Harmonik*. p43

[71] Jersild. *Romantikens Harmonik*. p97

4. Analysis and creation of a new model

To make a system we have not only to ask ourselves what do we know and what do we not know, but do we know what we know? We have to question all functions to see how they relate to each other but also see if the functions we use are suited to work in harmonic progressions. Do the functions help us to show how we relate the progression to a key centre, and at the same time can they show a direction forward?

These requirements put certain demands on a systems design. This is neither good nor bad but makes it easier, what to look for in its construction. Reading through all these books with their various theories, has enabled me to compile thoughts surrounding a design for a chromatic function analysis system. Here is a concluding summary that merges my ideas developing this new system. It is important to know why function analysis has been developed. Why has there been a need for such a system? And why has it constantly been updated?

Function analysis can be viewed as the music's grammar. Learning how to listen and relate functions, one can be fluent in music. For the fluent musician any music can be related knowing function analysis without perfect pitch. This makes the system essential for the general musician. We can see that the direction function harmony has taken over time leans towards a more chromatic system, linking far relationships to the tonic. The system has always been improved on to convey the music of its time in such a way to make music accessible. When the material used is not enough it either contributed by expanding the system or offer solutions that use the already known material in a more broad way.

Taking a look back to Rameau who first coined the concept of functions and their different characters, we see what created function analysis. Rameau discovered that using the diatonic scale the three main chords T,S and D can be extracted and with their unique qualities, it is possible to tell them apart. The scale became the base to create functions. What is great with these three main chords is that there is quality to tell them apart from each other and that gives them an acoustic confirmation that their function character combined with sound is unique. Here we learn that the dominant by character always is major because that is what makes it unique. That's why I oppose the ^{o}D or d because they do not reflect the major quality. These types of minor chords have another quality and should be give another sign. I doubt that many would argue for the case that g minor chord is the Dominant of C. It is not the common intervention. These three chords will have a fundamental role in my system and its not without reason that we still use them. They construct the cadence form that is the key structure in Jersild's book. Together they create a tonality centre. Its good to remember the grade these chords are perceived acoustically:

Tonic = Solid, still

Subdominant = Calm movement

Dominant = strong, moving direction

It should be noticed that the subdominant is not as solid as the tonic but has a character of something between the tonic and dominant. There is huge acceptance in the way we treat the resolution of our dominant chord but the subdominant is more treated like a link to the dominant. The subdominant however is a bridge of character, moving slowly.

Much has happened since the time of Rameau and to the way we have looked at music. Using a more liberal tonal language over time, we have expanded our perception of tonality to more far distant relations then the ones we get from our diatonic scale. We hold on to our basic structure as based on the diatonic scale as we try to relate distant chords to it. Here occurs an adaptation moving from a very free chromatic structure to scale-based system. Some pieces between the two systems merge without problem and some not as well, especially when trying to describe functions from outside the diatonic tonality. Today we mix both of the systems by added contributions, parallel by thirds, which change the relations of the functions structure. It is important, like grammar, that the structure is coherent. The three main chords are acoustically entitled but are all the parallels also acoustically entitled?

The main triads' common place is that they surround themselves by a fifth from the tonic and because of their unique acoustic character I want them to be the base of my system. I need to change the structure of relating chords by parallels (small and large thirds) since they don't have that unique quality that the main triads possesses. It is of course the parallels that are not common to the diatonic scale. Tp, Sp and Dp all serve their function as replacement for the main triads and can be used but only when the tonality is diatonic. Using these positions only tell us where their function is located from the main triads and not as a link to the tonic. These functions are not ideal but still accepted in my system, to convey position. When tonality expands beyond the diatonic functions we should move over to showing a direction to the tonic and the chromatic system. It should always be of interest to show the harmonic progression to the tonic even in diatonic structure. The parallels of the main triads should be used with caution. Therefore all other types of parallels are taken away and should not be used. These functions sever the harmonic current that should be a link to the tonic. The problem is when we relate a function to another function and then relating it again, we lose the general direction of harmony.

By building a system around these main triads we can incorporate the ideas of Jersild. Are the functions really serving their purpose changing the structure from a diatonic scale to a chromatic? Might an unimpeded way of writing functions in a harmonic progression, question certain functions? Jersild's book works thoroughly with this type of dominant current and will provide solutions.

This gave me the idea to try to create a chromatic function analysis system by changing the function relationship structure from parallels to the fifth. Stacking all dominant chords made me realise that their opposite must be all the minor chords. I will use Levy's way of inverting dominant chords to extract the minor dominants which will be all my missing minor chords. This will be an extreme way of working with the different dominant chords. The advantage of building the structure on the dominant chord is that I will keep a general direction of harmony, although inverted, and the functions will have a direct link to the tonic. These functions will create a substitute to the parallels, that are removed.

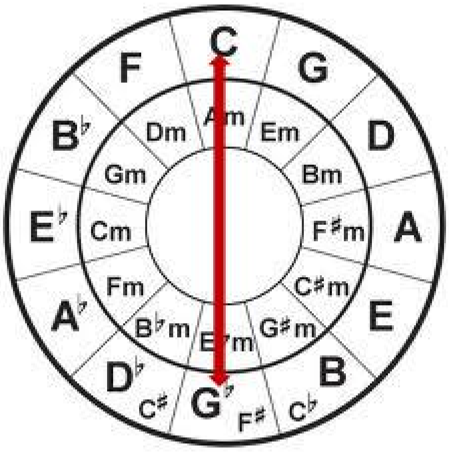
If the diatonic scale has then been the reference point in creating a function system and the steps are named with a function. The first chapter in Söderholm's book is all dedicated to scales from which he introduces functions and their relations. It might be that the diatonic scale has provided the material for creating a function analysis and therefore being the core structure. The issue here is that not all tones are included in a diatonic scale, and when we wish to explain function on other steps outside the scale there many available interpretations and a great variety used terminology that differs between music-theorists around. I will therefore change the scale material to a chromatic material and change terminology. I want the new terminology to be simple and easily understood so therefore I do not introduce any new symbols. I will instead make use of the three main triads since they are based on acoustic perception and available by character to the listener.

These steps play a fundamental role in creating basic functions. The steps by themselves are different from each other and play their own role as what function they can create. There is one function that we have built our western music on and that is the fifth which also happens to be a dominant. The way we have named these steps, differ in different systems, but both systems above show me my function's relation to my key centre (tonic). The main difference apart from naming these steps with numbers and the other one with a letters, is that Riemann analysis describes the harmonic relations in a piece. The terms can be changed since their primary goal is not to show a position but to show the flow music harmony is moving. Therefore I have to check if all functions in Riemann theory provide a good link in the musical flow so they serve their purpose. This made me wonder if some functions better serve their purpose than others and if some functions just are position-based names. So what can I know?

When I listen to music I hear when a chord is unstable and needs resolution. The resolution must be my tonic and these chords leading to my tonic must be different forms of dominant chord sequences until I reach my tonic. Just hearing a pitch I can approach it from either above and below therefore I can approach my tonic in the same way. This is what I know. The following question could be, when is a chord considered a dominant?

In my function analysis system I want everything to point at my tonic and that must be my different dominant chords. Therefore my tonality centre is fixed, it's possible to change key centre but it will be made more or less obsolete in my system. This fixed system reminds us of numeral analysis with a fixed 1-7 positions of the diatonic scale. I will make a fixed system but based on chromaticism instead and make it point towards the tonic. The dominant chord or the structure built on the fifth is ideal and will be my base for constructing this system, just as Riemann has done with his. The dominant is located a fifth above the tonic but since I can approach my tonic from both above and below, I can locate my second chord. To separate the two chords I will call this fifth under my tonic for subdominant. Riemann also does this. Riemann on the other hand goes on to relate triads without reference to the tonic. This is called dualism and is added into several collections of ideas by a few musicologists and theorists of the 20th century. These collections of ideas are called the neo-Riemannian theory. Its important to know that the function system we use have been worked on and improved many times over the years and that many of the ideas are not Riemann's. Relating functions by thirds is such an idea and not bad but it is misguiding to have a system built on fifths and then compromise and relate the functions by thirds. I can see that when relating either to the tonic, subdominant or the dominant, its respective minor parallel its logical, since they share scale structure but anything more than that is misguiding and not beneficial in describing the functions' relation to the tonic. Here is where I differ. To still keep the simplicity I will keep the three above parallels since most people are used to them but when more complexity is involved other options will be presented in my chart.

I have decided that the structure should be the dominant to tonic resolution and that I have come to terms with that the tonic can be approached from both sides in the circle of fifths. I have two fifths, dominant and subdominant, located a fifth from each side of my tonic. These fifths can relate them to their dominants and so forth stacking dominant upon dominants and subdominants upon subdominants. This makes it easy but a lot of stacking to cover all keys. Fortunately during the 19th century the harmony became more complex and the dominant chords were stacked with more notes and especially going by thirds. The romantic ideals made the dominant chord a good candidate with a desire to create a longing for resolution. By experimenting with the dominant seventh chord as it was considered easy to alter and change direction leading towards a wishful tonic, the dominant seventh chord could be changed. The chord that it could easily be altered to was another dominant seventh chord located on its tritone. The two chords co-join and share the third and seventh but jump to its opposite side on the circle of fifths, see figure 4.1



Figur 4.1: Circle of fifth depicting an tritone alteration

Changing the dominant chord on its tritone and to build another dominant seventh chord is known as a tritone substitute. In this case, instead of stacking fifths upon fifths, I can relate more or less remote keys by their tritone, writing alt over my function, indicating that the chord has been altered by the tritone. I can do this to any of my functions that are built as dominant chords. I can also do so with my tonic. So if I were to explain the key of F# Major to my key centre of C major, I can write it as the function T(alt). That means that my major chord is located at the distance of a tritone from my tonic and looking a tritone away from C-major I find my F# Major chord. I can now relate all my dominant chords chromatically to C major. This is how the functions are written by being stacked and altered by the tritone, see table 4.1.

$F^{\#}$	H	E	A	D	G	C
6D	5D	4D	3D	DD	D	T

Table 4.1: Dominant progression to the tonic

It's important to note that the functions are written in a way that is closest to the tonic, if put in harmonic progression. We are not bound to these functions since, depending on context or the harmonic progression, the chords may behave differently. An example would be to change H major from a S alt to a 4D. We can go all the way around using just dominants or just subdominants if the harmonic progression suggests it. In the chart, the parallels to the Tp, Sp and Dp are not used but can of course be added but should be used with caution and when used they have to be reinterpreted to show progression.

Up to now have I only explained major chords and we all know that this is only half of the work since we have all the minor chords left. I have a system based on fifths and I have agreed to use the minor parallel which share the same scale material as its major parallel but I wish to to have more of a function pointing to my tonality centre. Therefore I realised that I do want to base my system on the fifths and not on thirds. The problem that arises with functions based on thirds is that the structure based on dominant to tonic is cut and the functions by thirds then don't meet the properties of showing a dominant progression. When these parallels are used they need a dual representation to link the progression, see table 4.2. This concept is explained further down.

A	D	G	C	F
3D	DD	D	T	S
			D	

Table 4.2: Table showing dual representation

Reading Levy's book, an explanation of the minor functions, is that these are mirrored dominant chords. This was the feeling I received looking at the resolution of the A-flat going to G and then to resolve into my C major tonic. I did not know how to explain them. Luckily for me Ernst Levy, a musicologist, mathematician and music theorist, already studied and worked out a model that I can use. He calculated that by inverting a dominant chord that is positioned on axis drawn from the tonic and its fifth and mirroring it. The inverted chord will contain direction and possess the quality of movement like that of a dominant. You can invert chords to resolve to the tonic from the other side in the circle of fifths, being able to move clockwise. I understood that this is how I will solve my reflection of the dominant chord and since my dominant chord is a major chord, its mirror should have the outcome as a minor function and on the opposite side of my tonic in the circle of fifths. The process has been known as negative harmony for it wants to resolve the other way around, approaching the tonic from the side of the fifths. Since my system is based on the dominant structure this concept will enable a direction of harmony describing the minor functions. This concept will contribute another viewpoint in how we describe function harmony. I can now invert all my dominant functions and get all their negative functions to fill out the rest of my system. To mark a function as negative I have chosen to put the sign - in front. This will let us know that this negative chord is striving to resolute towards the tonic from the other side of the circle of fifths. We will refer to these dominant chords as negative dominants. I will use Levy's chart to demonstrate one way to invert these chords. I have also drawn a chart to show another way how to invert the chords, see figure 4.2. Both give the same result but give different viewpoints how to locate and how the negative dominants work.

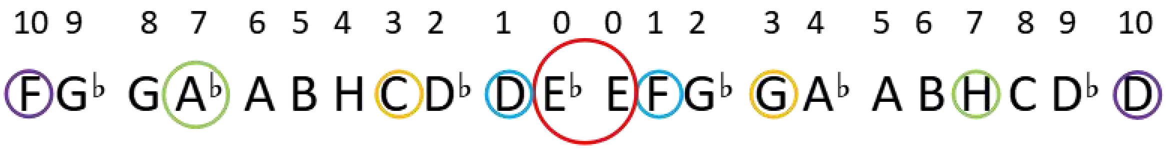
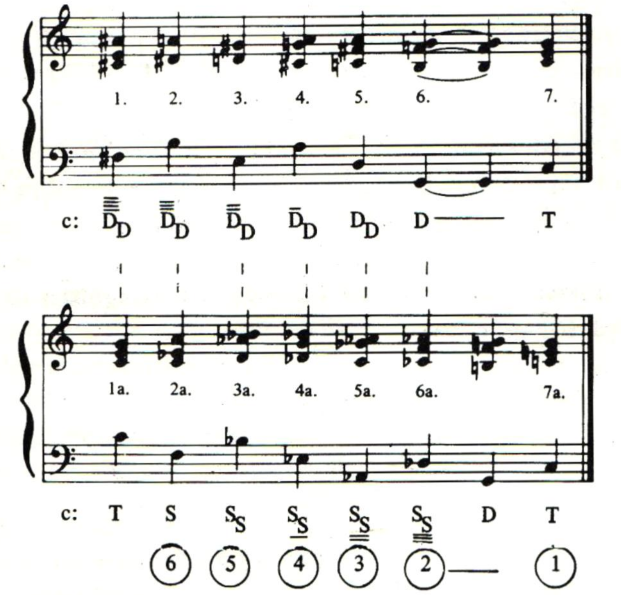


Figure 4.2: Intercept point with a dominant chord mirrored.

This provides us with a solution to invert all the dominant chords with their alterations and get the remaining minor chords. These are major Dominant chords, see figure 4.3



Figur 4.3: Major Dominant progression

In the picture we can see all the dominant chords positioned in order from furthest away to least to the tonic. We can now invert all these chords and we then get the remaining minor chords that the system currently is lacking. The benefit we gain is that the minor chords are positioned in progression to the tonic, see the thirteen figures i.e: figure 4.4 to figure 4.16

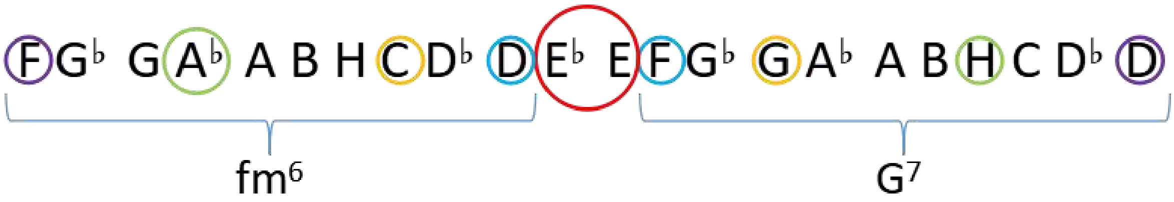

F G♭ G A♭ A B H C D♭ D E♭ E F G♭ G A♭ A B H C D♭ D
fm^6
G^7

Figure 4.4: C major negative dominant and C major dominant

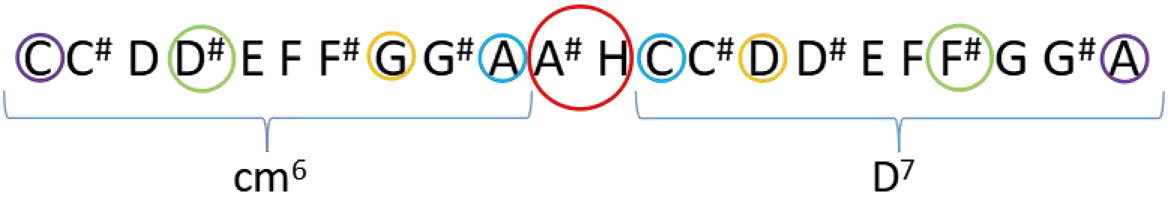

C C# D D# E F F# G G# A A# H C C# D D# E F F# G G# A
cm^6
D^7

Figure 4.5: G major negative dominant and G major dominant

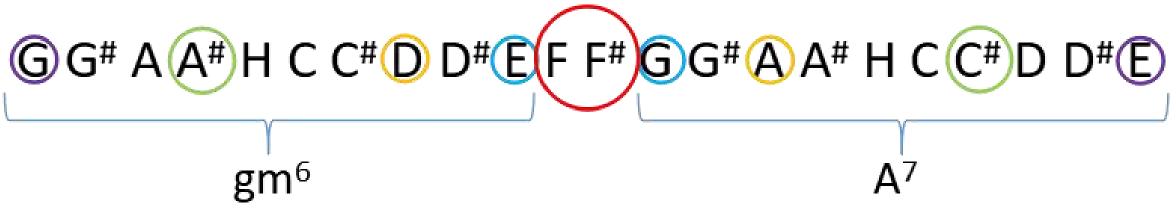

G G# A A# H C C# D D# E F F# G G# A A# H C C# D D# E
gm^6
A^7

Figure 4.6: D major negative dominant and D major dominant

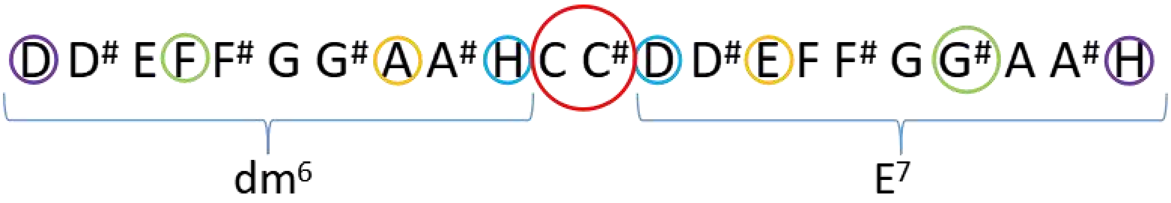

D D# E F F# G G# A A# H C C# D D# E F F# G G# A A# H
dm^6
E^7

Figure 4.7: A major negative dominant and A major dominant

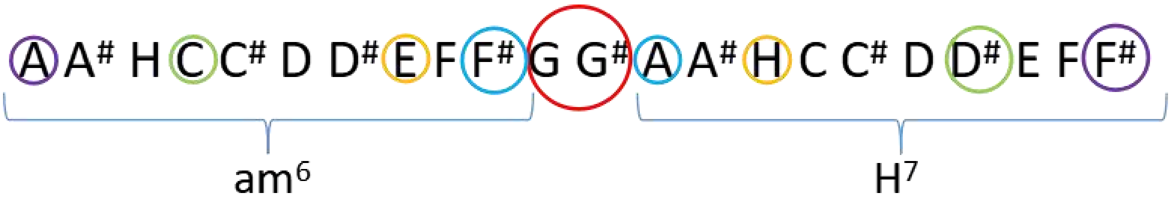

A A# H C C# D D# E F F# G G# A A# H C C# D D# E F F#
am^6
H^7

Figure 4.8: E major negative dominant and E major dominant

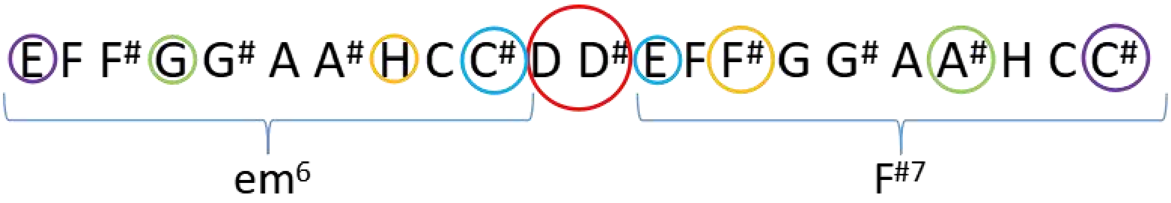

E F F# G G# A A# H C C# D D# E F F# G G# A A# H C C#
em6
F#7

Figure 4.9: H major negative dominant and H major dominant

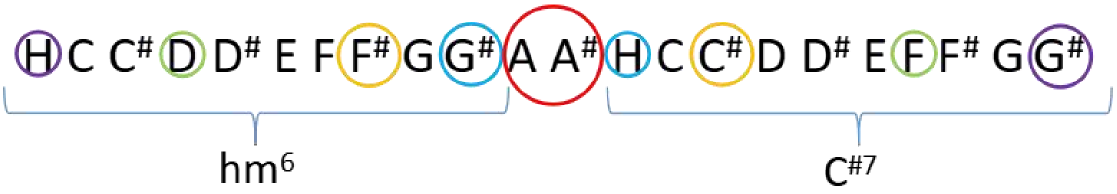

H C C# D D# E F F# G G# A A# H C C# D D# E F F# G G#
hm6
C#7

Figure 4.10: $F^{\#}$ major negative dominant and $F^{\#}$ major dominant

Now I will go thorough the inversion on the flat side on the circle of fifths

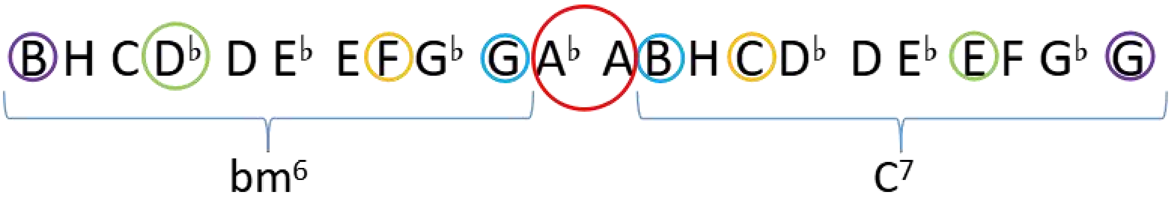

B H C D♭ D E♭ E F G♭ G A♭ A B H C D♭ D E♭ E F G♭ G
bm6
C7

Figure 4.11: F major negative dominant and F major dominant

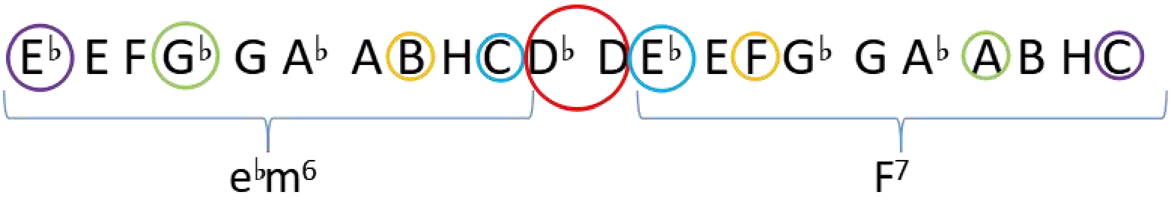

E♭ E F G♭ G A♭ A B H C D♭ D E♭ E F G♭ G A♭ A B H C
e♭m6
F7

Figure 4.12: B major negative dominant and B major dominant

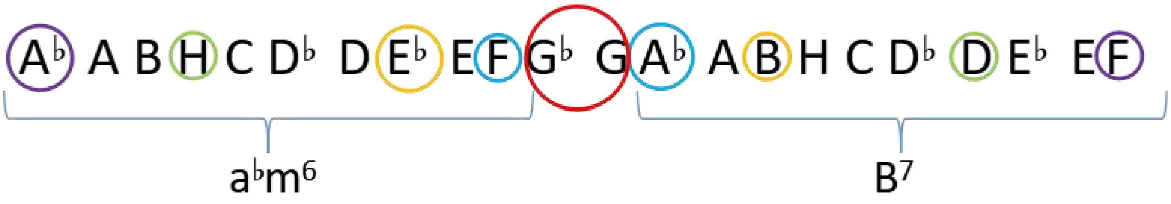

A♭ A B H C D♭ D E♭ E F G♭ G A♭ A B H C D♭ D E♭ E F
a♭m6
B7

Figure 4.13: $E^{\flat}$ major negative dominant and $E^{\flat}$ major dominant

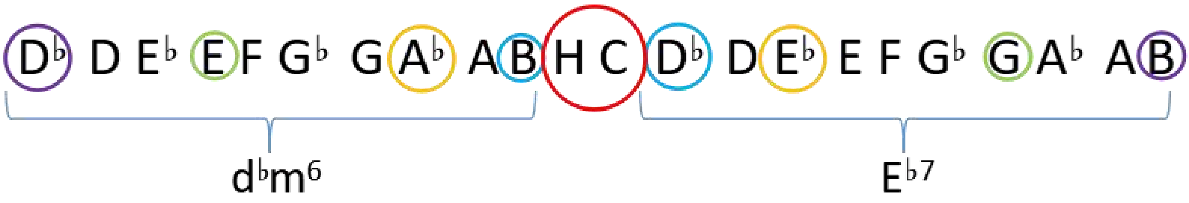


Figure 4.14: A♭ major negative dominant and A♭ major dominant

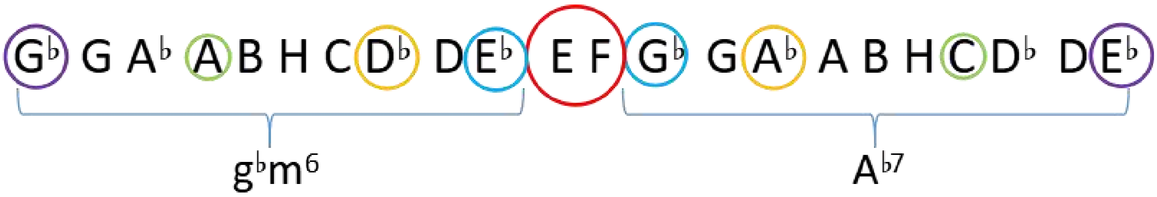


Figure 4.15: D♭ major negative dominant and D♭ major dominant

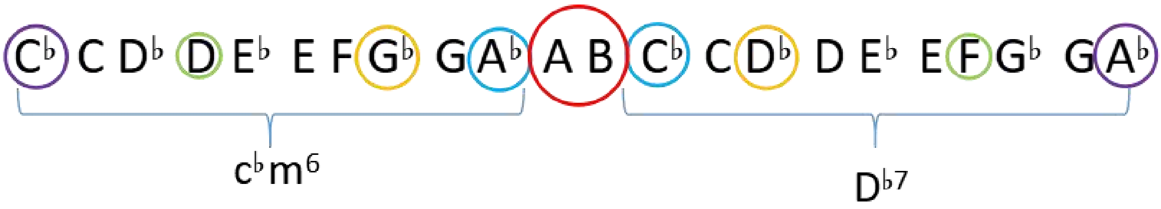


Figure 4.16: G♭ major negative dominant and G♭ major dominant

We are now presented with all minor chords and that they are moving in an opposing direction. We add these chords to the chart, and realising that the G7 is a dominant and that its mirrored inversion d minor -5 is its "twin" from the opposite in the circle of fifths. I give it the function -d naming it a negative dominant. The other side then has negative subdominants and in this case g minor is the negative subdominant. It is given the sign -s

The sign show a position within an harmonic progression. These symbols can also be stacked, working the same way as we did prior, also using alteration to describe position. We have all major and minor chords, with a designated function, put in chromatic order, using the dominant as a core structure to this system.

Being able to write functions in this way enables us to follow minor progressions in the circle of fifths that we could not have done earlier without relating functions to other or using "minor dominants".

-sss	-ss	-s	T
am	dm	gm	C

An interesting thing to realize is that the function Tp can now be reinterpreted as the function -sss and this shows the shift in position categories that Jersild includes the Tp in his table. This makes it easier to see where the harmonic current is going.

When we reinterpret a function we write first the function that finishes a harmonic sequence and under the function we place the new interpretation of the function. We call this dual representation and it is also to be noted that a function that is reinterpreted can be reinterpreted again. Demonstrations of this will be seen in following examples, see table 4.3

A	D	G	C	F
3D	DD	D	T	S
			D	

Table 4.3: Table showing dual representation

It is also important to talk about cadences. Jersild bases his system on the cadence and he makes it possible then to categorize chords in a way that enables an ongoing harmonic progression. The only critique he got was that limiting the system to certain cadence structures, sometimes function and music don't match. Composers don't always limit themselves to certain cadences either and if we want a system that can work when condition changes, we need a very liberate way, making it easy to use the functions.

It all comes to interpreting where we are in the progression. We can postpone the progression by relating to another tonic further away making the 3-2 position a 2-1. Jersild has also shown that many of the position categories are interchangeable. The plagal cadence is a good example to show that in order to end a progression, we don't need a dominant before the tonic.

To create a liberal way to cadence, I would look at a cadence as an enclosement of the desired key. In order to make a cadence, the key needs to be approached with a form of subdominant and a form of dominant chord. The subdominant and dominant are interchangeable and can be either minor and major. So we can approach the tonic from either side. It’s now possible to incorporate the idea of Levy and his use of mirrored functions. I also want to mention that to change key the composer must not make a cadence.

Being able to compile and merge these ideas, it has been possible to make an updated circle of fifths, that shows all new functions and their relationship to the tonic.

All major chords are found in the outer circle and all minor chords are found in the middle circle and the inner circle depicts all keys, see figure 4.17. As in Levy there are two currents. The outer circle moves counter clockwise and the middle circle moves clockwise. The inner circle, the circle to the right, present the keys in the circle of fifths. Using this structure I can show harmonic progression in major and minor chords and therefore I can remove the parallel minor as structure.

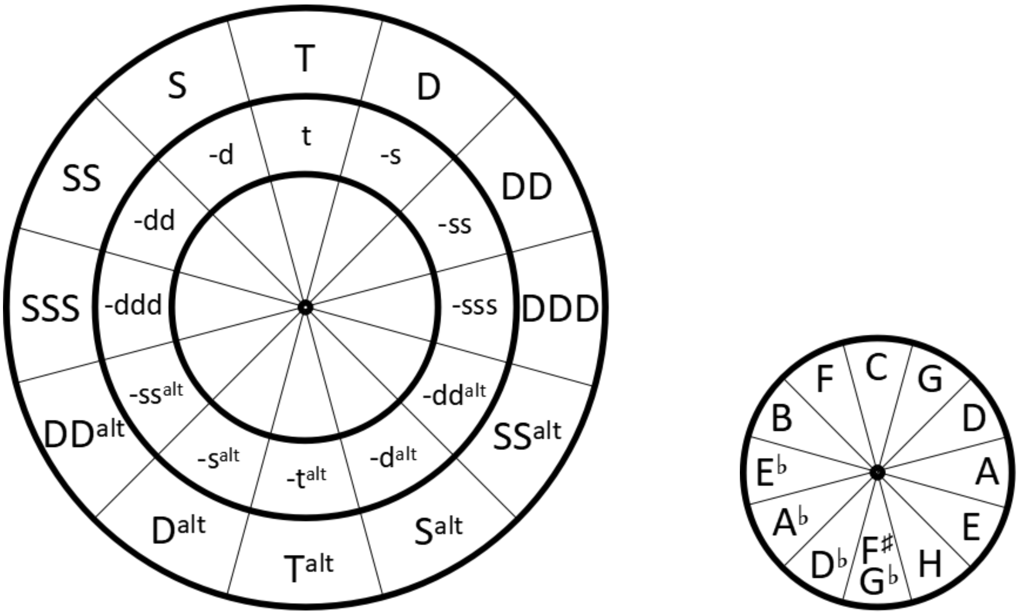


Figure 4.17: Outer and middle circle with major and minor functions and inner circle with all keys.

Combining the three circles to one circle, completes the the Chromatic Functional Analysis instrument. I call it *Bergström's Chromatic Function Analysis Circle* , see figure 4.18.

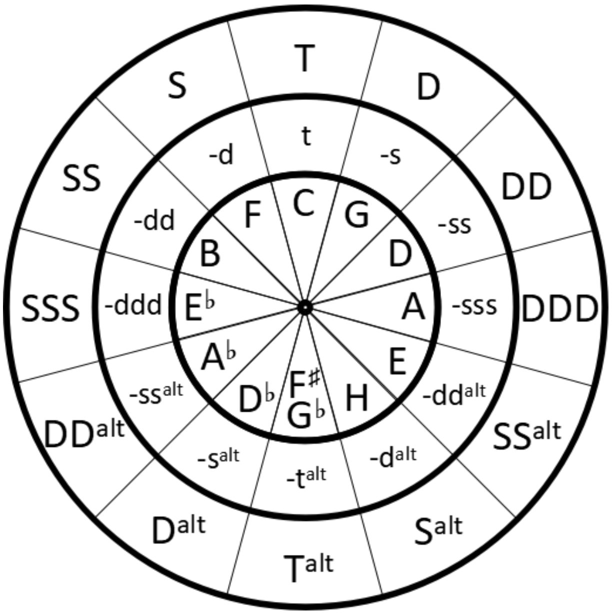


Figure 4.18: *Bergström's Chromatic Function Analysis Circle*

The complete circle combines the functions and their relation to key. If we change key the inner circle can be rotated to the desired key and the outer circle is still. All major chords are found in the outer circle, the minor chords in the middle and the keys in the inner circle.

When should the parallels be used? We now know that the parallel functions sever the harmonic progression and therefore that is what they can describe. I have made an example of my own where a progression is starting to take place but is instantly closed by a cadence. This will show that in these cases it could be just as good to have a parallel describing the severed progression. Here we might have to accept a position-based function. The function Tp might be better than a -sss since it still presents a tonic function. The parallels that should be used are following Tp, Sp and Dp. Any others are not needed and can be explained better by the other functions that show progression. In the table 4.4 C is the tonic.

Row 1 shows the ordinary way to harmonise the scale with functions

Row 2 is an attempt to show the movement by fifths using ordinary functions

Row 3 uses the new function designation from my chart

	C	am	F	G	am	dm	G	C
1	T	Tp	S	D	Tp	Sp	D	T
2	T	Tp	S	D	ddd	dd	D	T
3	T	Tp/-sss	S	D	-sss	-ss	D	T
						D -s		

Table 4.4: Table showing the difference between analysis systems and the Tp function.

The first and second row have problems showing a direction in harmonic progression and that is because the first row uses position-based functions. The chords are just pinpointed where they are located.

The second row is an attempt to show direction but is unsuccessful because it suggests that there are minor dominants.

The third row shows the direction in harmony and when possible it uses dual representation to show common function with the way we harmonise a scale and the way we use a chromatic function analysis system to intervene a system based on fifths with a system based on thirds. The second chord that could have carried on a progression, like the example with Liszt, is closed by the cadence. The harmonic progression is severed here and therefore we can use the term Tp to show that it is a tonic. It's possible to use the function -sss since we at this point only can show position, but it insinuates progression and therefore the Tp parallel could be more accurate .

Another concept that I wish to introduce to my system is something I call split function analysis. Learning that slash chords can be used to show how two or more different chords can be played simultaneously, I wished to transfer this concept to function analysis. In my course Advanced harmony, Second Cycle, I got the task to make an arrangement of the folk song *Om sommaren sköna*[72] , see figure 4.19, by my teacher Joel Eriksson, Senior lecturer at the Academy of Music and Drama at the University of Gothenburg. In the arrangement I have used this skill of slash chords, in the second bar. The chords are separated by a line. The functions are located under the notes. The functions are also separated by a line to tell the functions apart and also to tell which chords are being reinterpreted. The chord E^{+5} major is reinterpreted to a dominant therefore it's both dominant and a dominant to the next chord. The C major below is given the function $3D^{alt}$ and is a dominant to the next chord. The two chords now move in different progressions that occur simultaneously. The two coloured arrows help to guide the movement of the double progression that merges together on the E. This provides a possibility to explain dense harmonic structures.

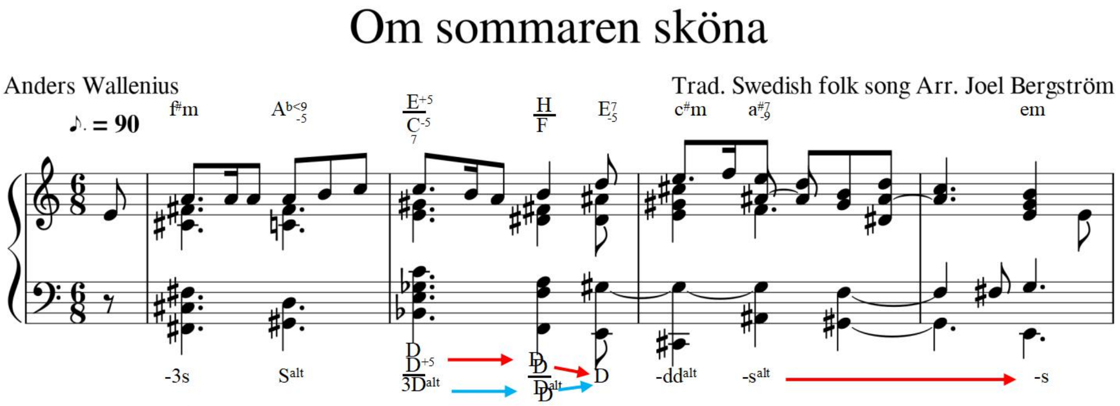


Figure 4.19: *Om sommaren sköna,* showing split function analysis

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[72] "Dalavägvisaren", Wikipedia, accessed May 20, 2018, https://sv.wikipedia.org/wiki/Dalav%C3%A4gvisaren

5. Proof of Concept

5.1. Jörgen Jersild, *Die Walküre*, Richard Wagner

In the example, figure 3.3.6, of Wagner's *Die Walküre*[73] Jersild states that the progression seems anti-functional but solves this by letting the structure relate to a new tonic every new bar. The tonics are g, c# ,d# and a. Although he keeps the structure intact so we can see that there is a clear pattern in the succession of chords. I on the other hand wish to show a relationship to the tonic without interfering by changing the tonic. It would also be great to use the real width that a chromatic system can offer.

Looking at the structure of the music we can see that there is a pattern and that the chords are grouped bar by bar and that their interval distance is the same throughout. When the next bar starts we end up on another place but the same course of harmonic progression repeats itself. This regularity is important to see how progression can look different, still being the same progression but scattered in the circle of fifths. Here we get to see the same progression but in an ongoing harmonic progression with a constant link to tonic.

The structure, see table 5.1, of the first bar looks like this:

S	DDalt	D	?

Table 5.1: Progression from Wagner's *Die Walküre*

The question mark is that this chord is a diminished and therefore it can both be interpreted as a dominant chord as well as a subdominant chord. This undetermined function is a perfect bridge, like a glue keeping two different structures together. We only have two bars but this is enough to see how the harmonic pattern works and construct a third bar. By doing this we realise that the last structure piece is shown and the structure is complete. This is how it would look like with the added third bar

C - Eflat - D - C#dim --- G# - H - B - Adim --- E - G - F# - Fdim

I have drawn a map over the circle of fifths colouring the pathway that Wagner uses, see figure 5.1 and figure 5.2. The structure is then placed as a sequence, that covers all the keys in the circle of fifths. The first sequence is coloured in red and show the movement from C-E flat - D - C#dim, then it continues to the second sequence. The second sequence, G# - H - B - Adim is showed in green and moves to the third sequence, E - G - F# - Fdim that is coloured blue. The thirds sequence binds the circle and goes to the first sequence. Showing the functions and relations between the sequences should prove a true test to the chromatic function analysis.

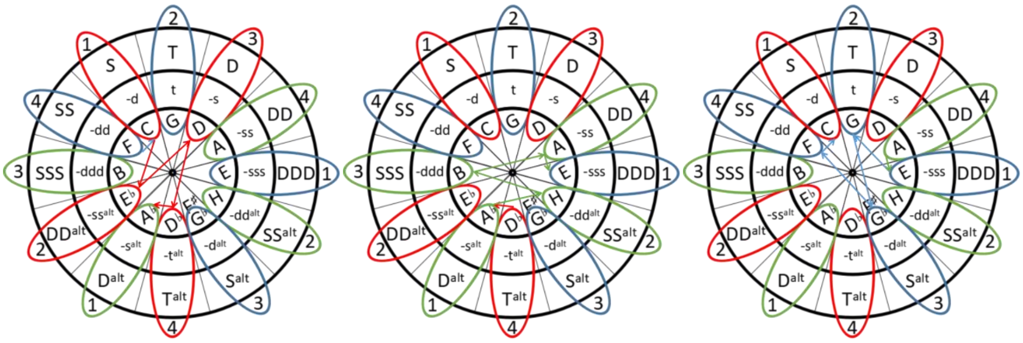

Figure 5.1: The function analysis circle for Wagner's *Die Walküre*

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[73] Jersild. *Romantikens Harmonik*. p97

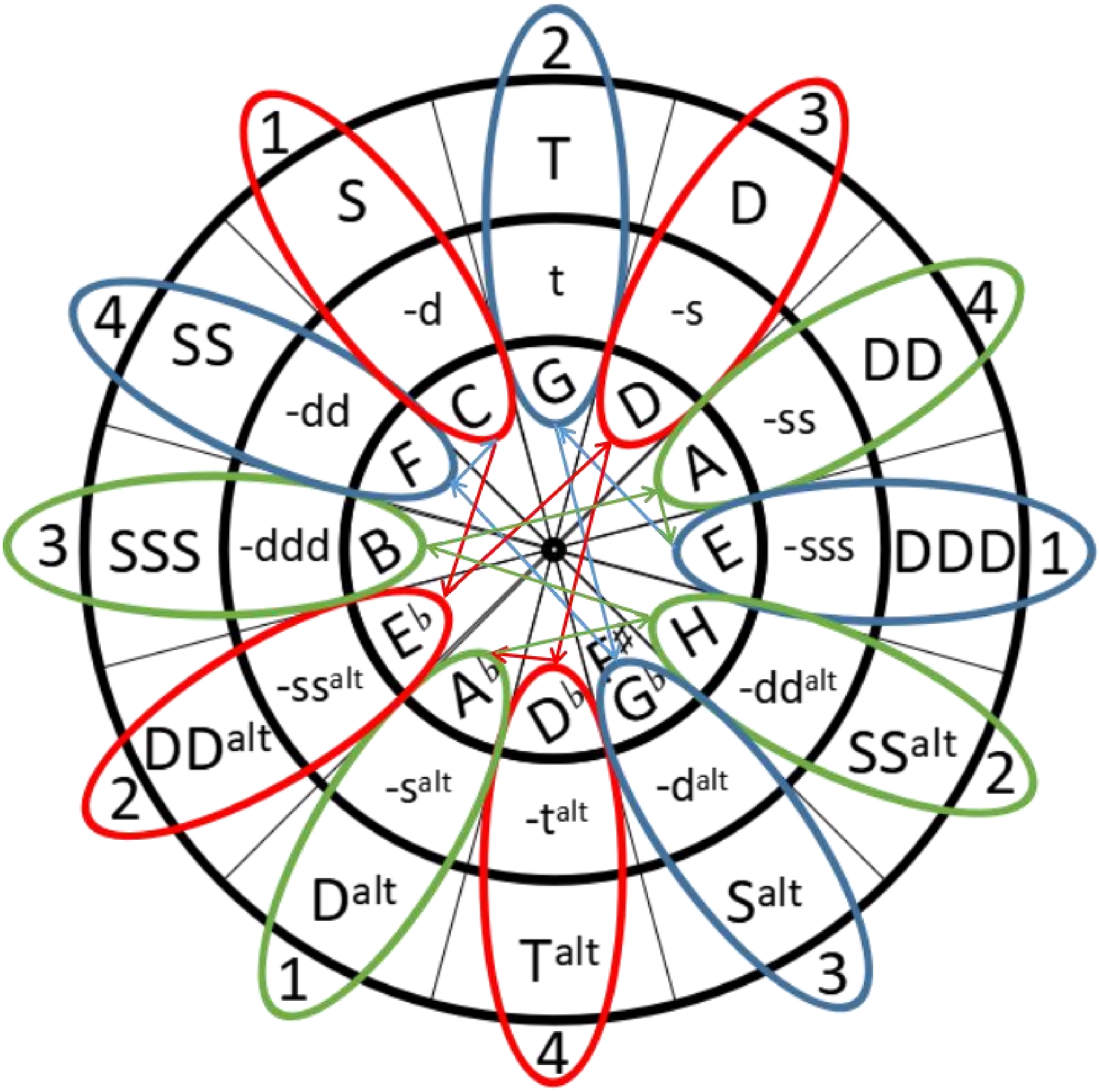

2
T
t
G
3
D
-s
D
4
DD
-ss
A
1
DDD
-sss
E
2
SSalt
-ddalt
H
3
Salt
-dalt
G♭
F#
4
Talt
-talt
D♭
1
Dalt
-salt
A♭
2
DDalt
-ssalt
E♭
3
SSS
-ddd
B
4
SS
-dd
F
1
S
-d
C

Figure 5.2: The function analysis circle for Wagner's *Die Walküre*

To relate all these functions to G major and still have an ongoing harmonic progression that we don't want to cut makes this a difficult task but very satisfying if completed. Its important to remember that different position categories like 3 and 2 are interchangeable as well as the idea that position 1 category can be replaced by a 4 position. Its all about how we interpret the positions that can make a smooth harmonic progression. In the first row the chords will be presented and in the second, third and fourth row will contain the function analysis and their re-interpretation for an ongoing harmonic progression, see table 5.2.

C	Eflat	D	C#dim	G#	H	B	Adim	E	G	F#dim	Fdim	C
S	DDalt	D	Talt no root	Dalt	4D	3D	DD<9 no root	3D	6Dalt	5D	4Dalt	S
			DD<9 no root				4D<9 no root				6Dalt<9 no root	
											Talt<9 no root	

Table 5.2: Functional Analysis of Wagner's *Die Walküre*

Here we get the result if we keep the tonic of G major in ongoing progression. We keep a current that is nice to behold and we let all chords use their own unique position in the system to locate and create a link to the tonic. I would like to comment some parts of the structure and why we reinterpret some of the functions in the analysis. Its safe to assume that the first chord is a subdominant then followed by a DDalt which continues the progression to D but here the <9 chord can be reinterpreted. As in the example with Franck this chord is interchangeable with either position category 3 or 2. Jersild also mentions that the functions D-T-D are not uncommon in Franck's music. This is also described in Söderholm's book. Since the rest is just a copy of this structure this is the ongoing sequence. I will continue with rest of the chords also since they give another colour to the harmonic progression then just changing tonic for every bar. When Wagner lets the tonic be reinterpreted as a dominant chord he displaces or postpones the harmony one step and when we reach The G#., it feels like we have reached a safe spot and then we are launched away a few position categories. Interestingly a position change occurs from 2-5 in this context which Jersild has missed to address in the book, but having the same structure as the other bars this is legitimate. I leave the treatise of the dominant to the composer. G# - Dalt is followed by H being 4D and then by B, 3D. We come to the next interpretation and the same procedure repeats as previous dim chord. The A dim is moved up from DD<9 to 4D<9 which moves into the next bar and E 3D. From E we take the next dramatic jump to G, which could be thought of as the tonic, but in the harmonic progression it gets the function 6Dalt moving to F# 5D to F dim. It moves up from 4D<9 to 6Dalt<9 and is re-interpreted again as a T<9 being a dominant chord to C. This connects the circle and is the last piece of the puzzle that was played out before me this summer as mentioned in the introduction.

5.2. Sten Ingelf, *Wanderers Nachtlied*, Franz Liszt

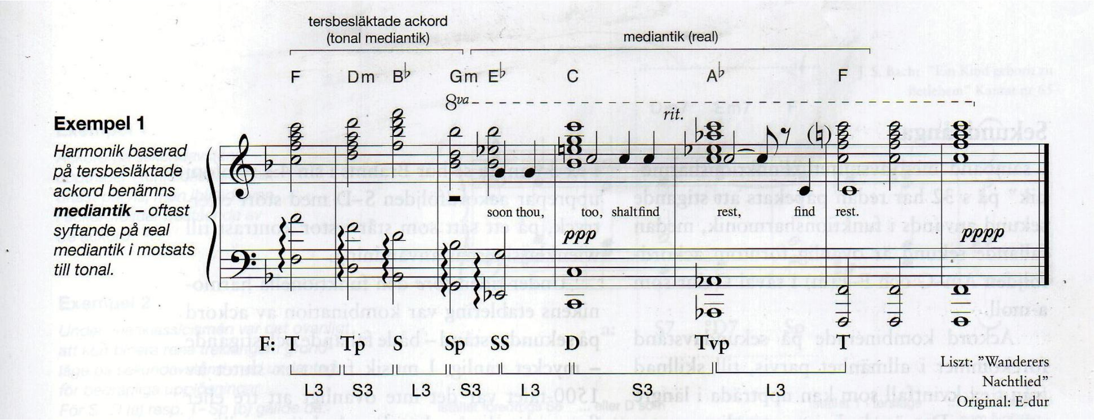
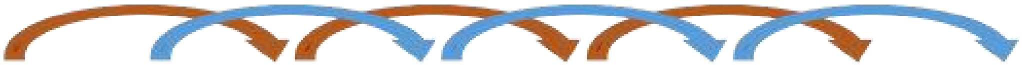

tersbesläktade ackord
(tonal mediantik)
mediantik (real)
F
Dm
B♭
Gm
E♭
C
A♭
F
8va
rit.
Exempel 1
Harmonik baserad på tersbesläktade ackord benämns mediantik – oftast syftande på real mediantik i motsats till tonal.
soon thou,
too,
shalt find
rest,
find
rest.
ppp
pppp
F: T
Tp
S
Sp
SS
D
Tvp
T
L3
S3
L3
S3
L3
S3
L3
Liszt: "Wanderers Nachtlied"
Original: E-dur

Figure 5.3: *Wanderes Nachtlied*, Franz Liszt

Studying the piece by Liszt, see figure 5.3, we see that there are two harmonic progression taking place alternating between each other, every other chord. The progression in the picture is severed and doesn't show this dual harmonic progression. In the chart below we are presented with a dual progression with an uncut progression to the tonic. Since we now have two progressions it could be argued that the first progression that ends on A flat should have a function that reflects conclusion of the progression. I will therefore use the tool of dual representation, reinterpreting the chord as a T2, indicating that it's not the final tonic but that that progression ends here. The A flat is therefore both a SSS and a T2, showing a link to the progression it was part of as well the end of the progression.

Here is the solution depicting the two progressions, see table 5.3



F	dm	Bb	gm	Eb	C	Ab	F
T	-sss	S	-ss	SS	D	SSS	T1
						T2	

Table 5.3: Functional Analysis of Liszt's *Wanderes Nachtlied*

5.3. Sten Ingelf, *Doctor Gradus ad Parnassum*, Claude Debussy

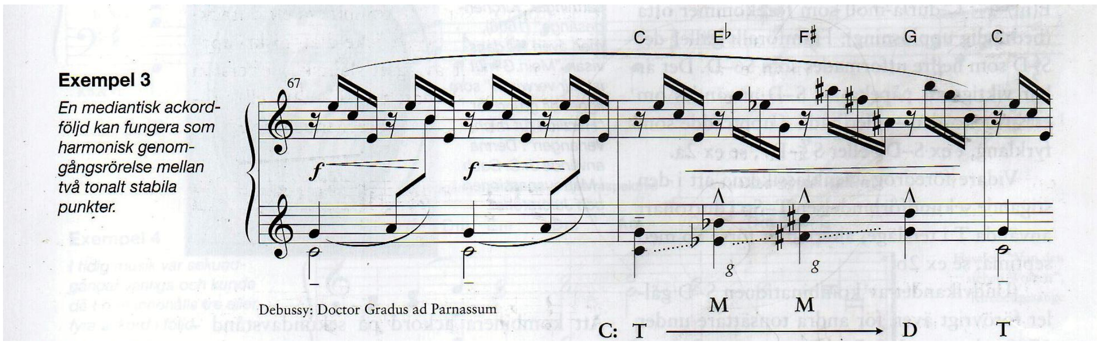

Exempel 3
En mediantisk ackordföljd kan fungera som harmonisk genomgångsrörelse mellan två tonalt stabila punkter.
67
C
E♭
F♯
G
C
f
f
g
g
M
M
C: T
D
T
Debussy: Doctor Gradus ad Parnassum

Figure 5.4: *Doctor Gradus ad Parnassum*, Claude Debussy

There is a great difference between different mediants and how their direction is in music. The symmetry in this set of chords, see figure 5.4, consists of small thirds. Chords located at a symmetrical distance have a quality that they are inversions of themselves. The musical experience is that we hear the music moving but the harmony does not. In this example, I realise that Debussy is using a diminished scale and diminished chords that can be explained as either subdominants or incomplete dominants with a lowered 9th. In this case the progression ends on a tonic and is followed by a dominant. Listening to the mediant chords I conceive them as subdominant without the F as a tonic since they are diminished and lowered 9th. The progression turns out just to be an S<9 without F. The cadence structure looks like this although the subdominant chord has been tampered with T-S-D-T

This is how the progression should be described if not using M.

C	Eb	F#	G	C
T	S<9 7	S <9	D	T

Table 5.4: Functional Analysis of Debussy's *Doctor Gradus ad Parnassum*

5.4. Valdemar Söderholm, *Example 368*, Johannes Brahms

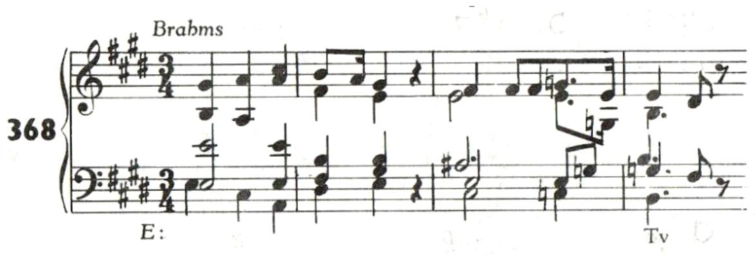


Figure 5.5: Example 368 Brahms

What can the last chord be if it is not a Tv? Well, is it a form of tonic at all? When we stop at this chord we can feel that it wants to resolve and in that case it is not a tonic, since the tonic represents total relaxation, see figure 5.5. How we use the term Tv is explained[74] by Söderholm. As he states:

"Music in minor keys often ends in major. One denotes this major chord as a variation of the minor tonic."[75]

Söderholm also mentions that the term Tv can be used ending a minor piece in major or vice versa ending a major piece in minor:

"The variant designation was also used in the change from major to minor"[76]

It is strange to me that he then decides to use this function in the middle of a progression that also has an aim to resolve. It was said that the term should be used in the end of a piece to suggest minor or major, not in the middle and especially not is progressions. I guess that there is no closer term that can provide a description of the function and therefore Tv is as close as he can get. When Ingelf changes from using the signs º and + to small and big letters, he provides a solution. That is to let Tv be a Ds. This function can at least show the location of the function but not why it has a tendency to resolve. Having read Levy, another solution is presented and that is that e minor chord is a negative dominant and that is why it wants to resolve. In this case it would be given the function D-d. That shows a resolution toward the dominant chord.

The piece is written in E major the function D-d resolves then to H major which is the dominant in this piece.

C	em	H
~~DDalt~~	D-d	D

Table 5.4: Functional Analysis of Brahms's *Example 368*

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[74] Söderholm, *Harmonilära*. p106.

[75] Söderholm, *Harmonilära*, Trans Joel bergström. p106.

[76] Söderholm, *Harmonilära*, Trans Joel bergström. p106.

6. Composition with support of the new model

6.1. Edith Södergran

I was given a task by my teacher in conducting, Jan Yngwe, professor of choir singing and conducting at the Academy of Music and Drama, University of Gothenburg, to compose a choral for a choir and conduct it. I was at that time reading Edith Södergran's, 1892-1923, poetry *Dikter*[77] *(Poems).* She is considered to have been one of the greatest modern Swedish-language poets. I am fascinated by her way of building emotional pictures with a mythically, naturalistic, and Nordic sound by using words of certain voice and rhythm. I chose to compose music to her poem Nocturne:

"Silverskira månskenskväll,
nattens blåa bölja,
glittervågor utan tal
på varandra följa.
Skuggor falla över vägen,
strandens buskar gråta sakta,
svarta jättar strandens silver vakta.
Tystnad djup i sommarens mitt,
sömn och dröm, -
månen glider över havet
vit och öm."[77]

and translated to English:

"Moonlit evening, silver clear
and the night's blue billows,
sparkling waves, numberless,
follow one another.
Shadows fall along the path,
on the shore the bushes softly weep,
black giants guard its silver in their keep.
Silence deep in summer's midst,
sleep and dream, -
the moon glides out across the sea
white tender gleam."[78]

Södergran has a lyrical touch to her poems that I as a composer appreciate. It makes it easy to put music to her text. The Nocturne depicts different scenes during night-time. This give me an impression of calmness yet a deceitful landscape. I wish the tempo to be slow, feeling like a summers breeze. The start of her poem describing the moon, the night and the sea gives an association to the colour blue, which sets me to write the piece in d-minor. This key conveys the lyrical dreamlike, yet haunting scenery of the dark night approaching. The main melody is is used three times in the piece. In the beginning, the middle with a sequence, and in the end. I associate this melody with the moon. The melody has then been the strongest factor in determining the harmonic language. It has also set a framework from what kind of musical language I wish to convey when not using the melody. This piece was written before I had my analysis system.

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77. Edith Södergran. *Dikter* (Stockholm:Wahlström & Widstrand, 2012)
78. Edith Södergran. Trans David McDuff *Complete poems* (Madison: Bloodaxe Books, 1984)

I start with the sopranos and Altos on the same tone and from it they split apart, creating two lines that can not confirm a harmonic structure. This makes it possible to move to other places that otherwise would suggest a certain harmonic progression. Musically this adds the feeling of the deceitful landscape. After the melody, all parts come in and join with a cadence to D major. To depict the waves I let the sopranos up on a high note reflecting the image of a wave falling. The bass and the tenor starts instead in a low register depicting the build up of a wave and when we reach the words "*follow one another*" all parts move together in line, landing on a subdominant that suggests calm movement. The text then observes shadows and creates a concern to this passage, I let the parts join the sopranos on the third beats, making the section off-beat. In bar 11 the concern level is turned up a little more, by using a chromatic scale in the bass line, modulating the progression to the dominant. The dominant is followed by silence before a sequence enters with the main melody in bass and tenor. A bar later the sopranos and altos enter with the main melody. The bass line split to two lines making parallel fifths. This is intended to make a tight feeling and a dense structure. Here Södergran changes focus in the text observing "*silence deep in the midsummers midst*" Here I associate summer to the colour green and change the harmonic landscape to e Phrygian. Previous to this section we had a dense sound altogether so here I choose to narrow it down and burst out into lyricism. The sopranos sing the text and to enhance the word silence, I let the Altos sing on *Con Bocca Chiusa*. This section ends with the two lines merging into one. This makes it feel like the piece could end but is meant as an affect for the following words "*sleep and dream*" and here we wake up from our dreamlike state and observe the moon once again before the piece comes to an end. Listen to Audio 1 - *Nocturne*[79] to hear the result.

By analysing this piece, I can see that the function analysis describes the position to the tonic and when there is a harmonic progression it can be shown without using the parallels if wished. It can also show cadences to the tonic from both sides of the fifth, making more options of harmonic expression. It's another way to to think but it soon becomes natural and it gives another viewpoint in understanding how function harmony can work.

Comparing the two choral works, I see that there is an originality in the use of tonal language. It's interesting to see how I worked with music before and after the creation of the new functional analysis model. The first piece, although intentional, keeps itself to one place and is nice but not challenging considering harmonic progression or in combining different elements with each other although the components are there. In the second piece it is more of everything already and I dare to do more of what I want. Reading Södergran's poems in the very beginning, before I had written any music, I remember looking at the poem *Stjärnorna* and thinking that its to difficult to set music to this one. This poem required more from me to undertake it. After having learnt the chromatic function analysis it became a tool that has given me a broader palette of colours to choose from. I then felt ready to take on the second piece for composing.

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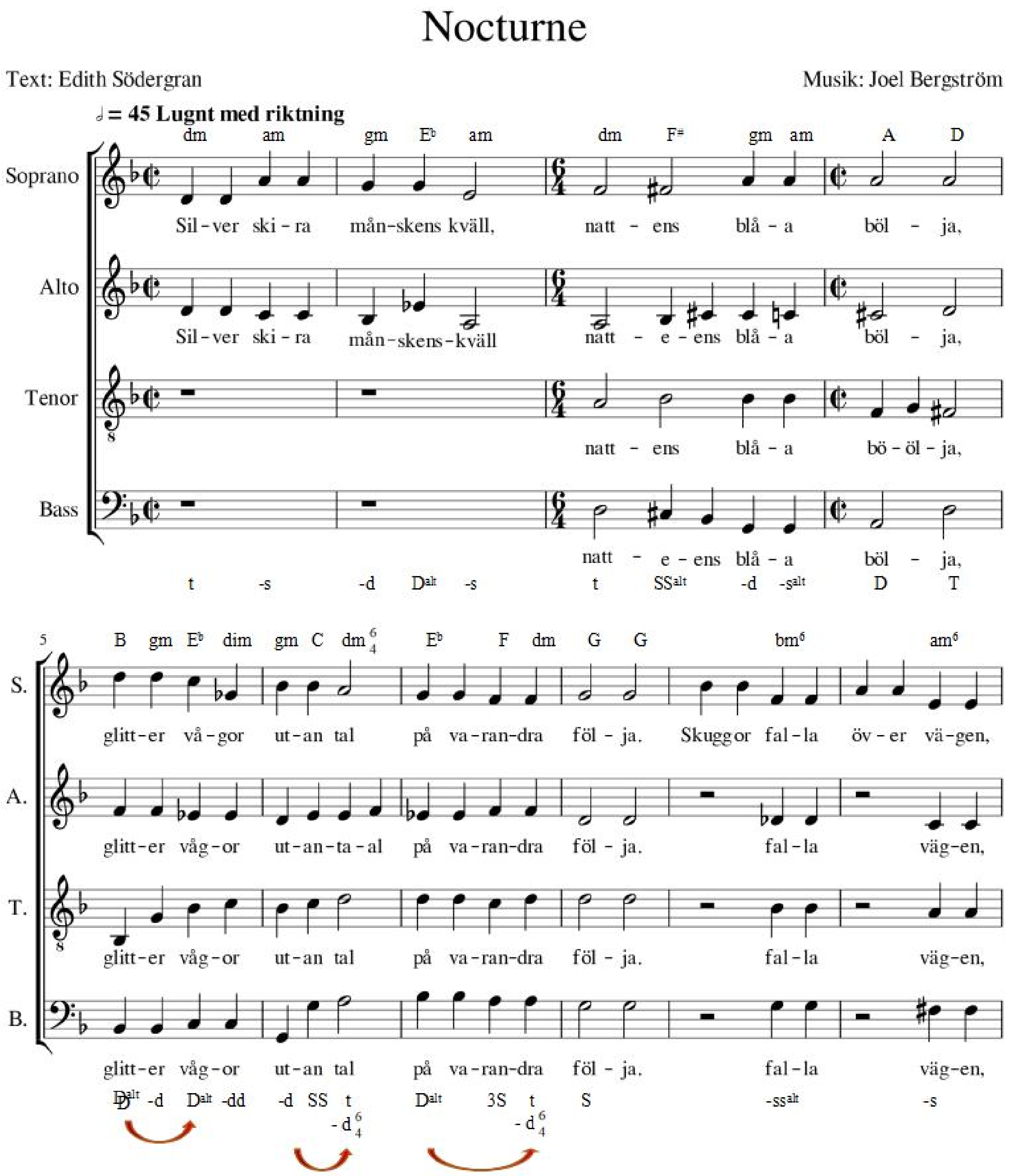
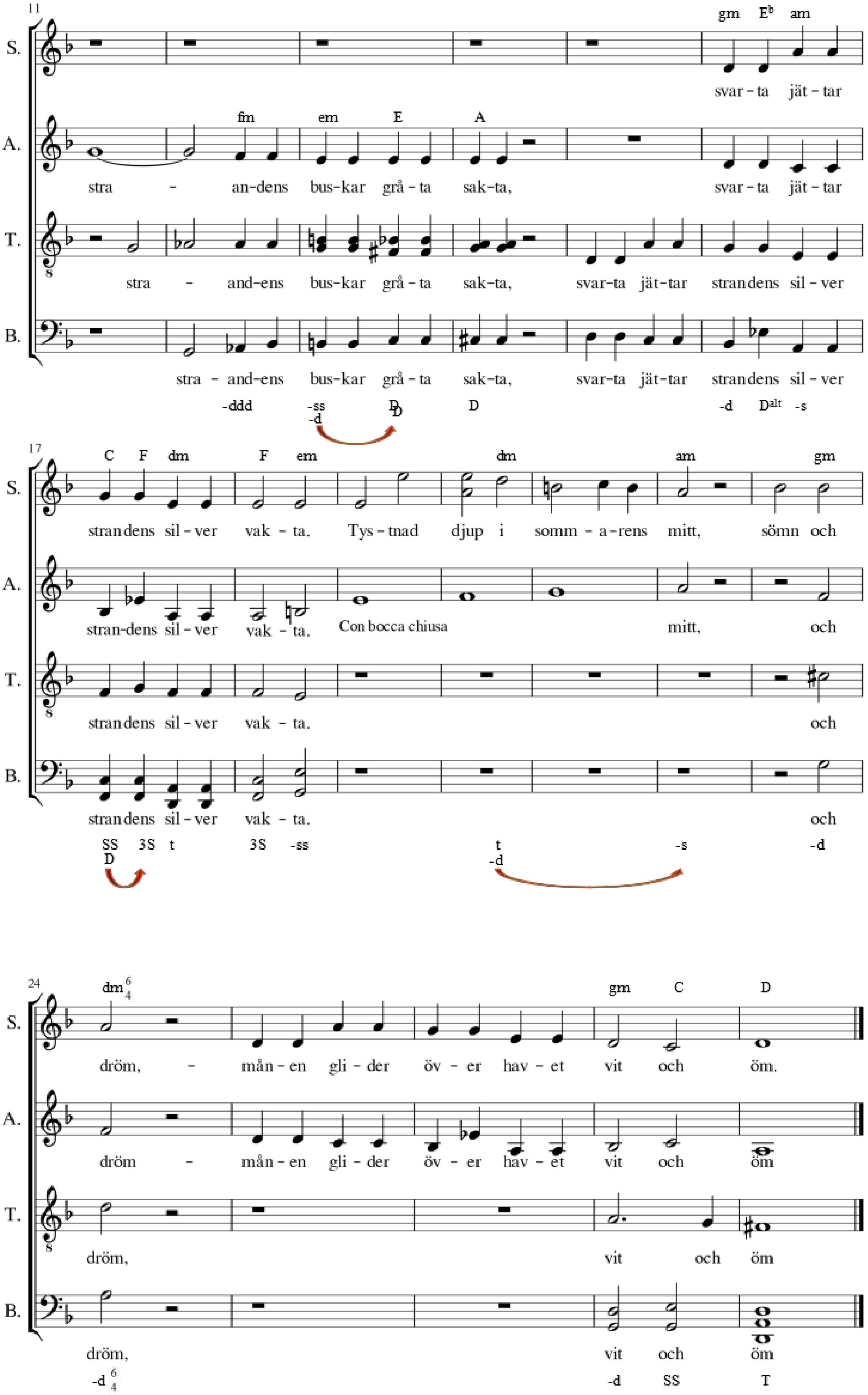
[79] Audio 1: Joel Bergström, *Nocturne*, HSM Church Musician Choir, conducted by Joel Bergström, recorded May 24, 2017, WAV format.

6.2. Function Analysis of *Nocturne*


Nocturne
Text: Edith Södergran
Musik: Joel Bergström
= 45 Lugnt med riktning
Soprano
Alto
Tenor
Bass
dm am gm E♭ am dm F# gm am A D
Sil-ver ski-ra mån-skens kväll, natt - ens blå - a böl - ja,
Sil-ver ski-ra mån-skens-kväll natt - e - ens blå - a böl - ja,
natt - ens blå - a bö - öl - ja,
natt - e - ens blå - a böl - ja,
t -s -d Dalt -s t SSalt -d -salt D T
5
S.
A.
T.
B.
B gm E♭ dim gm C dm 6/4 E♭ F dm G G bm6 am6
glitt-er vå-gor ut-an tal på va-ran-dra föl - ja. Skuggor fal-la öv - er vä-gen,
glitt-er våg-or ut-an-ta-al på va-ran-dra föl - ja. fal-la väg-en,
glitt-er våg-or ut-an tal på va-ran-dra föl - ja. fal-la väg-en,
glitt-er våg-or ut-an tal på va-ran-dra föl - ja. fal-la väg-en,
Dalt -d Dalt -dd -d SS t Dalt 3S t S -ssalt -s
-d 6/4 -d 6/4


11
S.
A.
T.
B.
gm E♭ am
fm em E A
svar - ta jät - tar
stra - an-dens bus-kar grå - ta sak-ta, svar - ta jät - tar
stra - and-ens bus-kar grå - ta sak-ta, svar-ta jät-tar strandens sil - ver
stra - and-ens bus-kar grå - ta sak-ta, svar-ta jät-tar strandens sil - ver
-ddd -ss -d D D D -d Dalt -s
17
C F dm F em dm am gm
strandens sil - ver vak - ta. Tys - tnad djup i somm - a-rens mitt, sömn och
stran-dens sil - ver vak - ta. Con bocca chiusa mitt, och
strandens sil - ver vak - ta. och
strandens sil - ver vak - ta. och
SS D 3S t 3S -ss t -d -s -d
24
dm 6 4 gm C D
dröm, - mån - en gli - der öv - er hav - et vit och öm.
dröm - mån - en gli - der öv - er hav - et vit och öm
dröm, vit och öm
dröm, vit och öm
-d 6 4 -d SS T

6.3. Composition and Function Analysis of *Stjärnorna*

The poem *Stjärnorna,* is a poem from Edith Södergran's poetry *Dikter*[80] *(Poems)*, also depicts a nightly environment. In it she witnesses the stars. She hears a star falling and then warns the reader not to walk in her garden since it is full of splinters. At this point I was done with my chromatic function analysis and could use it as an instrument in my composition. The poem *Stjärnorna* goes like this:

"När natten kommer
står jag på trappan och lyssnar,
stjärnorna svärma i trädgården
och jag står ute i mörkret.
Hör, en stjärna föll med en klang!
Gå icke ut i gräset med bara fötter;
min trädgård är full av skärvor."[80]

and translated to English:

"When night comes
I stand on the stairway and listen,
the stars are swarming in the garden
and I am standing in the dark.
Listen, a star fell with a tinkle!
Do not go out on the grass with bare feet;
my garden is full of splinters."[81]

Just like the poem Nocturne I started out creating a main melody out of the words "*When night comes"*. I then made a second melody from another section in poem where the "*stars are swarming in the garden"*. This poem is not just scary with closing night but she also warns us of the danger, we are not aware of. Therefore I find a worried tone in this poem. I choose then to have a more harsh tonal language to convey this worried feeling. I make use of a chromatic scale when I made my melodies. The first melody represents the worried tone and the the second describes the many stars moving and falling. The piece starts with Altos singing the melody and is then taken over by he Tenors. All parts join in the new section depicting all the stars swarming in the garden. In the beginning of this part I use a lot of chromaticism, to make us not be able to tell how many stars there are. The text then changes to her standing alone and here the word alone to me is associated to h-minor. I let the parts join together from the chromaticism and go from a dense rich sound to a shallow interval f-f#. The basses then start with the first melody and a few bars latter the sopranos enter with second melody and the two melodies merge. The text ends at this part with "*listen"* which is followed by a pause. At this part in the poem is where everything takes a turn and something bad could happen. I have also made sure that at this point we have reached the golden ratio in the piece. The piece is 24 bars and the golden ratio is 14,8 which i set to 15 instead. To make an extra effect out of this place i choose to put a c# minor chord here which is a tritone away from g minor. All parts come in to form a really dense chord to make an effect. The altos continue and there is a sequence between all parts over the text "*Do not go out on the grass with bare feet"* to urge the listener to listen to her words. To colour the word splinters at the end I let the sopranos and altos join in one by one making a cluster built on the chromatic scale that has been the key ingredient of this composition. This let us feel the sharpness of the splinters. The bass and tenor join in on the upbeat to the last chord.

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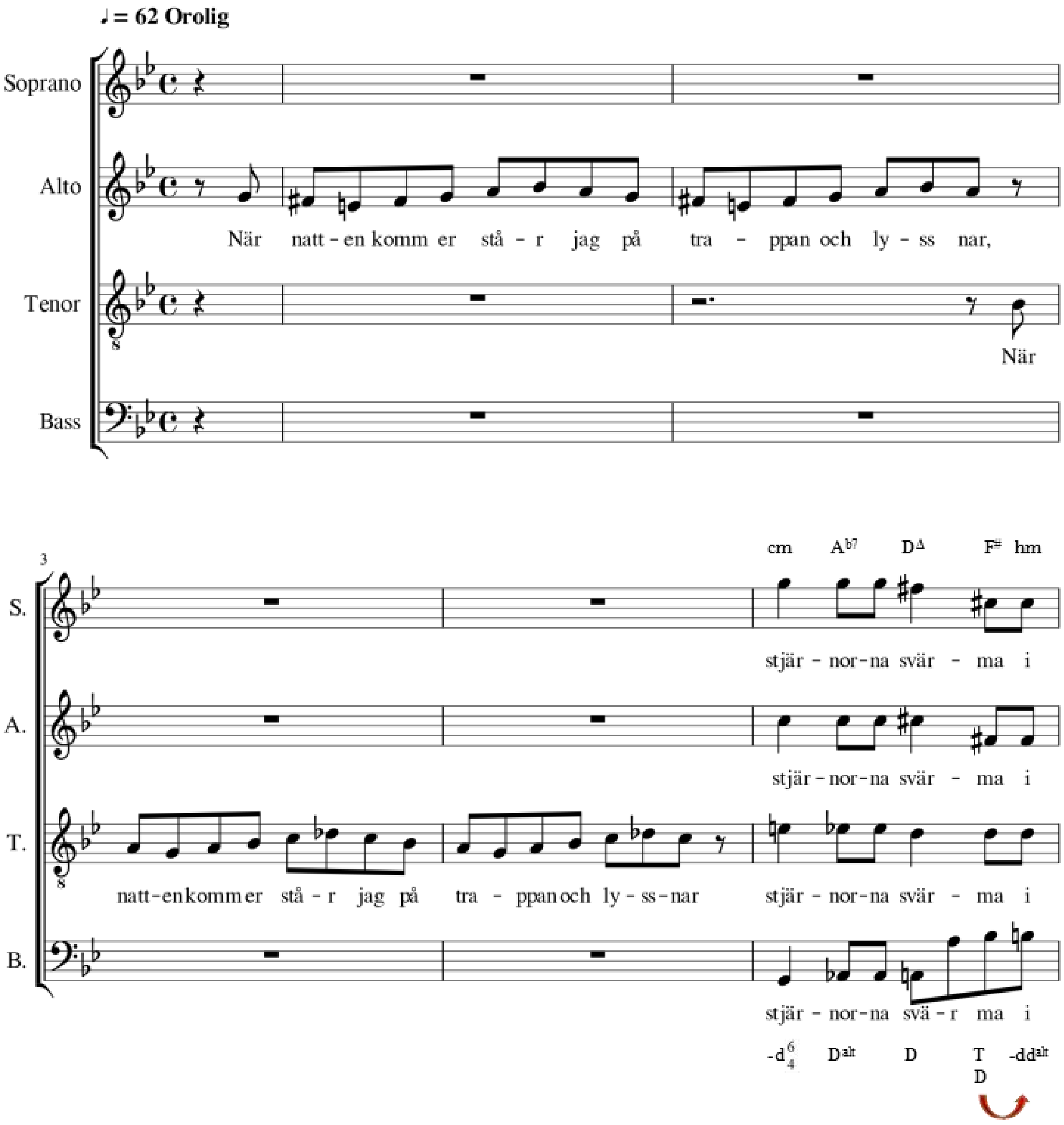
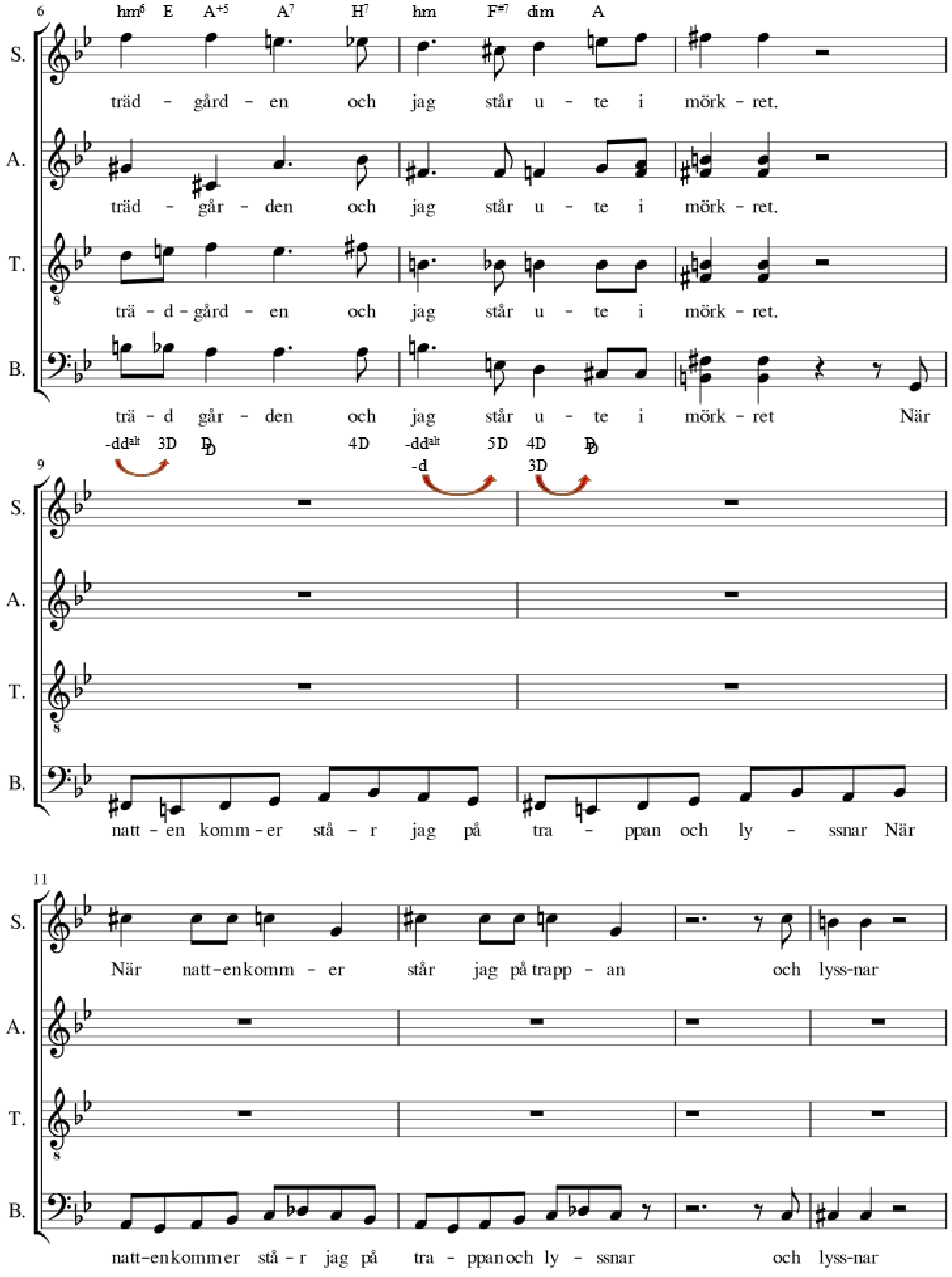
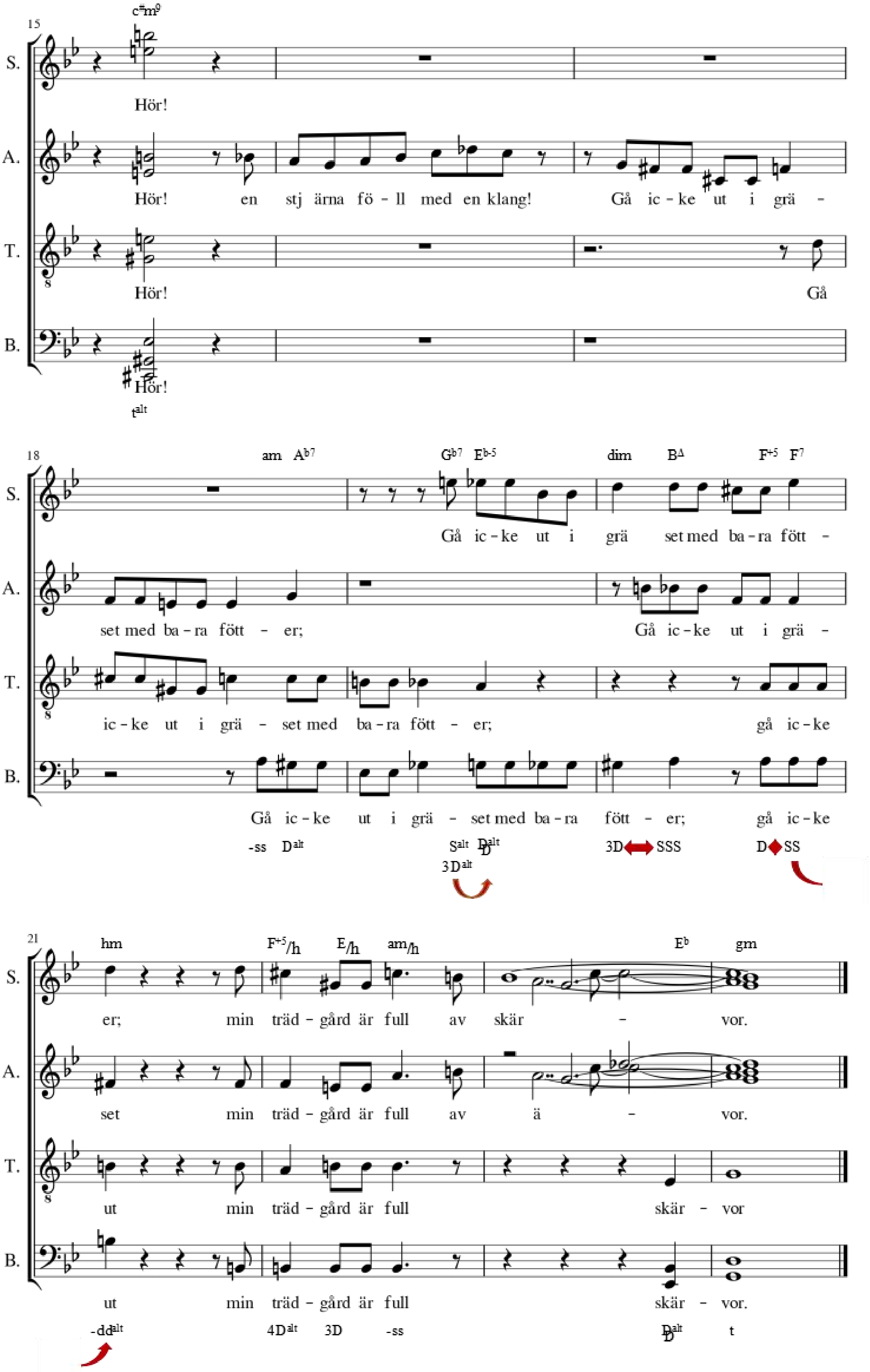
80. Edith Södergran. *Dikter* (Stockholm:Wahlström & Widstrand, 2012)
81. Edith Södergran. Trans David McDuff *Complete poems* (Madison: Bloodaxe Books, 1984)

Stjärnorna

Text: Edith Södergran
Musik: Joel Bergström


♩ = 62 Orolig
Soprano
Alto
Tenor
Bass
När natt - en komm er stå - r jag på tra - ppan och ly - ss nar,
När
3
S.
A.
T.
B.
cm A♭7 DΔ F♯ hm
stjär - nor-na svär - ma i
stjär - nor-na svär - ma i
natt-enkomm er stå - r jag på tra - ppanoch ly - ss-nar
stjär - nor-na svär - ma i
stjär - nor-na svä - r ma i
-d 6 4 Dalt D T D -ddalt


6
hm6 E A+5 A7 H7 hm F#7 dim A
S.
träd - gård - en och jag står u - te i mörk - ret.
A.
träd - går - den och jag står u - te i mörk - ret.
T.
trä - d - gård - en och jag står u - te i mörk - ret.
B.
trä - d går - den och jag står u - te i mörk - ret När
-dd alt 3D D 4D -dd alt 5D 4D D
-d 3D
9
S.
A.
T.
B.
natt - en komm - er stå - r jag på tra - ppan och ly - ssnar När
11
S.
När natt-en komm - er står jag på trapp - an och lyss-nar
A.
T.
B.
natt-en kommer stå - r jag på tra - ppan och ly - ssnar och lyss-nar


15
c#m9
S.
A.
T.
B.
Hör!
Hör! en stj ärna fö - ll med en klang! Gå ic - ke ut i grä -
Hör! Gå
Hör!
talt
18
am Ab7
Gb7 Eb-5
dim BΔ F+5 F7
Gå ic - ke ut i grä set med ba - ra fött -
set med ba - ra fött - er; Gå ic - ke ut i grä -
ic - ke ut i grä - set med ba - ra fött - er; gå ic - ke
Gå ic - ke ut i grä - set med ba - ra fött - er; gå ic - ke
-ss Dalt
Salt Dalt
3Dalt
3D SSS
D SS
21
hm
F+5/h E/h am/h
Eb gm
er; min träd - gård är full av skär - vor.
set min träd - gård är full av ä - vor.
ut min träd - gård är full skär - vor
ut min träd - gård är full skär - vor.
-ddalt
4Dalt 3D -ss
Dalt t

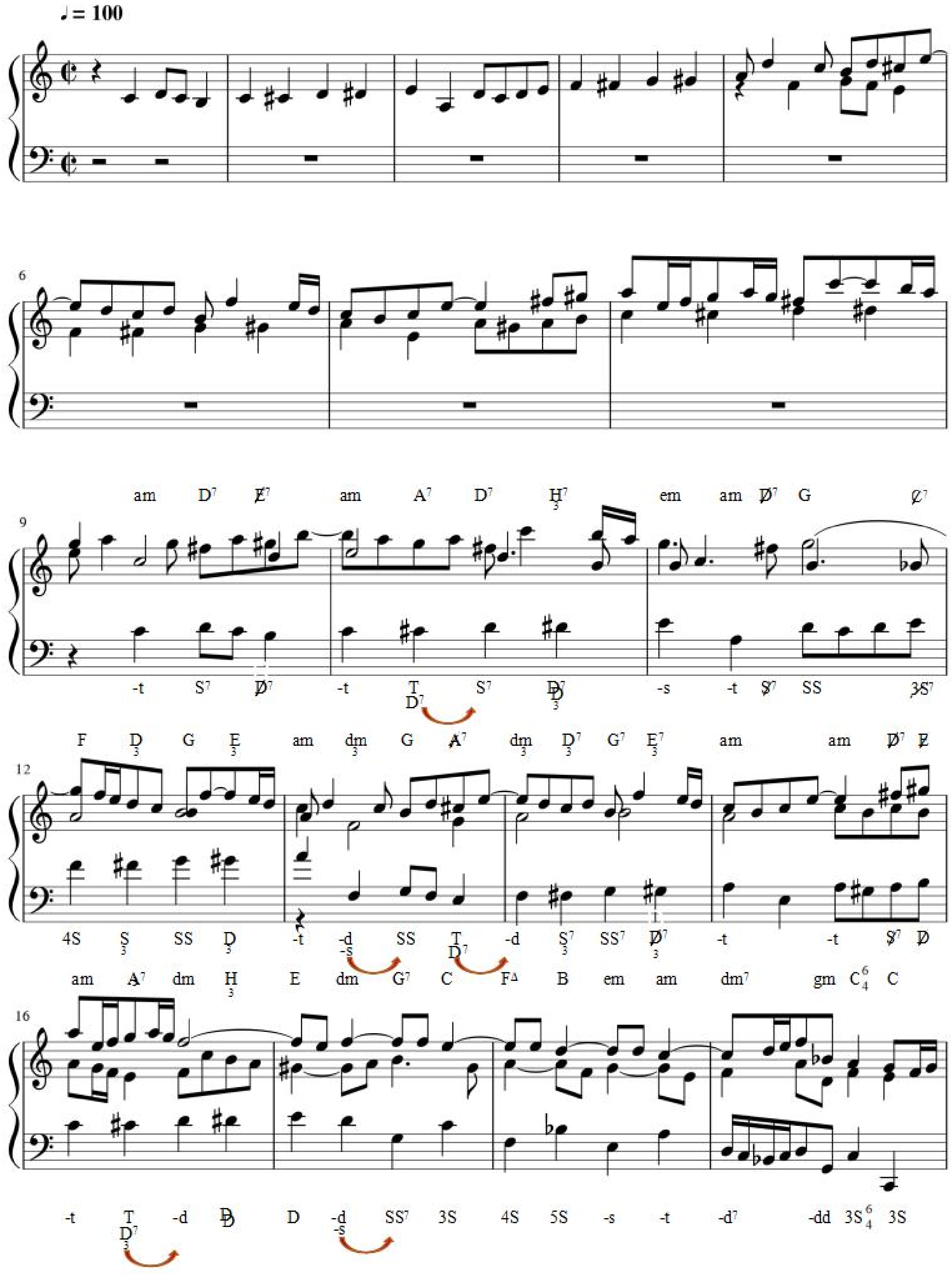
6.4. Composition and Function Analysis of *Kromatisk Fuga A-moll*

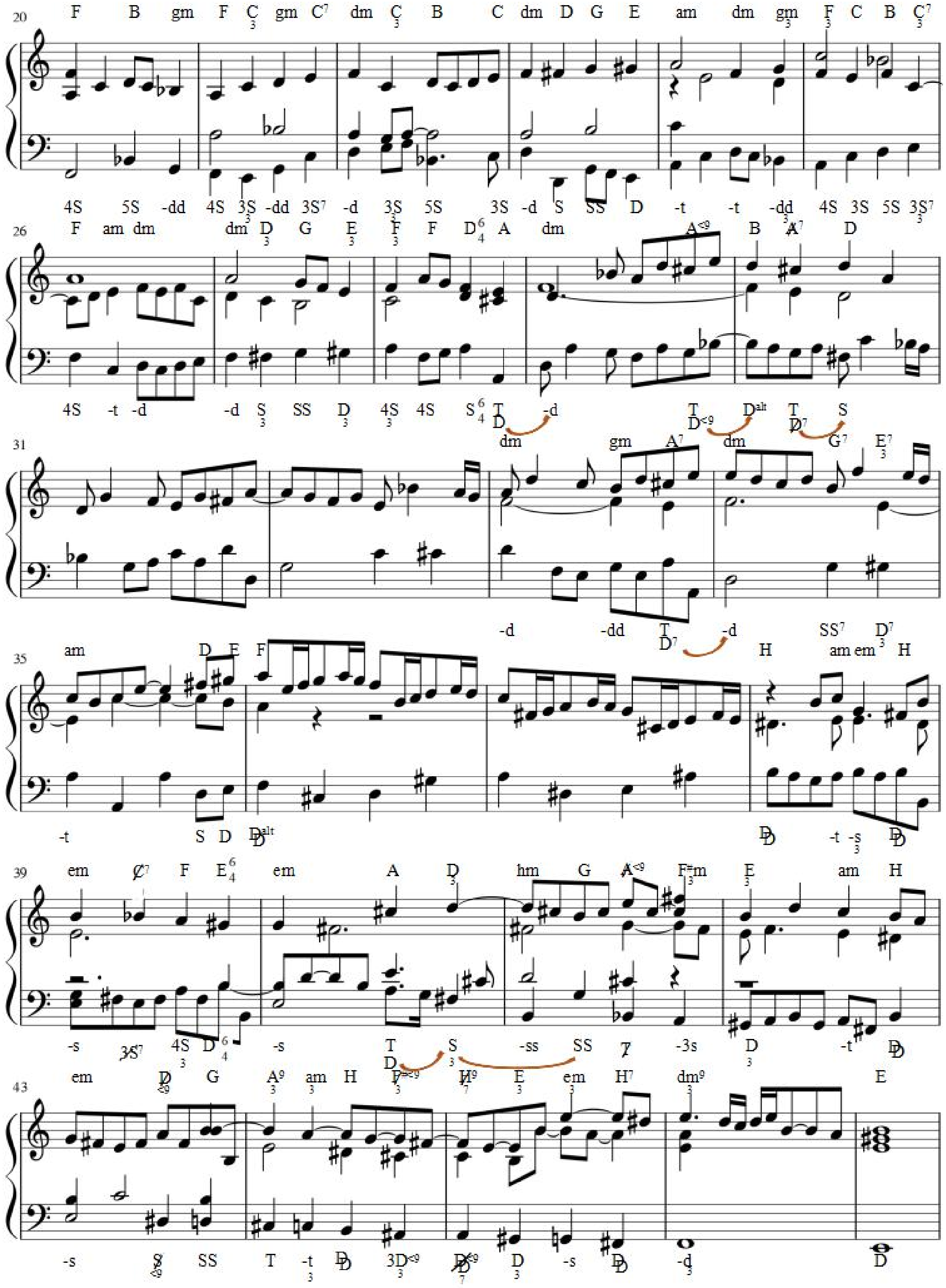
In my course Counterpoint 2, Second Cycle, I got the task to compose a fuge by my teacher Joel Eriksson, Senior lecturer at the Academy of Music and Drama at the University of Gothenburg.

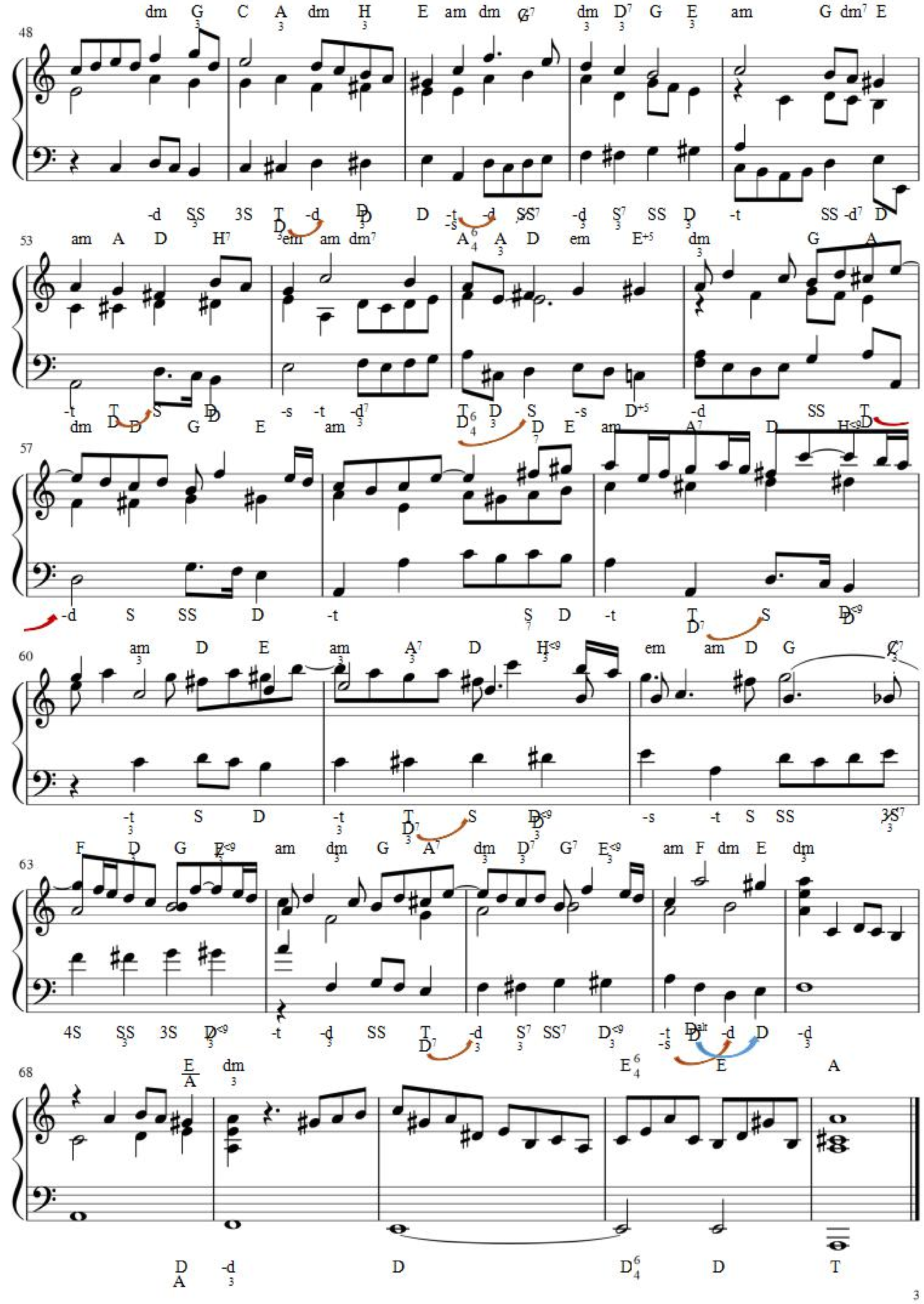
We have gone through a lot of different styles and how fugues were written in different periods. The fugue was supposed to be written in Baroque style and I was very limited to a harmonic language to convey the musical praxis convention of that time. Making an analysis became interesting, since I was limited to mostly functions that represented the scale and not to far fetched harmonic relations. The functions that represent the relative parallels take some time to get used to but knowing that these chords can replace the main triad, the new function shows both the harmonic progression and works as a substitute chord. In this piece I could have used the relative parallels but I chose to try to keep myself to the functions with progression as much as I could. I decided to make the fugue chromatic with three themes presented and then put together in the end, making the fugue complete. I decided then to present all the functions related to the tonic all throughout the piece. I realized that even though I write music that not always follows a clear order, the system does the best to explain the patterns. It takes some time to learn how the two currents of major and minor alternate but once we get a grip of that, the system shows the harmony very well and better than using the parallels. The first theme is a chromatic ascending line which is then followed by a counter subject. This counter subject is also my second theme that I develop later in the piece. After a fourth entry of the first theme the music continues by a sequence and lands in F major. Here I keep it calm and let the theme enter two times before making a cadence to d minor developing the counter subject with entries of its own. The new counter subject that is used, is the third theme that binds the three themes together in the end. After the entries of the second theme, there is an episode. From this part on the third theme is starting to take form and I let the first theme be the counter subject but I don't want give it all away yet so I have inverted the first theme upside down. After some time the inverted theme enters in the bass, but dramatically continues far down until it reaches the function -d. This function really conveys the thought linking the progression to E major that is the dominant that brings us back to a minor. At this time all the three themes are present together. They reach a climax and form a cadence that begins the coda. The bass lands on a pedal point and the piece finishes in A major.

Kromatisk Fuga A-moll

Joel Bergström


♩ = 100
6
9
am D7 F7 am A7 D7 H7 em am D7 G C7
-t S7 D7 -t T D7 S7 D7 -s -t S7 SS 3S7
12
F D G E am dm G A7 dm D7 G7 E7 am am D7 E
4S S SS D -t -d -s SS T D7 -d S7 SS7 D7 -t -t S7 D
16
am A7 dm H E dm G7 C F∆ B em am dm7 gm C6/4 C
-t T D7 -d D D -d -s SS7 3S 4S 5S -s -t -d7 -dd 3S6/4 3S


20
F B gm F C gm C7 dm C B C dm D G E am dm gm F C B C7
4S 5S -dd 4S 3S -dd 3S7 -d 3S 5S 3S -d S SS D -t -t -dd 4S 3S 5S 3S7
26
F am dm dm D G E F F D64 A dm A<9 B A7 D
4S -t -d -d S SS D 4S 4S S64 T D -d T D<9 Dalt T D7 S
31
dm gm A7 dm G7 E7
-d -dd T D7 -d SS7 D7
35
am D E F H am em H
-t S D Dalt D -t -s D
39
em C7 F E64 em A D hm G A<9 F#m E am H
-s 3S7 4S D64 -s T D S -ss SS 7 -3s D -t D
43
em D<9 G A9 am H F#<9 H9 E em H7 dm9 E
-s S<9 SS T -t D 3D<9 D<9 D -s D -d D


48
dm G C A dm H E am dm G7 dm D7 G E am G dm7 E
-d SS 3S T D -d D D -t -s -d SS7 -d S7 SS D -t SS -d7 D
53
am A D H7 em am dm7 A6/4 A D em E+5 dm G A
-t T D S D -s -t -d7 T6/4 D S -s D+5 -d SS T D
dm D D G E am D6/4 D E am A7 D H<9 D
57
-d S SS D -t S D -t T D7 S D<9
60
am D E am A7 D H<9 em am D G C7
-t S D -t T D7 S D<9 -s -t S SS 3S7
63
F D G E<9 am dm G A7 dm D7 G7 E<9 am F dm E dm
4S SS 3S D<9 -t -d SS T D7 -d S7 SS7 D<9 -t -s Dalt -d D -d
68
E/A dm E6/4 E A
D/A -d D D6/4 D T
3

7. Conclusion

The research conveyed within this degree project is based upon below four research questions:

1. Is it possible to design a fixed chromatic function analysis model that enables a simple way of understanding advanced harmony?

   I managed to work out a chromatic function analysis with fixed position for each tone in the scale, ordering them in position, by their progression distance to the tonic. Removing the structure based on thirds, I let the structure based on the fifth take a larger roll in explaining functions relations. Having one strong structure makes the whole system easier to understand. The result of having one structure was that it became easier to see how progressions are linked and how they move towards the tonic. Learning how progression works help to understand advanced harmony. I added two concepts to my theory. One of these is the concept of dual representation that allows a reinterpretation of the chords. A chord has both a function relating it to its previous chord and that to the following chord. This helps to understand harmony. The second concept is something I call split function analysis which I want to introduce from learning about slash chords. Having more than one progression going on simultaneous, we can, just as describing a slash chord, do so with functions, depicting this phenomenon. This also give solutions when we meet with advanced harmony.

2. Can I make a system that always shows the direction in harmony and keep a positioning system?

   By letting the structure be based on the resolving dominant chords and their negative inversions, I could show direction in harmony and keep a positioning system.

3. Can this system be used to offer other viewpoints in describing function harmony?

   Changing the structure to be based on the fifth, I gave that structure a more significant roll in detailing the functions. By adding the use of negative inversions of the dominant chord, It became possible to give another way of showing how functions relate to each other and how they work alternating between the two currents to the tonic.

4. Will this system support my creativity as an artist in the process of composing?

   Looking at my compositions the experience was that I felt more confident in my way of making music. I could understand beforehand how I wanted parts of the music to sound and the system could confirm that what I am doing is as I want to. With this confidence I dared to go further with my music and to express myself more. The chromatic function analysis instrument both supports me and enforces my artistic process in the arts of composition.

7.1. Suggestion for further studies in the area

Suggestion for further studies would be to investigate how the fixed chromatic function analysis model can support analysis of improvisations patterns and techniques, to be used in improving artistic improvisation skills. This subject will be addressed in my Master Thesis.

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Audio files

Audio 1: Joel Bergström, *Nocturne*, HSM Church Musician Choir, conducted by Joel Bergström, recorded May 24, 2017, WAV format.

Appendix A - *Bergström's Chromatic Function Analysis Circle*

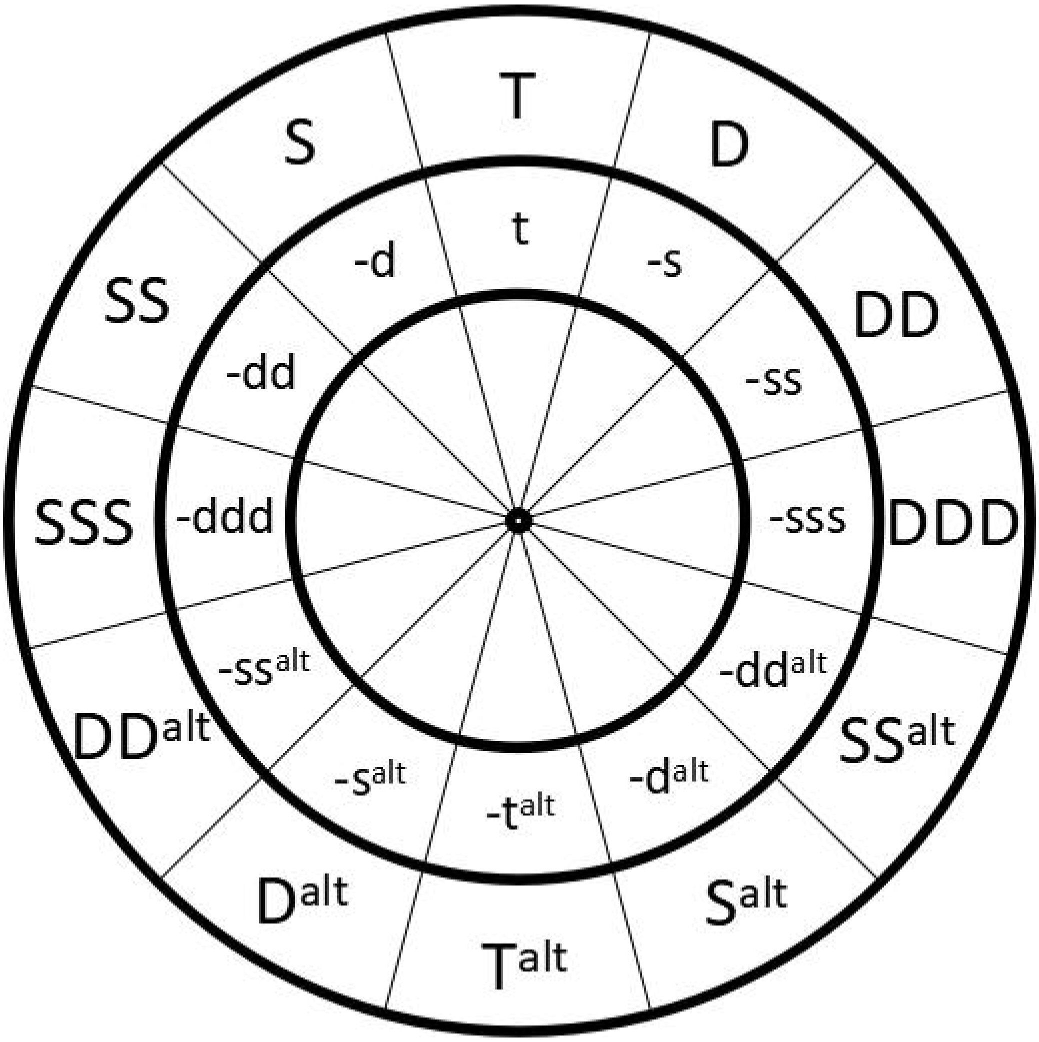

T
D
DD
DDD
SS^{alt}
S^{alt}
T^{alt}
D^{alt}
DD^{alt}
SSS
SS
S
t
-s
-ss
-sss
$-dd^{alt}$
$-d^{alt}$
$-t^{alt}$
$-s^{alt}$
$-ss^{alt}$
-ddd
-dd
-d

Figure 1: Chromatic Function Analysis Outer and Middle Circle

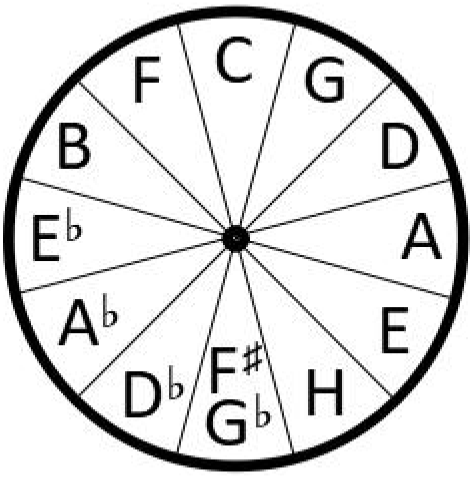

C
G
D
A
E
H
F♯
G♭
D♭
A♭
E♭
B
F

Figure 2: Chromatic Function Analysis Inner Circle

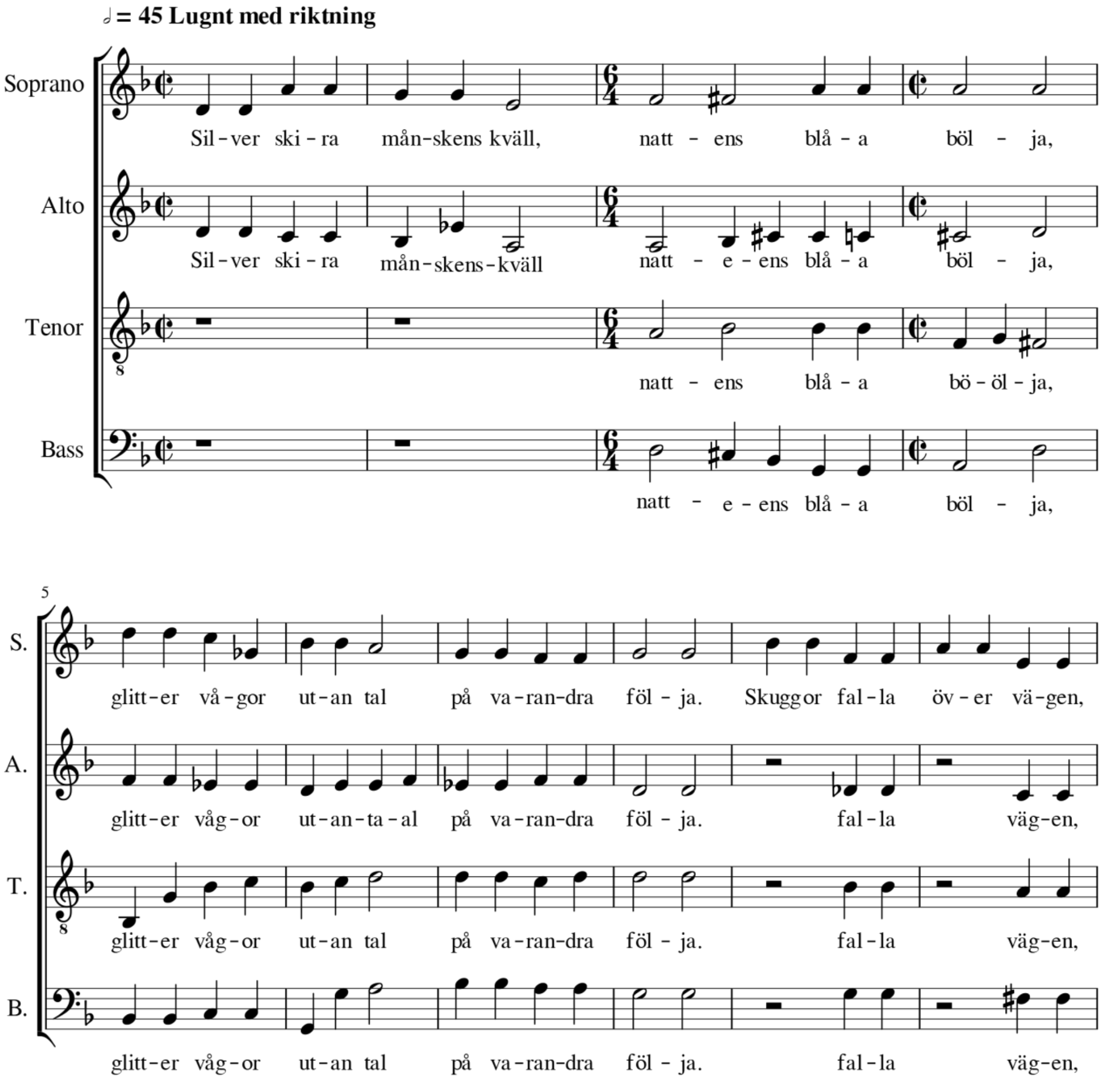
Instructions

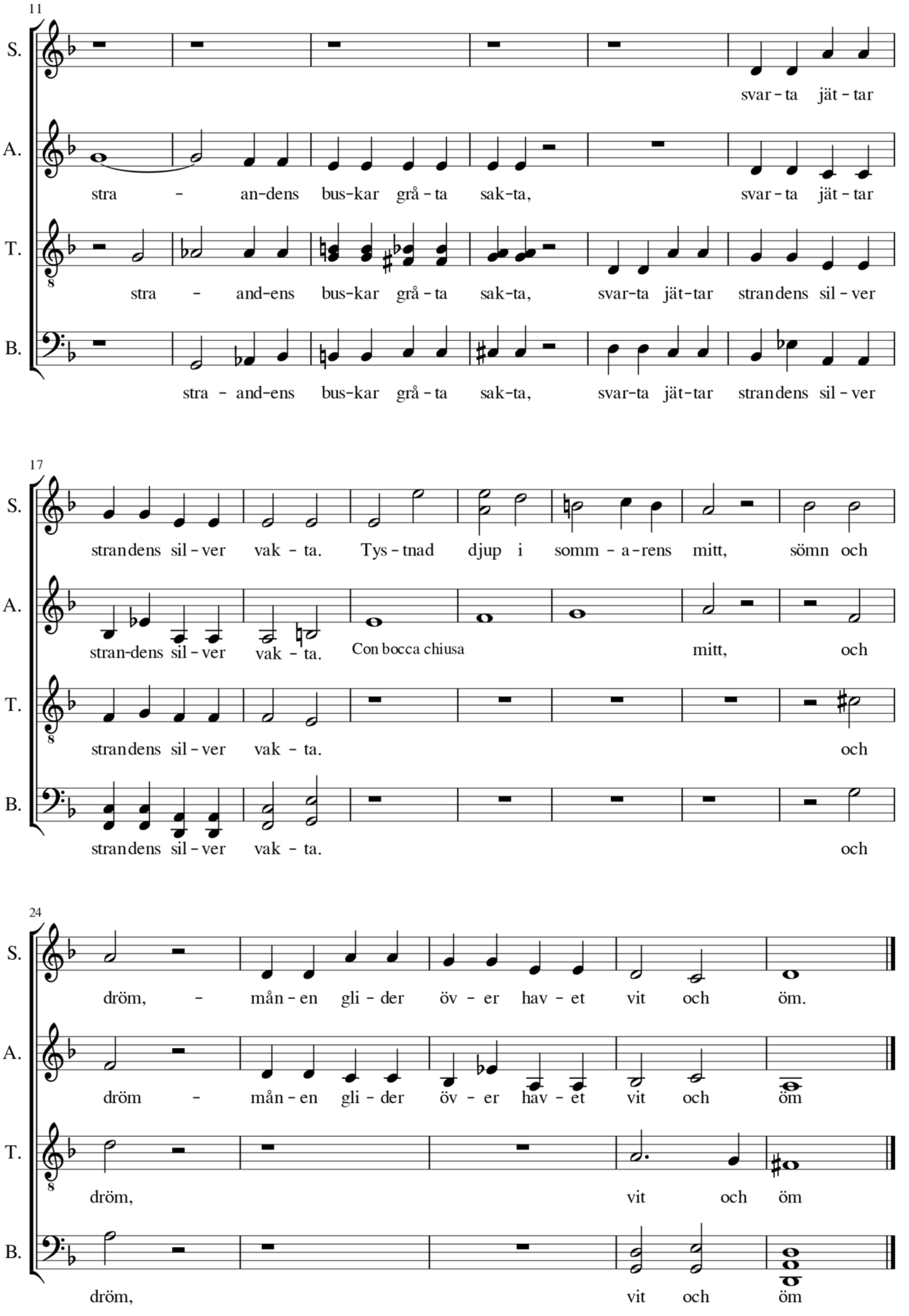
1. Use a scissor and cut out the two circles
2. Make a small hole in the centre of the two circles
3. Put the small circle above the large one and put a brass fastener through the holes and spread the legs

Appendix B - *Nocturne*

Nocturne

Text: Edith Södergran
Musik: Joel Bergström


𝅗𝅥 = 45 Lugnt med riktning
Soprano
Sil-ver ski-ra mån-skens kväll, natt - ens blå - a böl - ja,
Alto
Sil-ver ski-ra mån-skens-kväll natt - e-ens blå - a böl - ja,
Tenor
natt - ens blå - a bö-öl-ja,
Bass
natt - e-ens blå - a böl - ja,
5
S.
glitt-er vå-gor ut-an tal på va-ran-dra föl - ja. Skuggor fal-la öv-er vä-gen,
A.
glitt-er våg-or ut-an-ta-al på va-ran-dra föl - ja. fal-la väg-en,
T.
glitt-er våg-or ut-an tal på va-ran-dra föl - ja. fal-la väg-en,
B.
glitt-er våg-or ut-an tal på va-ran-dra föl - ja. fal-la väg-en,

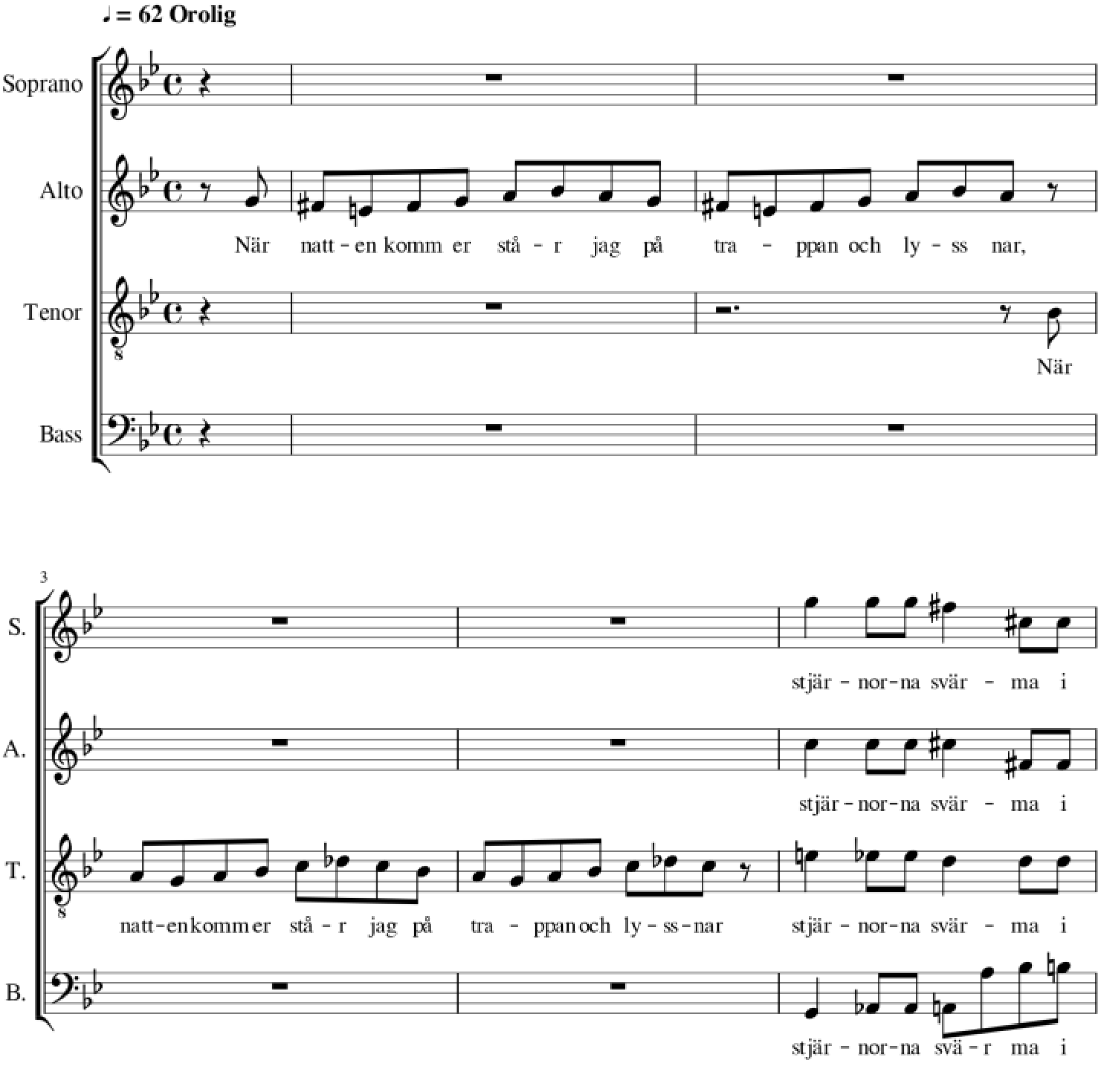

11
S.
svar - ta jät - tar
A.
stra - an-dens bus-kar grå - ta sak-ta, svar - ta jät - tar
T.
stra - and-ens bus-kar grå - ta sak-ta, svar-ta jät-tar strandens sil - ver
B.
stra - and-ens bus-kar grå - ta sak-ta, svar-ta jät-tar strandens sil - ver
17
S.
strandens sil - ver vak - ta. Tys - tnad djup i somm - a - rens mitt, sömn och
A.
stran-dens sil - ver vak - ta. Con bocca chiusa mitt, och
T.
strandens sil - ver vak - ta. och
B.
strandens sil - ver vak - ta. och
24
S.
dröm, - mån - en gli - der öv - er hav - et vit och öm.
A.
dröm - mån - en gli - der öv - er hav - et vit och öm
T.
dröm, vit och öm
B.
dröm, vit och öm

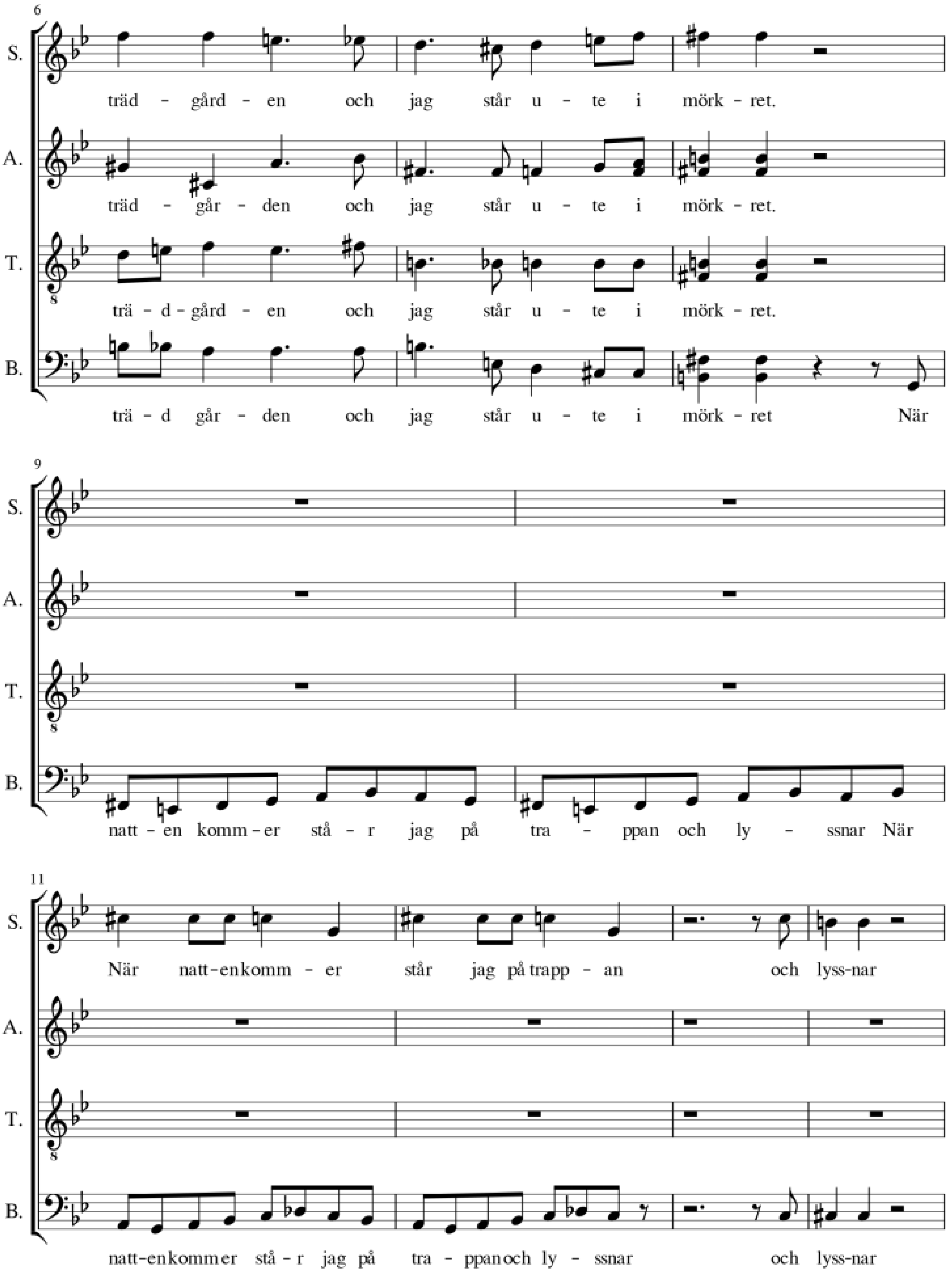
Appendix C - *Stjärnorna*

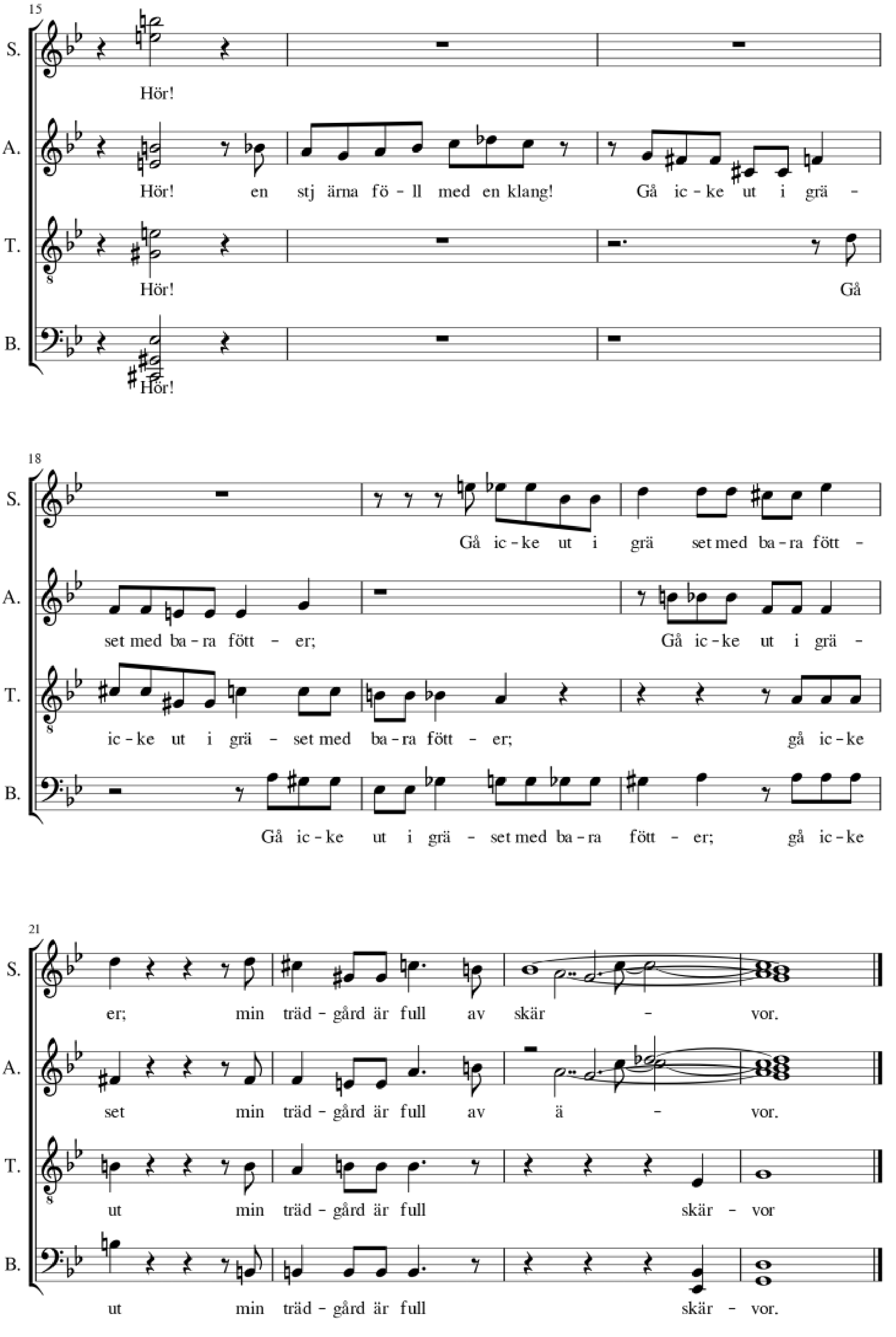
Stjärnorna

Text: Edith Södergran

Musik: Joel Bergström


♩ = 62 Orolig
Soprano
Alto
Tenor
Bass
När natt - en komm er stå - r jag på tra - ppan och ly - ss nar,
När
3
S.
A.
T.
B.
stjär - nor-na svär - ma i
stjär - nor-na svär - ma i
natt-en komm er stå - r jag på tra - ppan och ly - ss-nar stjär - nor-na svär - ma i
stjär - nor-na svä - r ma i

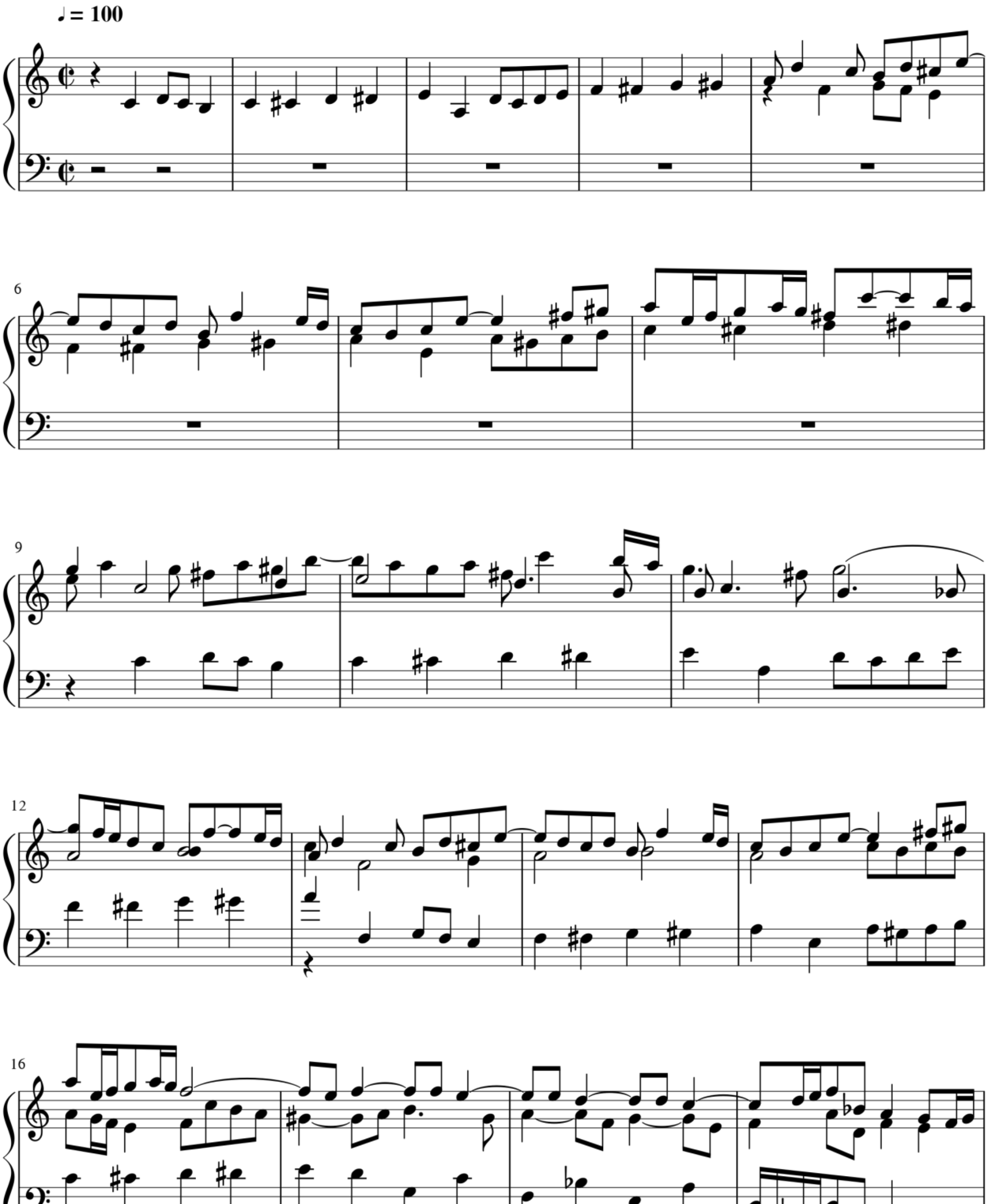

6
S.
träd - gård - en och jag står u - te i mörk - ret.
A.
träd - går - den och jag står u - te i mörk - ret.
T.
trä - d - gård - en och jag står u - te i mörk - ret.
B.
trä - d går - den och jag står u - te i mörk - ret När
9
S.
A.
T.
B.
natt - en komm - er stå - r jag på tra - ppan och ly - ssnar När
11
S.
När natt - en komm - er står jag på trapp - an och lyss-nar
A.
T.
B.
natt - en kommer stå - r jag på tra - ppan och ly - ssnar och lyss-nar

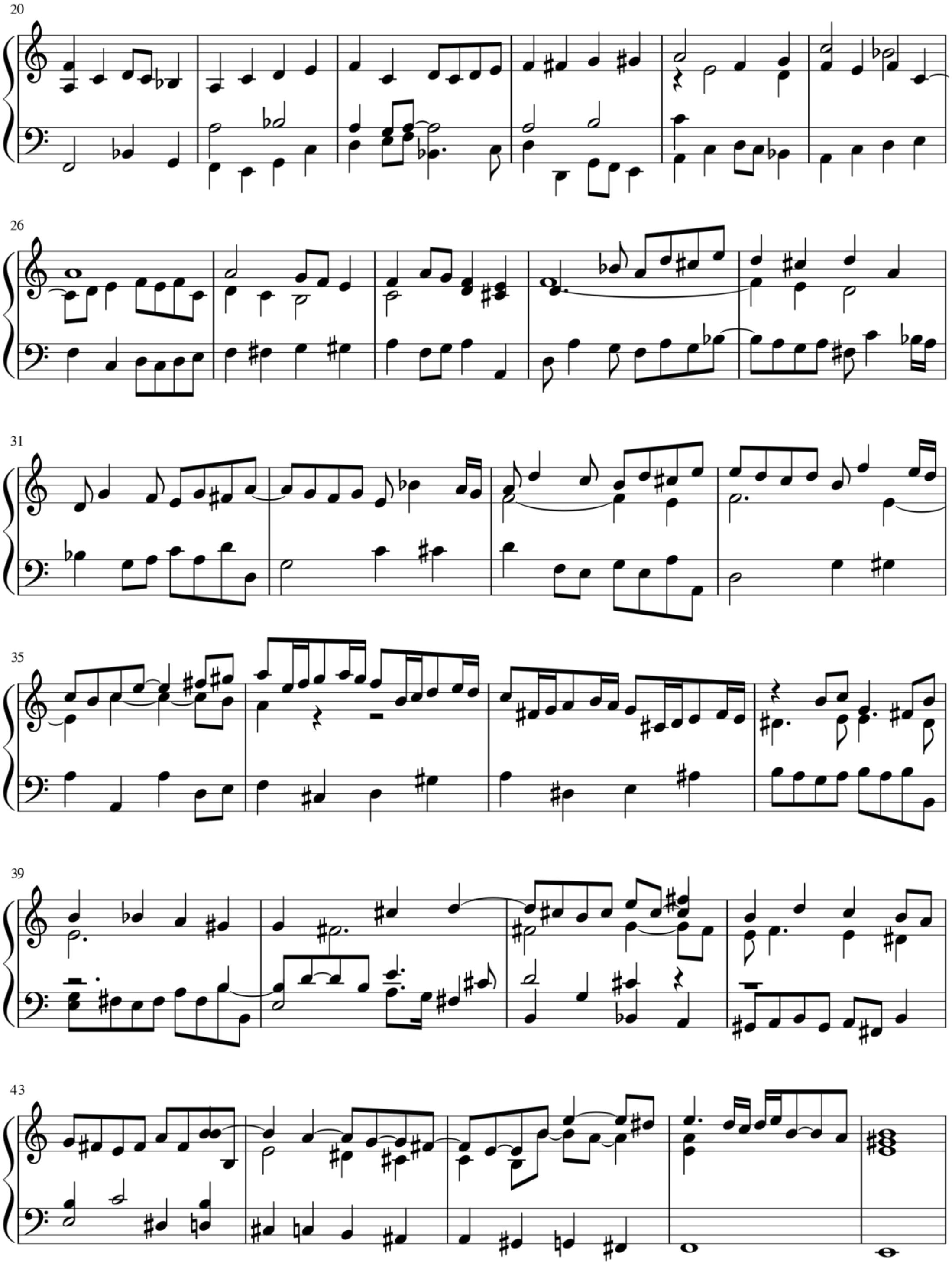

15
S.
Hör!
A.
Hör! en stj ärna fö - ll med en klang! Gå ic - ke ut i grä -
T.
Hör! Gå
B.
Hör!
18
S.
Gå ic - ke ut i grä set med ba - ra fött -
A.
set med ba - ra fött - er; Gå ic - ke ut i grä -
T.
ic - ke ut i grä - set med ba - ra fött - er; gå ic - ke
B.
Gå ic - ke ut i grä - set med ba - ra fött - er; gå ic - ke
21
S.
er; min träd - gård är full av skär - vor.
A.
set min träd - gård är full av ä - vor.
T.
ut min träd - gård är full skär - vor
B.
ut min träd - gård är full skär - vor.

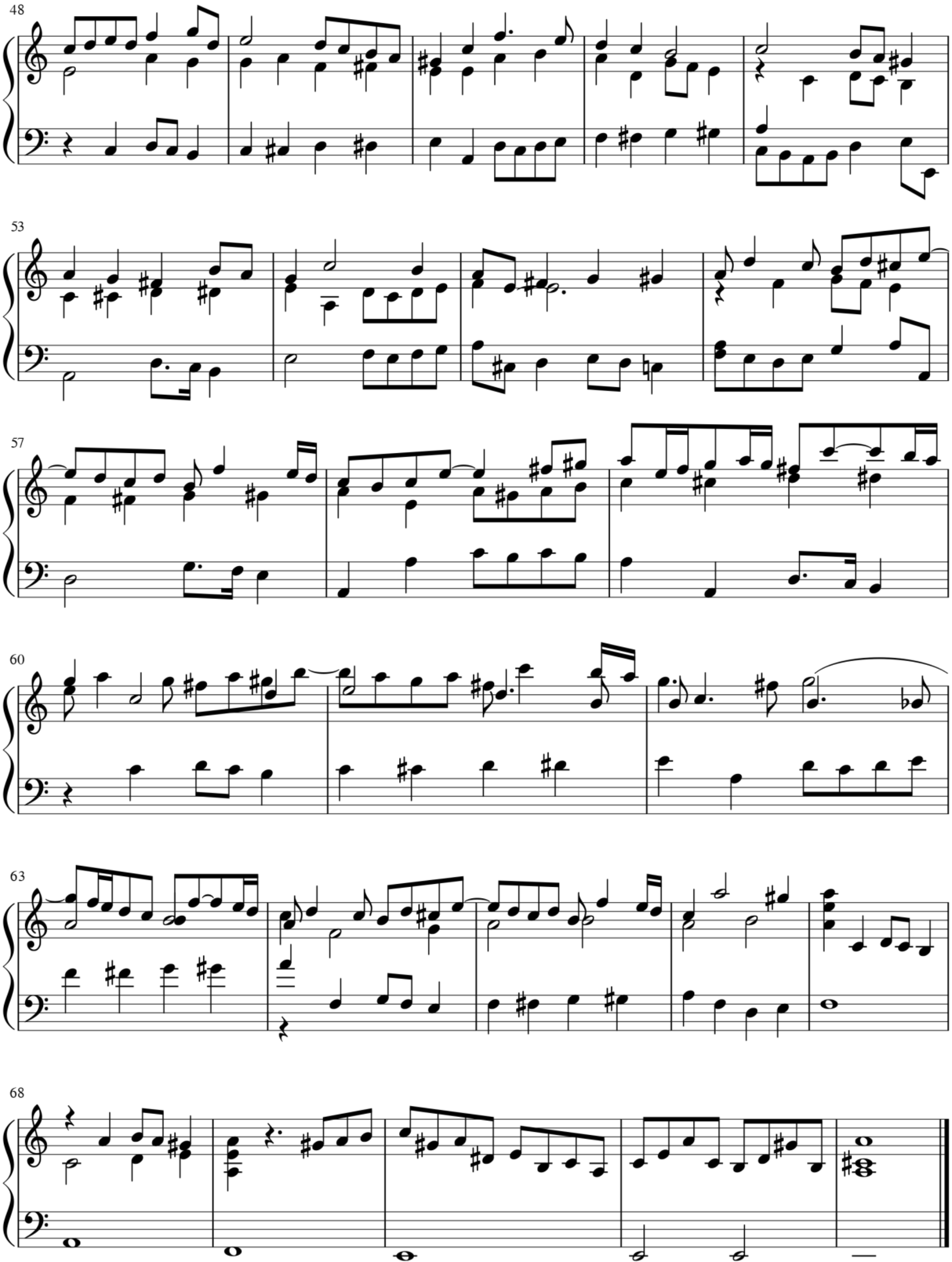
Appendix D - *Kromatisk Fuga A-moll*

Kromatisk Fuga A-moll

Joel Bergström

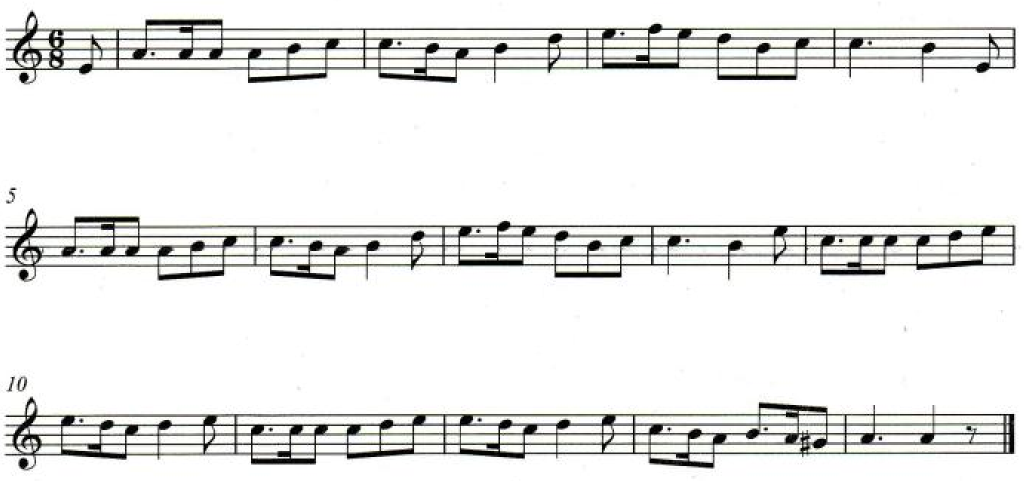




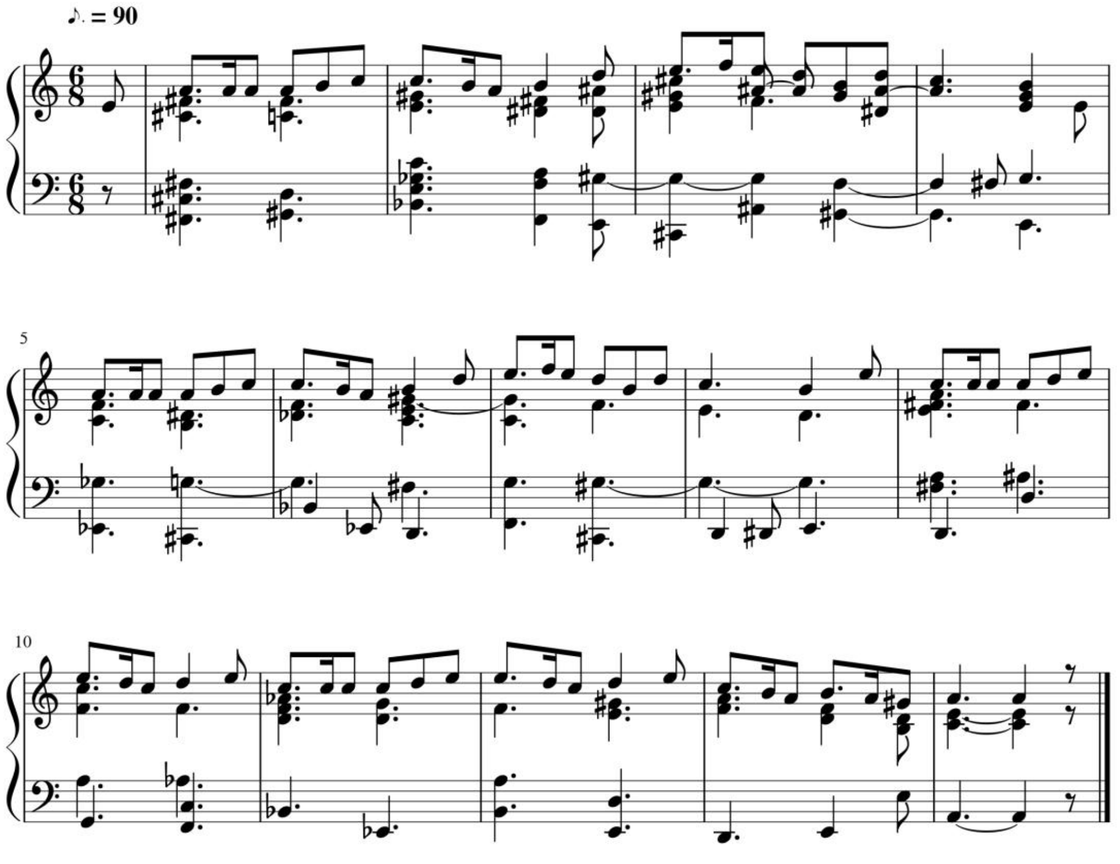


Appendix E - *Om sommaren sköna*

Structure as starting point:


Om sommaren sköna

Arrangement:


Om sommaren sköna

Anders Wallenius

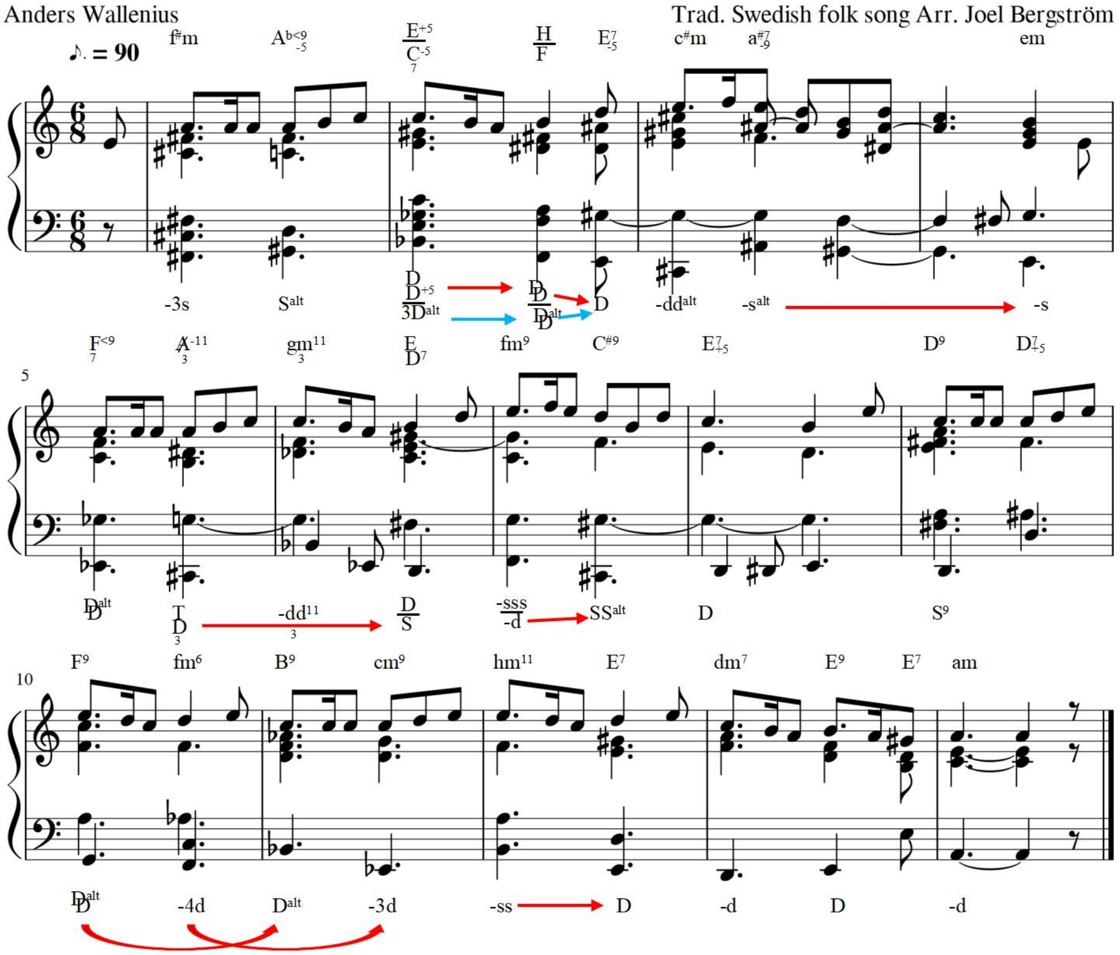
Trad. Swedish folk song Arr. Joel Bergström

Chromatic Function analysis of the arrangement:

Om sommaren sköna

Anders Wallenius

Trad. Swedish folk song Arr. Joel Bergström


♪. = 90
f#m
A♭<9 -5
E+5 / C-5 7
H / F
E7 -5
c#m
a#7 -9
em
D / D+5 / 3Dalt
D / D / Dalt
D
-3s
Salt
-ddalt
-salt
-s
5
F<9 7
A-11 3
gm11 3
E / D7
fm9
C#9
E7 +5
D9
D7 +5
Dalt
T / D 3
-dd11 3
D / S
-sss / -d
SSalt
D
S9
10
F9
fm6
B9
cm9
hm11
E7
dm7
E9
E7
am
Dalt
-4d
Dalt
-3d
-ss
D
-d
D
-d