(No?) Adventures in Recording Land: Engineering Conventions in Metal Music

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ABSTRACT

Inspired by claims that metal music production has become standardized, this article draws on interviews with eight internationally recognized producers examining whether a uniform methodology in recording metal exists and where creative freedom remains. The findings suggest that although recordists must abide by electro-acoustic laws and metal music’s pursuit of ever-heavier music, which entails some best practices, decades-long careers build on creative experimentation and sustained curiosity. The individuality of bands, songs, arrangements, and recording conditions requires individual production approaches, and most successful producers experiment to develop professionally and stay at the forefront of contemporary metal music production practice.

KEYWORDS

Metal music; rock music; record production; music technology; experimentation; creativity

Introduction

Modern recording can be like driving a Buick. You’re comfortably controlling things from behind the glass – but perhaps that lulls one into mediocrity.

This quotation is from rock producer Sylvia Massy’s book Recording Unhinged: Creative & Unconventional Music Recording Techniques (1). One may wonder what motivated her to write such a book, given that academic and journalistic music production literature paints a quite different picture. Zak points out that “most recordists have a wealth of anecdotes about how they have broken the rules of physics and thereby achieved a successful artistic result” (127). Evidence of creative experimentation is provided within Console Confessions (Savona) or Behind the Glass (Massey), books in which industry professionals offer insights into the making of certain productions. Academically, there is a growing number of works that highlight and often celebrate creative misuse of technology. The early misuses of tape and multi-track recording are frequently explored: Sam Phillips creating Elvis Presley’s signature vocal sound with a tape delay, Brian Wilson’s rich vocal arrangements for the Beach Boys through overdubbed recordings, George Martin’s avantgarde-influenced productions with the Beatles, or Phil Spector’s wall of sound created through rich orchestration of instruments and...
reverb chambers (Chanan; Cunningham; Moorefield). Bennett has argued that the advent of digital music production from the late 1970s and the hybridity of analog and digital practices have led to increased rule-breaking, creativity, and originality, which she describes as “maverick methods.” Warner has similarly shown how digital production has fostered creativity and evolved pop music.

It is undeniable that popular music has benefitted from technological development. Producers’ roles progressed beyond artist and repertoire (A&R) managers, and sound engineers, long considered merely technical assistants (Kealey), became integral to the sonic character of recorded music (Schmidt Horning). The various accounts agree that “recording has gone from being primarily a technical to an artistic matter” (Moorefield 13). Record production became mythologized (Gibson) and imbued with “magic,” to which the concealed nature of the work and production knowledge contributed (Bennett 83).

Rock is one of the genres that the academic study of creative record production has focused most on, not least because it coincided with significant technological advances in the 1950s and 1960s, such as the introduction of magnetic audiotape, multi-track recording, and stereophony. Metal music came into focus later (Mynett, “Sound at Source,” “Achieving Intelligibility”; Reyes, Sound; Turner, “Outlining,” Profiling) but has left its “embryonic phase” (Mynett, Contemporary 18) in recent years. Reyes (Sound), Turner (“Outlining”), and Thomas explored the impact of digitalization on the production of metal music, and Mynett examined the interplay between engineering and production and their role within the genre’s aesthetics (Metal, “Defining”). Williams traced the timbral changes in metal production from 1990 to the early 2010s. Production aesthetics of subgenres such as black metal (Reyes, “Blacker”), power metal (Herbst, “Formation”), and contemporary extreme metal (Mynett, “Defining”) have been investigated. These studies have in common that they highlight the benefits of digitalization for producing metal music, a genre that is sonically challenging to engineer with its fast-rhythmic subdivisions, distorted sounds, and sonic density (Mynett, Metal). In this respect, metal differs from other forms of rock music where traditional analog production workflows and recording approaches that favor live ensemble recordings over overdubs often remain the ideal (Grossberg; Keightley). In contrast, metal has been described as transgressive (Kahn-Harris), striving for ever-higher levels of heaviness (Berger and Fales; Herbst, “Heaviness”; Mynett, “Heaviness”) by pushing the boundaries of technology and record production.

Despite the common and possibly idealized trope in metal music research of transgression and heaviness, the reality may differ when it comes to record production. In profiling the mixing approach of metal producer Andy Sneap compared to his peers, Turner observes that the “practitioners share near-identical approaches” that likely follow a “general formula for mixing this genre of music” (Profiling 175). Thomas and King’s interview/study with seven metal producers similarly concludes that engineering methods have become so homogenized that they “converge into a production methodology” (503). The authors suggest that there are implicit but normative expectations in metal about how it should sound, which forces producers to apply similar recording and mixing approaches, limiting creative freedom and reducing their work to technical problem-solving (see also Thomas). These findings raise the question of whether metal
music production has become mass-fabrication in the Adornoian sense and an industry in which there is little space for individuality, originality, and creativity.

Based on interviews with eight internationally recognized producers, this research examines whether there is a standard in recording metal music that these professionals follow. The focus is less on stories of extraordinary experimentation and misuse of technology (see Chanan; Cunningham; Moorefield; Warner) nor on the producers’ phenomenological perceptions of their work (see Thomas; Thomas and King). Instead, the emphasis is on technical accounts of their production and engineering practice. Zak notes that “although record making is extremely technical, comments on the nature of its process and criteria . . . routinely deemphasize theoretical principles or justifications” (192). Correspondingly, Bennett argues that recordists tend to downplay their technological knowledge because it seems less interesting than mythologized studio stories (80). Concentrating on the technical processes in metal production, this study adds a new perspective. We focus specifically on the recording stage, extending research examining standardization in mixing metal music (Turner, Profiling). First, we elaborate on “maverick methods” (Bennett) and their place in metal music production. We then cover producers’ views on pre-production, after which we analyze the engineering of the rhythm group of drums, guitars, and bass to determine whether there is a standard approach in the way these producers work and where there is room for experimentation. Vocals are not part of the investigation because – apart from the fact that they all compress them to varying extents during tracking with standard compressors such as the Universal Audio 1176 or the Teletronix LA-3A, and use common microphones such as Neumann’s U47, Telefunken’s ELA M-251, or Shure’s SM7B, depending on the vocal style – the interviewed professionals did not elaborate on their vocal recordings. This limited attention to vocals is consistent with other studies that have interviewed metal producers (Thomas; Thomas and King; Turner, “Outlining,” Profiling) and may be explained in that the recording and processing of vocals in metal are far less different from other genres than the metal-specific production approaches for guitars, bass, and drums (Mynett, Metal; Herbst and Mynett). However, this should not be misinterpreted to mean that vocals are of lesser importance in the metal genre. Rather, the challenges and priorities are similar: the voice must convey the vocalist’s emotion and message and be intelligible in the context of the mix, which is achieved primarily through compression and frequency manipulation, generally using a common set of microphones, compressors, and channel strips such as those mentioned above (Mynett, Metal; Herbst and Mynett).

**Maverick Methods in Record Production**

Record producer Bruce Swedien once commented on the affordances brought by the continued development of technology: “In modern music production, the only limit to our sonic palette is our imagination. . . . [W]e are now free to create a sonic canvas with our creativity as the sole limiting factor” (qtd. in Zak 63). The possibilities of creating records like painting a canvas increased with the growing number of tracks available in analog multi-track and digital music production, which allows sounds to be processed individually and blended as desired. Zak highlights the complexity of record production and emphasizes the often-overlooked creativity in engineering. When it comes to the
options to paint the sonic canvas (see also Gracyk 79–83), he rightly stresses two constraints. Firstly, the imaginations of individuals are a “product of historical accumulation,” and secondly, recordists are guided by convention (Zak 63, 127). Conventions exist for a reason; they result from experimentation and the establishment of proven methods within a community of practice (Wenger), where they serve as a benchmark (Bennett 76). Over time, rebellious behavior and broken rules become part of the best practice of later generations and are no longer unique (Bennett 85–86).

From the viewpoint of systems models (Thompson), creativity does not emerge from a vacuum but is based on prior knowledge, traditions, and achievements. These requirements have an individual component in the recordist’s listening and professional experience and a socio-cultural component, determined by what is accepted in the “field,” here the (metal) music industry. Models of creativity emphasize learning because symbolic codes and techniques of the “domain,” a knowledge and symbol system with conventions, must be acquired and understood from the perspective of the field to deviate from norms in ways that are likely to be accepted (Thompson 69–70). In record production, the domain is genre-specific (Thompson 177), requiring specialist skills for metal (Mynett, Metal 1–2), possibly even for its subgenres with their different aesthetic ideals. If the field – a record label and the media – accepts variation due to its creativity, novelty, and originality, it releases a record and gives it airplay (Thompson 5). However, this view falls short if it does not include the target music community with its ideals and expectations. Metal fans do not accept every album that is released and featured in media. Rejection might be caused by an album’s too experimental nature, the wrong kind of transgression, or being mistimed and not in tune with the zeitgeist.

In the history of metal music, there are numerous examples of productions that deviated from the norm. Some were celebrated for their originality and uniqueness; others were rejected. Rick Rubin has been praised for his experimental approach (Brown 6). His minimalist, raw production without overdubs of Slayer’s Reign in Blood (1986), which unlike most productions of the 1980s lacked reverb (Brown 66–67), is still a landmark in metal’s history (Ferris). Another example of one of the most successful metal bands is Metallica, several of whose experimental albums were not received well. One of them is St Anger (Metallica, 2003), featuring a deliberately raw sound. Its producer Bob Rock explained the motivation:

We wanted a raw, unpolished sound. . . . We played it all live without overdubs. It’s a liberating feeling to ignore all the rules that exist in metal. You have to play this guitar with this amp, otherwise it doesn’t sound good. . . . Skip the rules and do what you want! For example I only needed 10 minutes for the drum sound. . . . Technically, you’ll hear cymbals go away and you’ll hear bad edits. We wanted to disregard what everybody assumes records should be and throw out all the rules. I’ve spent 25 years learning how to do it the so-called right way. I didn’t want to do that any more. (qtd. in McIver 325–26, 332)

In another interview, Rock added:

For me this is refreshing. Metal has always been about rules – about how the kick drum and the guitar and everything should sound – and I like the fact that St. Anger doesn’t sound like a traditional metal album whatsoever. This has really pissed some people off. . . . I love the fact that it was thrown in the face of radio and in the face of metal. It’s time for a switch, guys. Everybody’s been way too comfortable and it’s getting stale. (qtd. in Buskin)
The metal community saw it differently. Journalist Joel McIver described the “sound of St. Anger [a]s terrible. More than any other aspect of this experimental album, which showcased new composing, recording and mixing techniques on Metallica’s part, this is what failed” (331). Considering Turner’s (Profiling) and Thomas and King’s observation of metal having become standardized with an expected sound, these two examples contribute to the notion that experimentation was welcome in the 1980s but may have become less prevalent since the 2000s.

In addition to acceptance in the field with the symbolic codes and conventions of the domain, constraints lie in the recordist, the physical nature of recording, and a genre’s sonic characteristics. As Zak points out, there is an empirical nature to the recording process in rock that cannot be ignored (97, 127). Sound engineering is bound by electroacoustic laws, which also shape human perception. Engineers must acquire tacit knowledge, the “unarticulated, implicit knowledge gained from experience” (Schmidt Horning 126), and critical listening skills through a combination of experience, intuition, and experimentation. This includes knowledge of signal flow, skills to operate recording consoles and audio cards, experience with microphones, and understanding of the different production stages of recording, editing, mixing, and mastering. It also requires auditory skills to hear the effects of technology and manipulate sounds to make them work technically and aesthetically (Schmidt Horning; Zak).

Metal music is perhaps different from mainstream genres in that it takes its production to extremes (Mynett, “Distortion”). Turner argues that metal requires “extreme production methods … to achieve maximum sonic clarity,” citing the dense wall of distorted guitars as the greatest challenge (“Outlining”; see also Mynett, “Distortion”). Thomas and King speak of extreme, radical, and unrealistic sonic expectations that require reinforcing or replacing drum sounds with samples (501; see also Williams), performance quantization, and other enhancements through drastic processing to achieve hyperrealism and a “larger than life” sound (see Mynett, “Heaviness”). It is important to note that such hyperrealism is mainly created in the mixing stage, which receives increasingly more attention (Thomas 221). Performances are edited, and the sound of instruments made larger than possible in acoustic reality (Mynett, “Heaviness” 71). What does this mean for the recording phase? Is it losing relevance given the processed nature of the contemporary metal sound? How do recordists capture the sound to be staged larger than life during mixing? In the following, we will discuss these questions based on interviews with professionals and explore whether the practices they describe support the notion of a standard in engineering metal music (Thomas; Thomas and King).

**Method**

Eight producers specializing in metal music, who have helped define the sound of commercial metal since the 1990s and 2000s, were interviewed. The semi-structured interviews addressed how they typically prepare recording and record metal music and how their recording approach relates to the overall production process. Particular attention was paid to the technical details commonly overlooked (see Bennett; Zak),
whereas previously researched phenomenological aspects (Thomas; Thomas and King) were considered secondary. All producers agreed to the disclosure of their names:

- **Andy Sneap** (b. 1969, UK): credits include Testament, Arch Enemy, Overkill, Judas Priest, Megadeth, and Annihilator.
- **Daniel Bergstrand** (b. 1974, Sweden): credits include Behemoth, Dimmu Borgir, Meshuggah, In Flames.
- **Fredrik Nordström** (b. 1967, Sweden): credits include At the Gates, Arch Enemy, Dark Tranquility, In Flames, Opeth.
- **Jens Bogren** (b. 1979, Sweden): credits include Opeth, Arch Enemy, At the Gate, Soilwork, Dimmu Borgir, Amon Amarth.
- **Logan Mader** (b. 1970, Canada): credits include Five finger Death Punch, Gojira, Soulfly, Fear Factory.
- **Matt Hyde** (b. 1964, USA): credits include Slayer, Children of Bodom, Monster Magnet, Hatebreed, Behemoth.
- **Nick Raskulinecz** (b. 1970, USA): credits include Evanescence, Korn, Halestorm, Mastodon, Rise Against.
- **Ross Robinson** (b. 1967, USA): credits include Korn, Slipknot, Machine Head, Sepultura, Fear Factory.

All producers are from western regions of the northern hemisphere, which means that their experience may differ from that of professionals from other parts of the world, and the small sample size naturally does not represent the entirety of metal music production in its global and historical breadth.

In the following, the term “producer” is used to delineate the interviewed professionals in line with other research on metal music production (Herbst “Formation”; Mynett, *Metal*; Thomas; Thomas and King; Turner, “Outlining,” *Profiling*). Historically, record production has relied on specialized roles, usually divided between the creative, facilitative, and overseeing producer and technical experts, such as recording, mixing, and mastering engineers (Burgess). In metal music, the roles increasingly overlap, and the producer also performs most or all the technical roles (Thomas; Thomas and King; Mynett, *Metal*). There is limited quantitative data, but a recent study by Herbst and Mynett analyzing fifty professional metal mixes shows that of the mixing engineers studied, 82% produced the same song, 76% recorded and 66% mastered it. In the present study, the professionals’ statements about their working practices imply a shared producer and engineer role, according to the interview briefing, unless the statements or interpretations suggest otherwise.

The interviews of 370 minutes in length were audio-recorded and transcribed. Data analysis and interpretation followed Mayring’s Summarizing Content Analysis method, which aims to “reduce the material in such a way that the essential contents remain, in order to create through abstraction a comprehensive overview of the base material which is nevertheless still an image of it” (Mayring 64). A category system was inductively created according to recurring themes and iteratively refined to add details and change the structure whenever necessary.
Pre-Production

Pre-production is the stage in a production process where songs are prepared for recording, matching recording requirements and the band’s performance qualities (see Hepworth-Sawyer; Lauzon). Following a traditional approach (Hepworth-Sawyer 24–26), most interviewed professionals prefer to prepare production as much as possible before entering the studio. Depending on recording budgets and the personal relationship between producer and band, preparation takes between days to months and years. All are keen to work with bands to improve the songs, achieved through rehearsals, demo recordings, and constructing arrangements in the studio. Hyde explains,

The earlier I can get involved, the better; I like getting involved at the riff level. Sometimes I have a guitar player write a song and then take the five riffs and see what’s the verse. Some guys write great shit, but they don’t even know what the functions are, or they write a riff, and it’s a cool riff, but we need to mix it with another. I may manipulate the riff and try to sell it to them.

Hyde’s role could be described as that of the “collaborator” in Burgess’ typology (9–19), with a broad background in producing and as a musician and arranger who shares the creative work with the band. Mader approaches pre-production similarly:

I like to start pre-production with the MIDI drums just for the creative benefits. You can easily arrange. I do a lot of co-writing. Finding the right tempos, building the tempo maps before you go to mic a kit, you take the time to really know where you are going. More often than not, I’m doing the drums last these days. The very last thing I do is drums because the song is fully realized. You know where you are going; it just makes more sense.

Bogren tries to preserve some room for experimentation in the recording:

For me, it’s more about working with structures, the key of the song, and the basic rough elements. I never go into finding specific harmonies and every little detail and then treat the recording as a better version of the pre-production. I know some people do that, and perhaps it makes sense, but for me, pre-production has always been a more basic thing, and then a lot of magic happens in the studio.

Bogren indicates his belief in the occurrence of creative moments in recording, not much different from historical reports of earlier records (Chanan; Cunningham; Moorefield), and he seems, therefore, willing to accept the uncertainties of not preparing every detail of the arrangement. Nordström explains such risks, recalling a production where he was employed as a mixing engineer only. The songs were so “over-arranged” that it took him more than three days to mix a song. Overstepping his role as a mixer on this project, he rewrote the arrangement and re-recorded the entire album to make it work sonically (see Zak 171). For Nordström, the “arrangement is a very important part of a good mix.” Hence, he did not produce successful bands like Cradle of Filth because they were unwilling to change their arrangement to fit the technical demands of a mix. These examples illustrate the intertwined relationship between arrangement and production requirements (see Lauzon).

All producers agree that the compositional quality is crucial, but electroacoustic laws set certain constraints to what can be realized, requiring compromises to adapt arrangements to recorded format (see Zak 32). Therefore, producers must reflect on how to present instruments best on the record, including orchestration of the drum kit, the
number of kicks, snares, toms, and cymbals, and how they will sound in the recording space. Considerations include how hard artists play their instruments, whether they must adapt their style to engineering requirements, or how the technical approach can compensate for playing styles less ideal for recorded metal music—technical requirements and creativity overlap. Reducing the number of guitar tracks in a dense form part to make room for vocal harmonies and adding guitars with different chord inversions to fill space and “give the chorus a bit of a lift” (Snake) are just two examples of the interplay between engineering and arrangement.

Recording the drum, bass, and rhythm guitar tracks together has become rare since the advent of multi-tracking (Schmidt Horning 191–94). In rock music, the emphasis on carefully adding and shaping sounds is fundamental to the record’s aesthetic quality (Gracyk; Zak). With its complex structures, rhythmic subdivisions, and tempo changes, live recording has even more declined in metal. Hyde elucidates:

With most of these new bands, you’re always using click tracks and tempo maps. This is what changes. When I did [Slayer’s] God Hates Us All (2001), there were some count-offs, but there’s no tempo maps or click tracks on those records. And you can hear it, incredible tempo ramps. Places where the drums speed up and slow down, and that’s what the music needs. I remember just to try it one time to throw a click up, and let’s just try it at an even tempo. It just absolutely killed it. So, for that style, no, I can’t do it. In today’s music though, even if there are all those ramps, it’s all written in, and everything is precisely mapped out in pre-production. There are different styles of pre-production, and it has to do with the band. Usually, it has to do with what era they came in. I might be making a modern metal record, but if it’s with a band that’s been around for a couple of decades, they’re going to expect to go to a rehearsal space and play their shit, and that’s the way they’re gonna write and record it. And then I analyze that recording, and I generate a tempo map, and we figure it out that way. A lot of the new bands compose their shit primarily in the computer and primarily via MIDI, so a lot of those tempo maps are manipulated in that process, and I start in the computer. And the scratch tracks and tempo maps and everything that I’m going to need for my recording can be generated straight out of the pre-production out of the fact that it’s composed. A lot of the times the kick patterns. . . . You hear certain records, and I can tell for a fact that the kick is MIDI, and the guy is only playing hands over the kick because you get a specialized, ridiculously fake but really extreme sound. But sometimes it’s the right thing to do. It’s hyper-reality. It’s a certain type of thing. It’s part of the extreme nature of that style of music that’s done that way, and it can only be done if you have clicks and tempo maps.

The producers agree that recording to a click track is preferable from a technical point of view. Tempo changes have become integral to compositions and autographic for produced works, just like volume plays a compositional role in rock (Gracyk 31–36, 110). Click tracks give each form part and fill the right feel.

That tempo mapping can become an art in itself, often overlooked and perhaps unique to metal, is hinted at by Bogren:

In pre-production, one of the important parts for me is finding the tempos for the parts, and my tempo track will be up and down all over the song, sometimes even for a fill-in. . . . I think that’s fairly unique in metal. I’m not sure, perhaps loads are doing that, but I never saw it when I mix other projects.

However, some producers stress that click tracks and tempo maps can be detrimental. Like Hyde, Nordström sees a generational shift. Earlier drummers were not used to
playing to a click, and their feeling could not be captured well on the recording; but with younger drummers, this problem has disappeared. Only one producer, Robinson, is principally opposed to using click tracks:

For bands I work with, I don't use them. It's not acceptable. It's an attempt at looking good. Basically, I'm saying that my internal clock is not good, and so I'm afraid to be me, and therefore I'm gonna fake you out and pretend I'm something else and that's not organic or vulnerable.

For him, record production is fundamentally about capturing personality:

A great metal album must be infused with vulnerability where most metal bands want to be tough and hard. To me, [click tracks] that's just being a coward. What I want to do is that I make sure that people are feeling intimately with what the singer is singing about, and then this turns into a craving for each instrument, for each sound and performance and all of that. It just comes from fearless vulnerability and not looking good or tough or whatever.

This overarching ideology renders all principles in pre-production and production meaningless.

**Sound at Source**

Analog multi-track recording has led to a “fix it in the mix” mentality that has proliferated further with digital means of production (Schmidt Horning 185–91). Zak cites Def Leppard’s *Pyromania* album (1983), where the drum shells eventually had to be replaced by a Fairlight sampler because the drum sound missed vision (128). Lack of vision is unacceptable for the interviewed producers (see also Hepworth-Sawyer 32–36). They have a clear vision from the outset and know how recording and mixing will create the intended aesthetic (Lauzon). Hyde emphasizes that the mix is merely an extension of the recording:

I feel like I have the vision for a song the whole time we’re working on it. I know already during tracking what I’m really going for, and the roughs are usually pretty close to where I want to be. Many of the vocal and other effects are dialed in during tracking, because the way I worked is that after tracking drums, I went home and I did a mix in the box. (qtd. in Tingen)

This understanding of recording is consistent with the metal producers interviewed by Thomas (235–42). Rather than “fix it in the mix,” recording quality is essential, and the mix is seen as a means of taking the arrangement to another level (see also Moore 224).

In the days of analog recording, decisions had to be made at all production stages. Much of the Beatles’ mythology revolves around managing two, four, or eight tracks by blending sounds to make space for other overdubs (e.g. Cunningham 119–52; Moorefield 26–35). In digital music production, unlimited tracks are available, but all producers agree that it is best to commit and “getting the sound at source.” Performances are recorded through analog processors such as sound-coloring compressors and equalizers that will “impert a sonic fingerprint on recorded audio that affects how it integrates into the final mix” (Moore 209). Motivations range from getting the sounds right to preparing the mix and improving performances through better “vibes.” Some producers speak of pre-mixing so that the mixing is freed from sound-shaping and reduced to balancing
levels and frequencies (Bergstrand). Others are more cautious and emphasize that sounds cannot be sculpted in isolation because they must work in a dense mix (Bögren). Bögren describes himself as “old-school,” and the established working practices in an analog or hybrid domain are apparent in several statements. Nordström refers to In Flames albums made with sixteen tracks that required constant decisions. To this day, he does not want to have multiple guitar tracks to choose from when mixing; all microphones are summed before entering the audio interface. Overall, the intention to commit is in line with other interview studies with metal producers (Herbst, “Old Sounds”; Thomas), which found that limiting options, especially in times of infinite opportunities afforded by digital production, is considered beneficial. As Moore argues, making aesthetic decisions by committing to processing distinguishes engineering as part of the production from a purely technical procedure (224). Robinson, the only exception, processes the sound while aiming to capture the performer’s personality and not the production.

**Drums**

Modern metal drum sounds are a creation of the mix, where the kit is heavily processed and enhanced by samples (Thomas; Williams). Following the principle of “sound at source” (Moore), the interviewed producers still aim to create the best possible drum sound in the recording to reduce the need for sample reinforcement but to varying degrees. While Sneap records with sample reinforcement in mind, Nordström prides himself on bringing out the acoustic kit’s sound as much as possible. Irrespective of attitudes toward sample reinforcement, the producers choose drums for each song on an album to match the tempo, feel, and drummer’s playing style. Recording seven or eight snare drums for an album is typical.

When tuning, all producers prefer deep-sounding drums, but this is not always possible. Apart from drummers’ preferences in drum sizes, materials, and tunings, what sounds good in the room may not do so through a microphone (Nordström). Furthermore, each drum kit as an “acoustic animal” (Mader) must be treated differently. The aesthetics of metal’s subgenres must also be considered when tuning (Hyde). And just like choosing different drums for different songs, dampening the drumheads to shorten their length and control their ring/sustain depends on personal preference and what is needed for the arrangement (Bögren; Mader). While the kick is usually tuned as low as possible for sonic effect and because pitch recognition is vague at low frequencies (Williams 53–54), producers try to find pitches within the instrument’s optimal tuning range that harmonically match the pitch of the song and its tempo, with faster songs requiring higher-pitched and shorter drums (Bergstrand; Bögren; Raskulinecz).

Recording drums has changed as track counts increased. According to Zagorski-Thomas, the drum kit is now considered “multiple instruments rather than a unified whole” (201). Nevertheless, it must convincingly function as one instrument, despite recording microphones for each shell and cymbal, sometimes multiple microphones per instrument and additional microphones for overheads and rooms. The biggest challenges faced are bleed from other instruments into spot microphones and phase problems, leading to unwanted coloration and reduced low frequencies through comb filtering (Bartlett and Bartlett 219–20). Engineering is challenging with microphone numbers of up to forty on a kit. Hyde explains:
Part of a larger issue with metal drum sets is that it’s one instrument with 50 different sound sources coming at you at once. There may be 18 to 22 microphones on the kit. We’re gonna have our left and right overhead, there is something miking the china, there’s gonna be spot mics on splash cymbals, spot mic on the ride cymbal, spot mic on the hi-hat. This might have been eight mics just for the cymbals, and what does that mean? There are wild phase issues going on. Every time you add another microphone to the mix, you’re adding phase issues. In this case, 22 microphones gotta point at sound sources, pick them up successfully, reject as much as possible, grab the frequency content that you want to supply to your overall picture while rejecting the frequency content that you don’t want for that particular source and not disturb the phase of the whole thing. It’s an impossible problem . . . it’s just a million decisions that go together to get the thing.

The complexity and multitude of decisions contradict the notion of a standardized metal production (Thomas and King; Turner, Profiling). Production requirements still ask for specific solutions to individual problems.

Further variation exists in microphone choice. Specific microphone types are technically better suited for particular instruments (Bartlett and Bartlett), but these leave scope for personalized taste and aesthetic intent (Zak 109–11). Zak points out that “microphones are the technological soul of any recording project; the effectiveness of all other tools and techniques depends upon the quality of the image that the microphone is able to deliver” (108). Referring to Roland Barthes’s “grain of the voice,” Zak argues that microphones do not merely help capture the grain but are integral to its production. The microphone properties project an “aura” that will color the sound but do so in relation to placement, angle, and distance to the sound source (109–10). Selecting and positioning the microphones depends on the drum kit, instrument, and drum performance style, but also the recordist’s intuition and experience. Ultimately, “microphone selection on some level is intrinsically a mix decision in that it’s an irreversible sonic decision that profoundly affects how an element will behave in the final mix” (Lauzon 115).

Comparing microphone preferences proves difficult, even for each producer, because the variables prevent a standard approach. Aesthetic visions for an album, the tonal qualities of instruments, and different acoustic spaces make it impossible. Moreover, producers continue to evolve their practice, as evident in statements comparing past with current approaches. Robinson is again the only exception, “always the same engineering, same mics, different bands,” because he strives to capture performance and personality, so for him, recording equipment is a necessary but meaningless variable. His work is focused on coaching artists to perform at their best, with little regard for quality from an audio perspective.

The producers have favorite microphones or combinations. Hyde explains, “There’s certain microphones that I like to use for metal; I mean everybody’s got their different things.” Several producers prefer similar microphones on the drum shells, such as the AKG D112, Sennheiser E602, Shure Beta 52, or Neumann U47 on the kick, the Shure SM57 on the snare, and the Sennheiser MD421 or Shure Beta SM98 on toms, concurring with engineering practice outside metal and being an industry standard (Bartlett and Bartlett). But producers often vary microphones between productions, combining them with unusual choices or generally opting for more niche models, for example, the Beyerdynamic M88 – a vocal microphone – on the kick (Bergstrand), a Unidyne 545 or Josephson E22 (Bogren), Neumann KMS105 (Bergstrand), or Sanken CU31 (Nordström) on the snare. Overhead and room microphones vary even more, with some unusual choices such as
microphones by Nady (Bergstrand), Englund (Bogren), Advance Audio (Nordström), and a Shure harmonica microphone (Hyde) alongside the common Neumann KM184 or AKG C414, covering a price range from under one hundred to over a thousand US dollars. However, the observed choices of overhead and room microphones, besides some variation in shell microphones, do not point to a drum microphone standard in metal music. The differences are noticeable in other respects: the number of microphones used on instruments and how the cymbals and room are captured. Instead of recording individual cymbals, Bogren, Nordström, Mader, and Robinson opt for one stereo pair and additional support for rides, hi-hats, and small splashes. The others operate similarly but do not hesitate to add more microphones for smaller crashes and chinas if necessary. For Sneap, the number of microphones depends on the budget because higher numbers require more work to ensure phase correlation. Others like Bergstrand seem more experimental, reporting sessions with thirty cymbal microphones placed above and below, regardless of the recording budget: “I just put lots of microphones up and think this will probably sound like shit, and in the end, most of the times it’s, whoa, and you bring that setup on to the next session you do, and then you find a new one.”

Different attitudes to experimentation may determine the producers’ approaches, but musical variables can encourage new ways. A good example is Bergstrand, who explains how his approach to capturing the kick drum is influenced by song tempo:

You need to mic it up even closer with a drummer that is playing really fast, 270 BPM or something, to mic it up as close as possible. I also create some kind of cabin in front of the kick. A kick tunnel, sometimes I use three kicks, you know, in front of each other and build some sort of tent. Then you can also move it out a bit from the kick drum, trying to get the room too. If you close-mic it as hell, you get the resonance from the other kick.

Bergstrand sometimes replaces the tunnel with a grand piano, whose microphone captures a different low-end than a regular kick tunnel. Raskulinecz goes in the opposite direction when the song is fast: “If there is a lot of double bass, I usually try to just go with one mic just because it can get messy sometimes and the phase can get weird.” Instead of sculpting the low frequencies, he aims to capture the most precise sound.

Even producers less inclined to experiment do not seem to follow a strict methodology. Turner’s profiling study of Andy Sneap concludes that he has a clear mixing methodology (“Outlining”, Profiling), but Sneap’s approach to recording seems less systematic: “I record sub-kick quite a lot. A lot of times, I end up not using it, but I put it up there because it’s fun if you’re tracking as well. Sometimes I double-mic the toms. It just depends on what day of the week it is really, whether I can be bothered, if the budget is big enough.” Despite the manufactured nature of drums (Williams), its sound is decisive for the quality of commercial metal albums. While this may suggest a standard, almost mass-produced approach, the interviews indicate considerable experimentation. Apart from variation depending on bands, songs, and recording budgets, most producers change their approach to avoid boredom, out of interest in sonic exploration, and to develop professionally.
Guitars and Bass

Guitars in metal are usually the thing that ruin everything. Drums, if you have really bad tones, you can replace stuff, and if you finesse enough, it will sound like real drums, and it will sound expensive and good. But guitars, it’s gotta be there; you can’t do sound-replacing. You can re-amp the DI; that’s what I would usually do to fix a bad amp tone. (Mader)

The sound of the distorted electric guitar remains the mainstay of metal music (Mynett, “Heaviness”). Over time, the methods used to create ever-heavier guitar sounds have become more sophisticated due to a larger number of tracks and different microphones but have essentially changed little in the fifty-year history of the genre (see Berger and Fales; Herbst, “Historical Development”; Mynett, “Distortion”). The main approach is still a valve amplifier connected to a 4 × 12 speaker cabinet recorded with microphones. In recent years, digital amplifier simulations such as Line 6’s Helix, Fractal Audio’s AxeFX, and the Kemper Profiling Amplifier have made significant leaps in quality (Herbst, Czedik-Eysenberg, and Reuter; Williams). Some of the interviewed producers, including Sneap and Mader, have adopted digital devices, particularly the Profiling Amplifier, which allows an authentic capturing of the sonic fingerprint of analog amplifiers with the benefit of choosing tones at the touch of a button. This tonal variety is essential because it is often their responsibility to create a guitar sound when a player does not have a signature sound. As Hyde explains, “I’ve got a lot of different amps, a huge variety, I got all of them, and all the other guys do too. It’s about figuring out what the combinations are.”

The producers disagree over the relative importance of the setup of the amplification compared to the use of microphones to capture the guitar sound. For Raskulinecz, the amplifier is the critical component because it must be capable of reproducing the low frequencies of down-tuned guitars while providing clear attack to ensure note definition. By contrast, Bogren claims that the “head is 10% of the sound; the rest is all in the cabinets and mics.” Although there is disagreement about the relative importance, Raskulinecz may use two or three microphones for different qualities: one microphone for bass and one for pick attack.

Throughout the history of metal, producers have explored ways to make the guitar sound heavier (Berger and Fales). One strategy is splitting the signal to be reproduced by several amplifiers and cabinets. Metallica’s productions in the 1980s and 1990s served as inspiration for later bands. Bob Rock explained how he created Metallica’s guitar sound:

I think the big thing that I brought to . . . James Hetfield was using multiple amps, as well as using the differences in phasing, cabs, and heads that all combined to get one sound. Different volumes on different amps, for different frequencies and clarity. That’s basically what I’ve always done to record guitars. Multiple amps and multiple mics, and finding that sound. It’s basically a process of building the sound in the studio. (qtd. in Brown 62)

Blending different guitar sounds creates, in Rock’s words, “size.” Acoustically, this size is sonic density produced by the varying frequency components of the sound-shaping and capturing devices (Mynett, “Distortion”).

Few of the interviewed producers record multiple amplifiers and cabinets. Bergstrand prefers it because it delivers different “colors” or “grains” from the same performance. Sneap avoids such an approach due to possible phase problems. Instead of mixing
different amplifiers, he records different guitar tones for both sides, explaining it would make the sound “less demo-ish.” Bogren prefers Sneap’s approach, stating that blending multiple sounds for one performance would sound “less in your face” (see also Mynett, “Heaviness”).

It is commonly believed that the distorted electric guitar in rock and metal is loud (Gracyk 108–11; Williams 56–57). However, not all producers record guitars very loud. Nordström refers to the sound of a power amp, crucial for a rock sound, not being “tight” enough for metal. Moreover, note definition is further reduced at higher volumes because the microphone is more likely to capture the room resonance. Since high volumes are not ideal, Nordström has experimented with “toy amplifiers,” such as Marshall’s anniversary 1-watt JCM800. The result can be heard on HammerFall’s Dominion (2019) album. Sneap has a different strategy to improve note definition. The choice of speakers, for him more important than the amplifier, depends on the guitar’s tuning. He prefers Celestion Vintage 30 speakers for down-tuned guitars, which have more midrange than the Celestion V75s used in most traditional cabinets by Marshall and other manufacturers. The V75s have little midrange because older amplifiers already emphasize these frequencies. The producers’ different choices for the right combination of guitars, amplifiers, cabinets, and microphones do not demonstrate a general approach; instead, they are evidence of strategies that need to be tailored to each album or song (see also Zak 109–11).

Aside from the basic setup, producers pay close attention to the guitar arrangement and how it interacts with recording and mixing requirements (see also Zak 32). They agree that distortion should be used moderately on low-tuned guitars to maintain note definition (see Mynett, “Distortion” 76–77). This experience is at odds with Williams’ (53–54) argument that for low notes to be discernible, the guitar needs to be highly distorted to enhance the overtone series, increasing perceived brightness and pitch clarity. As the producers argue, the problem is not so much the frequency spectrum but the attenuated attack transients that are lost with too much distortion (Berger and Fales). As Mader explains:

Less gain is really important for low-tuned guitars, but you need to have a player that knows how to hit the strings. Some guitarists get their tone out of the gain from their amp but then pick really lightly – but that does not sound good. You really have to have the velocity and dig in, and that’s where you get the aggression and note definition while not needing a lot of gain.

Note definition results from a combination of spectral content, especially in the low frequencies where there should be little resonance emphasized by distortion, and envelope characteristics, ensuring clear note onsets (Mynett, “Distortion” 76–77). Sneap agrees with Hyde that punch does not come from high-gain saturation of modern amplifiers but from playing (see Mynett, “Heaviness” 69).

The appropriate amount of distortion depends on the number of guitar tracks. Doubling guitars for a stereo effect has been common in metal since Black Sabbath’s debut album in 1970. They had other goals than their hard rock colleagues Led Zeppelin when doubling guitars (Thomas 119). Instead of using guitar overdubs as a compositional tool to embellish melodies, Black Sabbath intended to maximize sonic weight. Consequently, the number of guitar tracks increased over time, so that by the
2000s, four tracks – two performances on each side – became the standard (Herbst, “Historical Development”).

The interviews suggest that mixing more than four guitars to increase sonic density further is uncommon because it reduces rhythmic clarity and punch. Less agreement exists on how many tracks are favored. In Colin Richardson’s tradition (Taylor), Sneap, Richardson’s former assistant, and Mader, whose band Machine Head chose Richardson to produce their early albums, prefer four guitars. Mader records the same signal chain and tone because of the slight chorusing effect it produces, whereas Sneap favors complementary tones on each side; one for low end and one for note definition, which also “smoothens out” the sound by preventing exaggerating sonic features and allowing different distortion levels to be blended. Despite individual differences, the producers stress that performance clarity can suffer, so quad-tracking was not the best choice for every band. Besides, as Sneap, Mader, Bogren, and Nordström agree, budget and available time often do not allow excessive layering, making it an economical as well as a creative decision. For Hyde, quad-tracking is also the producer’s attempt to impose a production on the band, not unlike Robinson’s mind-set. As Hyde explains, producing is about capturing a band, and two guitar tracks let the personalities of the players shine through better than hyper-real quad-tracking. Raskulinecz feels similarly: “All the doubling and doing the same thing again with a different tone, it can make it blurry, and I want to hear the notes, I want to hear the pick hitting the strings, I want to hear the diction of the riffs, and it’s easier for me to hear it and get the sound I want with a single performance in each speaker.”

To improve performance accuracy and emphasize the player’s character, the interviews strongly suggest that the increased technical level of modern metal has led to a return to recording only two guitars. Bogren states, “If I’m able to get the sound and weight I want from just two rhythm guitars, then I much prefer it,” suggesting that producers are balancing sonic density with performance quality. Instead of having four identical guitars throughout the song, producers would add extra guitars in individual sections to add width, density, or ambiance, making layering a creative arrangement choice rather than part of the overall sound design. The required width is typically achieved by recording different tones for the left and right guitar channels. Interestingly, evolution in engineering guitars is not a linear increase in X-ness (Berger and Fales 193) but involves a return to an earlier practice; in this case, to two tracks as in the formative phase of metal (Herbst, “Historical Development”).

Microphone technique seems to vary less between producers. To create the required “in-your-face” proximity, rhythm guitars are usually recorded close to the speaker with dynamic microphones (Mynett, “Heaviness” 69). The microphone of choice is Shure’s SM57, an essential component of most producers’ guitar sound. Sneap’s combination of Vintage 30 speakers and SM57 microphone captures the mid-frequencies well and has inspired numerous metal producers, as evidenced by his subforum on Ultimate Guitar and other message board threads (e.g. Mixingtips). Hyde and Robinson use only one microphone to minimize phase problems, but most, including Sneap, Mader, Bogren, and Raskulinecz, commonly blend the SM57 with a Sennheiser MD421 for its low-end frequency capture in the tradition of Colin Richardson, who was inspired by Bob Rock’s guitar sound (Taylor). Surprisingly, the interviewed producers do not highlight their impact on later generations of metal recordists. For example, Nordström has developed
the “Fredman technique,” a pair of SM57 with a mutual angle of 45 degrees facing each other, for which microphone clips are available from Wilkinson Audio and Fredman Digital. As he does not mention his signature technique, it can be assumed that exploratory achievements from the past have become standard practice (see Bennett 85–86) and are no longer noteworthy. Some producers use uncommon microphones for their main sound, for example, Bergstrand a Neumann TLM193 and Hyde a Beyer M160. Bergstrand, Bogren, and Hyde further add ribbon microphones like the Royer R121 or AEA R84 in rock guitar engineering tradition. Altogether, the amount of experimentation varies considerably between producers. Some like Sneap have one or two preferred approaches; others like Bogren, Bergstrand, and Hyde experiment on each album to find a unique tone.

In formative rock history, the bass was either recorded via DI box directly into the recording console or captured from the amplifier. Contemporary metal music production has a more complex setup, which, according to Nordström, is because modern bass players have their own sound, unlike the players of the 1980s and 1990s. In most productions of the interviewed producers, both signals are used: the direct signal (DI) for a clean and the amplifier for a distorted sound, mostly recorded with a Sennheiser MD421 like in rock music, to blend the bass with the guitars and cut through the mix better (Mynett, “Distortion” 77). Besides these two essential components, most producers experiment with additional layers, as evident in Bogren’s statement: “The track count usually runs away, I don’t like it, but it usually does, and I experiment quite a lot. Sometimes I separate, frequency-wise, the DI from the amp distortion.” Four to eight layers in total are common. Each fulfills a specific role, like increasing density through different distortion properties or better translating to smaller speakers and earphones. While the DI signal guarantees the solid low end needed for the wall of sound in metal, the remaining layers are free to choose. Just as common as recording bass amplifiers is experimentation with guitar amplifiers or fuzz and overdrive pedals to produce distortion as a fundamental component of the metal bass sound. Only Sneap is not too particular about the bass tone when recording because he re-amps it during the mix once he knows what sound works best with the guitars and drums (see also Mynett, “Defining” 309).

Discussion and Conclusion

The study was inspired by previous work that observed a standardized methodology in the production of metal music in the northern hemisphere (Thomas; Thomas and King; Turner, Profiling). Reasons often cited for homogeneity are an increased level of performance perfection (Mynett, “Distortion”; Thomas and King; Williams), facilitated by computer editing, and the quest for heaviness through more extreme production techniques (Berger and Fales; Turner, Profiling). Our interviews, however, illustrate various approaches and willingness to experiment, which contradicts the notion of standardization, at least in the sample population. Robinson, for example, is fundamentally against perfection. He encourages mistakes because, for him, “all of a sudden, music happens.” Engineering does not interest him much; if the performance is convincing and the artist’s personality shines through, he can make the sonics work. Massy recommends leaving enough time for the unexpected and having “elbow room for magic” (5). The interviews
support such an approach. If time is available and sufficient budget and good planning allow experimenting, most interviewed producers enjoy it out of artistic curiosity.

Nordström finds that it is boring to repeat himself, and this lack of excitement transfers to the listening experience. For his profession as a metal producer, curiosity is fundamental and must not cease to stay relevant and commercially competitive. Even Sneap, who operates most from an economic perspective within the sample, does not like to stick to a tried and tested system: “I just go with what feels right. Have a mess around; there are no set rules. You can’t just come in and say, ‘this is this, this and this.’ One of the joys of recording is making mistakes and finding little tricks out.” There is no doubt that electroacoustics laws constrain recording and producing metal music, but despite proven standards (Mynett, Metal), producers have individual approaches that they continue to develop. This is not only due to the bands’ compositions, arrangements, and performance qualities requiring individual solutions, but recording and producing are also creative tasks, in metal as in any other genre. One could even argue the characteristic pursuit of heaviness, transgression, and hyper-reality frees metal music from a performance-authenticity paradigm (see Mynett, “Heaviness” 71) like such existing in most rock music (see Gracyk), hence encouraging experimentation and creativity because it is not bound by the requirement to sound realistic. Zak and Moorefield claim that recording has shifted from a primarily technical endeavor to an artistic matter. The interviews suggest that the reality lies somewhere in between and that technical requirement and artistic creativity are not opposite ends of a pole.

Metal music production has been described as a series of problem-solving tasks with little room for originality and creativity (Thomas; Thomas and King). The findings do not support assumptions of mass-fabricated metal music in the Adornoian sense, even if best practices exist. Of the most accomplished producers, to which the interviewees belong, many manage to deliver commercially successful records while continuously redefining the art by advancing their craft. Building on the achievements of their predecessors, such as Bob Rock and Colin Richardson, who were both experimental and transgressed norms in the metal community, the interviewed producers push the boundaries. The main difference is that other than in the mythologized studio stories (Bennett; Chanan; Cunningham; Moorefield; Warner), the results of experimentation in contemporary metal are less obvious to the layperson and thus more accepted. It is relatively unlikely that a metal fan would recognize the sound of Bergstrand’s kick drum being captured from a grand piano or Nordström’s building HammerFall’s wall of sound from a toy guitar amplifier. Metal music production does not stand still. As the genre unceasingly strives for maximum sonic impact (Mynett, “Maximum”), it must continue developing technically and artistically.

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