

Empirical Explorations of Guitar Players Attitudes Towards Their Equipment and the Role of Distortion in Rock Music

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Introduction

The sound of the distorted electric guitar is widely considered a sonic trademark of most rock and metal music genres. As Robert Walser once claimed, the “most important aural sign of heavy metal is the sound of an extremely distorted electric guitar. Anytime this sound is musically dominant, the song is arguably either metal or hard rock; any performance that lacks it cannot be included in the genre” (1993, 41). Historically, the guitar and rock genre have been closely intertwined. From the early 1950s on, the solid-body electric guitar had been produced commercially and was already being played in blues, jazz, and Hawaiian music. Yet, it was the explosive emergence and international spreading of rock music that made the electric guitar popular throughout the Western world (Uimonen 2016, 2-3). In the history of popular music, the electric guitar’s diverse sounds created by numerous instrument models, amplifiers, overdrive and effects pedals became distinguishing features not only between rock and other genres (Gracyk 1996), but also between rock’s various subgenres and the multifaceted styles of metal (Berger and Fales 2005, 185; Cope 2010; Wallach, Berger, and Greene 2011).

Musical instruments are closely connected with genres and subgenres (Théberge 1997, 198), and some equipment is better suited for a particular genre than other gear (Jones 1992, 83). Therefore, musicians have modified instruments to their needs, as for example Edward Van Halen who famously altered his Marshall amplifier for higher distortion levels (Walser 1993, 43-44) and who built his ‘Frankenstrat’ in an attempt to combine the sounds and playing feels of two seminal guitar models, Gibson’s Les Paul and Fender’s Stratocaster (Obrecht 1978). Hence instruments and their individual sounds are of central importance for studying musical, cultural, and sociological aspects of rock music (Waksman 2003a).

Théberge argued that “[m]usical instruments are often the centre of controversy in pop and rock because their use is so intimately tied with the musicians’ notions of personal expression” (2001, 13). Closer inspection shows that despite popular music studies research having stressed

the general relevance of music technology, music production, and media-tized dissemination for rock music (Clarke 1983; Frith 1990; Jones 1992; Théberge 1997), scholars have paid less attention to the instruments involved (Waksman 2003a, 252). Similarly, the focus shifted from musicians to producers (Zak 2001; Moorefield 2010). Besides technological and production-related issues, popular music research has studied the electric guitar with regards to cultural identity and ethnicity (Waksman 1999), communication (Gracyk 1996), gender (Frith and McRobbie 1990; Walser 1993; Waksman 1999; Bourdage 2010), and fetishism (Uimonen 2016).

Despite this wealth of literature, there is still a profound lack of academic writing on what equipment rock guitar players choose to use and what goes into these choices. Clearly, many publications exist on famous rock guitarists from the 1960s and '70s: Jimi Hendrix (Whiteley 1990; Waksman 1999), Eric Clapton (Brunning 2002), Jimmy Page (Tolinski 2012), Tony Iommi (Cope 2010), and Eddie Van Halen (Walser 1993; Waksman 2003b), plus a plethora of (auto-)biographies. All this work honors achievements and reminds us of the classic times in rock history (Grossberg 1992; Gracyk 1996). Furthermore, numerous texts exist about innovators like Lester William 'Les Paul' Polsfuss (Waksman 1999) and influential instrument or amplification manufacturers such as Jim Marshall (Maloof 2004). In contrast, little attention has been paid to the large number and variety of amateur, semi-professional, and professional guitar players that constitute the majority of today's rock musicians. All these musicians continue to sustain genre traditions and develop rock music's diverse subgenres, even if only in local, regional, or national scenes (Wallach, Berger, and Greene 2011).

This article has its source in a larger empirical research project on the distorted guitar in rock music, which focuses on distortion's effect on playability and expressiveness (Herbst 2016, 2017b, 2019c), its influences on chord perception, song-writing, and production (Herbst 2017a, 2017c, 2018, 2019b; Herbst, Czedik-Eysenberg, and Reuter 2018), and on issues around genre aesthetics (Herbst 2017, 2019a, 2020). While most work on rock music and guitar culture has studied recorded music or star personalities, this study follows an empirical mixed-methods design (Creswell 2003, 208-227) by combining a quantitative survey (N = 413) of amateur and semi-professional musicians with ten qualitative interviews with professional guitarists of various prominence. It explores guitar players' attitudes towards equipment, based on the theoretically grounded assumption that the musicians' use of equipment is strongly connected with genre conventions (Hicks 1990; Jones 1992; Walser 1993; Gracyk 1996; Théberge 1997; Berger and Fales 2005; Cope 2010). The following questions arise from the

overarching research project and other rock and guitar literature: What are players' attitudes toward sound quality, and how do they approach crafting a personal sound? To what extent are players concerned with pursuing traditional guitar sounds? With an empirical design, the study contributes multifaceted data on the rock guitar to popular music studies largely missing so far.

Method

The study followed a sequential explanatory mixed-methods design (Creswell 2003, 208-227) using qualitative findings to complement quantitative results. Different approaches were combined to compensate for the weakness of each method and to come to a deeper understanding (Flick 2009, 23-34; 444).

Procedure and Sample

An online survey (included in the Appendix) generated the quantitative data. It was promoted on German-speaking online message boards.¹ Forums in countries other than Germany, Austria, and Switzerland were not addressed since the survey was in German. The response rate was high; 413 out of 569 questionnaires (73%) were fully answered within three weeks of data collection between 24 August and 13 September 2015.

97% of the sample were male. The age spectrum was between 15 and 64 years. The two largest age groups were those from 25 to 29 (16%) and 20 to 24 (15%) years. Each of the five-year-groups between 30 and 54 had approximately 12%. Least represented were the youngest (15 to 19 years, 3%) and oldest (55 to 59 years, 6%; 60 to 64 years, 3%) participants. Regarding the preferred genres played on the electric guitar (Figure 1), each respondent chose an average of 3.56 ($SD = 1.82$) out of 12 by multiple choice. Styles like blues, classic rock, and hard rock were generally favored; metal genres were less popular. The category 'no rock and metal styles' included styles commonly played without or with little distortion such as jazz, soul, funk, or reggae. A respondent's selected genres were generally stylistically close, for instance blues, classic rock, and hard rock; alternative rock, grunge, and punk; or all metal styles. The 'other rock/metal styles' were not clearly defined. However, since they were selected by participants who also favored extreme metal, metalcore, and nu metal, the 'other rock/metal genres' likely represented other 'extreme' styles of metal.

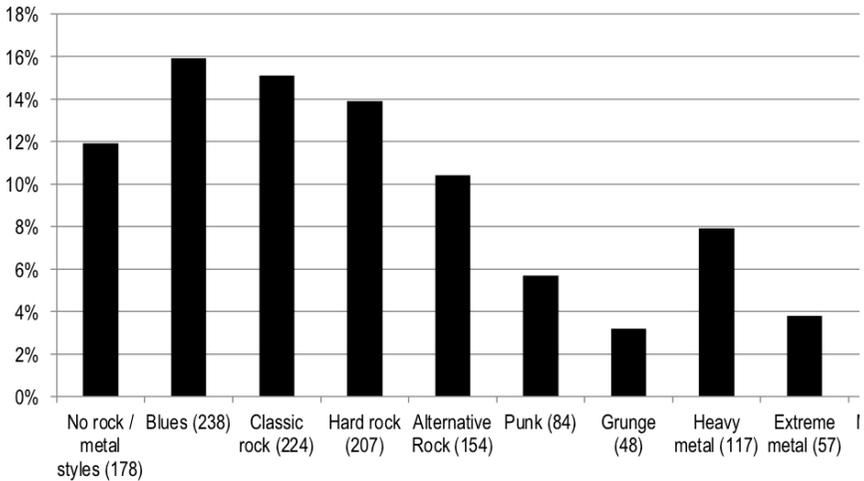


Figure 1. Participants' preferred genres played on the electric guitar (N = 1,487); numbers in brackets represent absolute numbers

As would be expected from the age structure of the sample, most participants played the guitar for many years. Most (58%) had 15 or more years of experience. A small number played less than a year (0.3%) or between one and three years (3%). The other groups were similar in size (4 to 6 years, 9%; 7 to 10 years, 14%; 11 to 15 years, 15%).

Regarding expertise, only 12 persons (3%) considered themselves amateurs, 216 (54%) intermediates, 134 (34%) semi-professionals, and 38 (10%) professionals. Most participants were self-taught (43%). 35% had instrumental lessons, 5% had studied for a research-focused music degree, and 3% did a higher education course in music performance. Further 13% had private lessons or mentors in bands. The decisive criterion for differentiating expertise groups was level of formal education, which correlated significantly albeit with a weak effect ($r_s = .15$; $p < .01$).

All genres except for hard rock and grunge showed clear correlations with age (Table 1). Playing experience correlated positively with blues and the 'no rock/metal' styles, and negatively with alternative rock, punk, and all metal styles except for heavy metal. Expertise and genre only correlated negatively for punk ($r_s = -.11$; $p = .02$) and positively for 'no rock/metal styles' ($r_s = .18$; $p < .001$). By tendency, professionals were less fond of playing metal genres.

Interviewing internationally renowned artists can be difficult because contact details are not publicly available, or requests do not get past their management. For this study, it was not possible to recruit enough professional guitarists from Germany with an international reputation.

Table 1. Spearman correlations between genre and age

Genres	No rock/metal	Blues	Classic rock	Alternative rock	Punk	Heavy metal	Extreme metal	Metalcore	Nu metal	Other rock/metal
r	.18***	.24***	.26***	-.15**	-.16**	-.15**	-.31***	-.30***	-.17**	-.16**

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$

Hence renowned players from other countries were also contacted. The final sample comprised ten internationally active professional guitar players, five from Germany and five from abroad. The players provided written answers to six questions (interview questions are included in the Appendix) about the overall importance of having a good and individual guitar sound, the relevance of distortion, their control over their guitar sound onstage and in the studio, and the effect of distortion on their playing. Gregor Hilden, a German solo artist, represented guitar styles played with less distortion such as blues, jazz, and soul. US-American Dave Hill, leader of the Dave Hill Group and instructor at Musician’s Institute, and German Alex Conti of the bands Atlantis and Lake, stood for the less distorted genres too. Swedish guitarist John Huldt, a session musician from Los Angeles, also participated. German players Thomas Blug (Thomas Blug Band, Rockanarchie) and Marcus Deml (Errorhead, Blue Poets) represented guitarists of instrumental bands. The remaining participants were recognized metal players: Germany-based Victor Smolski (Rage, Mind Odyssey), American James Byrd (James Byrd Solo, Fifth Angel), Angelo Perlepes (Angelo Perlepes’ Mystery) from Greece, and Swedish guitarist Christopher Amott (Arch Enemy, Armageddon).

Instrument

The survey included three parts addressing owned gear and preferred equipment, attitudes towards guitar sounds, and person-related data.² Questions on equipment and personal data had nominal and ordinal answer choices plus optional open comments fields. The attitudes were measured with 5-point interval scales with labels on the anchors, signing (1) as ‘complete disagreement’ and (5) as ‘complete agreement’. Six scales (Table 2) with satisfactory internal consistencies were constructed.

The scale ‘importance of guitar sound’ comprised items addressing the relevance of being able to precisely control one’s sound, a general statement on the importance of a high-quality sound, and about having a clear vision of one’s personal sound. Adjusting sounds’ captured the willingness

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Table 2. Psychometric scale properties

Scale	Cronbach's α	Explained variance	M	Min	Max	Variance	Items
Importance of guitar sound	.76	53%	4.40	4.27	4.69	.06	3
Adjusting sounds	.68	47%	3.52	3.05	3.80	.17	3
Experimentation	.74	39%	3.21	2.88	3.60	.08	5
Attitude toward distortion	.76	47%	2.99	2.38	3.43	.18	6
Evaluation of playing techniques	.72	42%	3.81	3.42	4.62	.19	9
Playing difficulties	.77	42%	3.09	2.98	3.31	.02	5

to using different tones in a song, adding effects pedals, and adjusting one's sound to the characteristics of each song. The scale 'experimentation' gathered attitudes towards experimenting with various guitars, amplifiers, cabinets, loudspeakers, pedals, and pickups. The scale 'attitude towards distortion' included items on playing feel, expressiveness, the relevance of distorted sounds when choosing or buying equipment, and the willingness to compromise clean sounds for higher-quality distortion sounds. Since distortion alters the acoustic characteristics of the instrument, the last two scales evaluated how such physical features affected the playing (Herbst 2017b, 2019c). In the 'evaluation' scale, the participants rated on the challenges distortion caused for several playing techniques. The last scale 'playing difficulties with distortion' assessed what impact distortion had on controlling noise such as feedback and overlapping notes.

Data Analysis

Expertise was evaluated with ordinal spearman correlation (r_s). Testing genres was only possible indirectly by comparing 'selected' with 'not selected' genres as they were saved in dichotomous variables. Genre differences regarding attitudes were evaluated by multiple regression analyses. The coefficient of determination (R^2) informed about the explained variance, and the standardized coefficient beta indicated strength and direction of the predictors. Nominal data such as choice of equipment was analyzed with chi-squared distribution and Cramer's V.

Results

Attitudes towards Guitar Sound

Guitar sound was very important for most players ($M = 4.40$; $SD = 0.66$). With this shared attitude, the genres did not differ significantly. A high-quality guitar sound was important to most players but more so for advanced players ($r_s = .22$; $p < .001$).

Despite highly valuing sound quality, the participants hesitated to agree to be adjusting their sounds regularly to the features of individual songs ($M = 3.52$; $SD = 1.00$). The genres varied to medium effect ($R^2 = .10$; $F(12, 399) = 3.67$; $p < .001$). Genres that tended more to vary or adjust sounds were alternative rock ($\beta = .20$; $p < .001$), classic rock ($\beta = .15$; $p = .01$), and 'other rock and metal styles' ($\beta = .11$; $p = .03$). Punk guitarists ($\beta = -.14$; $p < .01$) were less likely to change their sounds. Expertise did not have a significant effect on the tonal variety.

The sample population had a slightly positive attitude towards experimentation ($M = 3.21$; $SD = 0.96$). They experimented with different guitars, pedals, and amplifiers rather than with pickups, cabinets, and loudspeakers. On a single item level, creating an individual sound ($M = 3.80$; $SD = 1.04$) ranked far before an innovative sound ($M = 2.71$; $SD = 1.22$). The regression model explained medium variance on genres ($R^2 = .09$; $F(12, 401) = 3.24$; $p < .001$). Hard rock ($\beta = .16$; $p < .01$), classic rock ($\beta = .13$; $p = .02$), alternative rock ($\beta = .12$; $p = .03$), and 'no rock/metal styles' ($\beta = .11$; $p = .04$) players were more likely to experiment. Expertise had a small effect, yet the openness for experimentation increased with advanced abilities ($r_s = .14$; $p = .01$).

For all interviewed professional guitarists, the quality of their guitar sound was very important. Hill stated, "a good sound helps me to play my best. I have to be inspired by my guitar tone, or I find it hard to play in my style." Similarly, Conti described that adjusting his sound to the specific requirements of each song by carefully setting the gain level would enhance his playing. For him, the musical style was the most important criterion informing the setup of his sound. Blug and Deml compared their sound to the voice. Without the right sound, their playing would be constrained and meaningless. Creating the perfect sound, Smolski declared, required great effort. Since sounds were made up of many components, a good amplifier by itself was not enough. Rather, the right balance between pickups, guitar, cables, effects, amplifiers, and cabinets was decisive. It would take years of experience to find such a balance. Smolski further explained that his sound greatly influenced his playing and songwriting. Despite the importance of gear, several players regarded the human factor as equally relevant. Amott

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described, “the sound [...] is created mostly by my hands and how I play the guitar, and that goes for everybody. For example: I believe if Eddie Van Halen plugged in to my setup, he would still sound like Eddie Van Halen.” The right sound could support the artistic intention but only when it reacted to nuances. Huldt declared, “I go after sounds that makes my playing come through in an as honest as possible way.”

All players insisted on taking control over their guitar sound onstage and in the studio. The majority aimed to get their final sounds by deliberately setting amplifiers and positioning microphones to prevent recording or mixing engineers from altering it unnecessarily. A few guitarists as for instance Deml even started producing their own albums because they had been dissatisfied with the sound that external engineers and producers created. Although most professionals did not produce themselves, they still made a point of taking part in the engineering process. Especially in metal, shaping the guitar sound jointly with the producer was common. Amott described:

In the studio for the rhythm guitars [...] I always use 4 rhythm tracks to get that big 'wall of sound.' I will, together with the producer, mix and match different tones from different amplifiers and experiment with different settings and effects. This means sometimes recording with an 'uncomfortable' sound (for example with a lot of mid-range, or very 'fuzzy'). The point is then that the mixing and overdubbing of these sounds will blend together and create a bigger sound.

This strategy was not universal for rock and metal players. Perlepes, for instance, took care to produce his guitar sound with as little manipulation of the original sound as possible.

Distortion

Although distortion is a defining feature of the electric guitar, the sample population regarded it of medium importance ($M = 2.96$; $SD = 0.96$). Single scale items confirmed that the distorted sound was a relevant factor when choosing or buying gear ($M = 3.42$; $SD = 1.24$), yet most players did not like to compromise their clean sound for high-quality distortion ($M = 2.52$; $SD = 1.32$), which can be necessary because most guitar models and amplifiers have strengths in only a few sounds. The genres differed considerably ($R^2 = .38$; $F(12, 403) = 19.58$; $p < .001$). As would be expected, most positive about distortion were players of heavy metal ($\beta = .21$; $p < .001$), hard rock ($\beta = .21$; $p < .001$), extreme metal ($\beta = .19$; $p < .001$), punk ($\beta = .11$; $p = .01$), and metalcore ($\beta = .10$; $p = .04$). For musicians not playing rock or metal, distortion was rather irrelevant ($\beta = -.37$; $p < .001$). Compared to

genre, the differences between the expertise groups were small. Distortion became less important with growing expertise ($r_s = -.14$; $p < .01$).

The professional guitar players also commented on the relevance of distortion. Four of them did not see the need to make compromises between clean and distorted sounds. Huldt regarded the problem as solved with a two-channel amplifier. Deml played a custom-made amplifier to avoid this common dilemma. The blues and classic rock players had a more affordable solution as they created their distorted sound with overdrive pedals. Hill explained:

I prefer gear (amps) that provide a very good clean guitar tone... I use only tube amps for their warmth. I don't generally like solid state amps for guitar... I can always add overdrive and distortion with my pedals, so I don't have to compromise. On most of my gigs, I have to have a good clean sound, but my lead sound is easily added with pedals.

This approach also granted access to different sounds, as Hill further elucidated, "I also like to blend two distortions together to create a hybrid sound. I might have one pedal, like my Zen Drive set for a chunky rock rhythm sound, then I add my Xoctic Audio RC2 for a more singing lead sound for a solo. This can create a smoother set up between the rhythm and the lead". Blues and rock guitarists like Blug described a slightly different approach, "Since I set my main sound so that it distorts with the volume control of the guitar up, and that it is clean with less volume, the compromise depends on the gain level. If I need more gain, I use an extra distortion pedal to get the desired distortion irrespective of the amplifier. A real clean sound is of minor importance." The basic sound Blug described is a medium distorted one that can be 'cleaned up' with the guitar's volume control. This strategy was shared by others, especially by players of 'softer' genres. Conti and Perlepes even speculated on the electric guitar not having a clean sound at all. Perlepes reasoned, "for me there is no sacrifice because there is no "clean" sound. All the vintage amps that I'm using have a certain clip no matter what. On the other hand, some players think that the 'clean' sound is like plugging the guitar straight into a mixing board. That sound doesn't exist for me." Concurring with Perlepes, most metal players cared little about clean sounds. Smolski declared, "Since 90% of my songs are built on the distorted guitar sound, it is far more important when choosing equipment. Moreover, a good distorted sound is much harder to find than a clean sound. Therefore, I do not make any sacrifices when it comes to distortion." The statements further show that the players used tube amplifiers even if this dilemma could be solved with modern modelling, simulation, or profiling technology. Only Amott did not use

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traditional tube technology:

Within seconds of trying an amp or a guitar I know if it will work for me. How it responds to muting and chugging is an important factor, that the bass frequencies don't get too muddy and that it still has bite even if your(sic) playing with a lot of distortion on a down-tuned guitar. I play a digital amp now, a Kemper Profiler. It is great for portability and practicality, but I really do prefer the real thing, 100w tube amp heads of the brands ENGL, Marshall and EVH.

Amott's statement demonstrated that comparing the profiling device to 'real' tube amplifiers was still common, and digital technology was not chosen for its sound but its practicability.

Playing with Distortion

Distortion changes the physical properties of the guitar sound, which potentially affects the playing. The scale 'evaluation of playing techniques' measured if distortion made playing more difficult (1) or easier (5). The mean value of 3.82 ($SD = 0.49$) showed that distortion was overall perceived as simplifying. Especially feedback ($M = 4.61$; $SD = 0.76$), artificial harmonics ($M = 4.33$; $SD = 0.88$), and legato techniques ($M = 4.13$; $SD = 0.89$) profited from distortion. Single items further indicated that distortion helped to mask sloppiness ($M = 3.47$; $SD = 1.20$), yet, it did not suffice for facilitating faster playing ($M = 2.57$; $SD = 1.19$). Regarding playing difficulties, the scale's mean value of 3.10 ($SD = 0.83$) showed some challenges. Preventing noise with the fretting hand ($M = 3.32$; $SD = 1.18$) and the picking hand ($M = 3.14$; $SD = 1.20$) were considered the greatest difficulties.

The regression analysis did not reveal significant differences between the genres for both scales. The expertise groups did not differ in their evaluation of playing techniques but did so regarding playing difficulties. Amateurs tended to have problems playing with distorted sounds. These difficulties decreased with greater expertise ($r_s = -.16$; $p = .001$).

The interviewed professionals were clearly divided over the effects of distortion. According to Byrd, the player's skills were decisive: "The better one's technique, the less difference it makes. Good technique adjusts itself for equipment differences. If your playing is not articulate and fluid, you may fool some with a lot of gain, but you won't fool a player." Blues guitarists tended to be affected by distortion less. Conti stated that distortion neither significantly affected expressiveness nor caused difficulty. He warned, however, that too much distortion would hamper individual sound characteristics of guitar models. Deml highlighted reduced dynamic range while Huldts and Hill saw reduced sound clarity as a negative effect of distortion.

That is why even metal guitarists like Amott referred to the necessity of setting the gain level with care: “I think I play with less distortion than a lot of other metal players, at least on my lead sound. I have this obsession with playing clean and I don’t like the notes to get too muddy or blend together. Also, when you have an overly distorted tone, little nuances in your playing get lost.” Yet, other metal guitarists such as Smolski emphasized distortion’s potential to increase the guitar’s presence in a band arrangement: “Little distortion makes the sound fuller and the playing more articulate, clean and present. Too much distortion compresses the sound and increases the middle range, makes the sound more aggressive and often supports the playing.”

With regards to previous deliberations, the professionals gave advice on playing with a distorted sound. Byrd and Huldt suggested practicing with little or no distortion to avoid hiding behind its masking effect. Others emphasized the challenge to control noise and highlighted the importance of finding a sound that supports one’s expression. To acquire these playing skills, Bug recommended old tube amplifiers without preamplifier gain to work on phrasing and noise control. Deml and Hilden supported this advice, arguing against preamplifier distortion and modelling technology because of its limited dynamics and indirect connection between picking and resulting tone. Distortion produced with a tube power amplifier, in contrast, helped to retain dynamics and create an individual sound that was shaped by the fingers. Amott suggested experimenting with different sounds to find an individual tone:

Learn to control it and use it to its full extent. The distortion is almost an instrument in itself, I feel. There are many beautiful tones and effects you can get from it, as all the little details of your playing, like pick scrapes and overtones come through stronger than if you were to play with a clean sound. Also of course, the sustain of the notes will be longer.

These benefits were closely related to the challenges of sound control, as Amott further explained:

I’ve always felt it to be important to be able to control the string noise that can come with playing with distortion. Thus, in my opinion technique is not just how many notes you can squeeze into a solo, but also the ability to execute correct bends and to be able play clean. It is extremely beneficial to work on these things; it will make your playing stand out more and make it come alive.

Smolski shared this view, further stressing the importance to test guitar sounds in a band context.

Equipment

The participants of the quantitative study provided information on their preferred equipment, which allows insights into genre aesthetics and attitudes. For example, the associations and tonal characteristics of certain guitar models and shapes correlate with time of their emergence – the music being played on the respective instrument at the time – and they further are important for retro trends and styles. Semi-hollow body guitars already emerged in the 1930s. The first solid-body guitars being widely sold were Fender's single-coil-equipped Telecaster (1950) and Stratocaster (1954), and Gibson's Les Paul (1952), Flying V (1958), and Explorer (1958), all fitted with humbucker pickups. 'Superstrats', having Stratocaster shapes with humbucker pickups instead of single coils, were on the rise in the 1970s and became very popular in the '80s (Burrluck, and Seabury 1996), especially due to their suitability for distorted rock riffs and high gain solos as a consequence of noise reduction and high-level output (Herbst 2020). Since the 1980s, more extravagant shapes have been introduced by manufacturers including BC Rich. To this day, these shapes are associated with times, genres, and sound aesthetics, partly due to famous guitarists such as Les Paul player Jimmy Page and Stratocaster player Jimi Hendrix (Kitts, and Tolinski 2002; Herbst 2020).³

There were no significant differences in gear choice between the expertise groups; therefore, only general descriptive statistics and genre differences are reported. The sample population possessed an average of four ($M = 4.25$; $SD = 1.92$) electric guitars. The most popular shape was the Les Paul (28%), followed by the Stratocaster with humbucker pickups ('Superstrat', 20%). Further 14% preferred unspecified shapes with humbuckers. Less popular were more traditional guitar shapes with single coils (Stratocaster with single coils 10%, Telecaster 7%) and least semi-hollow body models (5%), the Flying V and Explorer (both 1.5%). 14% of the participants could not decide.

Guitar choice was hugely different between the genres (Table 3). Participants who did not play rock and metal diverged greatly from the others. They chose their guitar for their suitability for individual songs, hardly played extravagant shapes, and played less 'Superstrats' than players of other genres. Instead, they significantly preferred the traditional single-coil-equipped Stratocaster and Telecaster. Although the preference for the Les Paul was small compared to rock and metal genres, it still was the preferred guitar shape. Blues players had a similar profile, also resembling that of classic rock guitarists. Hard rock players were similarly tradition-conscious and favored the Les Paul more than players in any other genre. Despite this tradition-consciousness, they were not fond of the Stratocaster

with single coils.

The genres alternative rock, punk, and grunge all had uncharacteristic profiles and hence differed little from each other. The ‘Superstrat’ was the

Table 3. Preferred guitar shapes (only significant genres)

	No rock/ metal styles	Blues	Hard rock	Heavy metal	Extreme metal	Metal core	Other rock/ metal styles
Chi-square	$\chi^2=48.14^{***}$ V=.34	$\chi^2=33.43^{***}$ V=.29	$\chi^2=28.10^{***}$ V=.26	$\chi^2=42.68^{***}$ V=.32	$\chi^2=34.81^{***}$ V=.29	$\chi^2=23.19^{**}$ V=.24	$\chi^2=21.07^{**}$ V=.23
Stratocaster with SC	16% (6%)	14% (5%)	5% (15%)	3% (13%)	2% (12%)	0% (11%)	7% (11%)
Stratocaster with HB (‘Superstrat’)	16% (25%)	15% (30%)	26% (17%)	36% (15%)	47% (17%)	46% (18%)	29% (19%)
Telecaster	9% (6%)	8% (7%)	4% (11%)	3% (9%)	2% (8%)	5% (8%)	4% (9%)
Les Paul	19% (32%)	27% (24%)	30% (22%)	26% (26%)	18% (28%)	12% (28%)	19% (29%)
Semi-hollow body	9% (3%)	7% (3%)	4% (7%)	2% (7%)	2% (6%)	7% (5%)	2% (7%)
Flying V / Explorer	0% (4%)	2% (3%)	4% (1%)	6% (1%)	5% (2%)	2% (3%)	2% (3%)
Another shape with HB	11% (16%)	10% (20%)	13% (15%)	15% (14%)	14% (14%)	17% (14%)	18% (13%)
Depending on song	20% (8%)	17% (8%)	14% (13%)	10% (15%)	11% (14%)	10% (14%)	21% (11%)

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$; $df = 7$; $N = 406$; the values in brackets indicate the values of all other genres

primary guitar shape in metal genres, with a dominance in the hardest-subgenres, extreme metal and metalcore.

The average player owned 2.7 ($SD = 1.52$) amplifiers. 72% preferred the traditional tube design, 13% newer modelling technology, 5% hybrid, and 3% transistor amplifiers.⁴ A further 6% could not decide, and 2% did not know the technology of their amplifier. Different genre preferences only existed at a probability level of .1; hard rock players favored tube amplifiers the most, whereas metalcore and nu metal guitarists were open towards modelling technology above average.

Concerning amplifier construction, 53% preferred the stack (separate head and cabinet), 40% combos, and 7% racks. Genres differed considerably in their preference for certain construction types (Table 4).

Table 4. Preferred amplifier construction types (only significant genres)

	Chi-square	Stack	Combo	Rack
No rock/metal styles	$\chi^2 = 24.17^{***}$, $V = .25$	41% (64%)	51% (28%)	8% (8%)
Blues	$\chi^2 = 11.07^{**}$, $V = .17$	52% (57%)	43% (31%)	5% (12%)
Hard rock	$\chi^2 = 20.03^{***}$, $V = .25$	66% (42%)	29% (48%)	5% (11%)
Heavy metal	$\chi^2 = 34.56^{***}$, $V = .30$	76% (45%)	17% (47%)	7% (8%)
Extreme metal	$\chi^2 = 25.76^{***}$, $V = .26$	75% (50%)	9% (43%)	16% (7%)
Metalcore	$\chi^2 = 19.90^{***}$, $V = .22$	70% (52%)	10% (42%)	20% (6%)
Nu metal	$\chi^2 = 8.42^*$, $V = .15$	73% (52%)	16% (41%)	11% (8%)
Other rock/metal styles	$\chi^2 = 27.02^{***}$, $V = .26$	67% (50%)	18% (45%)	15% (5%)

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$; $df = 2$; $N = 397$

The amplifier stack was the standard in hard rock and most metal genres. Combos were more common in less distorted styles even though the stack was still used more widely. Only among the ‘no rock/metal’ players was the combo the favorite choice. Racks were the exception, yet they were significantly more common in ‘harder’ metal styles.

The preferences for amplifier output were balanced. Favored by 33% were the least powerful devices with up to 30 watts, followed by the models with 50 to 99 watts (28%). The most powerful amplifiers with 100 and more watts were used by a quarter (25%). Least popular were devices with 31 to 49 watts (15%). Regarding the genres players of metal styles preferred more powerful amplifiers than guitarists of other genres (Table 5). In contrast, the devices with low output were most popular in ‘no rock/metal styles’ and blues.

Table 5. Preferred amplifier power (only significant genres)

	Chi-square	up to 30 W	31 – 49 W	50 – 99 W	100+ W
No rock/metal styles	$\chi^2 = 12.79^{**}$, $V = .18$	41% (27%)	13% (17%)	28% (26%)	18% (30%)
Blues	$\chi^2 = 26.33^{***}$, $V = .26$	39% (24%)	19% (10%)	25% (29%)	17% (36%)
Heavy metal	$\chi^2 = 23.57^{***}$, $V = .24$	23% (37%)	8% (19%)	32% (25%)	38% (19%)
Extreme metal	$\chi^2 = 27.22^{***}$, $V = .26$	18% (36%)	7% (17%)	23% (27%)	52% (20%)
Metalcore	$\chi^2 = 25.99^{***}$, $V = .26$	15% (35%)	0% (17%)	31% (26%)	54% (22%)
Nu metal	$\chi^2 = 9.83^*$, $V = .16$	19% (34%)	8% (16%)	28% (27%)	44% (23%)
Other rock/metal styles	$\chi^2 = 16.34^{***}$, $V = .20$	23% (36%)	9% (18%)	31% (25%)	37% (21%)

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$; $df = 3$; $N = 397$

The determining factor for choosing amplifiers was their convincing sound quality (72%). Great flexibility (33%) and pragmatic reasons such as easy handling or good transportability (32%) were less important. Only 17% saw the price as decisive. Sound quality was significantly more important for players of all rock genres, including punk and grunge, with values between 82 and 94 percent. Flexibility was significantly more relevant for hard rock and classic rock guitarists. Handling and transportability were important only in ‘no rock/metal styles’, which might be due to the higher average age of this group.

Approximately half of the players regularly added distortion pedals (53%) to their sound, one-quarter sometimes (25%), and a fifth did not use them at all (22%). Clear genre differences existed. Whereas players of ‘no rock/metal styles’ and blues usually played with pedals, metal guitarists refrained from using them the most. In general, 47% intended to create additional timbres, 33% wished for more distortion, and a further 33% boosted the power amplifier for the specific distortion aesthetic this technique creates. More definition and transparency were of minor relevance (22%). The open answers indicated that most players used pedals either as a solo boost or to create different kinds of distortion. The reasons for using pedals varied considerably between the genres (Table 6). Additional timbres were the primary reason for players of ‘no rock/metal styles’, blues, and all rock genres, followed by greater distortion levels and power amplifier distortion. In contrast, the main purpose of distortion pedals for extreme metal and metalcore guitarists was to increase definition and transparency, a purpose not equally shared by heavy metal players.

Table 6. Reasons for using distortion pedals

	More distortion	Definition and transparency	Additional timbre	Power amplifier distortion
No rock/metal styles	37%* (28%)	21% (24%)	56%** (42%)	37%* (26%)
Blues	38%** (24%)	22% (23%)	54%** (41%)	36%** (23%)
Classic rock	37%* (27%)	23% (23%)	54%** (41%)	33% (27%)
Hard rock	37%* (28%)	27% (19%)	54%** (42%)	34%* (27%)
Alternative rock	38%* (28%)	27% (21%)	60%*** (41%)	36%* (27%)
Punk	36% (31%)	31% (21%)	50% (48%)	32% (30%)
Grunge	54%*** (29%)	29% (22%)	60%* (47%)	42%* (29%)
Heavy metal	28% (33%)	28% (21%)	44% (50%)	27% (32%)
Extreme metal	30% (32%)	45%*** (19%)	42% (49%)	23% (32%)

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Metalcore	20%* (33%)	49%*** (20%)	37% (49%)	22% (31%)
Nu metal	26% (32%)	26% (22%)	47% (48%)	21% (31%)
Other rock/metal styles	31% (32%)	35%*** (19%)	54% (46%)	33% (30%)

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$; $df = 1$; $N = 418$

Discussion

Importance of Guitar Sound

In both the qualitative and quantitative parts of the study, the participants emphasized the huge importance of a high-quality guitar sound. Besides general agreement to the respective scale, the collected data on equipment allows drawing further conclusions. The findings show that the participants owned four guitars on average; 20% had five and more, 15% more than ten. In addition, they possessed approximately three amplifiers. The sound quality, main reason for choosing amplifiers, raises the question as to why guitarists need more than one device. Since flexibility was less important, players are likely to use specialized amplifiers for achieving sounds that fit with genre aesthetics. This assumption is supported by the result of most genres having specific conventions regarding guitar shapes, pedals, and amplification.

The scales on adjusting the sound to the requirements of the music and on experimentation found less agreement. Whether this attitude can be ascribed to willingness or the instruments' tonal diversity cannot be answered with certainty. It might be that players do not care about access to a larger number of sounds as long as a few tones suit their personal style and favored genre aesthetics. Players tried to optimize their sound with different strategies. While beginners experimented with various guitar shapes and pedals, more experienced players extended experimentation to carefully selecting amplifiers, cabinets, and loudspeakers. Hence the focus shifted from instrument to amplification. Beginners might develop a preference for a distinct sound and feel of an instrument through direct contact, possibly not realizing or minding the nuances of the amplification chain as much as more experienced players do. Overall, the wish for an individual as well as innovative sound increased with more expertise. Whether this wish for an individual sound stays within genre conventions or extends its boundaries remains unclear.

The analysis revealed that expertise correlated with the intention of having an individual sound. The players acquired an awareness of sonic

details and learned to utilize these for developing their own style. In the interviews, the professional guitarists confirmed this. All of them created unique sounds by combining amplifiers and pedals or by using custom-made equipment. The findings confirm the close connection between sound choice and individual playing style, which is claimed in literature (Walser 1993; Gracyk 1996; Théberge 1997; Waksman 1999, 2003b). However, the results of both parts of the study were not congruent regarding a flexible guitar sound. The professionals chose their sounds more carefully, which accords with interview statements common in guitar magazines (Herbst 2016, 68-106; Herbst 2020). Professional musicians seem to value a flexible sound or merely have better means of shaping it. For example, HIM guitarist Viljami Lindström in a *Guitar* magazine interview described his practice of sending the signal to two amplifiers to blend a defined sound with clear attack of the pure amplifier with a thicker yet less defined sound, created by the fuzz pedal enriched amplifier (Becker 2010). Even blues musicians like Stevie Ray Vaughan are known for having played at least four amplifiers on stage in the 1980s (Frank 2008), and contemporary blues players such as Joe Bonamassa rely on a combination of various amplifier models by different manufacturers (Roser 2009).

Tradition-Consciousness

Grossberg (1992), Gracyk (1996), and Moore (2001) have claimed that rock music and its culture are tradition-conscious. If that were true, not only the compositions and performances but also the musicians' preferences and attitudes towards equipment would have to match this hypothesis. Journalistic literature such as a column by Hunter (2014a, 2014b, 2014c) on vintage guitars, pickups, and pedals, as well as magazines like *Vintage Guitar*, contribute evidence to this claim. Such specialist vintage magazines and more general ones like *Guitar* and *Guitar Player* pass on historical guitar knowledge to beginners, potentially influencing the choice of equipment and sound aesthetics of future generations.

A general tendency towards traditional equipment was confirmed, yet more so for blues, rock, and heavy metal than for newer metal genres. Les Paul and Stratocaster were generally the most popular shapes except for the various extreme metal styles; in addition, most amplifiers still had a traditional tube design. Newer technology such as transistor, hybrid, or simulation was the exception. This rejection of newer technology likely stems more from biased attitudes than from the actual sound quality, which accords with recent research (Herbst 2019; Herbst, Czedik-Eysenberg, and Reuter 2019) confirming the high quality of modern guitar amplification technology. The increasing popularity of low-output amplifiers (see also

Herbst 2016, 99-106; Herbst 2020) further indicates that tube distortion remains the aesthetic ideal. Among the genres, clear differences existed in sound aesthetics and reasons for choosing gear. This finding is insightful because it indicates that specific genre sounds do not solely stem from structural and performative differences plus production conventions, but also from specific guitar gear to some extent. Vice versa, specific equipment supports guitarists in playing different structures and genre-specific playing techniques (Herbst 2017a, 2017b, 2019a, 2019c).

Heavy metal guitarists were most fond of 'Superstrats,' loud amplifiers, and stacks, still seeming to prefer gear that early 1970s hard rock and heavy metal bands used (Brunning 2002; Cope 2010). In contrast, players of nu metal, extreme metal, and metalcore highly favored equipment capable of producing powerful sounds by down-tuned or seven-string guitars combined with high-output amplifiers (Herbst 2017a). Today's hard rock players appear to prefer traditional sounds, especially those by the Les Paul in the tradition of early Eric Clapton and Jimmy Page (Brunning 2002; Tolinski 2012). Classic rock players tend to stick to Les Pauls and Stratocasters with single coils, which were common in the 1960s. The deliberate use of pedals demonstrates the traditionalism of several genres too. Players of rock, blues, and 'no rock/metal' preferred additional timbres and overdrive pedals to boost tube amplifier distortion very much in the spirit of the 1960s and '70s. Similarly, the blues and rock guitarists preferred amplifiers up to 30 watts. These choices all contribute evidence to the popularity of the traditional tube distortion aesthetic (Herbst 2016, 2020).

The results overall confirm the tradition-consciousness described in rock music literature (Grossberg 1992; Gracyk 1996; Moore 2001). Most players hold on to genre conventions; norms are mostly disregarded by modern metal guitarists playing nu metal, metalcore, and extreme metal only. With its greater emphasis on tradition in rock than in modern metal, the guitar seems to be on a fine line between traditionalism and innovation (Herbst 2016, 2020).

Relevance of Distortion

Based on research in popular music studies (Hicks 1990; Baugh 1993; Walser 1993; Gracyk 1996; Berger and Fales 2005; Cope 2010), acoustic analyses (Herbst 2016, 2017a, 2017b, 2017c, 2018, 2019a, 2019b, 2019c; Herbst, Czedik-Eysenberg, and Reuter 2018), biographies of rock guitar players (Bockris 1993; Clapton 2007; Iommi 2012; Townshend 2012; Hasted 2013; Power 2014), and other journalistic literature (Palmer 1995; Guppy 2015; Mead 2015), the distorted sound aesthetic was expected to be highly important for rock and metal players. The quantitative results,

however, did not fully confirm this assumption. While there were items showing that for most players distortion was a relevant criterion when choosing an amplifier, many hesitated to agree that distortion was the only important tone. Genre affinity was the decisive distinguishing factor in this regard. As would be expected, distorted sounds were particularly valued by metal and hard rock players, and least relevant in blues and styles other than rock and metal. For various reasons, most players did not like to limit their instrument to the distorted sound. For some, the expressive potential was hampered (Herbst 2017b, 2019c) and for others, distortion led to an undesired sound aesthetic (Berger and Fales 2005; Herbst 2017a). Too much distortion could increase dissonance (Herbst 2017c, 2018, 2019b) or diminish a transparent band sound (Mynett 2017), as was highlighted in the open comments.

The interviews showed that professional musicians avoid making compromises if possible. They stated that they use custom-made equipment or combine several effects pedals to achieve different distorted timbres and a unique sound, closely linked with their musical expressiveness. This accords with studies on the acoustic effects of distortion (Herbst 2017b, 2019c). The quality of their distorted sound was most relevant for hard rock and metal players, and only they emphasized a positive connection between playing and expressiveness. Blues guitarists, in contrast, considered excessive distortion to hamper expressive playing. Despite research indicating otherwise (Herbst 2019; Herbst, Czedik-Eysenberg, and Reuter 2019), all interviewees agreed that tube amplifiers were the only adequate technology for distorted sounds. Even in the rare case that profiling technology was used for pragmatic reasons, the sound was meant to simulate tube amplifiers, which accords with analyses of online message boards (Herbst, Czedik-Eysenberg, and Reuter 2019). Overall, most of the professional players made huge efforts to create distorted sounds that supported their playing and artistic vision best.

Playing with Distortion

Previous studies have argued that distortion increases the guitars' potential for virtuoso solo playing in rock and metal (Walser 1993; Waksman 2003b). The present results support Herbst's (2017b, 2019c) acoustic studies from a musician's perspective. Most of the participants agreed that distortion facilitates playing. Masking of sloppiness was rated the main simplifying factor, which improved the playing feel rather than allowing faster playing. Issues concerning playing technique were considered less important; rather the use of distortion appeared to be motivated by its expressive potential (Herbst 2019c). Advanced players likely have learned

to cope with distortion's negative effects; they use its benefits (sustain, legato sound, rough timbre, easier artificial harmonics, and feedback) and seem to be less challenged by noise control, limited phrasing, and tonal assimilation (Herbst 2017b, 2019c). That may be why many experts did not remember what difficulties beginners face with this sound. Unexpectedly, both scales on playing with distortion did not differ between the genres; two other outcomes had been expected. Firstly, metal guitarists might have emphasized the challenges of playing with a much-distorted sound because handling distortion is regarded one of the major difficulties in literature (Govan 2003; Herbst 2017b). Secondly, they might have rated distortion as simplifying since it is fundamental to metal guitar playing, e.g. excessive palm muting, artificial harmonics, and fast picking (Herbst 2017b). Overall, expertise seems to be more important than genre affinity.

In contrast to the mainly homogenous ratings of the quantitative study, the interviewed professionals were divided over distortion's effect on playing. Some experts saw its impact decreasing with advanced playing technique, which is in line with the quantitative results. Especially for players of less distorted styles like blues, distortion level was determined more by expressive intentions than technical considerations because too much distortion may decrease dynamic range and tonal control (Herbst 2019c). The metal guitarists, aware of this, advised using as little distortion as possible to obtain the playing benefits and characteristic sounds expected in metal genres while retaining some dynamic range. Overall, rock and metal guitarists stressed the simplified playing feel with distortion and explained it in greater detail than players of 'softer' genres did.

The quantitative and qualitative results are consistent but do not completely coincide with the literature. Despite the simplifying effect, no general agreement was found for distortion to facilitate faster playing, which contradicts research on the 'shred guitar' (Walser 1993; Waksman 2003b; Herbst 2017b). This discrepancy could have been caused by the considerable playing experience most participants of this study had. Many open comments indicated that players cared about a proper playing technique. Even though challenges of playing with distortion found little agreement, the quantitative results and some open comments confirmed difficulties such as noise control and altered expressiveness due to decreased dynamic range (Govan 2003; Herbst 2017b).

Limitations

The findings are subject to certain limitations. The quantitative sample was gathered on online forums for guitar players. Since members of such communities are expected to have an interest in their instrument above

average, this sample may not be representative of all guitar players. Besides, only German-speaking musicians were captured; therefore results may differ in other countries. Even though underrepresented in most rock and metal genres (Bourdage 2010), the number of female guitarists (9 out of 413) was disproportionately low, which unfortunately made it impossible to investigate gender differences. Each participant selected four genres on average, which posed the methodological problem that genres had to be compared artificially, explaining the relatively small effect sizes. In addition, the genres' varying sample sizes must be considered.

Conclusion

Musical instruments are inextricably linked with music genres, their players' attitudes, and practices. The choice and use of equipment affects the sound of genres and influences the performer's expressiveness. This applies to the electric guitar with its characteristic distorted sound and its central importance for rock and metal genres in particular. So far, little research has concentrated on 'regular' rock guitarists, and theoretical work still overweighs empirical study. This article took a first step towards filling these gaps. It supports the works of Hicks (1990), Walser (1993), Gracyk (1996), Waksman (1999, 2003b), and Berger and Fales (2005), and it contributes to the slowly growing body of empirical work in popular music studies. The results confirm that guitarists acknowledge the relevance of instrument choice and sound, and demonstrate reflective practices of using gear. Equipment choices and attitudes differed between genres but matched, as expected, genre conventions almost perfectly, which gives rise to various issues for future research. It remains open as to why the participants strictly followed genre conventions. The findings suggest that the players strongly orientate themselves towards renowned role models, at least in blues, rock genres, and heavy metal; players of all genres orientate themselves with a long tradition. Whether or not this also applies to more modern metal styles is not clear. Not all modern metal styles have a fixed set of established conventions as early rock music does, shaped by a smaller number of celebrity players. It also remains unclear whether role models are equally relevant in all genres, and how genres and subgenres are developing. Are famous bands and musicians setting trends in top-down processes or do innovations emerge independently in small regional scenes as well? Although the findings cannot answer these questions, innovative sounds are likely connected more closely with professional players, indicating innovation resulting from top-down processes. This suggests that most amateur players reproduce genre traditions instead of exploring new sounds.

Since this work has been concerned with the German-speaking scene, future work may compare musicians in other countries and cultures. Although a similar outcome can be assumed in other Western countries, music scenes in other parts of the world may be different. Another question not quite answered is how equipment choice and use are influenced by pragmatic decisions. Yet, the results allow us to conclude that rock players refrain from comfortable and flexible modern equipment whereas metal guitarists are inclined to use new technology. Detailed interviews with guitarists at different stages of their amateur or professional career would be valuable for gaining knowledge about this underrepresented group. Comparing guitar players with other instrumentalists would also reveal how instruments shape genre sounds and compositions. Finally, future research may consider the interrelation of instruments, amplifier and effects settings, recording techniques, production conventions, and intended genre aesthetics. Such work could provide deeper understanding of further factors shaping the specific sounds of rock and metal music genres.

Notes

1. www.musiker-board.de/forum/e-gitarren-forum.75, www.gitarren-forum.de/forum.php, www.gitarrenboard.de, www.gitarre-spielen-lernen.de/forum, www.guitarworld.de/forum/index.html
2. Besides genres, expertise level, and experience on the guitar, experience in bands, age and formal education were gathered. Since the relevance of this data was not significantly relevant except for understanding the sample, it was not considered in the results section.
3. The survey asked for common shapes instead of models to avoid exclusion merely due to brands. For example, Les Paul is strongly associated with manufacturer Gibson, and Stratocaster and Telecaster are associated with Fender. Consequently, Les Paul copies by manufacturer ESP, for example, would be included under the “Les Paul” label.
4. For an overview of guitar amplification technology see Herbst, Czedik-Eysenberg, and Reuter (2019).
5. In the online version of the survey, the labels on the anchors were marked as ‘complete disagreement’ (1) and ‘complete agreement’ (5) instead of individual symbols for the five intervals.

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Appendix

Appendix 1: Quantitative online survey

The data used in this article is based on a more extensive survey published in Herbst (2016). The following survey contains all item batteries relevant for the data analyzed in this article. The original language of the survey is German.

1. Let's start with your favorite equipment for distorted guitar playing. What guitar shape do you prefer for distorted sounds?	
<input type="checkbox"/>	Stratocaster with single coils
<input type="checkbox"/>	Stratocaster with humbucker (incl. Superstrats like Ibanez, ESP)
<input type="checkbox"/>	Telecaster
<input type="checkbox"/>	Les Paul
<input type="checkbox"/>	Flying V / Explorer
<input type="checkbox"/>	Semi-hollow guitar
<input type="checkbox"/>	Other guitar with humbucker
<input type="checkbox"/>	Depends on the song / cannot decide
2. How many electric guitars do you own?	
(selection box)	
3. What amplification technology do you prefer for distorted sounds?	
<input type="checkbox"/>	Tube
<input type="checkbox"/>	Hybrid (combination of tube and transistor)
<input type="checkbox"/>	Transistor
<input type="checkbox"/>	Modelling / simulation
<input type="checkbox"/>	Depends on the song / cannot decide
<input type="checkbox"/>	I do not know
4. What design does this amplifier have?	
<input type="checkbox"/>	Head and separate combo (stack)
<input type="checkbox"/>	Combo
<input type="checkbox"/>	Rack
5. How much power does the amplifier have?	
<input type="checkbox"/>	Up to 30 watts
<input type="checkbox"/>	31 to 49 watts

<input type="checkbox"/>	50 to 99 watts
<input type="checkbox"/>	100 or more watts

6. Why do you prefer this amplifier? (multiple choice)	
<input type="checkbox"/>	Convincing sound quality
<input type="checkbox"/>	Great flexibility
<input type="checkbox"/>	Easy to use and to transport
<input type="checkbox"/>	Cheap acquisition
<input type="checkbox"/>	Other reason: (open comments field)

7. How many electric guitar amplifiers do you own?	
(selection box)	

8. Do you also use overdrive, distortion, or fuzz pedals?	
<input type="checkbox"/>	Yes
<input type="checkbox"/>	No
<input type="checkbox"/>	Sometimes

9. What do you use these pedals for? (multiple choice)	
<input type="checkbox"/>	More distortion
<input type="checkbox"/>	More definition and intelligibility
<input type="checkbox"/>	Additional tones
<input type="checkbox"/>	Other reason: (open comments field)

10. In the next section we will focus on your personal attitudes on your individual guitar sound. Please rate.					
	-- ⁵	-	o	+	++
My guitar sound is important to me					
I have a clear notion of a good guitar sound					
It is important to me that I can set my guitar sound exactly as I want to					
I like to test instruments, amplifiers, and effects pedals in music stores					
I inform myself about guitar equipment on message boards or by guitar magazines					
I have invested into equipment this year already					
I am willing to pay for quality					

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I can match a guitar sound to a style (musician, music genre)					
The distorted sound is particularly important when I choose or buy gear					
I am willing to compromise the clean sound for a good distorted sound					
11. This section concerns your attitude towards experimentation.					
Having an individual sound is important to me	--	-	o	+	++
I experiment with different amplifiers					
I experiment with different cabinets and speakers					
I experiment with different pedals					
I experiment with different pickups					
I aim for an innovative sound					
12. The next section is about your sound ideals.					
	--	-	o	+	++
I orientate myself towards role models					
I orientate myself to sound ideals of the 1960s and '70s					
I prefer traditional electric guitars (Stratocaster, Telecaster, Les Paul)					
Tube amplifier sound is important to me					
I prefer power amplifier distortion					
I principally only play tube amplifiers					
I can distinguish a tube amplifier from a transistor or modeling amplifier by its sound					
13. This section is about adjusting guitar sounds to repertoire.					
	--	-	o	+	++
I consider how my sound will affect my playing					
The choice and amount of distortion are influencing my playing					

I adjust my sound to the characteristics of a song / each song					
If necessary, I use multiple sounds in a song					
I use the option to switch between different distortion sounds by foot (i.e. several amplifier channels or overdrive pedals)					
I use the guitar's volume knob in my playing to control distortion					

14. Please rate whether the following playing techniques are more difficult or easier with distortion.					
	More difficult				Easier
Clean fretting without noise					
Fast alternate picking					
Sweeping					
Legato (hammer-on, pull-off, Slide, tapping)					
String bending					
Artificial overtones / harmonics					
Feedback					
Palm muting					
Overall, playing with distortion is...					

15. Next, we will concentrate on the positive features of distortion. With distortion I...					
	--	-	o	+	++
can play faster					
can mask sloppy playing					
feel more comfortable					
can express myself better					
Further effect 1:	(open comments field)				
Further effect 2:	(open comments field)				

16. Now we focus on aspects that are more challenging when playing with distortion. Distortion makes it difficult to...					
	--	-	o	+	++
control noise with the fretting hand					

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control noise with the picking hand					
control feedback					
play dynamically and to play musical accents					
avoid overlapping or smearing notes					
Further effect 1:	(open comments field)				
Further effect 2:	(open comments field)				
Do you have an explanation as to why distortion makes playing guitar easier or more difficult?	(open comments field)				

17. How do you regard the electric guitar compared to the acoustic guitar?					
	--	-	o	+	++
The electric guitar is a different instrument than an acoustic guitar					
The electric guitar inspires me to play or compose different music					
When I change my electric guitar sound, my playing varies					
When I play loud and distorted, my body movements change (i.e. stamping, head banging, jumping)					
Without distortion I would not play guitar at all					
Playing with distortion is more fun					

18. This final section captures personal information. What is your gender?	
<input type="checkbox"/>	Female
<input type="checkbox"/>	Male
<input type="checkbox"/>	Other / prefer not to answer

19. How old are you?	
(selection box)	

20. What styles do you predominantly play on the guitar? (Multiple choice)	
<input type="checkbox"/>	Blues
<input type="checkbox"/>	Classic rock
<input type="checkbox"/>	Hard rock
<input type="checkbox"/>	Alternative rock
<input type="checkbox"/>	Punk

<input type="checkbox"/>	Grunge
<input type="checkbox"/>	Heavy metal
<input type="checkbox"/>	Extreme metal (i.e. thrash, black, death)
<input type="checkbox"/>	Metalcore
<input type="checkbox"/>	Nu metal
<input type="checkbox"/>	Other rock / metal styles
<input type="checkbox"/>	No rock / metal styles (i.e. jazz, funk, reggae)

21. How long have you been playing guitar (acoustic and/or electric)?	
<input type="checkbox"/>	Less than 1 year
<input type="checkbox"/>	1 to 3 years
<input type="checkbox"/>	4 to 6 years
<input type="checkbox"/>	7 to 10 years
<input type="checkbox"/>	11 to 15 years
<input type="checkbox"/>	Over 15 years

22. How long have you been playing in bands?	
<input type="checkbox"/>	Less than 1 year
<input type="checkbox"/>	1 to 3 years
<input type="checkbox"/>	4 to 6 years
<input type="checkbox"/>	7 to 10 years
<input type="checkbox"/>	11 to 15 years
<input type="checkbox"/>	Over 15 years

23. What is your highest formal musical education?	
<input type="checkbox"/>	No education / self-taught
<input type="checkbox"/>	Musical society
<input type="checkbox"/>	School of music
<input type="checkbox"/>	Research-focused higher education
<input type="checkbox"/>	Performance-focused higher education
<input type="checkbox"/>	Other: (open comments field)

24. How would you assess your playing abilities?	
<input type="checkbox"/>	Beginner
<input type="checkbox"/>	Intermediate
<input type="checkbox"/>	Semi-professional
<input type="checkbox"/>	Professional

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25. Do you have any further comments relevant to electric guitar playing?

Appendix 2: Interview questions

1. What is the overall relevance of your guitar sound for your playing?
2. When choosing your gear, do you make compromises between clean and distorted sounds? What sacrifices would you make for a good distorted sound?
3. How does the level and tone of your distortion affect your playing (e. g. for expressiveness or playing difficulty)?
4. To what extent do you exert influence in engineering the sound of your guitar in the studio and/or live?
5. What is your advice for beginners and advanced guitarists concerning the use of distortion?
6. Any other important aspects concerning the role of distortion for electric guitar playing?