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# Dissonance in metal music: Musical and sociocultural reasons for metal's appreciation of dissonance

## ABSTRACT

*This article explores reasons for the proliferation of dissonance in metal music. It asks why metal musicians compose dissonant songs and what sociocultural functions dissonance may have for metal as a community. The findings suggest that exploring ways to further utilize dissonance is crucial to the genre's development and continued transgression, especially in progressive and extreme subgenres, and that fans derive pleasure and meaning from dissonance in the music. Dissonance is not only present in many metal compositions, but its prominence suggests that dissonance is one of the genre's central aesthetic features, at least in its more extreme subgenres. This is a subversion of the typical values in mainstream popular music, where dissonant features are fleeting points of tension. The article argues that dissonance is valued for its congruence with an aesthetic that transcends the genre through its overall transgressive traits. Such an aesthetic is appealing because it facilitates the exploration of negative emotions and ideas in safety, both individually and communally.*

## KEYWORDS

dissonance  
analysis  
musicology  
music theory  
transgression  
aesthetics  
emotion

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## INTRODUCTION

The development of metal music has generally been marked by an increase in key musical features such as heaviness (Berger and Fales 2005; Herbst 2017), transgression (Kahn-Harris 2007), extremity (Smialek 2015), precision (Mynett 2019) or complexity (Hannan 2018). As Harris Berger and Cornelia Fales put it:

[M]etalheads affirm that they hear a quality X, heaviness, that defines the genre that contains it, a genre that must demonstrate greater X – that must increase in Xness – over time. If X were ‘brightness’ (presumably a timbral quality), then over time the music’s timbre would become brighter; if X were ‘syncopation’ (presumably a rhythmic quality), then over time the music’s rhythm would become more syncopated.

(2005: 193)

Another parameter that has increased over time in subgenres that fall under the ‘extreme’ label (e.g. death metal, black metal, deathcore, grindcore) rather than ‘lite metal’ (Weinstein 2000) is *dissonance*. Although it has traditionally been understood as a harmonic feature (see Tenney 1988), it also concerns formal structure, rhythm and metre, and tonal aspects of music (Terhardt 1984; Krebs 1987; Rehding 2018).

The musicological analysis of dissonance and the accompanying cultural reading of this sonic feature has become a growing area of scholarship within metal music studies. Harris Berger (1999) highlights the importance of dissonance, chromaticism, obscure parts and structures with few repetitions for the extremity and heaviness of the genre in his early analysis of death metal. Mark Mynett similarly observes metal’s ‘tendency towards atonality and dissonance [...] through the use of chromatic progressions [...] often resulting in the perception that the music lacks a key signature’ (2019: 307), and Eric Smialek (2008, 2015) emphasizes the role of structural dissonance and other ‘unpleasant’ sonorities for extreme metal (see also Kahn-Harris 2007). In recent years, rhythmic and metre-based dissonance have increasingly been analysed, concentrating on key bands like Meshuggah (Pieslak 2007; Capuzzo 2018; Hannan 2018; Lucas 2018). Such studies can be credited with applying concepts of metric and rhythmic dissonance (Schillinger 1941; Krebs 1987, 2003; Biamonte 2014) to metal music through defined, detailed case studies, but they have not yet developed a systematic understanding of the various forms that dissonance can take. In addition to these structural and compositional parameters, other studies have highlighted the relevance of timbral qualities for the perception of dissonance (Lilja 2009; Herbst 2018; Virtala et al. 2018). These studies focus almost exclusively on electric guitar distortion, explaining how the mere act of overdriving the instrument creates sonic dissonance and how distortion alters the perception of harmonic structures. Dissonance can result both from specific pitch relationships (harmony) and from ‘annoying features of a sound’ (timbre) (Terhardt 1984: 282). Consequently, music may be structurally consonant but sensorily dissonant, or vice versa, or both structurally and tonally dissonant.

From a general music theory perspective, dissonance has been theorized (1) statically for individual chords as ‘events’, (2) from a voice-leading perspective that includes chord progressions and (3) from a more holistic

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tension and relaxation perspective that considers syntactical and contextual aspects of musical structures (Rehding 2018). Furthermore, vertical and horizontal structures need to be taken into account. In traditional counterpoint harmony, for example, an interval like a minor second may be perceived as dissonant when played simultaneously as a harmony (vertical pane), but be consonant when played as part of a melody (horizontal pane) (Rehding 2018). Other secondary factors such as tempo, loudness and pitch affect the sense of tension and relaxation, providing an alternative view of consonance and dissonance (Rehding 2018: 459). In contrast to music theory approaches, the cognitive sciences have focused on perceptual qualities, especially auditory beating ('roughness' created in the 'critical bandwidth') induced by certain intervallic ratios and its interplay with timbral elements such as the composition of the harmonic spectrum (Plomp and Levelt 1965). There is still no consensus on what constitutes dissonance, partly because approaches to its definition and measurement are not fully compatible, and partly because perceptions vary from a sociohistorical perspective due to habituation (see Rehding 2018). As a compromise solution between theoretical and perceptual approaches, David Huron (2006: 311) suggests using the term 'sensory dissonance' for the 'static experience of clangorousness', and the term 'tension dissonance' for dynamic aspects that develop over time and encompass anticipation and the accompanying emotional experience.

A significant complicating factor in the study of dissonance outside the realm of musical structures is the fact that its perception varies across cultures, differs between individuals and develops over a lifetime (see Tenney 1988; Rehding 2018). As Tudor Popescu et al. note: 'listeners with more experience in music will have learnt to derive pleasure from music not merely based on its surface (acoustical) properties, but from several other dimensions [...] such as structural cues and culturally or autobiographically relevant connotations' (2019: 6).

The significant impact of musical enculturation and listening experience has been described for metal music, with fans of extreme metal deriving pleasure from repeated listening to familiarize themselves with dissonant or otherwise extreme sonorities and to understand and appreciate transgressive features (Smialek 2015; Yavuz 2017; Hannan 2018). Furthermore, dissonance likely has social and emotional functions, as learning to accept or even embrace initially 'unpleasant' and extreme music creates a social space for distinction and communal or individual (self-)definition (Weinstein 2000; Yavuz 2017). It can occur in musical structures, dynamic developments, timbres and formal and rhythmic properties, resulting in various forms of dissonance that are composed of several components. In metal, dissonance varies between subgenres and metal produced in different time periods, as Berger and Fales (2005) have noted in the related case of heaviness. Ultimately, dissonance is still a slippery concept whose definition is constantly changing and employed differently in diverse genres within and outside of metal (see Tenney 1988; Huron 2006; Rehding 2018).

Given the importance and multiple musical and sociocultural functions dissonance seems to have, it appears worthwhile to study how and why much metal music has become more dissonant over time through harmonic, structural, rhythmic, metric and timbral complexity or extremity, and how this shift may have contributed to the genre's development and diversification, particularly in its more extreme subgenres. This development was probably not

coincidental but deliberate in finding new expressive means and satisfying the social and emotional needs of the metal community (see Yavuz 2017), which became accustomed to new forms of extremity and demanded ever more extreme forms (Berger and Fales 2005). Arguably, only a minority of bands within a metal subgenre are likely to push the boundaries, yet these innovators have contributed, and will continue to contribute, to a general increase in dissonance, or perhaps to novel ways of achieving it, and thus to the development of the genre.

Against these contextualizing remarks on dissonance, this article explores possible reasons for its proliferation from the genre's inception to the more extreme forms of metal music in the twenty-first century. In particular, it seeks to find answers to the questions of why and in what ways many metal musicians have committed themselves to greater dissonance in their compositions and what sociocultural functions dissonance can have for metal as a community. To answer these questions, a musicological analysis first examines forms of harmonic, metrical and structural dissonance, demonstrating their function in metal – bearing in mind that not all metal artists and subgenres have pursued dissonance to the same extent. Aspects related to music technology and production are beyond the scope of this analysis, but the sound of the distorted guitar must be understood as an inevitable factor in any musicological analysis of metal (see Herbst 2018). In a second step, possible perceptions and meaningfulness of dissonance in metal are investigated, supported by sociologically based literature and cultural interpretation, to help explain the musical phenomena.

Altogether, the study investigates the existence of a popular music culture that relies heavily on unusual musical practices, reflecting on why dissonance might be perceived atypically or, more precisely, replaces consonance as a state of normalcy. The findings suggest that exploring ways to further increase or diversify dissonance is crucial to the genre's evolution, and that fans can derive pleasure and meaning from dissonance in the music. The investigation argues that dissonance is not only indubitably present in many metal compositions, but the prominence of many of these dissonances would imply that they are central to the aesthetic of much metal music, such as there is no release from the 'conflicting' intervals or rhythms (see also Hannan 2021). This is a subversion of the typical values in music patterned on the tonal syntax of European music of the eighteenth and nineteenth centuries, where dissonant features should be fleeting points of tension, resolved in favour of predictable and more satisfying consonances. Beyond the mere appreciation of musical aesthetics, the article argues that metal music values dissonance for its congruence with an aesthetic that transcends the genre through its overall transgressive traits. Such an aesthetic is appealing because it facilitates the exploration and catharsis of negative emotions and ideas in safety, both individually and communally (see Walser 1993; Weinstein 2000; Yavuz 2017).

## **HARMONIC DISSONANCES**

### ***Dissonant intervals***

Intervallic relationships have historically been the primary site of dissonance (see Tenney 1988), which is no different in metal. Early metal songs used  $b5$  intervals due to their striking breakage of a major or minor scale, as in 'Black Sabbath' (1970) (Figure 1).

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## Standard tuning

1. All scores have been transcribed and created by the authors.

♩ = 109



Figure 1: 'Black Sabbath', 0:38 (Black Sabbath 1970).<sup>1</sup>

Even in such an early example, dissonance is a central feature. The minimalist riff consists of only two notes. After the tonic is established with two iterations in the first bar, the dissonant  $b5$  is maintained for an entire bar before being resolved only when the riff repeats. This practice of characterizing a riff with a noticeably dissonant interval has been retained since metal's inception. Unsurprisingly, metal songs have gone further than using only one dissonant note in a riff. It is not unheard of for guitarists to achieve dissonance by combining entirely different scales in a riff, as in Figure 2:

Drop Db Tuning  
(Notes sound 1/2 step lower than transcribed)

♩ = 118

Figure 2: 'Addicted to Pain', 0:04 (Alter Bridge 2013).

In the first two bars, the dissonant Locrian mode (see Berger 1999: 210–20) is clearly established, with a tonic,  $b2$ ,  $b7$  and  $b5$  being played. Crossing into the third bar is a rhythm played on the major third, relative to the established tonic. While the Locrian mode consists of dissonant intervals, they have at least been clarified throughout the opening bars. Introducing a note outside of Locrian causes further disruption, with the likely effect being a disruption to the listener's acclimatization to this 'tension dissonance' (Huron 2006: 311).

In the two examples, dissonance is not only a point of tension but largely the purpose of the riff. Taking into account a larger number of songs than can be discussed here, it appears that dissonances tend to appear at points of anticipation in older songs, whereas later songs are inclined to disrupt throughout (Berger 1999). While these examples have been reserved to

horizontal (melodic) structures, the phenomenon of dissonance being central to the aesthetic is even more pronounced when considering combinations of notes.

### Dissonant harmonies

As a bridge between melodic and chordal playing, it is common for musicians to harmonize a melody. This technique effectively creates a chord, as more than one note is sounding simultaneously. However, each constituent note of the chord is played by a different musician, giving them greater freedom to play complex melodies rather than fixed chord shapes. Conventionally, musicians harmonize using consonant intervals, as in Iron Maiden’s (1983) ‘The Trooper’ (Figure 3):

Standard Tuning  
♩ = 162

Figure 3: ‘The Trooper’, 0:00 (Iron Maiden 1983).

In this example, two guitars harmonize at intervals of a third in E minor, with the consonant chord progression E minor, D major and C major being implied. By dividing these chords between guitars, a more detailed riff is possible with phrases interweaving each chord.

This practice has been applied in creating passages perhaps more dissonant than would otherwise be possible. The band Dillinger Escape Plan are known for their dissonant and unpredictable compositions. Guitarist Ben Weinman has stated that ‘[e]verything about Dillinger was incorrect, certainly in terms of theory, we went against everything’ (Hannan 2018: 454). In attempting to create a deliberate sense of error, Dillinger have combined dissonant interval groups with lengthy and complicated phrasing (Figure 4):

Guitar 1- Standard Tuning  
♩ = 250

Guitar 2- Standard Tuning

Figure 4: ‘43% Burnt’, 0:43 (The Dillinger Escape Plan 1999).

From the third beat of the first bar, the guitars harmonize at a  $b2$  interval. From the fourth quaver of the second bar, this dissonant interval is maintained an octave higher by the first guitar. The dissonant nature of a  $b2$  is by now well established. The dissonance created by this harmony only adds to the disorientating sound of the rapid tempo and wide intervallic gaps. Bookending this dissonant passage are uncommon septuplet groupings, which in the third bar are underscored with a  $Bb5$  chord. Given that Dillinger ‘went against everything’, the unmistakable and complicated dissonances in this passage were a deliberate expression of their transgressive aim.

There is little point in claiming that metal solos have increasingly employed dissonant harmonization over time, as there are examples of earlier bands (e.g. Slayer) using dissonance in the 1980s and of contemporary extreme metal bands (e.g. Khemmis) harmonizing in a consonant manner. Harmonization, however, is a way to control the degree of dissonance, and this means has been employed throughout metal history.

### Combined dissonances

The previous examples have been exemplars of metal songs that use dissonant intervals melodically and in simultaneous notes as chords. These manifestations may be combined to create music with even more emphasis on dissonance. While the previous deliberations analysed vertical structures of only two notes, a greater dissonance may be achieved in larger chords (Herbst 2018). Figure 5 demonstrates a riff containing multiple dissonant chords:

Drop C Tuning

♩ = 95

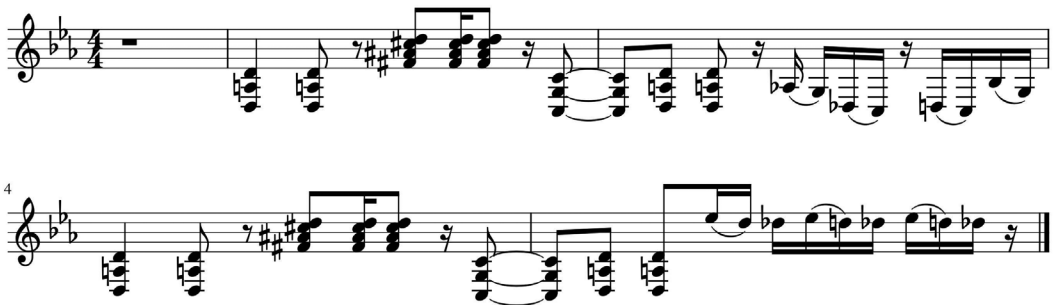


Figure 5: ‘Chalk Teeth’, intro, 0:01 (Toska 2016).

The second chord shape shares only one note with the prevailing key signature, already creating dissonance with respect to harmonic function. From its  $F\sharp$  base, the intervals within this chord are a minor third, a major third and a minor second. As well as containing a highly beating minor second interval, this dissonance is exacerbated by two other intervals bringing their own harmonic series (Herbst 2018).

Along with this vertical dissonance, ‘Chalk Teeth’ also contains several melodic dissonances. In bar three, a low  $Db$  briefly interpolates a legato-based fill as a Phrygian  $b2$ . Legato is characterized by an even flow of notes. In this instance, however, the flowing notes only create further oddity in ‘Chalk Teeth’

with the inclusion of an abrasive  $b2$ . This effect of smoothly played, yet dissonant sounding notes, is also utilized in bar five. Following the D5 power chords, the riff jumps to a relatively high register and plays three notes chromatically. While the proximity of chromatic notes already creates a dissonant effect, this fill is technically played as a chord; while the  $E^b$  and D are played consecutively on the guitar's second string, the lower  $D^b$  is played and then sustained on the third string. This effect highlights the dissonance clearly, not only in contrast with the lower sounding chords but also as a functionless chromatic melody coupled with beating from the simultaneously sounding notes.

A simultaneous D and  $D^b$  effectively creates a  $b2$  interval. Such  $b2$  chords are often played in a high register and have been identified as a 'treble register dissonance' by Smialek (2015: 106). Smialek has observed such chords as sounding 'out of tune' and carrying 'connotations of instability', with a striking contrast to metal's otherwise low register, as seen in 'Chalk Teeth'. These 'treble register dissonances' are a common use of dissonance in metal and are generally realized in one of two ways. Firstly, they may be used for sheer shock value, as in Figure 6:

7 String Guitars- 1/2 Step Down  
(Notes sound 1/2 step lower than transcribed)

$\text{♩} = 170$

Guitar 1

Guitar 2

P.M. 8

P.M. 8

Figure 6: 'Future Breed Machine', 0:29 (Meshuggah 1995).

The staccato, high-pitched  $b2$ s create a jarring, alarm-like effect. The suddenness of these staccato dissonances at the beginning of the song might make an unaccustomed listener jump. Further adding to their stabbing effect is their contrast with an extremely low-register rhythm guitar. Combined, both guitar parts create disorientation that is difficult for the ears to follow.

Secondly, 'treble register dissonances' (Smialek 2015: 106) can again lay beneath a lower rhythm but with a droning, atmospheric effect. Given



the unresolved beating of  $b2$ s, an unsettling atmosphere is created, as in Figure 7:

7 String Guitar  
Drop A Tuning

$\text{♩} = 140$

Figure 7: 'Reign of Darkness', 0:15 (*Thy Art Is Murder* 2012).

Unlike in 'Future Breed Machine' (Figure 6), this dissonance is constant, suggesting unequivocally that a dissonant effect is the purpose of this passage.

### Characteristic dissonances

The previous examples have shown how dissonances can be used to create transgressive effects of sound. This has occurred by breaking the sense of harmonic function with accidental notes. However, it is worth noting that dissonance can be created without breaking a key signature simply by enacting tension on an otherwise consonant chord.

Metal is identified indubitably by guitar distortion (Berger and Fales 2005). Interestingly, as the methods with which transgression is achieved have become more complex, metal musicians have experimented with clean guitar sounds. It has been argued that a song does not qualify as metal music without guitar distortion (Walser 1993: 41), although clean sections are used within songs that are otherwise typically metal. Clean guitar parts offer compositional dynamics, as well as a place to demonstrate greater theoretical prowess. Figure 8 depicts a clean section at 1:17 of Toska's 'Chalk Teeth':

Drop C Tuning

$\text{♩} = 42$

Figure 8: 'Chalk Teeth', clean, 0:50 (*Toska* 2016).

While notated in C minor in keeping with the rest of the song, this short passage is emblematic of the Phrygian Dominant scale with its  $b2$  and major third. Following the opening  $b2$  notes, a C major triad is constructed. There is no fifth-degree present or, in terms of harmonic function, no 'Associate' (see Lilja 2019). Instead, this arpeggiated chord is constructed from a C root (Base), E third (Agent) and F subdominant, acting as a characteristic dissonance (Lilja 2019: 362).

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Although Esa Lilja (2019: 363) acknowledges that ‘Agents’ are the strongest signifier of ‘functional meaning’, Daniel Harrison (1994) has noted the relative strength of the subdominant fourth. Within harmonic function, the fourth only appears as the ‘Base’ in its respective subdominant function: ‘Thus, 4 [the fourth] should be theoretically [...] able to communicate subdominant function while appearing in any voice’ (Harrison 1994: 48). Given the strength of the major third ‘Agent’, its characteristic dissonance arising from conjoining with a clear subdominant fourth may be regarded as particularly conflicting in ‘Chalk Teeth’. Moreover, the close intervallic relationship (b2) between a major third and fourth likely gives rise to sensory beats (Plomp and Levelt 1965).

Even when metal temporarily sheds its crucial guitar distortion, harmonic transgression is still achieved by dissonance. The use of more theoretically complex musicianship, not only via harmonic function but also by alluding to combinations of scales, is well facilitated by clean guitar sounds where subtlety can be better achieved.

### Pseudo-root notes

The last examples have shown how dissonance can be used either by deviating from harmonic function or by using characteristic dissonances within it. However, metal can be composed without harmonic function and even without a tonic root in the conventional sense.

Smialek suggests that the lowest open guitar string functions ‘the same way a tonic would in tonal music’ (2015: 167). Conveniently for metal guitarists, dictating riffs by the lowest string creates a heavier sound (Mynett 2019: 306). The open string root is often played with distorted palm-muted chugging to create a highly percussive rhythm. Furthermore, a dissonant effect can easily be created when a riff is based on one pedal tone, such as an open string root. Figure 9 demonstrates:

Drop Db Tuning  
(Notes sound 1/2 step lower than transcribed)

♩ = 135

8 P.M. ---| P.M. | P.M. ---| P.M. ---| P.M. ---| P.M. ---| P.M. ---| P.M. ---|

3 8 P.M. P.M. P.M. ---| P.M. ---|

Figure 9: ‘Vivid’, 0:12 (Sikth 2017).

Where the lowest open note, Db, underpins the riff as a pseudo-root pedal tone, the higher register notes create a site of dissonance. While Alter Bridge’s (2013) ‘Addicted to Pain’ (Figure 2) was also built from a pedal tone, the Locrian mode was clearly outlined, and the brief reference to the Phrygian Dominant scale still pertained to the tonic pedal. ‘Vivid’ is more

obscure; it features both a minor seventh and a major sixth, and both a natural and flat fifth along with a minor third. The chords in the final bar introduce a major seventh. Since no consistent western scale is insinuated, the open *D♭* is likely being used as a base from which to play intervals that are dissonant between themselves. This effect is emphasized by the unusual placement of accents; eleven of the sixteen strong beats in this riff are marked by the pedal tone, with a higher-pitched melody note usually falling straight after. This accentuation creates a distinctly 'off-kilter' effect. Since no true key signature is played, the riff is effectively atonal. Vincent Persichetti has asserted:

In atonal music, relations between tones occur without reference to a diatonic scale formation. There is movement to and from characteristic intervals but the central force is usually melody, and not a governing harmonic base [...] The various elements in atonal music are tightly knit by extreme motivic concentration.

(1978: 261)

Between each semi-quaver cluster in 'Vivid', a melodic force characterized by dissonance persists. The basis of an open string creates the desired heavy metal sound. Notes with conflicting relationships to this pseudo-root and between themselves are played seemingly at random, creating an unpredictable and dissonant melody.

In creating a similarly arbitrary melodic effect, metal musicians have been known for using chromatic runs or portions of the chromatic scale (Berger 1999). Often, this is composed unequivocally, such as in Figure 10:

Standard Tuning

♩ = 164

Figure 10: 'Sweating Bullets', 1:10 (Megadeth 1992).

Where chromatic notes follow one another with the same semitone interval each iteration, rather than with the varying intervals in a diatonic scale, this obscures any sense of a scale and tonic root (Lilja 2009: 146). This disorientation is heightened by semitones being the same intervallic value as a  $b2$ , where the immediate proximity makes each interval challenging to differentiate (Smialek 2015: 166) in a perceptive sense.

Chromatics are also used in a more motivic sense, as described by Persichetti (1978). For instance, Slayer's 'Raining Blood' utilizes multiple chromatics along with a pseudo-root basis (Figure 11):

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Eb Tuning

(Notes sound 1/2 step lower than transcribed)

♩ = 178



Figure 11: 'Raining Blood', 0:32 (Slayer 1986).

While chromatic notes make up the higher melodic contour, they are also underscored by a lower descending chromatic. This lower motif begins with an Eb on the fourth quaver and follows a chromatic descent from beats one (Fb) and three (Eb) of bar two. This melodic motion recalls 'cyclic sets' from Klumpenhouwer Networks, where 'alternate elements unfold complementary cycles of a single interval' (Perle 1996: 21). The two chromatic motions do not pertain harmonically to the low Eb notes that begin the riff. The central theme is a descending dissonance, verified by a lowest open string pseudo-root rhythm. Chromatics present a visual as well as sonic equidistance; they are, effectively, notes played in a straight line. This pertains directly to equidistant and symmetrical intervals (see Lilja 2009: 146). Chromatic intervals are functionally dissonant since there is no distinct relationship between any of the given intervals and, therefore, no distinct point of resolution or orientation (Smialek 2015: 166).

Although not a pseudo-root, another way pitch dissonance can be created in metal is with a similar disregard for root note functionality, that is, a lack of resolution. For instance, the closing riff in 'The Pot' clearly outlines the D Phrygian mode (Figure 12).

Drop D Tuning

♩ = 106



Figure 12: 'The Pot', 5:58 (Tool 2006).

However, the Phrygian mode is still centred functionally on a tonic root. While the b2 belongs harmonically to this passage, closing the riff on the b2 is not merely an unsatisfactory ending but highly dissonant in that the b2 is *almost* the tonic. A tonic ending would have been a consonant resolution; however, ending so close creates a tantalizing effect. The listener is left with an impression of dissonance even after the song has ended, with no possibility of returning to the established root.

## METRICAL DISSONANCES

### *Background to rhythmic dissonance*

Joseph Schillinger (1941) is credited with conceiving the terms rhythmic consonance and dissonance. Rhythmic dissonance is taken to exist since the strict pulse of most western music can act as a consonance. Western music fits into clear rhythmic groups known as bars, commonly divided into four equal beats. Pitch attacks typically align with these beats, with this coherence

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supposing a rhythmic consonance. Harald Krebs has noted how rhythmic dissonance arises from a listener's attention to strict pulse:

Indirect dissonance exists because of our tendency as listeners to maintain an established pulse for a short time after it is discontinued in actuality [...] there arises a brief but clearly perceptible conflict between the mentally retained first layer and the actually sounding second layer.  
(2003: 45)

Events concerning bars occur at the 'metric level'; events spanning several bars occur at a 'hypermetric level'. Conversely, events within a bar affect the 'tactus level' (Biamonte 2014). Events of even smaller scale, like subdivisions of beats, are within the 'subtactus level'.

Metrical dissonance can occur in two ways. Firstly, 'unequal or noncongruent layers of motion' (Krebs 2003: 12) effectively describes at least two rhythms occurring simultaneously, called a polyrhythm. Polyrhythms are supposed to be dissonant due to the discernible conflict within the bar, leading the listener to expect 'resolution' (Krebs 2003: 13). Resolution occurs simply by the disappearance of a conflicting rhythm, either immediately or by 'dilution' (Krebs 2003: 111), where conflicting attacks are gradually abandoned. It is worth highlighting that odd-numbered time signatures, such as  $\frac{5}{4}$ , are not considered dissonant in themselves, as there is no conflict between rhythmic layers. However, Nicole Biamonte (2014) has described these 'asymmetrical' metres as comparatively unstable.

The second metrical dissonance is 'congruent but shifted layers' (Krebs 2003: 12), known as 'syncopation'. Given the coherence of each layer, syncopation does not affect the metre but occurs at the tactus level. This rhythmic dissonance creates 'interest and tension' (Biamonte 2014) rather than disruption and particularly affects melody within a bar. Resolution can occur by the disappearance of one layer or by adjustment so that constituent layers become coherent.

### Submetrical dissonance

In metal's predecessor – rock music – syncopations are mostly performative, meaning they are not necessarily integral to a song's structure or identity (Temperley 1999: 38), as syncopations rarely disrupt the overall structure or even the delineation of a single bar.

In metal, the embellishment of syncopations has the potential to conflict momentarily with the established pulse and can be crucial to a song's identity. In some instances, syncopations appear to be used to create an inherently unsettled ostinato, as in Figure 13:

Standard Tuning

$\text{♩} = 100$

Figure 13: 'Psycho Holiday', 0:11 (Pantera 1990).

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While relatively minimalist in pitch, 'Psycho Holiday' is still able to create a dissonant effect simply by placing chord accents unexpectedly. Relevant to the lyrical theme, this syncopation is more likely compositional than performative, given each bar contains a fixed rhythm character.

In more contemporary metal, rhythmic characteristics as small as syncopations are even more vital to compositional identity. Many modern songs contain breakdowns, a section that emphasizes rhythm and heaviness by shifting to a half-time feel that emphasizes sonic weight (Smialek 2015: 171; Kennedy 2017: 89). A breakdown is typically slower than other song sections and features few note changes to focus on rhythmic quality. Often, breakdowns feature rhythmic (and pitch) dissonance; this tension 'is the source of the breakdowns compelling energy' (Gamble 2019: 340–41). Figure 14 depicts a syncopated breakdown:

Drop A# Tuning

♩ = 132

Figure 14: 'Deliver Me', 2:02 (Parkway Drive 2010).

Beginning with sixteenth-note pairings, each rhythmic cluster acts as what might be called a rhythmic anacrusis. Syncopation occurs where an eighth note is held across the strong beats, except on beat three. These syncopations are anticipated by a rhythmic anacrusis from the sixteenth note pairs. Along with the obvious tension from the displacement of accents, the anticipatory effect of the sixteenth notes leading to the displacement emphasizes the rhythmic dissonance. Also, the lack of variation in pitch offers the listener little other than rhythmic character to focus on.

Conversely, breakdowns also use syncopation where the accent is delayed. Figure 15 demonstrates:

7 String Guitar  
Drop A Tuning

♩ = 125

Figure 15: 'The Human Condition', 2:30 (Chelsea Grin 2010).

While still creating tension against the strict pulse of a song, this syncopation type has less of an anticipatory effect. Instead, the delayed accents occurring after beats three and four sound somewhat lost. Since they are off-beat but not anticipated, they may be heard as somewhat random or even disturbed. This effect is emphasized by the unvarying use of b5 chords in this breakdown. This sense of disorientation is appropriate to the song's existential lyrical theme and a crucial component of the composition.

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**Metre level dissonance**

A method of creating dissonance at the metre level is by stacking different metres (Krebs 2003: 12–13). When these metres realign every bar, this is a polyrhythm. Polyrhythms have a profound effect on structure, as different voices are effectively acting independently and in conflict. In their conventional form, polyrhythms appear in metal, as in Figure 16:

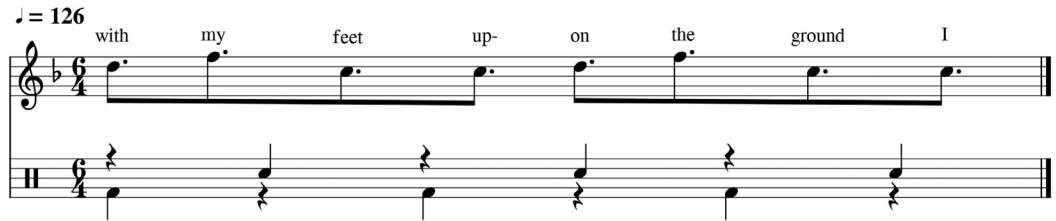


Figure 16: 'Lateralus', 7:30 (Tool 2001).

This is an 8 : 6 polyrhythm, where eight notes in the bass are incorporated into the  $\frac{9}{4}$  established by the drumbeat. The skilfulness of superimposing conflicting beats creates a groovy rhythm. The tension enacted at the points where accents do not coincide creates interest as well as dissonance from what is effectively syncopation. While these conflicting rhythms certainly create some degree of dissonance, a polyrhythm still resolves periodically. However, metal musicians have managed to employ the groovy effects of polyrhythms whilst further emphasizing the dissonant effect.

The opening passage of Disturbed's (2000) 'Down with the Sickness' features a 3:2 polyrhythm superimposed over a  $\frac{4}{4}$  pulse (Figure 17).

HT= High tom drum

BL= Bass drum and low tom drum

$\frac{4}{4}$	♩				♩				♩				♩			
HT	X			X			X		X			X				X
BL	X		X		X		X		X		X		X		X	

Figure 17: 'Down with the Sickness', 0:01 (Disturbed 2000).

The lowest common multiple of 3 and 2 is 6, meaning six beats are required to cycle this polyrhythm. Noting how  $\frac{4}{4}$  does not evenly divide by six, it makes for an interesting compositional choice that the polyrhythm was imposed in this way; it necessitates a truncation to avoid becoming a polymeter where bar lines would have been crossed in retaining the pattern. While the differing cardinalities of polyrhythmic layers are considered dissonant in themselves, this truncation demonstrates a manipulation of polyrhythm. This 'tresillo' pattern has been researched elsewhere, including in Biamonte (2014), where it is described as 'creating tension' and being 'out of phase in the middle'. Rhythmic dissonance and an 'indirect dissonance' (Krebs 2003: 45) are created by thwarting an established pattern and listener expectation.

Metre-level dissonance, or ‘tactus preserving grouping dissonance’ (Waters 1996; see also Biamonte 2014), can also be created via the relationship between neighbouring bars. Metal musicians often use odd-numbered time signatures. Although these are consonant in themselves technically, they are commonly used in a way that becomes dissonant (Biamonte 2014). What could be called tandem bars – or ‘alternating metres’ (Garza 2017) – are utilized, often consisting of an odd then even count bar alternating around one another, shown in Figures 18 and 19:

D Standard Tuning

♩ = 93

Figure 18: ‘Blood and Thunder’, tandem, 1:32 (Mastodon 2004a).

Drop C Tuning

♩ = 95

Figure 19: ‘Chalk Teeth’, tandem, 3:51 (Toska 2016).

Tandem bars have the immediate effect of ‘indirect dissonance’ (Krebs 2003: 45) on the listener due to the repeated, rapid-succession misalignment. This concept can also be more complex, such as in Figure 20:

Standard Tuning

♩ = 227

Figure 20: ‘Beneath the Mire’, 6:47 (Opeth 2005).

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Here tandem groups of bars alternate around each other, exacerbating the confounding effect.

Lastly, even more profound dissonances can be created when a pattern of three separate time signatures alternate, especially if some of the constituent signatures are grouped, as depicted in Figure 21:

D Standard Tuning

♩ = 128

The musical score consists of four staves of music. The first staff is marked 'P.M.' and begins with a 3/4 time signature. The second staff starts with a 3/4 time signature, followed by a 7/8 time signature, and ends with a 3/4 time signature. The third staff starts with a 3/4 time signature, followed by a 7/8 time signature, and ends with a 3/4 time signature. The fourth staff starts with a 3/4 time signature, followed by a 4/4 time signature, and ends with a double bar line. The music is written in a single melodic line with a key signature of one flat (Bb).

Figure 21: 'Megalodon', 2:24 (Mastodon 2004b).

In 'Megalodon',  $\frac{3}{4}$ ,  $\frac{7}{8}$  and  $\frac{4}{4}$  are played. The second iteration of  $\frac{3}{4}$  lasts for three bars, compared with every other iteration, which lasts only one. This embedded grouping adds further inconsistency, makes the pattern less discernible and thwarts expectation within occurrences of even the same time signature. Arguably, the repetitive nature of these schemes still makes perception easier than a completely through-composed string of metre changes. However, presumably, some compromise must be made for artists to be more likely to be able to perform the patterns convincingly and to convey some sense of groove, which requires a degree of predictability and repetition.

### Hypermetrical dissonance

Another way to create dissonance involves stacked metres, which do not realign each bar. Krebs has argued that a determinant for the 'inherent intensity of grouping dissonances is length of cycle; the more pulses elapse before attacks of the constituent layers coincide, the more intense the dissonance' (2003: 57). This is logical, given that pulse layers would be less congruent if they spend more time misaligned. Since a polyrhythm aligns every bar, it is only dissonant due to its internal disturbances. In the case of polymeter, however, not only is there conflict within the bar, but each respective metre

may not realign for a vast number of bars. This may possibly render a polymeter more dissonant than a polyrhythm and arguably make it a very effective way of achieving metrical dissonance if intended.

The concept of polymeter has been combined with other metrically dissonant concepts discussed previously. Meshuggah are perhaps best known for their composition 'Bleed' (2008), which, along with featuring polymeter, arguably wavers between various time signatures with respect to the guitar accentuation. Drummer Tomas Haake maintains a  $\frac{4}{4}$  pulse with a backbeat. With the guitar lines transcribed to match this metre, the opening to 'Bleed' appears as in Figure 22:

↑ =Begin string bend  
 ↓ =End string bend

8 String Guitar  
 Tuned 1/2 step down  
 ♩ = 115

Figure 22: 'Bleed',  $\frac{4}{4}$  transcription, 0:00 (Meshuggah 2008).

While this hearing is certainly valid, a closer analysis of 'Bleed' suggests that polymeter is at play. The only differentiation within the guitarists' consistent rhythmic pattern (Figure 23) is the gradual semitone string bend to and from the same  $E_b$  pitch. The guitarists' process of beginning or completing a string bend is the only delineation of a section in an otherwise uniform riff. However, these string-bend marking points do not coincide with the  $\frac{4}{4}$  bar lines.

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Figure 23: Consistent rhythmic pattern in 'Bleed'.

The clear starting points of the riff move above the consistent  $\frac{4}{4}$  of the drums, using separate time signatures. Transcribed independently of the drums, 'Bleed' may be heard as in Figure 24:

8 String Guitar  
Tuned 1/2 step down

$\text{♩} = 115$

Figure 24: 'Bleed', 0:00 (polymetric transcription).

Where bar lines are delineated is the only audible discrepancy within the passage. As well as this conflict with the drums  $\frac{4}{4}$  is the previously discussed 'indirect dissonance' (Krebs 2003: 45) of conflicting subsequent metres. In the guitar part alone, there is an unusual combination of three time signatures, creating little pattern between themselves. This renders 'Bleed' not only metrically dissonant in that two separate voices pulse independently, but one of these voices continuously conflicts with itself. Lastly, it is worth highlighting the lack of melodic content, other than the difference of a semitone in the string bend, emphasizing the unusual rhythmic content. This is relevant to the argument underscoring this part of the analysis, as the riff is effectively stripped of all content save for the (metric) dissonance itself.

## AUTHENTICITY

Metal musicians value their authentic sound over mainstream recognition (Kahn-Harris 2007). Leaving dissonance aside for a moment, several authors have noted that much of metal's appeal is found in features that have limited popular appeal. Helen Farley describes this aesthetic, claiming that 'the symbolism, extreme lyrics and diabolical imagery are intended to shock and as such are a protest against the pervasiveness of societal norms' (2009: 83–84). As a consequence of this anti-mainstream attitude, negative ideas are often seen as positive or complimentary in metal (see Yavuz 2017). This attitude directly parallels metal's approach to musical dissonance. The notion of negative as a compliment has been observed by Smialek: '[T]echnical death metal fans and musicians value when their music comes across as sounding "brutal", but that sense of brutality is achieved through complexity and meaningful disorientation [dissonant riffs]' (2015: 192). While this further affirms that typically negative phenomena are received positively in metal, it still begs the question of why these particular authentic traits are valued.

Most obviously, metal values authenticity (in the sense of being true to its subcultural origins) because it seeks to be rebellious (Weinstein 2000). By avoiding mainstream appropriation, metal has the virtue of creating 'other possibilities of cultural signification, opening a space of alternative meanings' (Partridge 2012: 73). By being authentic, by way of not conforming to mainstream expectations, metal may be deemed more meaningful, interesting and original; it is authentic for the sake of being authentic. This rebellious style was realized musically in the vast amount of dissonance in the previous musical analysis. Unsurprisingly, there are other ways in which authenticity is valued in metal, such as the musicians' genuine instrumental abilities (Walser 1993; Weinstein 2000; Mynett 2019).

Along with having authentic motives and meanings, metal songs must generally be composed using skilful and genuine technique in terms of abilities on the musical instruments (and vocals). The electric guitar, as the principal instrument (Walser 1993: 41), is complicated and challenging to play (Weinstein 2000: 23). Mastery of the guitar is not only admirable to listeners but gives the guitarist a greater capacity to compose authentic music. A great amount of effort is desirable in many parameters of metal, such as the aggression and speed with which instruments are played (Mynett 2019). Also, the ability to break musical rules and compose convincingly using great amounts of dissonance requires a reasonable degree of instrumental skill (Mynett 2019).

Emphasizing the value metal audiences place on authentic ability and compositional skills, Ian Reyes (2013: 249) has documented the egregious

reception of the band Hellhammer. Hellhammer composed 'extremely basic, repetitive, and badly performed' songs. Supposedly, they became 'the worst heavy metal band to ever make a record' (Reyes 2013: 249), with this infamy tainting the future projects of Hellhammer members. This would suggest that a degree of compositional complexity and performance precision is highly desirable (Mynett 2019), at least in more progressive interpretations of metal and less so in lo-fi-centred subgenres like black metal or grindcore. This reverence for skilled musicianship is relevant to dissonance. If dissonance is taken to be the breakage of typical rules, and if some forms of dissonance, especially on a rhythmical level, require extraordinary skill to perform, it is a creative tool with which to build an authentic product. Dissonance pertains to values such as transgressing against predictable mainstream practices as well as showcasing skilfulness and a genuine effort at being creative.

## THE SCENE

Developing any understanding of music beyond its sonic construct requires understanding its sociocultural context. The meaningfulness and interpretations of a composition do not appear randomly.

Interestingly, at least some metal branches originated from places of great struggle and frustration (Weinstein 2000). Of course, an individual in their personal circumstance may receive music differently from others; however, this does not exclude the importance of community. For instance, both Black Sabbath and Judas Priest formed close to Birmingham in the late 1960s, wherein they experienced a 'tough industrial upbringing' (Partridge 2012: 99). Where Andrew Cope has asserted music is influenced 'by the pressures and dynamics of political and economic circumstances' (2010: 27), the actual manifestation of this influence within music has been described as 'meaningful to audiences because its elements already hold cultural currency' (Partridge 2012: 79). In other words, some of the meaningfulness is in the semblance of its place of origin (Herbst and Bauerfeind 2021). Dissonant sounds, at least originally, were the noises of struggle, incongruity and unresolved frustration, employed in such a skilful way so that the musician takes control of the dissonance and wields it expressively (Weinstein 2000).

Exceptions like power metal aside, most metal is not happy. From its origins in post-war industrialism, it expresses seriousness and frustration by exploiting dissonance as well as other transgressive themes such as loudness and horror-like content (Kahn-Harris 2007). This transgression is a currency circulating the metal scene. Concerning the scene itself, the communal values of metal are explicit not only in the contextually relevant expressive values but also in the discourse of its participants. As a whole, the metal scene favours authentic, abrasive and even aggressive notions not dissimilar to its musical dissonance. This includes scene members often being heavily pierced and tattooed (Weinstein 2000: 27–31). Along with the graphic album art, the visuals of metal as a whole usually depict 'angularity and thickness [...] a menacing, armour-breaking mace or saw-tooth appearance' (Weinstein 2000: 28), particularly concerning band logos (Kahn-Harris 2007). The metal scene offers a place of belonging for the transgressive (Kahn-Harris 2007). Along with being a site in which to explore negative sound structures, metal provides a place for individuals to express themselves in transgressive ways, such as with the dress senses (Cardwell 2017).

Keith Kahn-Harris has objectified these notions as forms of capital, such as ‘mundane subcultural capital’ (2007: 122), which describes a commitment to the scene, such as having a job that contributes to the metal culture. Also, there is ‘subcultural capital’, which is the merit of being ‘in the know’. Subcultural capital might include ‘fashionable haircuts’ and ‘current slang’ words (Kahn-Harris 2007: 121), as well as wearing appropriate attire (Cardwell 2017). This sense of being ‘in the know’ must include having some appreciation of dissonance, along with other abrasive musical tropes such as heaviness (Berger and Fales 2005; Herbst 2018) and loudness (Weinstein 2000) and the transgressive visuals described above. Further to these types of capital is ‘transgressive subcultural capital’ (Kahn-Harris 2007: 127), obtained by such ‘radical individualism’ as taking the risk of attempting to contribute something new to the scene. Whether this discourse, specifically the acceptance of dissonance, is learned (perhaps even just tolerated for the sake of involvement in the scene as might be the case with subcultural capital) or retains a genuine appeal (i.e. it merits transgressive subcultural capital) is addressed in the following.

### CATHARSIS

Deena Weinstein (2000) has contended that the aggressive features of metal are a method through which negative emotions can be purged. One broad form of catharsis obtained from music is that elements of music might be meaningful to listeners due to a similarity to their own culture, background and experiences (see Yavuz 2017). This idea has been touched upon by Kate Quinn (2019), who describes catharsis in this respect as occurring through ‘narrative therapy’. Quinn asserts that experiencing a ‘narrative’ with other scene members has the benefit of ‘outsider witness’, wherein ‘listening to and relating to metal music [is] supporting an alternative narrative about the recognition and management of emotions and around outsider witness in the wider metal community’ (2019: 421). Listeners share their experiences collectively via the music. This virtue would seem believable in light of the clear communal values demonstrated within metal and with how the music may be an item for listeners to have in common with one another since it bears semblance to a time, place and attitude. Moreover, another study has argued that the ‘metal community seems to master stress pretty well [...] Fans might find relaxation not only within their music but by belonging to a specific group’ (Eischeid et al. 2019: 146). Dissonance might be relevant to these points of finding catharsis both in the music and in the sense of belonging, in that musical practices that are undesirable to outsiders might help demarcate the metal scene.

This ‘narrative therapy’ (Quinn 2019) can be taken further when considering how individuals might experience a relatable narrative in the metal music itself. Along with sharing their experiences via music, individuals may be thought of as sharing their experiences with the music, as per Weinstein: ‘[M]etal’s insistence on bringing chaos to awareness is a complex affirmation [...] of the power to confront those forces in the imagination, and of the power to transcend those forces in art’ (2000: 38). As Weinstein asserts with the term ‘power’, metal is far from bland and tame. The musical analysis should have demonstrated the intricacies and differentiation that metal offers. Where metal captures the imagination, it is empowering and might offer the individual a vicarious experience. Similar to how metal functions in social contexts, Morris has observed:

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The emotional satisfaction of the metal concert is not compensatory but empowering, for it allows the fans to express their rage against their social powerlessness [...] The imagined empowerment of fans within the scene is connected to their ability at concerts to get in touch with 'something greater'.

(2015: 300)

The 'imagined empowerment' with 'something greater' offers a vicarious expression of the aggression, angst and transgression so obvious in the sound of metal. The vicarious listening experience of metal has also been observed more literally:

[T]he active listening practises of death metal fans are especially suited to recordings with multiple twists and turns that reward repeated listenings, allowing fans to eventually anticipate and evade each phenomenological 'trap' as though they were playing along to the music in their own minds.

(Smialek 2015: 153)

Wherein metal is often highly engaging, such that listeners can achieve a cathartic effect by engaging in 'active listening', being hypnotized by music that is in many ways highly relatable to them (see also Yavuz 2017).

Metal research indicates that the breakdown section is a primary source of catharsis and might be an apt demonstration of the psychological experience of metal music (Smialek 2015; Gamble 2019). Breakdowns like those previously discussed focus on rhythmic dissonance and appear to cause much physical catharsis at live concerts; as Nick Crossley argues, emotions are embodied phenomena, and 'the "body" involved [in emotional response] is a communicative agent rather than a mechanical being. The corporeal dimension of emotion is not a third-person physiological process but engaged and expressive praxis' (Crossley 1998: 23). Along with exploring negative emotions communally through transgressive music, breakdowns are a heightened catharsis to the extent that they 'provide gratifying opportunities for experiencing violence as both giver and receiver' (Gamble 2019: 347). Like how horror-like themes are experienced safely through metal (Walser 1993; Kahn-Harris 2007), breakdowns allow the (mostly) safe exploration of violence in mosh pits.

Moshpits are a 'direct physical expression of the kinetic energy in the music' (Gamble 2019: 347), where audience members push and pull at each other, often shoulder-barging and running in stampedes. They are a communal activity where violence is explored in a relatively safe manner. Moshpits are an immense source of catharsis, facilitated by the tension of rhythmic and sometimes pitch dissonance. Breakdowns have been described as getting 'your aggression out' and as 'an aggression releaser' (Gamble 2019: 347), which is unsurprising when considering the adrenal release of participating in what might be likened to a contact sport. The aggressive desires of anger can be realized separate from their causes, without the negative implications of causing actual harm.

Metal is cathartic, not only in 'narrative therapy' (Quinn 2019) but through empowerment, where negative emotions can be shed through controlled violence. With its strong linkage to natural human traits, metal contains a genuine appeal to audiences, not least due to the perceivable tension created by dissonances.

## THE *JAMAIS VU* OF DISSONANCE

The requirement for authenticity in metal has been discussed, wherein rebelliousness, skilfulness and the showcasing of supposedly unlikeable aesthetics are culturally rewarding traits. These traits have been loosely labelled transgressive. In creating this authentic transgressiveness, however, metal must maintain a balance. For as much as metal musicians wish to transgress, they must resist imploding the genre and retain at least some familiarity as they create recognizable metal. Defining features of metal have been outlined, such as distortion, power chords and dissonance, which instigate this required familiarity. Nonetheless, what is easy to overlook is that metal, at least more progressive and/or extreme styles, requires the addition of something new and authentic to these factors.

In the context of extreme metal, familiarity and innovation have been reified by Kahn-Harris:

Genres are sites of both innovation and of stable creativity within strict limits. Within the extreme metal scene these very different views of creativity and innovation are negotiated in the context of the tension between the instability rewarded by transgressive subcultural capital and the homogeneity rewarded by mundane subcultural capital.

(2007: 131)

Where genres are sites of tension, members of the metal scene are rewarded for their dedication to and maintenance of their genre (mundane subcultural capital), and rewarded higher if they can transcend this and bring along something new (transgressive subcultural capital). As a result, metal listening might be likened to a feeling of *jamaïs vu*, a French borrowing describing experiencing something known and familiar and yet perceiving it to be novel and unfamiliar. For example, a listener might discover a new metal song, which is familiar and recognizably metal, yet simultaneously novel and a fresh insight into the possibilities of sound. Robert Walser states that 'musicians are ceaselessly creating new fusions and extensions of popular genres. Yet musical structures and experiences are intelligible only with respect to these historically developing discursive systems' (1993: 27). By way of this genre development can be found the development of dissonance; there are no radical jumps in what is consonant or dissonant, only gradual shifts as new, authentic sounds are desired. Eventually, these new sounds become accepted as consonances. In testing genres such as metal, new dissonances are experimented with, acting as a tension not just within particular songs but against the genre as a whole. These dissonances gradually lose their effect with time and habituation, opening space for new creative ideas.

## CHALLENGING LISTENING

So far, it has been contended that metal has innovated and transgressed so much that, in some cases, it is not intended to be listened to in any conventional, recreational way. This is unsurprising, as metal has long since been distinguished by its overbearing, dissonant sound, something that is undesirable in mainstream music (Kahn-Harris 2007). This transgressiveness has compounded so much that metal might purposefully be challenging to comprehend, with this challenging listening itself becoming an aesthetic of metal.

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This aesthetic might have originated with music that demanded active listening rather than challenging listening per se, spanning centuries from classical music to progressive rock (see Moore 2001: 90) and beyond. Active listening is usually concomitant to complex music (see Moore 2001: 24). For complicated and quasi-unpleasant music, the act of listening might demand enough of the listener to be a genuine challenge. Smialek has noted that complex, dissonant music is 'an acquired taste' and 'may take a few listens to truly get or appreciate [...] but it is very much worth the effort' (2008: 112–13). Music such as Meshuggah's effectively rejects any sense of familiarity for listeners unaccustomed to their music; for Meshuggah fans, their music is systematic and plays with expectations in a rigid framework. Other than that, the timbre and instrumentation are clearly metal.

Aspects of challenging listening have been observed by Olivia Lucas at a Meshuggah concert:

The affinity between music and math is a longstanding one [...] The 'nerds' in the balcony use embodied cognition of the music for the pleasure of processing the rhythmic patterns as they go by, while preferring to keep the motion in their minds.

(2018: 55)

Herein, listening to such complicated music is pleasurable, as it might be likened to trying to solve a musical puzzle; the reward is in solving it and coming to understand the music by means other than its surface-level sound. This reward is a vital artistic implication for dissonant music, as that which is perhaps most dissonant is not intended to be heard in a conventional sense at all. Rather, this is music one should contemplate and think about instead of simply feeling and hearing the respective sounds.

Dissonance in contemporary music can be understood as desirable not only for the sake of transgression but also as a rewarding dimension of listening. Dissonance in metal must either be tolerated in some way or understood by its theoretical underpinnings to be appreciated as an art. This is a vital defining of dissonance: the musical features themselves are indifferent; it is always the act of listening that defines dissonance. Especially in contemporary metal, the listener may get used to dissonance as they come to understand and surpass the deliberate challenges of the music.

## CONCLUSION

Metal is a prime example of how dissonance can be learned subculturally and subconsciously, at least in many of its subgenres, which are innovative yet still pay homage to the genre's origins. In metal, the perception of dissonance is never fixed; as listeners become accustomed to it, musicians need to find new ways to subvert listener expectations again. Exceptions aside, metal music is defined by ever-increasing X-ness (Berger and Fales 2005: 193), and too much consonance can hardly be tolerated, as metal always strives for new transgressions (Kahn-Harris 2007) to set itself apart from the mainstream and older, less extreme metal subgenres. The analysis has outlined ways in which dissonance can be created through disturbing harmonic and metric expectations. In many of the more extreme metal genres, consonance is eschewed in favour of greater levels of dissonance for musical, sociocultural and emotional reasons.

Dissonance can be understood as an essential component of metal's musical development in terms of both existing subgenres and the emergence of new ones. By this logic, newer subgenres within the domain of extreme metal (such as 'post-black metal') must be dissonant to obtain subcultural capital and meet the criteria of the metal subculture. Increasing dissonance is one way among many for metal as a meta-genre to evolve through the diversification and proliferation of subgenres and sub-subgenres. For these reasons, fans of metal cannot perceive dissonant sounds as inherently negative. Rather, dissonance may be appealing. This also applies to abstract dissonances like complex (poly)rhythms and metres that are difficult to grasp; audiences hear deeper into music than mere theoretical parameters such as consonance and dissonance. It is reasonable to find pleasure and gratification in music by means beyond existing theoretical ramifications if audiences find pleasure in what has historically been regarded as unpleasant. Like heaviness, dissonance has contributed to the development of metal music and continues to do so.

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