

# THE MUSICAL LANGUAGE OF HEAVY METAL

A Study of Form, Rhythm, Modes, and Harmonic Structure

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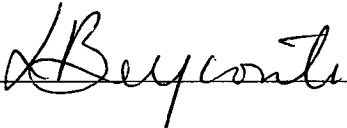
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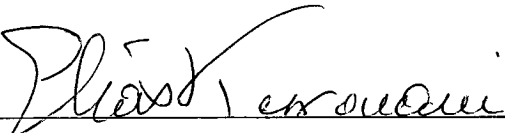
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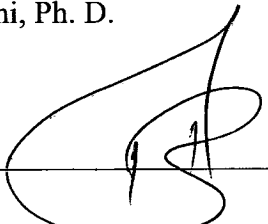
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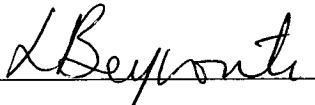
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## **Abstract**

As a classical musician who has played in the styles of twentieth century popular music, I developed an interest in studying and analyzing popular music, particularly Heavy Metal music. This study focuses on Heavy Metal's musical language of the period between the early 1970s and mid-1980s, including bands such as Deep Purple, Black Sabbath, Ozzy Osbourne, Judas Priest, and Iron Maiden. It covers the historical background of the style, then analyzes extensively the harmonic structures of the genre and examines the form, rhythm, and melodies using statistical data from a corpus selection of Heavy Metal repertoire.

## **Chapter I: Introduction**

Although cultural and sociological dissertations were made about Heavy Metal, it had very little academic attention from a Musicological point of view. The aim of this research is to study and analyze the musical language of Heavy Metal, and point out its relationship with classical music. This part of my research will serve as an introductory section to the thesis by pointing out the purpose of the study, statement of the problem, research questions, and thesis plan.

### **Purpose of Study**

The purpose of this study is to examine the musical language of Heavy Metal by studying and analyzing its form, rhythm, modes, and harmonic structure. By doing so, it explores various methods of music analysis, their applicability and limitation regarding the study of Heavy Metal. It focuses on Heavy Metal music of the period between the early 1970s and mid-1980s by concentrating on the most important bands of that era, who happened to come from British origins.

### **Statement of the Problem**

The term Heavy Metal itself is problematic because it is heavily debated between musicians and scholars. In the very first episode of “*Heavy: The Story of Metal*”, a four-part documentary aired on VH1 in 2006, during interviews with some of the best known Metal bands, the members were asked the following: “How would you define Heavy Metal?”

*“I don’t know”, “that’s an open ended question”, “let’s go to another question”, “that’s a tough one”, “It has always been an extraordinary thing to talk about, because you have to hear it, you have to experience it”*

These were the best answers they could ever get. Critics, books, bands, and writers have different definitions of Heavy Metal. Heavy Metal is a term that serves a broad concept. It was first used to define the subgenre of Rock music emerged in the late 1960s but as the subgenre evolved, Heavy Metal remained as an umbrella term for all its stylistic variations (Lilja, 2004).

However, the list of pioneers in this research is heavily debated and connected to confusion between “Hard Rock” and “Heavy Metal”. Whether Hard Rock and Heavy Metal are separate genres or just synonyms has been the subject of debates among scholars, listeners, and the music industry. Sam Dunn describes Hard Rock and Heavy Metal as two different genres. Despite the fact that they overlapped in the early history of Rock, they evolved in different directions, the former remaining close to its Blues and British Blues roots and the latter drawing more Punk and Hardcore Punk influences. From this point of view, Cream, Blue Cheer, Deep Purple and Led Zeppelin were primarily Hard Rock bands because of apparent presence of strong Blues and Psychedelic Rock influences in their music. However, these bands, considered pioneers, featured what later would become the key elements of Heavy Metal, specifically, riff<sup>1</sup>-based music, virtuosic guitar style, falsetto vocal style, double bass drum, more complex rhythmic patterns, usage of power chords<sup>2</sup> and heavily distorted amplification

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<sup>1</sup> Riff is a repeated melodic figure or chord progression played repeatedly and often forming basis of composition

<sup>2</sup> The chord consisting of root note and fifth or root and fourth, frequently with octave doublings

of the guitar sound. Such distortion produced a thicker, 'heavier' guitar sound due to resultant tones of power chords and characteristics of power amplifiers (Walser, 1993).

Other opinions are also present in both academic sources and musicians and consider the use of the two terms interchangeable (Dunn, 2005).

Both theories are acceptable. Therefore, to avoid confusion, Heavy Metal will be used in this thesis for labeling the music of the 1970s, known as early metal, and its evolved subgenre known as New Wave of British Heavy Metal (NWOBHM) in the 1980s, whereas "Metal" will be applied as an umbrella term for the Heavy Metal subgenres.

## **Research questions**

This study is prompted by the following three questions:

- 1 – Are there any principles for the harmonic structures in Heavy Metal?
- 2 – Do Heavy Metal songs abide by rules in terms of forms, rhythm, and melodies?
- 3 – Can Heavy Metal be analyzed by abiding to the norms of Classical music?

## **Thesis Plan**

Following the introduction in chapter 1, that included our definition of the term Heavy Metal that will be studied in this research, chapter 2 starts with an overview of the genre by exploring its history, influence, roots, pioneers, and subgenres, giving us an overview of the genre. This section also covers the etymology of the term and how it was used over times. The next section in chapter 2 contains a review of literature, including pioneering studies that introduced this subject to the world of musicology.

Chapter 3 includes the research methods used in this study and the process of collecting data. This section also goes through the research problems and methodological issues that are directly related to the selection and extraction of data. Chapter 4 discusses the results of the analyzed data. The results are discussed in four different sections that cover the harmonic structure, modes, rhythms and forms. The last chapter includes a conclusion of the obtained results and answers the proposed research questions, proving that there are many principles guiding the musical language of Heavy Metal. Appendix “A” contains detailed harmonic analysis of the corpus selection.

## Chapter II: Literature Review

### History and Background

#### Etymology

In Chemistry, Heavy Metal refers to any metallic element that has high density' for example mercury. The origin of the term "Heavy Metal" in a musical context is uncertain.

Metal historian Ian Christe describes it as a profound mood. (Christe, 2003) Iron Butterfly's debut album, released in early 1968, was titled Heavy. The first use of "Heavy Metal" in a song's lyrics is in reference to a motorcycle in the Steppenwolf song "Born to Be Wild", also released that year (Walser, 1993)

The first documented use of the phrase was from a review by the critic Mike Saunders written for the Rolling Stone Magazine in the November 12, 1970 issue. He commented on an album put out the previous year by the British band Humble Pie: "Safe as Yesterday Is, their first American release, proved that Humble Pie could be boring in lots of different ways. Here they were a noisy, unmelodic, Heavy Metal-leadened shit-Rock band with the loud and noisy parts beyond doubt."

It's the first time the term was used to describe hard music. What did the term mean and which bands did it apply for? The answer remains a mystery up until today.

#### Influence and Roots

The two most significant influences on Heavy Metal music are the Blues and Classical music. Although they are two distinct styles, they both helped shaping Heavy Metal and giving it its characteristic sound (Christe, 2003).

**Blues**

African blues music and specifically its “12-Bar Blues” form have provided the foundation of rock music, and, as Heavy Metal is in some ways merely the heaviest and most powerful of Rock music, it shares its roots in the blues. Beyond that basic connection, however, the earliest forms of Metal owe a bit more to the blues (Weinstein, 1991).

As Rock music continued to evolve in the mid to late sixties, the influence of Blues was particularly profound, as British artists in particular took inspiration from earlier American Blues musicians such as Muddy Waters and Howling Wolf. These British musicians, like Eric Clapton (Cream) and Jeff Beck (Jeff Beck Group), began emulating the earlier American Blues, but at much higher volumes, and with much greater guitar amp distortion, two key characteristics that would make their way into Heavy Metal (Charlton, 2003). In Cream, Eric Clapton and bassist Jack Bruce specialized in playing heavy unison blues riffs, as in “Sunshine of Your Love,” creating another Metal trope, one that would be picked up by Black Sabbath.

The primary chord form in Blues music and most Rock music is a power chord, meaning a chord whose voicing is composed of the root fifth, with an octave of the root often added (Lilja, 2004). This power chord is so named for the powerful and simple sound it produces. It also sounds particularly good when played with an amp. While the sound of distorted power chords may be found in numerous idioms of Rock music, it is the main focus of Heavy Metal (Walser, 1993). As the early Blues Rock groups grew in volume with the development of bigger, more powerful amplifiers by makers like Marshall, drummers moved from playing basic Blues shuffles to playing heavier beats and using larger kits in order to match and better complement the rising volumes of



guitar amplifiers. Vocalists, for their part, began refining their technique, using more powerful voice to be heard in the louder context of the music. All of these developments, of course, set the stage for the powerful sound of Heavy Metal (Christe, 2003).

### ***Classical Music***

While Blues music may be seen as a foundational influence that influenced the evolution of Heavy Metal, Classical music didn't play any role in the foundation of Heavy Metal. Classical music has functioned as an influence that most often is overlaid upon the music (Walser, 1993). The Beatles are most often noted as the first rock band to introduce Classical elements into Rock. Following some of their experiments, classically trained musicians such as keyboardists Keith Emerson and Rick Wakeman were important innovators in Progressive Rock, bringing much more Classical ideas into rock.

Ritchie Blackmore and Jon Lord of "Deep Purple" were some of the very first musicians to bring some of these Classical ideas into Heavy Metal (Walser, 1993). An excellent example is in the song "Highway Star" from the band's Machine Head album. While the song rock/blues derived progression, the extended solos of both Lord (organ) and Blackmore (guitar) feature classical motifs and scale patterns. These early experiments would influence such later artists as Scorpions' guitarist Uli Jon Roth and Ozzy Osbourne guitarist Randy Rhoads, who would both go on to incorporate Classical motifs into their soloing. Their forays into Classical would be superseded by those of Yngwie Malmsteen, whose technical mastery of the guitar was steeped not only in the work of Blackmore but also in the compositions of Mozart, Bach, and Beethoven, and more particularly in the compositions of the violinist Niccolò Paganini (Walser, 1993).

Malmsteen in particular was extremely influential in his integration of Classical elements into Rock guitar playing and helped to create the subgenre of Neoclassical Rock and Metal, a genre characterized by Classical scales and arpeggios played at blindingly fast tempos and incredible precision, and even composed an electric guitar concerto including a fugue. Musicians like Malmsteen and Rhoads may actually be closer to the Classical tradition than we might think. While our experience of Classical music is based on performances in a carefully preserved tradition, many Classical composers were live performers who incorporate improvisation into their performances, a tradition that musicians like Malmsteen and Rhoads carried (Walser, 1993).

### **Origins and Pioneers**

Critics disagree over who can be labeled as the first Heavy Metal band. Most credit Led Zeppelin, Black Sabbath, and Deep Purple, with American commentators tending to favor Led Zeppelin and British commentators tending to favor Black Sabbath. A few American argue that other groups including Iron Butterfly, Steppenwolf or Blue Cheer were the pioneers (Dunn, 2005).

#### ***Led Zeppelin***

In 1969 Led Zeppelin released its first album titled Led Zeppelin. Part of the reason that the group is often cited as one of the first Metal groups, is that it went further in introducing the elements of Robert Plant's particularly high and powerful vocal range, John Bonham's huge sounding drums and technically advanced playing, and Jimmy Page's guitar heroics, all of which became new standard elements in Heavy Metal and made the group a prototype for bands of the genre (Christe, 2003).

In terms of the songs Zeppelin played, much of its repertoire consisted of the Blues covers of the era, which they played at increasingly high decibel levels like their fellow bands.

### ***Black Sabbath***

As Heavy Rock evolved, the elements of loud and distorted guitar, thundering drums, and wailing vocals became as central to its personality as the actual music that was played, and Black Sabbath was one of the first groups to move away from explicitly playing Blues influenced music as they found their unique way to utilize these elements. Sabbath instead, pioneered the playing of loud riffs (Christe, 2003) . The riffs were tuned down a half step or more from standard guitar tuning, giving them a darker timbre. Most people associate Black Sabbath with its front man Ozzy Osbourne, but it was Tony Iommi, the band's guitarist who was responsible of the band's sound (Dunn, 2005).

Part of the reason for this move was the result of a tragic circumstance, as guitarist Tony Iommi had only a few years earlier had lost the tips of two of his main fretting fingers in an industrial accident (Cope, 2010). While facing difficulty in playing complex chords the artificial fingertips that he had managed to fashion, he evolved a simpler approach that focused on heavy single string riffs and power chords, tuned down since the reduced tension of the strings was easier to play. These features of Iommi's personal guitar style gave Sabbath much of its signature sound and went a long way toward refining the unique style of Heavy Metal (Cope, 2010). While many of Sabbath's songs had riffs that were derived from the minor pentatonic scale of Blues music, they increasingly departed from Blues licks and played on the strengths of the heavy sounds of the guitar and band, evolving a new and darker sounding music, which

in part derived from the lower register of Iommi and bassist Geezer Butler's instruments.

Black Sabbath was probably the first band to exploit the sound of these instrumental changes for their own sake (Cope, 2010). And as they did, they helped opening up new possibilities for music that would use the new heavy sounds, essentially leading the way to what we now call Heavy Metal. As they and later groups like Judas Priest continued to strip out the blues elements, they brought us closer to metal (Christe, 2003).

### ***Deep Purple***

Meanwhile, something was brewing in Hertford, just north of London. A quintet by the name of Deep Purple was experimenting with many of the same influences as their countrymen to the northwest. However, unlike the amateurish nature of Black Sabbath, Deep Purple featured a collection of professional musicians, each highly skilled and coveted for their instrumental prowess (Walser, 1993). What occurred was a hard-driving, turbo-charged, highly musical form of prototypical Heavy Metal, fueled by Ritchie Blackmore's guitar pyrotechnics and Ian Gillian's soaring vocals. The songs were equally as intense as Sabbath's, only more complex with numerous flourishes of instrumental virtuosity, and use of classical models. Ultimately, Deep Purple helped establish and define Heavy Metal as a genre while simultaneously challenging its limits and conventions (Christe, 2003).

### **New Wave of British Heavy Metal**

The term New Wave of British Heavy Metal, also known as NWOBHM, was first used in the British music newspaper "Sounds" in May 1979 by its editor Geoff Barton. The article was written after attending a concert in London's Bandwagon, a

music venue run by DJ Neal Kay that hosted weekly live band concerts, introducing new Metal bands (Dunn, 2011). On May 8, Neal Kay invited journalist and editor Geoff Barton to this concert, saying: “If you come up you will not be disappointed, I will show you something you have never seen before”. The concert was featuring Iron Maiden, Samson, and Angel Witch. The results were astonishing, said Neal Kay; “Geoff Barton put double pages about us in *Sounds*” (Dunn, 2011). Barton’s review of this show, printed in the next issue of *Sounds* magazine was the first printed reference of the New Wave of British Heavy Metal.

As for this movement itself, it was being established through the years, as a new wave of music opposed the Punk music, which was exploding in England and dominating the music scene in the late 70<sup>s</sup>. The music was heavily influenced by Classic Metal of early Heavy Metal bands such as Black Sabbath, Led Zepplin, and Deep purple, but was more riff oriented, and energized the style by taking the speed, energy, and aggression of punk music, and added a second guitar to get a heavier sound. In mid 70s, NWOBHM was established as an underground movement and started to spread locally in England, but didn’t capture the major record labels attention (Weinstein, 1991).

This all changed in 1980, when Iron Maiden, one of the best known, and still active NWOBHM band released its debut album entitled “Iron Maiden”. In Sam Dunn’s documentary “*Metal Evolution*” during his interview with the band Manager Rod Smallwood, and band founder/bassist Steve Harris, Dunn asked “what did EMI see in your band to sign a record deal?” They respectively answered: “They saw one thing, packed venues”, “They couldn’t get in, they were stuck in the back, they couldn’t even see the band properly, I think whether they liked the music or not, they though, what’s going on here, we should sign them before someone else does”. Ashley Goodall

(Former A&R, EMI Records) said: “it was full, people were wearing red t-shirts with Iron Maiden on them, and just to the right of the stage, Ozzy Osbourne was watching while being interested, with that look saying : “New generation here..” (Dunn, 2011). The album ranked among the top ten in the UK charts. Among other NWOBHM bands are Def Leppard, Motorhead, and Saxon, Angel Witch, and Tygers of Pan Tang.

### ***Golden Age***

Heavy Metal and NWOBHM reached its peak in early to mid-1980<sup>s</sup>. With the release of Iron Maiden’s 3<sup>rd</sup> album “*Number of The Beast*” in 1982, the NWOBHM started to crack the mainstream. The album sold 14 million copies worldwide, and ranked number 1 in the UK. It was Iron Maiden’s new singer Bruce Dickinson that helped propel the movement toward its mass popularity. Dennis Stratton, ex-guitarist of the band said: “I think Paul’s voice was okay in the first album, but struggled with the second album. If the band is going to make it in America, they will need a new singer that can compete with Ronnie James Dio, Robert Plan(Led Zeppelin), and all the guys with a high range vocal.” (Dunn, 2011).

### ***Influence on Other Styles***

New Wave of British Heavy Metal influenced new bands as well as old bands. Many old bands were inspired by the movement, creating some of the most memorable music in their careers (Dunn, 2011). Jess Cox, vocalist of Tygers of Pan Tang mentioned: “The bands that we were supposed to wipe away, Judas Priest and the UFO, actually became bigger because of us, then even before”. These old bands came with some of their greatest albums: White Snake’s *Ready an’ Willing*, ACDC’s *Back in Black* etc...

Moreover, the movement led to the development of new genres and subgenre that will be listed in the next paragraph.

## **Instrumentation in Heavy Metal**

One of the key elements of Heavy Metal music is its instrumentation, in particular, the electric guitar (Weinstein, 1991). The electric guitar is the most important virtuoso instrument of the past three decades (Walser, 1993).

A traditional Heavy Metal band consists of an electric guitar, an electric bass, a drum kit, and one or more vocalist. This setup can be found in almost every band that plays Metal music and its subgenres. The addition of another instrument is very common and favored by many bands. Bands like Deep Purple used keyboards and synthesizers.

In the early 70s, bands with two guitarists started to emerge; they used them to enrich their music with additional harmonies. (Judas Priest and Iron Maiden). The timbre is an essential music parameter that can help the listener identify the musical genre of a song, for instance, the most distinguishable sign of Heavy Metal is the sound of its distorted electric guitars (Walser, 1993). Heavy Metal vocals vary in style ranging from multi-octave operatic vocals of Judas priest's Rob Hallford and Iron Maiden's Bruce Dickinson, to the intentionally gruff vocals of Lemmy Kilmister of Motorhead.

The discovery of guitar distortion just may be one of the happiest accidents in modern music history. Early guitar amplifiers were limited in their capabilities, and would often produce undesirable fuzzy and distorted sound on high volumes. Audio engineers spent decades trying to avoid distortion and produce perfectly clear, unaltered waves on record. In 1951, the "Kings of Rhythm" recorded their song "Rocket 88" on a

damaged amp that created distorted guitar sound (Shepard, 2003). Few years later, audio engineers started to receive requests from guitarists to produce devices that could add distorted sounds to the guitar (Walser, 1993). Distorted guitars could produce loud sounds that can be sustained for a long period of time without volume loss. This opened new horizons for guitarists and affected their composition techniques. Extremely loud volumes characterized live performances of metal acts. In a Deep Purple Concert, three people were knocked out cold with 117 decibels of Classic Rock fury at London's Rainbow Theatre in 1972. Guinness invented the World's Loudest Band category three years later, crowning Deep Purple as the original kings of noise.

The dynamics capabilities of distorted electric guitars are very limited due to the extensive use of compressors, making it difficult for the band to incorporate crescendos and diminuendos. For this reason, the bands settle with terraced dynamic, similar to the baroque harpsichord, alternating between few different volumes.

The bass guitar had a small but very important role in this genre. The root of the chords is often played on electric bass to enrich the harmony. Few bands used distorted bass guitars.

## **Sub Genres**

From the early 70s till present, Heavy Metal evolved as a distinct genre, and led to the creation of many subgenres. Below is the list of the main subgenres with a brief description.

### **Neoclassical Metal:**

Neoclassical Metal refers to the music of guitar virtuosos who had extensive classical training or who were otherwise influenced by Classical music. Emerging in the



1980s early Neoclassical Metal was mostly instrumental music with extremely fast solo sections employing a lot of sweep picking arpeggios and Classical harmonies, or even interpretations of virtuosic pieces of Baroque, Classical, and Romantic music. Other than employing harmonies and lead guitar phrasing from Classical music, Neoclassical Metal is similar to NWOBHM with its distorted guitar timbre, mid to high tempo, loud drumming and strong bass. The subgenre is mostly guitar-centered. Vocals are mostly high register, inspired by influential Hard Rock vocalists such as Ian Gillan, but unlike them more frequently deviating from pentatonic scale.



**Figure 1: D-Beat**

### **Speed Metal**

Speed metal is a short-lived but historically important subgenre that existed in the beginning of 1980s. It is a mixture of Punk music and NWOBHM. The style features more rhythm than melody oriented songwriting, with fast tempo, and a specific drum pattern called D-beat (Figure 1).

### **Power Metal**

Power Metal was innovated by NWOBHM inspired bands like Helloween, Gamma Ray and others who played fast and melodic songs with high register vocals, more melodic riffs, but at the same time borrowed rhythmical structure, fast tempo, and extensive usage of two bass drums from Speed Metal.

## Thrash Metal

From the early 1980s the Metal scene has seen one of the most intensive diversification in the history of its existence. Underground scene bands, notably Metallica, Megadeth, Anthrax and Slayer (referred to as the ‘big four’ of thrash metal) were creating a new, previously unseen extreme form of metal by mixing the speed and aggression of hardcore Punk with more complex song structure and arrangements of NWOBHM (Walser, 2003). Young musicians wanted to be faster, better players, and more aggressive than others. The music features alternating tempos with extensive use of double bass drums. Double time drumming<sup>3</sup> patterns are also common for the genre. Harmonically thrash metal is usually based on modal scales. In thrash metal it is also common to use chromatic notes in a diatonic scale or to use chromatic scale-based riffs lacking any tonal center. Vocals are frequently shouting (Christe, 2003).

## Death Metal

Death Metal originated in the mid-1980s as a darker and more extreme form of Thrash Metal and was inspired by influential thrash acts such as Slayer and Kreator (Christe, 2003). The music is more focused on atonal riffs and triton interval than Thrash Metal and features abrupt tempo and time signature changes both to accede the listener’s expectations. Pentatonicism is extremely rare in this subgenre. Drummers use double bass drums and as a rule employ extremely fast drum patterns including blast beats<sup>4</sup>. Guitars commonly use low tuning and similarly to Thrash Metal feature fast riffs with extensive usage of palm muting and tremolo picking. The song structure is most

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<sup>3</sup> A drum rhythm pattern where, in the simplest form, instead of standard beat where the bass drum accents 1<sup>st</sup>, 3<sup>rd</sup> beats and snare drum -2<sup>nd</sup> and 4<sup>th</sup>, bass drum hits every strong beat and snare hits are on weak beats.

<sup>4</sup> Blast beats are drum pattern featuring bass drum, snare drum and high-hat on eighth note subdivision or alternatively one of the three following sixteenth note subdivision

frequently different from the standard verse-chorus framework employing sudden key changes, extensively using chromatic scale, diminished seventh arpeggio, and atonal riffs (Bukspan, 2003).

### **Melodic Death Metal**

Melodic Death Metal is a blend of NWOBHM inspired melodic riff-based music and elements of Death Metal music. In contrast to Death Metal this subgenre sometimes features keyboards in addition to two guitars, a bass, drums, and vocals (Bukspan, 2003). Riffs are based more on modal scales, while dissonant intervals in general are less emphasized. Similar to death metal it features tempo changes, blast beats, growling vocals, and overall timbre.

### **Traditional Doom Metal**

Starting in the 1980s, this subgenre usually featured slow tempo and long, epic song structures with melancholic lyrics. Although being overshadowed by Thrash and Glam Metal, it survived and even diversified in several directions; its vocals are clean and melancholic (Bukspan, 2003). Lyrics are commonly about depression, grief and fear, but also cover such themes as mythology, fantasy or battle.

### **Progressive**

Progressive Rock extended the compositional complexity and the technical proficiency of Rock music by incorporating improvisational approach of Jazz and musical structures of Classical music in its usually long instrumental sections. Inspired by this outlook, Heavy Metal artists created progressive metal in the mid-1980s (Christe, 2003). Similarly to its parent genre, Progressive Metal music features complex songs both compositionally (long compositions sometimes consisting of few different

sections, key changes, complex structures), and rhythmically (frequently employing odd time signatures and polyrhythm). Progressive bands frequently practice concept albums. The most notable Progressive Rock influenced group in this genre is Dream Theater (Bukspan, 2003).

### **Industrial**

Industrial Metal is an umbrella term that refers to merging an experimental approach and production techniques into different Metal subgenres. Industrial Metal emerged in the late 1980s when industrial music inspired artists like Ministry, Godflesh and KMFDM started employing distorted guitar sound and Heavy Metal riffs. Later in the 1990s a new generation of bands such as Rammstein merged electronic music elements into the genre (Bukspan, 2003).

### **Metalcore**

Metalcore is a fusion genre referring to the mixture of various (mostly thrash, death and melodic death) Metal subgenres with Hardcore Punk. Most notable feature characterizing to all of metalcore subdivisions is the big emphasis on breakdowns a feature borrowed from Hardcore Punk. Breakdowns in Metal refer to the typically slowed down section of a song (frequently slowed to a half tempo) featuring rhythmically oriented guitar riffs mostly on open lowest strings to achieve heavier sounds, and simple drum patterns to further emphasize heaviness (Bukspan, 2003).

### **Black Metal**

The label 'Black Metal' appeared in the 1980s and referred to the music of bands such as Venom, Bathory. It was only in the early 1990s that Norwegian bands such as Emperor, Mayhem, Burzum and Darkthrone developed musically distinct form

of the genre. Since then the genre further diversified into more commercially oriented form featuring synthesizers by bands such as Dimmu Borgir and Cradle of Filth. Among synthesized instruments the harpsichord, violin, organ, and choir are most common that give the music an orchestral feel or a cathedral-like setting (Bukspan, 2003). Black Metal can be typified by its high-pitched 'shrieking' vocals (noticeably different from death growls), extremely fast tempos, and blast beat and D-beat drum patterns. Guitars usually are in standard tuning, riffs are based on modal scales, though, chromatic scales and dissonant intervals are also actively practiced. Solos are rare in the genre (Christe, 2003).

### **Gothic Metal**

Gothic Metal is a diverse genre, which refers to a blend of dark, depressive atmosphere of Gothic Rock, created by multilayer textures of synthesizers, and metal music. Three bands are credited as pioneers of the genre: Anathema, Paradise Lost, and My Dying Bride. All three started their careers as Doom/Doom Death bands, doom metal inspired depressive riffs and aggressive growling vocals, but then started searching the ways to create darker atmosphere by actively experimenting with keyboards, violins, and adding female vocals (Bukspan, 2003).

### **Nu-Metal**

Nu-Metal is another fusion genre combining the elements of relatively modern popular genres outside of Metal such as Electronic music, Hip-Hop, Post Punk, Grunge and Funk. Emerged in the mid-1990s, Nu-Metal was the revival of Metal into mainstream. Some authors argue that the roots of the genre can be traced back in the mid or late 1980s when first attempts to merge the act of rapping with Metal music were made (McIver, 2002).

## Review of Literature

While Heavy Metal had very little academic attention, even less work has been done from the point of view of music theory and analysis. The few studies made on Heavy Metal are primarily concentrated on non-musical aspects; most of the studies focused on sociological aspects of the genre itself (Lilja, 2009).

Perhaps the most widely recognized study of Heavy Metal that concerns the music itself is Robert Walser's "*Running with the Devil: Power, Gender, and Madness in Heavy Metal*" (1993). Walser's book is a landmark for Heavy Metal scholarship in music theory. "*Running with the Devil's*" five chapters are diversified, but are linked nicely to the idea of power. The second and third chapters are the centerpiece of the book since they are the only chapters that discuss the music of this genre. In the second chapter, Walser explores various aspects of Heavy Metal's basic music grammar by covering the guitar and vocal timbres, modes, harmony, rhythm, and melodies. This chapter covers the aspects mentioned above, but fails to go further into musical details and analysis, thus giving an overview of the subject and a historical overview with little attention to technical details. The third chapter focuses on the intersection of Heavy Metal and Classical music and explores the use of baroque style figurations and actual quotation of baroque instrumental music, especially with Ritchie Blackmore<sup>5</sup>, Randy Rhodes<sup>6</sup> and Yngwie Malmsteen. Walser included transcription of the works inspired by baroque music, provided musical analysis, and pointed similarities to specific pieces by Bach and Vivaldi.

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<sup>5</sup> Guitarist of Deep Purple.

<sup>6</sup> Guitarist of Ozzy Osbourne.

One of the most important and recent studies of Heavy Metal music is Esa Lilja's "Theory and Analysis of Classic Heavy Metal" (2009). Lilja's study looks in depth into Heavy Metal's harmony from the point of view of music theory and analysis, particularly as applied to traditions in classical music. His study focus on the era between the late 1960s and mid-1980s, including bands such as Black Sabbath, Deep Purple, Led Zeppelin, Judas Priest, and Iron Maiden. Lilja studies extensively the characteristics of distorted chords and their effects on harmonic construction and points out the relationship between Heavy Metal and Classical music, exploring further this subject that was introduced by Walser in his book.

The research of Trevor De Clercq and David Temperley "*A Corpus Analysis of Rock Harmony*" (2011) has inspired me to choose my thesis subject and apply their research method to Heavy Metal music. Their research employs Rolling Stone's "500 Greatest Song of All Time" to analyze the harmonic motion of Rock music. Their primary goal was to provide norms of regularities of Rock music harmony. The study mentions that evaluating popular music in terms of the common-practice tradition may cause us to overlook other kinds of logic operative in rock that can't be understood by classical norms. In their study, Clercq and Temperley favor the designation of pre-tonic and post-tonic chords, rather than Riemann's system of functional harmony. Their work asserted that: IV and V are the most common non-tonic sounds and pre-tonic chords; IV-V-I is a common pattern of chord progression; and VII<sup>b</sup> is the most frequent post-tonic chord. Although Clercq and Temperley's work is related to Rock music and not Heavy Metal, their methodology is used as the basis for harmonic structures study of Heavy Metal in this research.

## **Chapter III: Research Method**

This research study is conducted to determine the musical language of Heavy Metal by exploring the main features and characteristics of the style.

### **Methodological Issues**

Our assumption is that Heavy Metal songs have a certain form and harmonic structure that is known on an unconscious level to the composers and experienced listeners in this particular style. Moreover, the creation of these structures is guided by certain underlying principles that we are aiming to find. Therefore, finding these patterns in harmonic structure and form will require analysis of selected Heavy Metal songs.

Two significant methodological issues arise here. The first one is the selection of the corpus (list of songs to be analyzed), and the second one is how to extract the harmonic information.

### **Corpus Selections**

As mentioned earlier, the term Heavy Metal proves to be a problematic term, and there is some disagreement as to what is considered Heavy Metal and what is not. The best way to do the selection is using lists of “Top 100”, “Greatest Songs” etc.. of music media outlets (Websites, Magazines, Newspapers). Doing so would also create a new problem, because in most of the cases, the lists are chosen by the editor(s). As a result, the inclusion or exclusion of a song depends entirely on the subjective opinions and preferences of few individuals.



To avoid this issue, we used a website called The Top Tens ([www.Theoptens.com](http://www.Theoptens.com)) which has a category called best Heavy Metal Songs. The list is based on a 6 years old poll that includes 5000 votes. This methodology is not foolproof because for example, some individuals might not consider some of the top songs in the list as Heavy Metal songs. Therefore, our analysis will be based on this list with the right to include or exclude songs based on our definition of Heavy Metal, which was discussed earlier in this thesis, and also based on the year of the compositions; focusing on the early 1970s till the mid-1980s, a period of around 15 years.

As far as we know, this is the best available method to create a corpus of songs that are generally considered to be Heavy Metal. In the selection, we started by choosing the top seven bands that happens to be British bands. Those bands are: Deep Purple (1968-Present), Black Sabbath (1968-2017), Judas Priest (1969-Present), Iron Maiden (1975-present), Saxon (1977-Present), Ozzy Osbourne (1979-Present), and Dio (1982-2010).

The second step was choosing four songs of each band. The selection was based on the same poll, their bestselling albums, and the style of songs, in addition to other polls from the same website that are related to each band for example: Best Iron Maiden songs, best Deep Purple albums, etc...

The final corpus selection comprised of 28 songs composed by 7 different bands is shown in Table 1. Three songs of the selection are composed post 1990, but they were selected anyway for two main reasons: First, they belong to the same bands that are crucial to the genre and its development, and second the songs are the top hits of the

bands, for example, although Iron Maiden is a NWOBHM band that started in 1975, their most popular song is “Fear of the Dark” (Fear of the Dark, 1992).

**Table 1: Corpus Selection**

<b>Band</b>	<b>Song Title</b>	<b>Album Title</b>	<b>Year</b>
<b>Deep Purple</b>	Smoke on the Water	Machine Head	1972
	Highway Star	Machine Head	1972
	Burn	Burn	1974
	Black Night	Scandinavian Nights	1988
<b>Black Sabbath</b>	Paranoid	Paranoid	1971
	Iron Man	Paranoid	1971
	War Pigs	Paranoid	1971
	Heaven & Hell	Heaven & Hell	1980
<b>Judas Priest</b>	Victims of Changes	Sad Wings of Destiny	1976
	Breaking the Law	British Steel	1980
	Electric Eye	Scream for Vengeance	1982
	Painkiller	Painkiller	1990
<b>Iron Maiden</b>	Hallowed be thy Name	Number of the Beast	1982
	The Trooper	Piece of Mind	1983
	Fear of the Dark	Fear of the Dark	1992
	Dance of Death	Dance of Death	2003
<b>Saxon</b>	747 - Strangers in the Night	Wheels of Steel	1980
	Princess of the Night	Denim and Leather	1981
	Crusader	Crusader	1984
	Heavy Metal Thunder	Heavy Metal Thunder	2002
<b>Ozzy Osbourne</b>	Crazy Train	Blizzard of Ozz	1980
	Mr. Crowley	Blizzard of Ozz	1980
	I Don't Know	Blizzard of Ozz	1980
	Bark at the Moon	Bark at the Moon	1983
<b>Dio</b>	Don't Talk to Strangers	Holy Diver	1983
	Rainbow in the Dark	Holy Diver	1983
	Holy Diver	Holy Diver	1983
	We Rock	The Last in Line	1984

### Harmonic Structure Extraction

In analyzing the songs selected above, our aim is to extract their harmonic structure, with the ultimate goal of finding patterns that can be related to the key center of the pieces. Although the main chords used in this genre are power chords, and not the traditional major and minor chords, we will stick to the classical roman numerals analysis that is directly related to the key. Moreover, Roman numeral analysis seemed to be the most appropriate notational system for our analysis.

Here is an example: [C] I-II | V-I | IV| I ||

The ‘C’ in brackets at the beginning indicates the tonal center. It is often difficult to categorize Heavy Metal songs in the common-practice tonal systems of ‘major’ or ‘minor’, as many songs adhere to other modes, or freely mix triads from the major and minor modes, or even combine elements of major and minor simultaneously; for example a minor third in the melody over a major triad. However, the tonal center of a song can usually be identified. In this context, we will use ‘key’ simply to mean ‘tonal center’ in a broad sense, with no implication of common-practice tonality.

Extracting the harmonic information from each song was challenging for many reasons. In Classical music, the composers or their copyist usually notate the music and then the scores are published and made available to the public. For example, it is really easy to find the scores of Mozart’s sonatas because there are many editions that published his sonatas, and even some editions are available online. In the case of Heavy Metal, music is based on recording medium and not on scores. While few published noted arrangements of this genre are available, they are generally created by professional arrangers, and not the composers themselves. Therefore, the extracted

information of the corpus is almost entirely based on our transcription of the songs by ear, and in few cases, double checked with some few available arrangements.

After transcribing the songs, and analyzing those using roman numerals, we wrote a computer program to extract statistical information without any human errors. The program works as follows:

In the following example, the song is composed of eight measures.

```
[C]   : I-II | V-I | IV| I |
      : I | I | IV-V | I ||
```

The program reads the following degree numbers and automatically deletes repeated numbers. For example, the last four measures, I | I | IV-V | I || would be interpreted as I-IV-V-I and not I-I-IV-V-I, thus counting the I chord only twice and not three times. The resulting chord transition would be: I to IV, IV to V, and V to I, considering the first two measures as I and not I-I. In other words, chord transition is only considered when changing from one root to another. This method will be used to examine the most commonly used degrees in the scale and chord transitions.

Because the songs are not always linked to one tonality or mode and sometimes use a mixture of both, the used roman numerals will reflect the roots of the chords corresponding to the major scale. Therefore, the degrees of a major scale will be: I, II, III, IV, V, VI, and VII. On the other hand, the degrees of a minor scale will be: I, II, III<sup>b</sup>, IV, V, VI<sup>b</sup>, and VII<sup>b</sup>. The flat sign don't necessarily indicate the use of a flat, but implies that the chord degree is lowered compared to the one of a major scale. For instance, the III degree of the note A will be C# because C# is the third note degree of the A major scale. On the other hand, III<sup>b</sup> will represent C natural because C is the third note degree of A minor scale.

## Chapter IV: Results and Discussion

### Characteristic Sounds

Heavy Metal is typically characterized by a guitar/drum dominated sound, distorted guitars, loud vocals and typical chord progressions and riffs. Other characteristics include:

#### **Palm Mute**

Palm muting is a very important Metal technique. The palm mute is a playing technique for the electric guitar and bass guitar, executed by placing the side of the picking hand below the little finger across the strings to be plucked, very close to the bridge, and then plucking the strings while the damping is in effect. It is also called pick hand muting, or right hand muting, because it's done with the picking hand, which is the right hand. Palm muting is a standard technique used in classical guitar performance, under the name pizzicato, which is borrowed from the bowed string instrument.

#### **The Power Chords (Dyads)**

The most common type of chord used in Heavy Metal is a two-note variety called "Power Chord", consisting of a root note, which names the chord, and a second note which is a perfect fifth above. "Expanded power chords" is another term used for the power chord used in a different voicing, which is mainly by adding the octave root on the top of the chord. This results with a thicker and fuller sound than the two note version. The power chord is an essential feature of Heavy Metal. According to Walser: *"the power chord is used by all of the bands that are ever called Heavy Metal and, until Heavy Metal's enormous influence on other musical genres in the late 1980s, by few*

*musicians outside the genre*” (Walser, 1993). The power chord cannot be said to have a major or minor quality. However, the tonal context can imply such qualities. Figure 2 shows typical voicings of powers chords built on F. Inverted power chords are also used, but not as much as root position power chords.



**Figure 2: Power Chords Voicing**

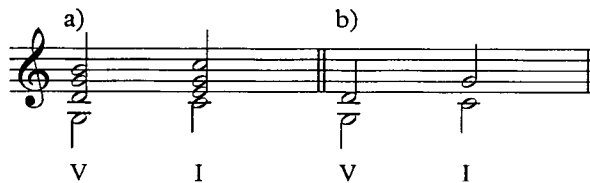
In Heavy Metal, power chords are almost always used with distortion, which can be regarded as a characteristic of metal music in general.

## Harmonic Structure

In music, harmony refers to the way chords are constructed and how they follow each other (Kamien, 1976). Jean-Philippe Rameau revolutionized music theory in his 1722's *Treatise of Harmony*” by introducing the fundamental relationship of chords (Christensen, 2002). Hugo Riemann (1849-1919) focused on the harmonic function of degrees and divided them into three categories: Tonic (T), Subdominant (S) and Dominant (D). According the Riemann, all chord structures are representatives of the three primary functions.

In this research, 28 Heavy Metal songs from 7 different bands were analyzed to find certain patterns in harmonic progressions, and hoping to define the harmonic functions of the chords that are particular to this genre. As discussed earlier, Heavy Metal harmony is based on parallel harmony of power chords, so in this context, functional relationship is made upon the relationship of roots, regardless of the voicing. According to Lilja, the experience of harmonic function does not require traditional voice leading, thus, there is no reason why traditional voice leading should be crucial in

defining harmonic function (Lilja, 2009). The following example in figure 3 shows two V-I cadences, the first one (a) using traditional voice leading, and the second (b) one using power chords. The dominant tonic relationship is very clear that the listener can even hear internally the inner voices.



**Figure 3: Voice leading in power chords**

## Results of the Corpus Analysis

The first aspect examined was the overall distribution of chord degrees, regardless of their voicing and inversion. Table 2 shows the results of chords distribution in the analyzed corpus. In this table, the second and third columns show the total number of instances of each chord and their proportion of the total chords used. The third and fourth columns show the song instances of each chord out of 28 songs and their percentage.

The most frequently used chords are I and VII<sup>b</sup>. Together, they form 58% of all the chord instances. Not surprisingly, I is the most used chord as it is the key center of every piece, but surprisingly the VII<sup>b</sup> chord appears almost equally to I. Moreover, I and VII<sup>b</sup> are the only chords that are used in each of the analyzed songs. Next come VI<sup>b</sup>, III<sup>b</sup>, and then IV. Combined together, they form 33.4% percent of the chord instances almost equal to the VII<sup>b</sup> chord alone. As discussed earlier, most of the Heavy Metal songs are based on minor modes; therefore, there aren't any occurrences of the III and VII chords that are related only to major modes. As we can see, because the music

is mainly modal, the V chord doesn't seem to have great importance in this genre as much as it had in classical music. This shows departure from common practice norms.

**Table 2: Distribution of Chord Roots**

Root	Instances	Percentage	Song Instances	Percentage
I	1516	30%	28	100%
II <sup>b</sup>	56	1.1%	4	14.3%
II	110	2.2%	12	42.9%
III <sup>b</sup>	558	11.1%	26	92.9%
III	0	0%	0	0%
IV	513	10.2%	25	89.3%
V <sup>b</sup>	36	0.7%	2	7.1%
V	218	4.3%	25	89.3%
VI <sup>b</sup>	610	12.1%	27	96.4%
VI	18	0.4%	2	7.1%
VII <sup>b</sup>	1414	28%	28	100%
VII	0	0%	0	0%

The next aspect examined is the harmonic transition of chords within the same tonal center as shown in table 3.

It is clear that the most frequent chords to precede the I chord are VII<sup>b</sup>, then IV. Moreover, the VII<sup>b</sup> chord is also the most used after the tonic. In this context, it is safe to consider the VII<sup>b</sup> degree as the dominant chord, and VI<sup>b</sup> as the predominant chord. The hierarchy of chord progression in Heavy Metal music can be extracted from this table.



**Table 3: Chord Transitions**

	I	II <sup>b</sup>	II	III <sup>b</sup>	III	IV	V <sup>b</sup>	V	VI <sup>b</sup>	VI	VII <sup>b</sup>	VII
I	0	25	59	182	0	125	22	64	332	0	681	0
II <sup>b</sup>	37	0	0	18	0	0	0	1	0	0	0	0
II	23	16	0	55	0	1	0	12	2	0	1	0
III <sup>b</sup>	128	4	36	0	0	127	14	2	26	0	221	0
III	0	0	0	0	0	0	0	0	0	0	0	0
IV	215	6	0	108	0	0	0	36	71	0	77	0
V <sup>b</sup>	22	0	0	0	0	14	0	0	0	0	0	0
V	76	0	3	7	0	51	0	0	53	0	28	0
VI <sup>b</sup>	53	0	6	31	0	65	0	49	0	0	405	0
VI	2	0	0	8	0	0	0	0	8	0	0	0
VII <sup>b</sup>	934	5	6	149	0	130	0	53	118	18	0	0
VII	0	0	0	0	0	0	0	0	0	0	0	0

To examine more closely the relationship of the chord roots, the following tables allow us to examine closely the distribution of pre and post tonic, dominant, and subdominant chords, while considering that the VII<sup>b</sup> chord is the dominant in this genre. Degrees that don't show any data in the following tables are excluded.

**Table 4: Pre-Tonic and Post-Tonic Chord Roots Distribution**

Root	Pre-Tonic	Percentage	Post-Tonic	Percentage
II <sup>b</sup>	37	2%	25	2%
II	23	2%	59	4%
III <sup>b</sup>	128	9%	182	12%
IV	215	14%	125	8%
V <sup>b</sup>	22	1%	22	1%
V	76	5%	64	4%
VI <sup>b</sup>	53	4%	332	22%
VI	2	0%	0	0%
VII <sup>b</sup>	934	63%	681	46%

Table 4 shows, as we concluded earlier, that the VII<sup>b</sup> chord is the most used chord after I. This suggests that VII<sup>b</sup> is favored as a way of approaching or leaving the tonic. Next come IV as pre-tonic, and VII<sup>b</sup> as post-tonic. II<sup>b</sup>, II, V<sup>b</sup>, and VI are avoided as pre-tonic.

Table 5 shows the distribution of pre and post dominant chords. I is unsurprisingly the most used degree as pre and post dominant, which is also the case in common practice music. Because I is the tonic, VI<sup>b</sup> takes the function of the subdominant as it the most used chord as pre-dominant after I. Next come III<sup>b</sup> with lower occurrences. The most used post dominant degree is I, the tonic, followed also by III<sup>b</sup>.

**Table 5: Pre-Dominant and Post-Dominant Chord Distribution**

Root	Pre-Dominant	Percentage	Post-Dominant	Percentage
I	681	48%	934	66%
II <sup>b</sup>	0	0%	5	0%
II	1	0%	6	0%
III <sup>b</sup>	221	16%	149	11%
IV	77	5%	130	9%
V	28	2%	53	4%
VI <sup>b</sup>	405	29%	118	8%
VI	0	0%	18	1%

Next we will examine the VI<sup>b</sup> chord that can be regarded as the subdominant. Post subdominant is usually the dominant, and this is the case here as shown in table 6 VII<sup>b</sup> is the most frequent post-subdominant chord in the table. Next comes IV and I. Pre-subdominant dominated by the I chord, followed by VII<sup>b</sup>.

**Table 6: Pre-Subdominant and Post-Subdominant Chord Distribution**

Root	Pre-Subdominant	Percentage	Post-Subdominant	Percentage
I	332	54%	53	9%
II	2	0%	6	1%
III <sup>b</sup>	26	4%	31	5%
IV	71	12%	65	11%
V	53	9%	49	8%
VI	8	1%	0	0%
VII <sup>b</sup>	118	19%	405	67%

Based on the analysis of the corpus selection, we can conclude that, in a way, Heavy Metal have a structural functional harmony known to composers on an unconscious level. According the Arnold Schoenberg, the harmony of popular music consists of mere interchange of tonic and dominant to express a tonality. Our assumption in this thesis is that, although the music is mainly modal, functional harmony exists in heavy metal, and it is based on the Tonic (I), Subdominant (VI<sup>b</sup>), and Dominant (VII<sup>b</sup>) as opposed to IV and V in Classical music.

To confirm this relationship, table 7 shows the occurrences of different type of cadences in the selected repertoire. In 57% of the songs, the concluding cadence is based on a VII<sup>b</sup> - I progression.

**Table 7: Cadences**

Cadence Type	Instances	Percentage
VII <sup>b</sup> - I	16	57%
V - I	6	21%
III <sup>b</sup> - I	2	7%
VI <sup>b</sup> - I	2	7%
IV - I	1	4%
I - VI <sup>b</sup>	1	4%

Based on the analyzed data, we classified the chord degrees into the three main functions: Tonic, subdominant, and dominant. Primary and secondary chords are also included. (Table 8)

**Table 8: Harmonic Functions in Heavy Metal**

Type	Primary	Secondary
Tonic	I	-
Subdominant	VI <sup>b</sup> - III <sup>b</sup>	IV
Dominant	VII <sup>b</sup> - V	IV-III <sup>b</sup>

The most frequent progressions in this style are: VI<sup>b</sup>-VII<sup>b</sup>-I, VII<sup>b</sup>-VI<sup>b</sup>-I, and III<sup>b</sup>-VII<sup>b</sup>-I. The (VI<sup>b</sup>-VII<sup>b</sup>-I) progression is called Aeolian progression or “Aeolian Pendulum”. It functions as a cadential progression, similar to the (IV-V-I) progression in classical music (Björnberg, 1984). This progression is extensively used in heavy metal, especially with bands like Iron Maiden who made it their trademark progression (Lilja, 2009). For example, in the song Fear of the Dark (Fear of the Dark, 1992) this progression is almost used in the entire seven minutes songs, even modulating with the same progression. The two successive guitar solos of the song use the same Aeolian progressions: I | I | VI<sup>b</sup>-VII<sup>b</sup> | I |, the first solo on F#, and the second one on D.

The II chord is not included in the previous table because it doesn't have any relevant harmonic function. It is mostly used in cycle of fifths, or as a passing chord between I and III<sup>b</sup>, thus having no significant importance on the overall harmony. In the selected corpus, the II chord was used in only 43% of the songs; it occupies 2.2% of the chords used in all the songs. An example of its use can be found in Black Sabbath's “Heaven and Hell” (Heaven and Hell, 1980) portrayed in figure 4.

E: I II III<sup>b</sup> VI<sup>b</sup> VII<sup>b</sup> I II III<sup>b</sup> IV III<sup>b</sup> II I

T (pass.) S S D T (pass.) S D (pass.) T

**Figure 4: Heaven and Hell - Black Sabbath**

In this example the II degree is considered as a passing chord, whereas IV serves as the dominant chord.

Ozzy Osbourne’s opening theme of Crazy Train (Blizzard of Ozz, 1980) is an archetype of heavy metal progression. It combines two of the most frequent chord progressions in

I III<sup>b</sup> VII<sup>b</sup> I VI<sup>b</sup> VII<sup>b</sup>

F<sup>#</sup> : T S P.M.-1 D P.M.-1 T S D

**Figure 5: Crazy Train - Ozzy Osbourne**

Roots and pedal tones play an important role in Heavy Metal music. In tonal context, the cadential 6/4 with its resolution is considered as a suspension on the dominant base, but not as I<sup>6/4</sup>,V,I as shown in figure 6. Therefore, it has the function of the dominant.

D D T

V I

**Figure 6: Cadence**

The same concept can be applied to the pedals in Heavy Metal. Figure 7 shows the introduction of Dio's *We Rock* (The Last in Line, 1984) that features pedal on the A note played by the guitar and doubled by the bass. This riff can be analyzed as an extension of the tonic "I" and not as three different chords.

**Figure 7: Dio - We Rock**

Figure 8 is the harmonic reduction of the previous example. This riff can even abide to the classical analysis on non-chord tones (N.C.). The first and second can be seen as double neighboring tones (*double broderie*), and the last was as passing tones that leads back to the first chord.

**Figure 8: We Rock - Dio (Harmonic Reduction)**

Heavy Metal progressions are in a way similar to the Renaissance and Baroque ground basses (ostinatos) such as *Passamezzo*, *Folia*, *Romanesca*, and *Passacaglia*. The reason why they are similar is because some songs are composed entirely on one or two

main progressions, with variation of melodies, colors, lyrics, and vocal lines. A good example is Dio's *Rainbow in the Dark* (*Holy Diver*, 1983). The four minutes song is based on two progressions, each alternating between three chords.

Moreover, some musicians, especially the classically trained ones like Deep Purple, used a lot of progressions inspired by Classical and Baroque music. For instance, Deep Purple's "Burn" (Burn, 1974) used a cycle of fifths, which is a typical Baroque progression.

Figure 10 illustrates the guitar solo in deep purple's *Burn*. This solo contains a lot of classical features. First, the progression is a typical feature of the baroque era and was used by almost every composer in that period. Second, the chords are in root position and first inversion, using a traditional voice leading that is very similar to Handel's *Passacaglia* from his *Suite in G minor* HWV 423, and shares with it the same tonality.

Figure 9 illustrates the reduction of Handel's *Passacaglia* (without non chord tones) and points out the similarities, even in the melody and upper voices. Third, the bass uses passing tones linking the chord tones in a way that is very similar to the baroque's *basso continuo*.

The image shows a musical score for a reduction of Handel's *Passacaglia*. It consists of two staves. The upper staff is in treble clef and the lower staff is in bass clef. The key signature is G minor (two flats) and the time signature is 4/4. The score shows a sequence of chords: I (G3), IV<sup>6</sup> (C4), VII (Bb4), III<sup>6</sup> (Eb5), VI (F5), II<sup>6</sup> (D6), V (G#5), and I (G6). The lower staff shows a bass line with passing tones linking the chord tones of the upper staff.

**Figure 9: Reduction of Handel's Passacaglia**

The musical score is presented in two systems. The first system consists of four staves: two for 'Guitar 1' and two for 'Organ' and 'Bass'. The second system consists of four staves: two for 'Guitar 1' and two for 'Organ' and 'Bass'. The key signature is one flat (B-flat) and the time signature is 4/4. Roman numeral chord markings are placed above the first staff of each system: I, IV<sup>6</sup>, VII in the first system; and III<sup>6</sup>, VI, IV, V<sup>#</sup> in the second system. The guitar parts feature a melodic line with eighth notes and sixteenth notes. The organ part provides a harmonic accompaniment with chords. The bass part provides a steady rhythmic foundation with quarter and eighth notes.

Figure 10: Burn (solo) - Deep Purple



## Scales, Modes, and Voice Leading

In the traditional western music, at least since the early 18<sup>th</sup> century, music was based on two modes: the major and minor, also called the tonal system. However, the scales or modes used in Heavy Metal vary much more and can be traced to at least three primary sources: Pentatonic and Blues scales, the modal scales (or church modes), and the Western major/minor tonal influence.

### Pentatonic and Blues Scales

As discussed earlier, Heavy Metal has its roots in Blues and Rock. Thus, it incorporates a main feature of the style which is the use of pentatonic and blues scales. This can be found excessively in guitar solos, guitar riffs, and vocal lines. Figure 11 shows the verse of Deep Purple's Highway Star (Machine Head, 1972) that is based on the G pentatonic scale shown in figure 12.

G B $\flat$  C B $\flat$

No-bod-y gon-na take my car, I'm gon-na race it to the groud.\_\_\_\_

Figure 11: Verse of "Highway Star" – Deep Purple

Figure 12: G minor pentatonic

Another example is the opening riff from Deep Purple's Black Night (Scandinavian Nights, 1988) which is based on the E pentatonic Scale.

Figure 13: Opening riff of "Black Night" - Deep Purple

## Modal Scales

The most frequently used modes in this style other than the pentatonic and blues scales are the church mode, as the music is mainly modal. There are seven different modes, each having a different arrangement of tones and semitones. The modes are: Ionian, Dorian, Phrygian, Mixolydian, Lydian, Aeolian, and Locrian. These modes can be classified into minor and major modes, based on the intervals of 3<sup>rd</sup> starting from the root note:

- Minor Modes: Dorian, Phrygian, Aeolian, and Locrian.
- Major Modes: Ionian, Lydian, and Mixolydian.

Heavy Metal music usually favors minor modes, with a particular emphasis on the Aeolian mode. 27 out of the 28 analyzed songs are based on the Aeolian mode. Figure 14 shows the verse of Iron Maiden's *Fear of the Dark* (*Fear of the Dark*, 1992). The vocal line is based on the D Aeolian, sung over a typical Aeolian progression: I | VI<sup>b</sup> | VII<sup>b</sup> | VI<sup>b</sup>-VII<sup>b</sup> |.

D Bb C Bb C

I am a man\_ who walks a- lone... And when I'm walk-ing a dark

D Bb C Bb C

road at night or stroll - ing through the park.\_

Figure 14: *Fear of the Dark* - Iron Maiden

The Phrygian mode is also commonly used in Heavy Metal. Its characteristic chord is the II<sup>b</sup>. Figure 15 shows the chorus of Judas Priest's Painkiller (Painkiller, 1990) which is based on the B Phrygian scale; its characteristic chord is the C chord.



**Figure 15: Painkiller - Judas Priest**

However, the Dorian mode isn't used as often as Aeolian and Phrygian in riff construction, but appears extensively in guitar solos. If the Aeolian mode A is harmonized with power chords (perfect fifth) the second degree will contain an F#, a note particular to the A Dorian. As concluded in the previous section, the II chord doesn't have any important function, and is mostly used as passing chord, but its use creates a combination of the Aeolian and Dorian mode. Figure 16 shows the harmonization of A Aeolian.



**Figure 16: Aeolian Mode harmonized by power chords**

Figure 17 illustrate an example of the use of Dorian mode on G in Deep Purple's Highway Star (Machine Head, 1972)

G5      Fsus2/G   C/G      Fsus2/G   G5      Fsus2/G   G5

**Figure 17: Highway Star - Deep Purple**

Other uses of the seven church modes can be found in the Heavy Metal repertoire, but aren't a main feature of the style, and are used less than the three modes mentioned above.

### **Tonality: Major and Minor**

Although modal scales play an important role in Heavy Metal harmony, the influence of Classical music is prominent in its vocabulary, in particular the use of minor and major tonality, and Classical chord progressions. Many Heavy Metal musicians were classically trained. For instance, Deep Purple's own guitarist Ritchie Blackmore took Classical guitar lessons before Deep Purple. Their organ player John Lord was classically trained, and even composed a "Concerto for Group and Orchestra" (1970) incorporating a symphonic orchestra with the band (Lilja, 2009). Blackmore himself said: "For example, the chord progression in the Highway Star Solo...is a Bach progression". Blackmore was an influential guitarist of the 1960s and 1970s (Walser, 1993). Ozzy Osbourne's guitarist Randy Rhoads also grew up in a musical house, a son of two music teachers (Walser, 1993), and studied piano, guitar, and music theory. Therefore, although most of the bands were influenced by Classical music, elements of Classical music are more prominent in the music of Deep Purple and Ozzy Osbourne more than other bands.

## Guitar Solos

Heavy Metal songs feature at least one guitar solo and few solos by other instruments (Walser, 1993). Iron Maiden in particular, added a third guitarist in 1999, and since then, most of their songs feature two or three guitar solos. The virtuosity of guitar solos is often paired with an exotic combination of modes.

The most dominating mode used in guitar soloing is the minor pentatonic, which is blues-inspired. Some guitar solos are entirely based of the pentatonic mode. A classic example would be Paranoids' (Paranoid, 1971) guitar solo which in entirely based on the E minor pentatonic mode as shown in figure 18.

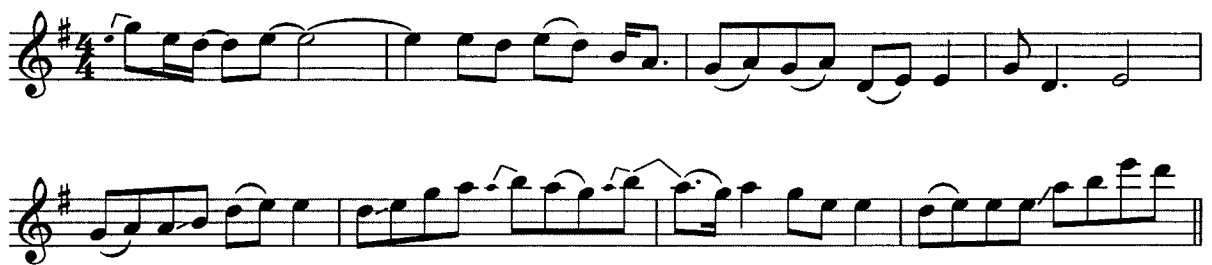


Figure 18: Guitar solo from Paranoid - Black Sabbath

An example a mixtures of modes in shown in figure 19 taken from Black Sabbath's War Pigs' solo (Paranoid, 1971). This solo starts on G Mixolydian than switches to G pentatonic.

The image displays two staves of musical notation for a guitar solo. The top staff is labeled "G Mixolydian" and shows a descending eighth-note scale starting on G4, with a flat on the seventh degree (F natural). The bottom staff is labeled "G Pentatonic" and shows a pentatonic scale starting on G4, with a triplet of eighth notes at the end.

Figure 19: Guitar Solo from War Pigs - Black Sabbath

### *Analysis of Highway Star Solo*

One of the most interesting solos is Deep Purple's Highway Star (Machine Head, 1972). This section will examine the scales and modes used in Richie Blackmore's solo of Highway Star (see appendix B for full score). The first sixteen bars are played on eight measures on D, then eight measures on A. The progression can be regarded as I-V in D, or modulation from D to A. The reason why we prefer to consider it as modulation is because the solo opens with a blues derived lick on D pentatonic, continuing the idea for the first eight measures. The E note used in measure 3 is a passing tone borrowed from D Aeolian. The next eight measures are played over A chord, but the solo switches to A pentatonic, and used the F# from A Dorian in measure 11, thus making the first 8 measures based on the key of D, and the next 8 on the key of A. The next section starts on measure 17, getting back to the key of D over a progression (I-IV-VII $\flat$ -V). The mode used here is A Aeolian, playing arpeggios over chords with few passing tones. The third section, starting from measure 33, is a classically inspired section on D. It recalls articulation of harmonic progressions in Vivaldi's violin concerto in D minor (Walser, 1993). The section ends with a chromatic passage leading the last bluesy contrasting section played over an A chord. The last part used purely pentatonic and blues modes.

### Keys Centers

Based on the analyzed corpus, we extracted the key center of all the songs. Table 9 illustrates the used keys and concluded that the most used key is the key of E.

**Table 9: Key Centers**

Key	Instances	Percentage
E	15	54%
A	5	18%
D	3	11%
G	3	11%
C	1	4%
F#	1	4%

The reason why the E key is the most used key can be linked to two main reasons. The first one is because this genre is centered around the electric guitar. Keys that involve open strings in the guitar (E-A-D-G-B-E) tend to be rich in harmonic overtones. For example, the first two overtones of the note E are E and B, thus, playing an E on the 5<sup>th</sup> string can produce harmonics by vibrating the first (E), second (B), and 6<sup>th</sup> string (E). On the other hand, playing an E<sup>b</sup> on the guitar won't produce any harmonic tones on other strings, resulting in a poor and mellow timbre. For this same reason, most of the Classical guitar repertoire is written in the tonalities of E, A, and D (minor or major), because these three notes are the 3 open bass strings on the instrument. Similarly, the most used keys in heavy metal as shown in table 9 are E, A and D.

The second reason for the use of these key centers is the fact that the music relies extensively on pedal tones that are usually on the tonic. Therefore, having E, A,

or D as key centers makes it easier to play these pedals, regardless of the position of the other notes because the pedals can be played on open strings.

### Modulation

This section will examine the modulation of the selected corpus. First of all, 16 songs did modulate to one or more different keys and 12 songs remained in the same key without changing their key center. The most favored modulation is found to be to the 4<sup>th</sup> degree; for example C to F, E to A etc. Modulation to the 5<sup>th</sup> and 7<sup>th</sup> degree is also common with some bands. For instance, the Classical influenced band Deep Purple uses most the modulation to the 5<sup>th</sup> degree that is common in Classical music.

A common type of modulation, particular by Iron Maiden, is the phrase modulation, also known as direct modulation. This type of modulation occurs between phrases where the first one ends in the home key, and the second phrase begins immediately in a different key, and sometimes by juxtaposition, meaning that the same phrase is transposed to a different key. Figure 20 illustrates the modulation that occurs between the first and second solo in Iron Maiden's *The Trooper* (Piece of Mind, 1983) where the first phrase is in E, and the second is identical but in A.

	E5	D5	B5	C5	D5	E5	D5	B5	C5	D5
										
E:	I	VII <sup>b</sup>	V	VI <sup>b</sup>	VII <sup>b</sup>	I	VII <sup>b</sup>	V	VI <sup>b</sup>	VII <sup>b</sup>
A5	G5	E5	F5	G5	A5	G5	E5	F5	G5	
										
A:	I	VII <sup>b</sup>	V	VI <sup>b</sup>	VII <sup>b</sup>	I	VII <sup>b</sup>	V	VI <sup>b</sup>	VII <sup>b</sup>

Figure 20: *The Trooper* - Iron Maiden



Another common type of modulation is the common chord modulation that uses a chord that is common to the two keys. The common chord(s) is often called a pivot chord(s). Example of a common chord modulation can be found in Ozzy Osbourne's *Crazy Train* (Blizzard of Ozz, 1980) illustrated in figure 21. In this example, the modulation is made to the relative key: the verse of *crazy train* is based in F# Aeolian, and the modulation occurs to the relative major of F# which happens to be A. This type of modulation is very common in Classical music. The phrase ends with D5 and E chords that are respectively the 6<sup>th</sup> and 7<sup>th</sup> degree in F#. This can be regarded as a half cadence in the key of F#, since we found in the last chapter that the 6<sup>th</sup> degree have the function of subdominant, and the 5<sup>th</sup> functions as the dominant, thus making it a half cadence in F#. On the other hand, D5 and E are also found in the key of A, making them the pivot chords. In the new key of A, these chords are the 4<sup>th</sup> and 5<sup>th</sup> degree. This song uses a mixture of modal and tonal scales in a way that is similar to Classical music.

The figure displays two staves of musical notation in treble clef with a key signature of two sharps (F# and C#) and a 4/4 time signature. The first staff represents the verse, starting in F# Aeolian mode. It features a sequence of chords: F#5, A5, E5, F#5, D5, and E. Below the staff, the chord functions are labeled: F#(aeol): I, III<sup>b</sup>, VII<sup>b</sup>, I, A:  $\frac{VI^b}{IV}$ ,  $\frac{VII}{V}$ . The second staff represents the chorus, which modulates to the key of A major. It features a sequence of chords: A, E/A, D/A, and A5. Below the staff, the chord functions are labeled: I, P.M., V<sup>6</sup>, P.M., IV<sup>6</sup>, P.M., I. The 'P.M.' labels indicate power chords. The modulation from F# Aeolian to A major is achieved through the common chords D5 and E.

Figure 21: Verse and Chorus from "Crazy Train" - Ozzy Osbourne

## Rhythm

Rhythm, an aspect that is often neglected in music analysis, is an essential element in Heavy Metal music. This section will go through all the important features and characteristics of rhythm in Heavy Metal. The meter is often 4/4 with very few exceptions. In the analyzed corpus, the 28 songs are based on 4/4 meter, but two songs have introductory sections in compound meter. For instance, Black Sabbath's "War Pigs" (Paranoid, 1971) starts with a slow ballad like introduction in 12/8, and then changes to 4/4. Also, Iron Maiden's "Dance of Death" (Dance of Death, 2003) starts in 6/8, and then switches to 4/4.

Although the meter is simple and supposedly easy, it is much more complex on an internal level. The rhythmic framework is organized more basically on a pulse than a meter (Walser, 1993), and this pulse is more likely to be irregular, based on upbeats and syncopation.

### Upbeats

An upbeat is an accent made on a weak beat or between the beats, for example on the second eighth note of a beat. The following example in figure 22 demonstrates the difference between a regular and irregular beat. Notice that although the first and second examples are composed both of 8 eighth notes, the latter create a new pattern of rhythm using upbeats: two dotted quarter notes then a quarter note.



Figure 22: Upbeats

Going back to the selected repertoire, figures 23 and 24 shows this rhythmical device used in the intro of Ozzy Osbourne’s “Bark at the Moon” (Bark at the Moon, 1983) and “Crazy Train” (Blizzard of Ozz, 1980).

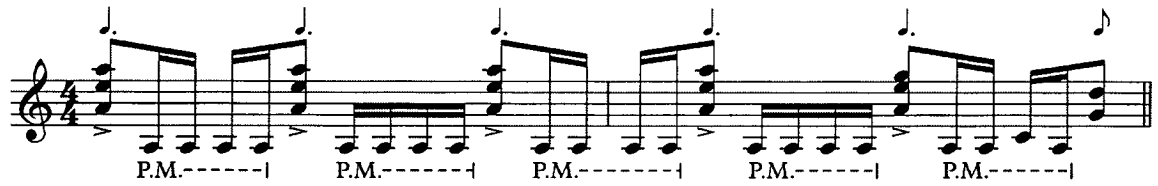


Figure 23: Bark at The Moon Intro - Ozzy Osbourne

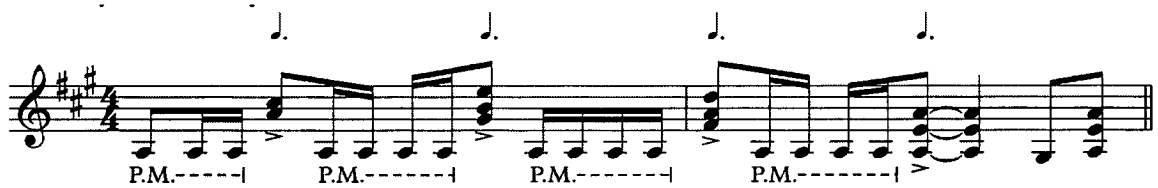


Figure 24: Crazy Train - Ozzy Osbourne

Moreover, the pattern shown in the first example can be found in Burn’s solo (figure 25).

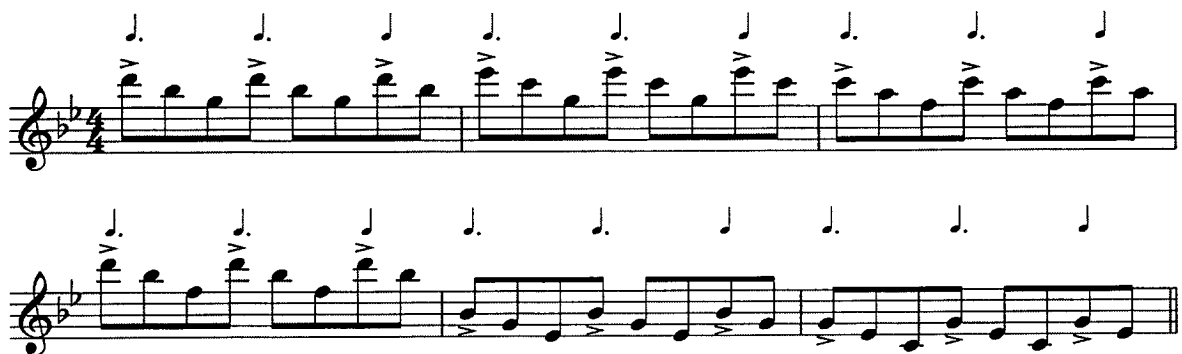


Figure 25: Solo from Burn - Deep Purple

Iron Maiden's Hallowed be thy Name (Number of the Beast, 1982) contains a very similar rhythmic figure in the guitar solo accompaniment as shown in figure 26.



**Figure 26: Hallowed be thy Name - Iron Maiden**

### Syncopation

Interestingly, when syncopated, upbeat create a rhythmical effect typically associated with this particular genre. Syncopation shifts the accents of the meter resulting in a displacement of accents. This can almost be found in any Heavy Metal song. The vocal melodies are almost always syncopated, even if the music is regular. A great example would be Black Sabbath's Paranoid (Paranoid, 1971) shown in figure 27.

Fin-ished with my woman - an 'cause - she - could-n't help-me with my mind.

P.M.-----

Figure 27: Paranoid - Black Sabbath

Judas Priest's Electric Eye (Screaming for Vengeance, 1982) and Ozzy Osbourne's I Don't Know (Blizzard of Ozz, 1980) also feature a syncopated vocal line over a regular accompaniment (Figures 28 & 29).

You think you've pri-vate lives, think noth-ing of - the kind. -

P.M.- P.M.- P.M.- P.M.- P.M.-

Figure 28: Electric Eye - Judas Priest

People look - to - me - and say - Is the end near? - When is - the fi - nal day?

P.M.----- P.M.----- P.M.-----

Figure 29: I Don't Know - Ozzy Osbourne

### Half Beat

Half beat or half time is a rhythmic device that is common in this genre, but not crucial to it. Briefly, half beat is literally half beat. It occurs when the drum beat play a half-speed groove while the guitar part remains unchanged. It gives the feeling that the underlying beat is suddenly going at half of the song's speed. Examples of half beats can be found is Dio's Don't talk to Strangers (Holy Diver, 1983) and Ozzy Osbourne's Bark at the Moon (Bark at the Moon, 1983) (Figures 30 & 31).

The image shows two staves of music. The top staff is a guitar line in 4/4 time, consisting of a series of eighth notes. The bottom staff is a drum line with 'x' marks indicating hits. A bracket labeled "Half-Beat Section" spans the final two measures of the drum line, where the hits are spaced out to half the original tempo.

Figure 30: Don't Talk to Strangers - Dio

The image shows two staves of music. The top staff is a guitar line in 4/4 time, featuring a complex melodic line with many sixteenth notes. The bottom staff is a drum line with 'x' marks indicating hits. A bracket labeled "Half-Beat Section" spans the final two measures of the drum line, where the hits are spaced out to half the original tempo.

Figure 31: Bark at the Moon - Ozzy Osbourne

### Gallop Rhythm

The Gallop rhythm (figure 32) is a rhythmical figure used a lot in Heavy Metal, and in particular by Iron Maiden. They used it to an extent that it became also a trademark for the band. This rhythmic figure can be found in all their four songs that were analyzed for this study. It appears sometimes with the whole band, and sometimes with only one instrument like the guitar, bass or drums. Figure 33 shows example of its use with Iron Maiden from “The Trooper”(Piece of Mind, 1983).



Figure 32: Gallop Rhythm



Figure 33: The Trooper - Iron Maiden

Although this rhythmical pattern is extensively used by Iron Maiden, many other acts used it in their songs including Black Sabbath, Ozzy Osbourne, Dio, Saxon and more. The following example in figure 34 is from Heaven and Hell's verse (Heaven and Hell, 1980) showing both the drums and bass playing the gallop rhythm.

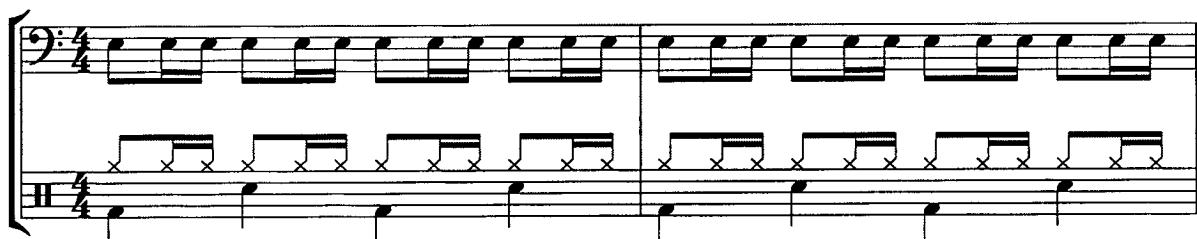


Figure 34: Heaven and Hell - Black Sabbath

### Blues Influence

As discussed in the first part of this study, blues influenced directly the evolution of Heavy Metal, but its characteristics are rather hidden in the music, and mostly portrayed in the guitar solos and riffs, more than the rhythm. Nevertheless, some songs borrow rhythmical characteristics of the blues. A great example would be Deep Purple's "Black Night" (Scandinavian Nights, 1988) which is inspired by the blues, and uses up-tempo bluesy shuffle as the main rhythm for all the instruments, and even the main theme. Figure 35 shows the rhythm used in this particular song.



**Figure 35: Black Night - Deep Purple**



## Form

### Riff Forms

The form of a riff and/or a progression is very similar the forms in Classical music. According to Oxford groove music online, a riff is a short melodic ostinato which may be repeated either intact or varied to accommodate an underlying harmonic pattern.

A standard four-measure riff is usually in one of the following forms:

#### ABAC

The most common form of riffs is the ABAC form, also known as “Period”. The period is also the most common theme-type in the Classical style (Caplin, 1998). The period is divided into two phrases fulfilling the antecedent and consequent functions. William E. Caplin’s book “Classical Form” divides each of the two phrases into two smaller parts where the first part comprises the basic idea and a contrasting idea, and the second part repeats the same basic idea but ends with cadential closure. This form can also be simply called ABAC, where A is the basic idea, B the contrasting idea, and C the cadential closure. This form is typical in Heavy Metal. Figure 36 shows the opening theme of Deep Purple’s “Smoke on the Water” (Machine Head, 1972), the riff that launched Deep Purple into the heart and mind of generations, and one of the most emulated riffs of all time (Stetina, 2001).



Figure 36: Smoke on the Water - Deep Purple

Another example of this form can be found in Black Sabbath's *Heaven and Hell* (Heaven and Hell, 1980) as shown in figure 37.



Figure 37: Heaven and Hell - Black Sabbath

### **ABAB**

The second type of riff used in this genre is ABAB, which is composed of two identical phrases, each containing the basic idea “A” and the contrasting/cadential idea “B”.

Figure 38 shows the opening theme of Iron Maiden's *Hallowed be thy Name* (Number of the Beast, 1982) which incorporates this form.



Figure 38: Hallowed be thy Name - Iron Maiden

**AAAA**

AAAA is the simplest form of all; it is based on the repetition of a motif or riff. Figures 39 and 40 illustrates this form in Black Sabbath's Paranoid (Paranoid, 1971) and Judas Priest's Victims of Change (Sad Wings of Destiny, 1976)



**Figure 39: Paranoid - Black Sabbath**



**Figure 40: Victims of Change - Judas Priest**

**AAAB**

The last form AAAB is very similar the AAAA but with an altered ending. The following example in figure 41 is Fear of the Dark by Iron Maiden (Fear of the Dark, 1992)

The image shows two staves of musical notation for the song 'Fear of the Dark' by Iron Maiden. The notation is in a single treble clef with a key signature of one flat (Bb). The music consists of eighth and sixteenth notes. Above the first staff, there are two brackets labeled 'A'. The first bracket covers the first four measures, with a 'D' chord symbol above it. The second bracket covers the next four measures, with a 'Bb' chord symbol above it. Below the first staff, there are two brackets labeled 'A' and 'B'. The 'A' bracket covers the first four measures, and the 'B' bracket covers the next four measures. Above the second staff, there are two brackets labeled 'C' and 'D'. The 'C' bracket covers the first four measures, and the 'D' bracket covers the next four measures.

Figure 41: Fear of the Dark - Iron Maiden

### Large Scale Forms:

In this section, we aim to describe the basic large-scale structures of Heavy Metal and how the riffs fit into these forms.

Heavy Metal forms are in a way similar to the traditional forms of popular music. One of the most typical forms in this style is the compound AABA form. The compound AABA form is a combination of verse-chorus form and AABA form.

First, we will examine the AABA and verse-chorus form, than the compound form that is based on those two.

#### *AABA Form*

The AABA form is based on the strophic verse (A), and a contrasting bridge (B) for example:

- Introduction
- Verse (A)
- Verse (A)
- Bridge (B)
- Verse (A)
- Coda

This form can be found extensively in Blues and Rock songs. Heavy Metal doesn't favor this form; instead it combines it with the verse-chorus form.

### ***Verse-Chorus Form***

The verse-chorus form is composed of sets of strophic verses and non-strophic choruses. In contrast to the AABA form, the focus in a verse-chorus song is squarely of the chorus. There are two main types of verse-chorus forms: simple verse-chorus forms (using the same distinctive guitar riff or progression) and contrasting verse-chorus form (employs different music for every section).

An example of this form can be found in Deep Purple's "Smoke on the Water" (Machine Head, 1972) shown in table 10.

**Table 10: "Smoke of the Water" Form - Deep Purple**

Intro	24mm
Verse 1	16mm
Chorus	6mm
Interlude	8mm
Verse 2	16mm
Chorus	6mm
Interlude	8mm
Verse (instrumental)	12mm
Chorus (instrumental)	6mm
Interlude	8mm
Verse 3	16mm
Chorus	6mm
Coda	20mm

This song is composed of 4 cycles of verse-chorus. As we can see in this example, interludes might be present between the cycles of verse-chorus, or sometimes between the verse and the chorus. Their presence doesn't change the overall form of the song because they serve as transition between sections.

***The Compound AABA Form***

The compound AABA form is the most used form in Heavy Metal music. It combines features from both AABA and verse-chorus form to create a more sophisticated form. This form is similar very similar to the verse-chorus form, but with an added contrasting section resulting in a large AABA form, where the A section is composed of two vocal sections: a verse and a chorus, and the B section includes new material, a bridge section, and other instrumental sections including guitar solos. Within each of the A and B sections, an introduction, transition, or coda might be included. One of the additions can be a pre-chorus, which is a non-strophic vocal section that serves as a transition from the verse to the chorus.

Dio's *Rainbow in the Dark* (Holy Diver, 1983) is a typical example of this form.

Table 11 shows the outline of its form.

The A sections includes an 8 measures introduction stating the main theme of the song, followed by the verse, chorus, then a small transition.

The B section is mainly the guitar solo which can be divided into two sections followed by an instrumental transition to get back to the A section.

The last A section is similar to the first two, but with an added coda that ends with a fade out, a feature that is used in many the analyzed songs.

**Table 11: Rainbow in the Dark – Dio**

	Intro	8mm
<b>A</b>	Verse 1	16mm
	Chorus	4mm
	(transition)	4mm
<b>A</b>	Verse 2	16mm
	Chorus	4mm
	(transition)	4mm
<b>B</b>	Solo section 1	16mm
	Solo section 2	4mm
	(transition)	4mm
<b>A</b>	Verse 2	16mm
	Chorus	4mm
	(transition)	4mm
	Coda	8mm

Based on the analyzed corpus (table 12) 93% of the songs are in compound form, with 21% of them being varied (longer B section, or an additional A section), and only 7.1% incorporate the Rock/Blues influenced verse-chorus form.

**Table 12: Forms**

<b>Form</b>	<b>Instances</b>	<b>Percentage</b>
<b>Verse-Chorus</b>	2	7.1%
<b>Compound</b>	20	71.4%
<b>Compound (varied)</b>	6	21.4%

## Chapter V: Conclusion

What has been done in this research is a musicological survey of Heavy Metal's musical language from various points of view including the study of form, rhythm, modes, harmonic structure, and addressed important issues concerning the analysis of this genre.

This study answered our main questions as follows:

First of all, Heavy Metal has its own harmonic logic and principles. The attraction of chords is based on the three functions that we identified: The tonic, subdominant, and dominant. I was identified as the tonic, VI<sup>b</sup> and III<sup>b</sup> as the subdominant, and VII<sup>b</sup> and V as the dominant. Secondary functions were also explored showing that IV can substitute the subdominant or the dominant depending of each case. Also, the most frequently used chord progressions in this genre were identified.

Secondly, we concluded that Heavy Metal songs abide by certain rules that govern its form, rhythm and melodies. The riff structures are in a way very similar to the periods and sequences in Classical music as defined by William Caplin, moreover, the large scale form of the selected corpus is based one distinct form which is the compound AABA form. The rhythmical studies showed characteristic devices that are commonly used by all the bands of this genre such as syncopations, upbeats, and gallop rhythm.

Thirdly, we proved that Heavy Metal can be analyzed and understood by using Classical norms. For instance, the harmony, form, melodies, modulations, structures, and non-chord tones were analyzed in a way that is very similar to the Classical music



analysis, although the musical language is different in many aspects, especially in voice leading.

While this study serves as a foundation of Heavy Metal music analysis, it is also a valuable base for statistical analysis of harmonic progressions and form. Similar analysis of other Heavy Metal bands will also help develop a general theory of this genre. Furthermore, while these types of studies help shaping the theory of the genre in general, they can only identify common features of it. For this reason, studying the music of each band separately will be one of my next objects of studies. For instance, each of the studied aspects of this thesis can be studying further and explored. For example, the rhythmical aspect of Heavy Metal, or even of a particular band can be studied more in depth.

However, this study leaves many questions unanswered. We strongly believe in the need of detailed analysis of Heavy Metal music. Such foundations are vital to the growth of Metal music theory and popular music studies in general.

## Glossary

**Beat:** The underlying pulse in music, in relation to which, the length and timing of notes are measured.

**Dyads:** Two-note chord.

**Distortion:** Form of audio signal processing used to alter the sound of electric guitar by increasing the gain. This results in fuzzy tones.

**N.C:** Non-chord tones; tones that are that part of a certain chord or harmony.

**Palm Mute:** Electrical guitar technique of picking notes.

**Pedal:** A sustained note over chord changes.

**Power Chords:** A Type of dyads that comprises the fundamental notes and its fifth

**Riff:** a short, self-contained musical thought, or phrase, which appears repeatedly and play an important role in a song. Tends to be specific to rock and metal

**Triad:** A chord consisting of three different notes.

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**Burn – Deep Purple***Burn - 1974*

Tonal Center [G] – 4/4

- Intro : I-IV | I-IV-I | I-IV | I :||<sup>x4</sup>
- Verse 1 : I | I | VII<sup>b</sup> | VII<sup>b</sup> | I | I | IV | IV |  
: I-IV | I-IV-I | I-IV | I |  
: I | I | VII<sup>b</sup> | VII<sup>b</sup> | I | I | III-VII<sup>b</sup> | IV |
- Chorus : I | I | VI<sup>b</sup> | VI<sup>b</sup> | IV | IV |  
: I-IV | I-IV-I | I-IV | I :||<sup>x2</sup>
- Verse 2 : I | I | VII<sup>b</sup> | VII<sup>b</sup> | I | I | IV | IV |  
: I-IV | I-IV-I | I-IV | I |  
: I | I | VII<sup>b</sup> | VII<sup>b</sup> | I | I | III-VII<sup>b</sup> | IV |
- Chorus : I | I | VI<sup>b</sup> | VI<sup>b</sup> | IV | IV |  
: I-IV | I-IV-I | I-IV | I :||<sup>x2</sup>
- Bridge<sub>[D]</sub> : I | I | VI<sup>b</sup> | VI<sup>b</sup> | VII<sup>b</sup>-I | III<sup>b</sup>-VII<sup>b</sup> | V | V |  
: VI<sup>b</sup> | VI<sup>b</sup> | I | I | VI<sup>b</sup> | VI<sup>b</sup> | VII<sup>b</sup> | VII<sup>b</sup> |  
: I-IV | I-IV-I | I-IV | I :||<sup>x2</sup>
- Guitar Solo<sub>[G]</sub> : I | I | VII<sup>b</sup> | VII<sup>b</sup> | I | I | IV | IV |  
: I | I | VII<sup>b</sup> | VII<sup>b</sup> | IV-III<sup>b</sup> | I | I |  
: VI<sup>b</sup> | VI<sup>b</sup> | I | I | VI<sup>b</sup> | VI<sup>b</sup> | V | V | V | V |  
: I | IV | VII<sup>b</sup> | III<sup>b</sup> | VI<sup>b</sup> | IV | V | V :||<sup>x2</sup> V | V | I-IV | I-IV | V | V |
- Main Theme : I-IV | I-IV-I | I-IV | I :||<sup>x4</sup>
- Bridge<sub>[D]</sub> : I | I | VI<sup>b</sup> | VI<sup>b</sup> | VII<sup>b</sup>-I | III<sup>b</sup>-VII<sup>b</sup> | V | V |  
: VI<sup>b</sup> | VI<sup>b</sup> | I | I | VI<sup>b</sup> | VI<sup>b</sup> | VII<sup>b</sup> | VII<sup>b</sup> |
- Organ Solo<sub>[G]</sub>: I | I | VII<sup>b</sup> | VII<sup>b</sup> :||<sup>x4</sup>
- Solo 2<sub>[G]</sub> <sub>[D]</sub> : I | I | VII<sup>b</sup> | VII<sup>b</sup> :||<sup>x2</sup>  
: I | IV | VII<sup>b</sup> | III<sup>b</sup> | VI<sup>b</sup> | II | V :||<sup>x2</sup> V  
: I-IV | I-IV | V | V |
- Main Theme : I-IV | I-IV-I | I-IV | I :||<sup>x2</sup>
- Verse 3 : I | I | VII<sup>b</sup> | VII<sup>b</sup> | I | I | IV | IV |  
: I-IV | I-IV-I | I-IV | I |  
: I | I | VII<sup>b</sup> | VII<sup>b</sup> | I | I | III-VII<sup>b</sup> | IV |
- Chorus : I | I | VI<sup>b</sup> | VI | IV | IV |  
: I-IV | I-IV-I | I-IV | I :||<sup>x2</sup>
- Outro : I-VII<sup>b</sup> | IV-III<sup>b</sup> | VI<sup>b</sup>-V | VI<sup>b</sup>-V | VI<sup>b</sup>-V | VI<sup>b</sup>-V | I |

**Tonal Center** : G (Aeolian)**Modulation** : Yes, to D.**Foreign Chords** : Yes**Guitar Solo Modes** : minor, dorian, blues, and pentatonic minor**Meter** : 4/4**Form** : Typical Compound Form**Other Notes** : Used a baroque inspired progression with inversions: I | IV<sup>6</sup> | VII<sup>b</sup> | III<sup>b6</sup> | VI<sup>b</sup> | II<sup>6</sup> | V | and synthesized sounds.















































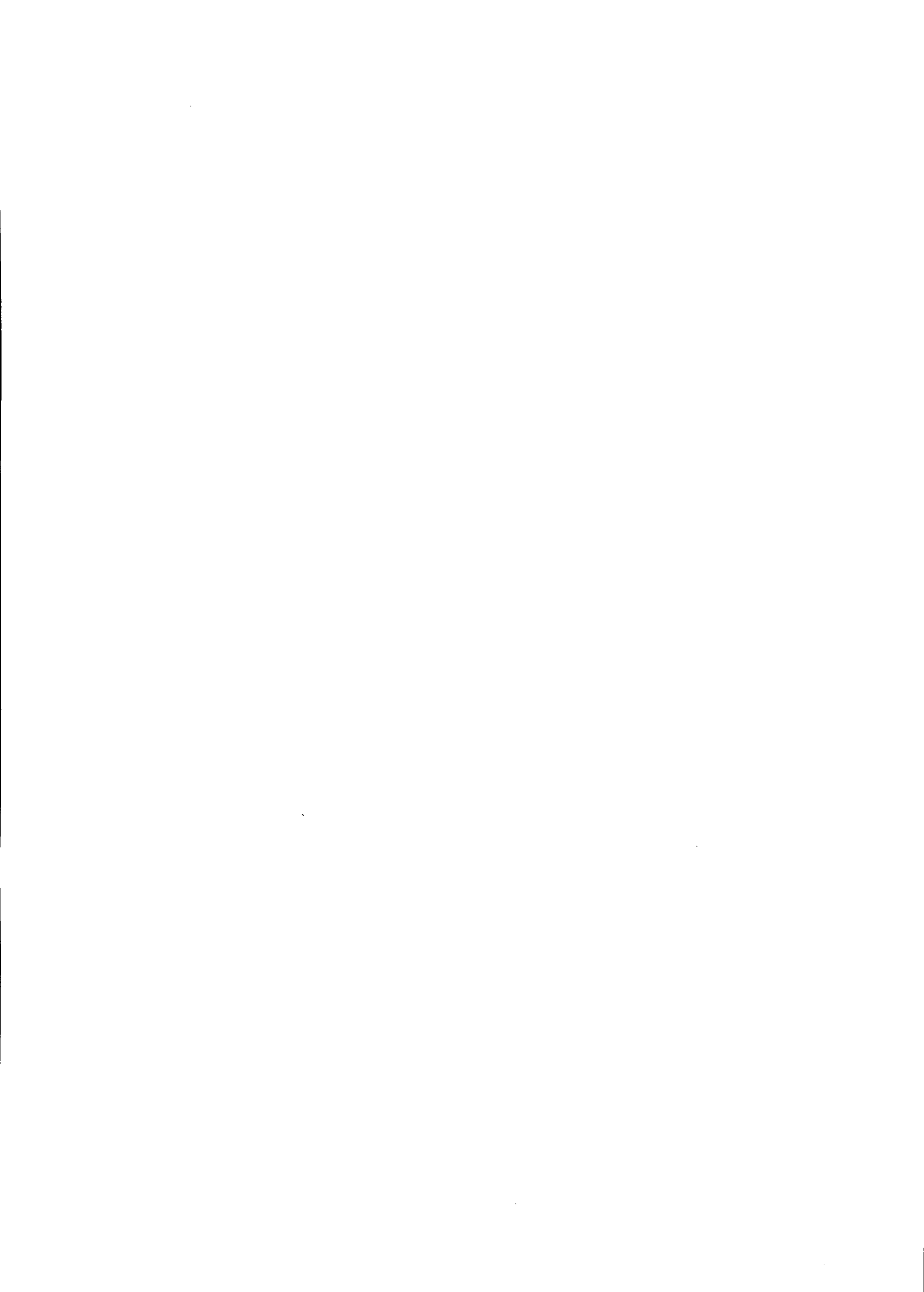


















## Appendix B: Highway Star Solo Transcription and Analysis

### Highway Star Solo

(D pentatonic) D (borrowed from D minor/aeolian)

5 (borrowed from D minor/aeolian)

9 A (A pentatonic) (A dorian, major 6th)

14

(D aeolian) D G

18 p. p. p. p.

22 C A D

27 G

30 C A

Detailed description: This is a musical score for a guitar solo in 4/4 time, transcribed in standard notation. The key signature has one flat (B-flat). The score is divided into measures, with measure numbers 5, 9, 14, 18, 22, 27, and 30 marked at the beginning of their respective lines. The solo is characterized by a melodic line with many slurs and ties, and several instances of grace notes. Chord symbols are placed above the staff to indicate harmonic context: D, A, G, and C. Dynamic markings 'p.' (piano) are used for some notes. Annotations in italics provide theoretical analysis: '(D pentatonic)' for the first line, '(borrowed from D minor/aeolian)' for notes in measures 1-4 and 5-8, '(A pentatonic)' and '(A dorian, major 6th)' for measures 9-13, '(D aeolian)' for measures 18-21, and 'C' and 'A' for measures 22-26 and 30-34 respectively. Arrows point from the 'borrowed from D minor/aeolian' annotations to specific notes in the score.

2 D (*D aeolian/minor*)

34

Musical notation for measure 34, D aeolian/minor scale. The staff shows a sequence of eighth notes: D4, E4, F4, G4, A4, B4, C5, B4, A4, G4, F4, E4, D4. The key signature has one flat (Bb).

G

36

Musical notation for measure 36, G scale. The staff shows a sequence of eighth notes: G4, A4, B4, C5, B4, A4, G4, F4, E4, D4, C4, B3, A3, G3. The key signature has one flat (Bb).

C

38

Musical notation for measure 38, C scale. The staff shows a sequence of eighth notes: C4, D4, E4, F4, G4, A4, B4, C5, B4, A4, G4, F4, E4, D4, C4. The key signature has one flat (Bb).

A (*chromatic passage*)

40

Musical notation for measure 40, chromatic passage. The staff shows a sequence of eighth notes: C4, D4, E4, F4, G4, A4, B4, C5, B4, A4, G4, F4, E4, D4, C4. The key signature has one flat (Bb).

42

Musical notation for measure 42, chromatic passage. The staff shows a sequence of eighth notes: C4, D4, E4, F4, G4, A4, B4, C5, B4, A4, G4, F4, E4, D4, C4. The key signature has one flat (Bb).

44

Musical notation for measure 44, chromatic passage. The staff shows a sequence of eighth notes: C4, D4, E4, F4, G4, A4, B4, C5, B4, A4, G4, F4, E4, D4, C4. The key signature has one flat (Bb).

(*A blues and dorian*)

46

Musical notation for measure 46, blues and dorian scale. The staff shows a sequence of eighth notes: C4, D4, E4, F4, G4, A4, B4, C5, B4, A4, G4, F4, E4, D4, C4. The key signature has one flat (Bb).



### Appendix C: Drums Notation

The image displays a set of six musical staves for drum notation. Each staff begins with a double bar line and a vertical line on the left side. The instruments and their notations are as follows:

- Crash Cymbal:** Four asterisks (\*) are placed on the top line of the staff, each with a vertical stem extending downwards to the first space.
- Ride Cymbal:** Four 'x' marks are placed on the top line of the staff, each with a vertical stem extending downwards to the first space.
- Hi-hat:** Four 'x' marks are placed on the top line of the staff, each with a vertical stem extending downwards to the first space.
- Snare:** Four quarter notes are placed on the second line of the staff, each with a vertical stem extending downwards to the first space.
- Toms (High to Low):** A sequence of notes on the top line of the staff. The first four notes are quarter notes on the first, second, third, and fourth lines. The fifth note is a quarter note on the fifth line, followed by a beamed eighth note on the fifth space, and a final quarter note on the fifth line.
- Kick Drum:** Four quarter notes are placed on the bottom line of the staff, each with a vertical stem extending downwards to the first space.

