

[in press, *Evolutionary Behavioral Science*, May 2022]

**Extreme metal guitar skill:
A case of male-male status seeking, mate attraction, or byproduct?**

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Abstract

There has been much debate around the ultimate explanation of cultural displays such as music and art.

There are two main competing hypotheses for the function of music: sexual selection or byproduct of the complexity of the human brain. Although there is evidence that playing music increases male attractiveness, the sexual selection explanation may not be mutually exclusive to all types of music.

Extreme metal is a genre that is heavily male-biased, not only among the individuals that play this style of music, but also among the fans of the genre. Therefore, it is unlikely that extreme metal musicians are primarily trying to increase their mating success through their music. However, musicians in this genre heavily invest their time in building technical skills (e.g., dexterity, coordination, timing), which raises the question of the purpose behind this costly investment. It could be that men engage in this genre mainly for status-seeking purposes: to intimidate other males with their technical skills and speed and thus gain social status. To explore the reasoning behind investment in technical guitar skills, a sample of 44 heterosexual male metal guitarists was recruited and surveyed about their practicing habits (newly created survey for this study), sexual behavior (using the SOI-R), and feelings of competitiveness toward the same sex (via the ICS). The survey results indicated that time spent playing chords predicted desire for casual sex with women whereas perceptions of playing speed positively predicted intrasexual competitiveness (a desire to impress other men). The discussion addresses how these results, and the extreme metal genre, might relate to the three competing hypotheses for the function of cultural displays.

Keywords; extreme metal; guitarists; evolutionary psychology; male-male status-seeking; mate attraction; byproduct

Public Significance Statement: This study explores the idea that heterosexual male metal guitarists are motivated to invest heavily in getting good at guitar to primarily impress other men. The study's results provide some support for this idea. Additionally, metal guitarists also seem to be somewhat motivated by a desire for casual sex.

Extreme metal guitar skill:

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Introduction

Creative displays such as music and art have been debated in terms of what evolutionary function, if any, they serve. Evidence of creative cultural displays dates back to between 300,000 and 500,000 years ago with the use of red ochre (Watts, et al, 2016). Because creative displays have been part of human history for such a long time, and because people invest so much time in them (in some cases dedicating their lives to them in the form of a career), it is reasonable to search for a reason behind such devotion. Different (and sometimes competing) hypotheses have been advanced to explain creative displays. The logic of the most commonly discussed hypotheses is explained in the following sections.

Mate attraction

One hypothesis for creative displays is that they are part of a strategy to enhance attractiveness to the opposite sex and to increase mating success, otherwise known as the display hypothesis or the cultural courtship model (Miller, 1999; 2001). Because of discrepancies in minimum parental investment between the sexes (with women's minimum investment being much higher), women are choosier when seeking a mate (Mogilski, 2021; Trivers, 1972). Therefore, creative displays through media such as art and music should be produced more often by men as a means to attract women. Indeed, men historically have produced more art, literature, and music than women across cultures (Lange & Euler, 2014; Miller, 1999). Furthermore, such creative works are produced by men predominantly during young adulthood, which corresponds to when men engage in the greatest mating effort, especially short-term mating effort (Carr, et al, 1998). Regarding music specifically, there is support for the cultural courtship model, as women rate men as having higher mate value if they can (vs. cannot) play the violin, drums, and saxophone. The effect of playing these instruments had less effect on men's perceptions of women's mate value (Madison, et al, 2018). Of greater importance to the current study, women respond more positively to men's Facebook friend requests if he is holding (vs. not holding) a guitar in his profile picture (Tifferet et al., 2012).

Status-seeking

Despite some support for the cultural courtship model, it has been criticized for a lack of genetic evidence, with nonsignificant female heritability for musical aptitude (Mosing, et al, 2015). Furthermore, in this same study of genetic influences on musical ability, greater musical ability negatively predicted mating success. Such criticisms led to other speculations about the function of creative displays. Another hypothesis for musical displays is the status competition model (Price & Van Vugt, 2014; Winegard, et al, 2018). According to this model, both men and women produce cultural artifacts and displays to impress their (same-sex) peers and/or coalitional members to obtain status and prestige. However, this model still recognizes that men create more cultural displays than women because men are more interested and involved in conflicts between opposing coalitions. Thus, cultural displays operate as a method for men to impress other men (Winegard, et al, 2018). Evidence that men invest in efforts to impress other men has been documented. Because status for men often entails displaying aggressiveness or physical prowess, previous research focused on these types of displays. For instance, men drive a car more aggressively when the passengers are men (vs. women; Jackson & Gray, 1976). Also, men are more interested in sports, more likely to attend sporting events, more interested in objective measures of athletes' performance, and the prestige afforded to professional athletes is based on evaluations from other men (James, 2001; Winegard & Deaner, 2010). Men sometimes use their appearance to intimidate other men rather than to attract women. For example, in a study examining how others perceive men's beards, women rate men's faces as less attractive when they have beards compared to being clean-shaven, and both sexes rate bearded men as having higher status and as being more aggressive compared to when the same men are clean-shaven (Dixson & Vasey, 2012).

Cognitive byproduct

The cultural courtship model does not explain all cultural displays, and the status competition model has not been well tested. Another perspective on cultural displays (including music) suggests that they serve no function and instead are a byproduct of high intelligence in humans or the general ability to adopt culture (Hodgson & Verpooten, 2015; Lieberman & Billingsley, 2021; Pinker, 2021). Steven Pinker

made this famous statement about music: “I suspect that music is auditory cheesecake, an exquisite confection crafted to tickle the sensitive spots of at least six of our mental faculties” (1997, p. 534). The faculties to which he was referring were language, represented in the form of song lyrics, auditory scene analysis involving the detection of the sources of sounds, emotional calls as music can sometimes sound similar to wailing or moaning, habitat selection involving identifying sounds that indicate a safe or unsafe environment, and motor control needed for tasks such as walking and running (Pinker, 1997). Recent research supports the byproduct (or auditory cheesecake) hypothesis, as one study revealed that musician status did not predict preferences for prospective mates. Instead, people who were musicians preferred musicians to non-musicians, suggesting that this is a domain in which people gauge prospective mates for degree of similarity (Bongard, et al, 2019).

The case of extreme metal music

It could be argued that different styles of music serve different purposes. Especially relevant to the current study, it has been speculated that extreme metal music is a cultural display intended to impress other men as it signals rebelliousness, risk-taking, intelligence, and abstract cognitive capacities (Winegard, et al, 2018). This is a reasonable speculation, given the qualities of extreme metal music and the types of fans it attracts. A preference for extreme metal music is negatively correlated with agreeableness (Anderson, et al, 2021), which could support the idea of signaling rebelliousness and/or aggressiveness. There is also a skewed sex ratio in terms of extreme metal fans. Men report stronger preferences for music genres that are “heavy,” such as non-mainstream, hard rock, psychedelic rock, and heavy metal; on the other hand, women prefer softer and mainstream genres like chart pop, folk, and classical (Colley, 2008). In fact, according to Spotify data, “progressive deathcore” was the genre that had the lowest representation of female listeners (Ord, 2020). This skewed ratio is also reflected in demographic analyses of metal concert attendees in Finland (one of the countries in which extreme metal is the most popular), with more male than female attendees. Additionally, women who attend extreme metal concerts perceive themselves as more masculine than the average woman (Kinnunen, et al, 2020). Musicians who produce extreme metal music show an even more skewed sex ratio, such that one of the

best predictors of the number of extreme metal musicians in a given country is the number of males ages 15–24 years in that country (Maguire, 2021).

To provide more detail on what we mean by the term “extreme metal,” the following will provide a brief history of the type of music of interest for the current study. The genre of “heavy metal” is the most commonly recognized type of metal music that is traced back to the 1970s in the United Kingdom, being inspired by both blues and psychedelic rock with arguably the first heavy metal band being Black Sabbath (Weinstein, 2000). However, even at this early time in metal, there came to be, in the 1980s and 1990s, more mainstream types, such as hair metal. For instance, in 1990, one of the top 10 selling albums was Mötley Crüe’s *Dr. Feelgood* (one of the most popular hair metal bands; Aly-Tovar, et al, 2020). From this height of popularity, however, came the development of numerous other subgenres of metal starting from the 1980s through the 2000s, and there are now 26 officially recognized subgenres of heavy metal (see Angeler, 2016 for complete descriptions).

For the current study, we were mainly interested in types of metal that involve the most technical guitar skill: progressive metal, neoclassical metal, thrash metal, death metal, and in some cases black metal (Angeler, 2016). Arguably, music played in these genres and their subgenres requires technical skills in terms of guitar virtuosity. The term extreme metal is a loose term and can include elements of all these mentioned subgenres (Angeler, 2016). Taken together (and applied for the purposes of the current study), it can be speculated that extreme metal is a genre that involves some of the most intense runaway male-male competition and status-seeking, perhaps along with a few others known for advanced technical skill such as progressive jazz and atonal classical music. Based on previous hypotheses about the evolutionary functions (or lack thereof) of music, the argument could be made that different genres of music serve different functions rather than one explanation fitting for all music. For instance, some types of singing and children’s music are more directly related to offspring care (Mehr, et al, 2021). It could be that pop music, slow romantic ballads, or any type of music that is naturally pleasing to the ear, is mainly produced by men to attract mates, as proposed by the cultural courtship model. On the other hand, heavier music, music that is faster, more intense, more musically complex, and/or is naturally dissonant due to

uncommon time signatures/keys that are more difficult to play, might be produced by men to impress other men in accordance with the status competition model. Extreme metal is very fast, in which it is not uncommon to see tempos as high as 400 beats per minute, compared to the most common tempo range of 100 – 150 beats per minute (Mynett, 2019; Schreiber, et al, 2020). It is also technically complex (songs are rarely based on just a few looped chords). Instead, extreme metal is marked by advanced guitar techniques such as sweep-picking, string-skipping, and tapping, as well as the use of dissonant-sounding diatonic modes and unconventional scales. Most extreme metal musicians must invest considerable time to competently play this style of music, with extreme metal guitarists reporting at least six hours of practice per day to maintain speed and dexterity (O'Donnell, 2014). Thus, it could be argued that, in terms of signaling, men play extreme metal guitar as a means to impress other men in a type of runaway status-seeking competition. The features of metal music since the 1970s support this idea, as metal guitar solos have gotten progressively faster and more frequently feature special (e. g. more difficult to play) techniques since the beginning of the heavy metal genre in the 1970s (Herbst, 2017; Slaven & Krout, 2016). A focus on guitarists in this genre is also ideal to examine the status-seeking psychology behind it as guitar has been referred to as the sonic trademark of the metal genre compared to singers in more mainstream bands (Berger and Fales, 2005; Herbst, 2017; Walser, 1993).

As has been mentioned, the main trait that is likely to be signaled through extreme metal guitar expertise is rebelliousness and/or aggression due to the nature of the music, but it is possible that it may signal other traits as well. Some research has already shown that just being a fan of metal music is associated with an affinity for cognitive complexity and that liking metal music is positively associated with the Need for Cognition (or enjoyment of cognitively stimulating tasks rather than simple tasks; Schmaltz, et al, 2020). Other research has shown that liking metal music is associated with openness to experience, more negative attitudes toward authority, lower self-esteem, greater need for uniqueness, and lower religiosity (Swami, et al, 2013).

The current study

Given the features of extreme metal music, and what they may potentially be signaling, we propose that extreme metal guitar competency is a skill that is invested in primarily by men and displayed for the purpose of impressing other men. More specifically, we hypothesize that greater hours spent practicing, a focus on more technical playing styles typical of “shredding” (e.g., scales, arpeggios) compared to chords, and fast playing speeds will positively predict intrasexual competition as measured by the Intrasexual Competition Scale (ICS). For exploratory purposes, we will also investigate how these same guitar-practicing habits relate to mating success and motivation.

Methods

Participants

We recruited 328 participants to complete an online survey. To qualify for the study, participants must be at least 18 years of age, fluent in English, and fans of (*not* producers of) metal music. Efforts were made to advertise the study on websites targeting fans and/or musicians of metal music, including American Facebook pages for musicians, Polish Facebook pages for metal musicians, and a message board called *Encyclopaedia Metallum: The Metal Archives*. Despite securing an initial sample of 328 participants, many were dropped due to incomplete data, incorrectly completed surveys, and extreme outliers (more than 3 standard deviations from the mean on target variables; see Table 1 for target variable descriptives). The final sample of participants was 108 and included *both* those who listen to metal and metal guitarists (those who chose “Yes” to a survey question asking if they play guitar). For the current study, we were *only* interested in male heterosexual guitar players (given that hypotheses about cultural displays are based on evolved heterosexual male psychology), which further reduced the sample to 44. The 44 male guitarists ranged 18–47 years, with an average age of 29.23 ($SD = 7.31$). Participants were predominantly from the United States (43.2%), with the next largest sample from Poland (15.9%), followed by Canada (11.4%). The rest of the sample was mainly European in terms of nationality. The majority of participants were single (59.1%), had a bachelor’s degree (43.2%), and considered themselves to be of the middle class in terms of income (72.8%). These demographic characteristics are typical for the two most represented countries: Poland and the United States (for instance, see OECD, 2019). In

terms of guitar-related demographics, 22 participants either have at one time or were currently in a metal band at the time of data collection, 14 have played live shows at least once, and 8 were signed to a record label.

Measures

Mating success and motivation

To examine how mating success and/or motivation is related to guitar-practicing habits, we defined mating motivation through sociosexuality and mating success through lifetime number of sexual partners. More specifically, sociosexuality, or behaviors and attitudes toward casual sex, was measured using the Sociosexual Orientation Inventory Revised (SOI-R; Penke & Asendorpf, 2008). The SOI-R can be used to measure sociosexuality in terms of how restricted or unrestricted an individual is toward casual sex, or it can be used to measure three subcategories of sociosexuality: attitudes, behaviors, and desires regarding casual sex. In the current study, the alpha reliability for the total SOI-R was .87. For the behavior facet, alpha was .84, for the attitude facet it was .88, and for the desire facet it was .87. Lifetime number of sexual partners was open-ended. It should also be noted that the men in our sample had comparable scores on the SOI-R to those in more general populations of young men. For example, Penke and Asendorpf (2008), using a sample of 1026 men found a mean total SOI-R score of 4.93 (the mean SOI-R score for the current study is 4.65; see Table 1).

Intrasexual competition

We hypothesized that guitar playing habits will positively predict degree of intrasexual competitiveness. To measure participants' degree of competitiveness toward same sex individuals, we used the Intrasexual Competition Scale (ICS; Buunk & Fisher, 2009), which recently performed well in terms of validity via confirmatory factor analysis and invariance testing (Albert et al., 2022). The ICS assesses two factors, one reflecting feelings of frustration when competitors are better off (inferiority frustration) and another reflecting enjoying being better off than competitors (superiority enjoyment; Albert et al., 2022). In the current study, global intrasexual competition alpha reliability was .87. For

inferiority frustration, alpha reliability was .85 and for superiority enjoyment it was .81. It should also be noted that the men in this sample had mean intrasexual competition scores similar in magnitude to those reported in other studies looking at male college students in general. For instance, Ponzi et al (2015) report a mean total ICS score of 3.30 while Buunk and Massar (2012) report a mean total ICS score of 1.80 (the mean total ICS score for the current study is 2.33; see Table 1).

Guitar practicing habits

To better understand how SOI-R and ICS scores are related to guitar playing, we created a survey to measure guitar practicing habits, the Guitar Practicing Habits Inventory. The reason we had to create our own survey is that existing measures on instrument-playing habits frequently focus on how playing an instrument is associated with musculoskeletal pain/disorders (Berque, et al, 2014; Kuorinka, et al, 1987; Lamontagne & Bélanger, 2012) or motivations for playing an instrument (usually aimed at children; Comeau, et al, 2019) rather than the different styles or types of techniques used during musical instrument practice. The Guitar Practicing Habits Inventory consists of seven items that inquire about how participants perceive their own guitar practicing habits compared to other guitar players they know. Specifically, it asks how much time they spend practicing, how much of that time is devoted to practicing chords versus single note exercises like scales, arpeggios, and tapping, how technical their playing is, and how fast they play compared to other guitarists they know. There is also an item asking about the maximum tempo at which they can still play cleanly (for those that use a metronome while practicing). Items were constructed with response options in Likert-style format ranging from 0 to 9. For instance, the item on chords was phrased as follows: “How much of your practice time is spent playing chords?” with 0 representing no time spent playing chords and 9 representing all time spent playing chords. Similarly, the single note exercise item was phrased as, “How much of your practice time is spent playing single note exercises (solos, scales, arpeggios, tapping, etc.)?” with 0 representing no time spent playing these and 9 representing all time spent playing these. See the Appendix for the full survey.

Procedure

This survey was completed at the participants' convenience. Participants clicked on a link to complete an online survey anonymously that was posted on websites known to attract metal fans and/or musicians. Upon first opening the survey, participants were presented with an information sheet and had to click the "Agree" button to indicate consent for participation. Once participants agreed, they had to indicate that they were at least 18 years of age and liked metal music, otherwise they were prevented from answering further questions and the end-of-survey message appeared. Participants then completed the survey at their leisure in one sitting. Participants received no compensation for completing the study. We did not ask participants what exact type of metal they play due to the wide array of overlapping and indistinct (and often unofficial) subgenres of metal there are. Instead, to get an idea of the type of metal they played, we asked them to rate, on a scale from 1 – 10, how much they liked a song representative of older traditional heavy metal (Black Sabbath's *Iron Man*) and how much they liked an objectively much more technical song representative of extreme metal (*Shards of Scorched Earth* by Rings of Saturn)¹. On average, guitarists tend to play music that is similar to or at least inspired by music they like (MacIntyre & Potter, 2014). All procedures and recruitment methods were IRB-approved at a university in the Midwestern United States.

Results

We first conducted zero-order correlations between all guitar-related variables (hours spent playing guitar, time spent playing chords, time spent playing single-note exercises, and perceived speed of playing), mating-related variables (the SOI-R and its subscales and number of lifetime sexual partners), and competitiveness variables (the ICS and its subscales). Significant positive correlations were revealed

¹ To get a better idea of the differences in technical skill level between the two songs, we have provided YouTube links to guitar tutorials showing how to play each one. To see how to play *Iron Man* by Black Sabbath see this link: <https://youtu.be/q8jrm91bqog>. To see how to play *Shards of Scorched Earth* by Rings of Saturn, see this link: <https://youtu.be/BfCYgorqgLA>.

between the time spent playing chords and both lifetime sexual partners and the desire facet of the SOI-R. Also, there were significant positive correlations between the ICS and both time spent playing chords and perceived playing speed. See Table 2 for more details.

Based on the zero-order correlations, the subsequent set of analyses tested whether guitar-practicing habits predicted lifetime number of sexual partners using multiple regression. Specifically, predictors were the number of hours spent practicing guitar per day, how much of that time is spent playing chords, how much practicing time is spent playing single-note exercises, and perceived speed of playing. We also included the likeness ratings of the two songs (Black Sabbath and Rings of Saturn) to get a better idea of the style of metal they likely played. The dependent variable was lifetime number of sexual partners. These four guitar-related variables did not significantly predict number of lifetime sexual partners in the overall model, $F(4, 39) = 1.533, p = .212$, but the variable of time spent playing chords positively predicted number of lifetime sexual partners ($\beta = .312, t = 2.057, p = .046$). Because guitar practicing habits did not predict the lifetime number of sexual partners but there was a significant correlation of time spent practicing chords for the SOI-R desire score, we thought the significant result might reflect the desire facet of the SOI-R, even if these guitarists were not able to fulfil this desire. Thus, the next regression analysis used these same guitar-playing predictors and SOI-R desire facet score as the criterion variable. This time, the overall model was significant, $F(4, 39) = 4.60, p = .004$. Time spent playing chords was the only significant predictor, as it positively predicted SOI-R desire ($\beta = 0.519, t = 3.865, p < .001$). See Table 3 for the details of the mating success and motivation regression models.

Next, we tested whether guitar-practicing habits predicted intrasexual competition using multiple regression. Once again, the number of hours spent practicing guitar per day, how much of that time is spent playing chords, how much of that time is spent playing single-note exercises, and speed of playing were the predictors (along with the likeness ratings for the Black Sabbath and Rings of Saturn songs), and the total ICS score was the criterion variable. The overall model was significant $F(4, 39) = 2.869, p = .036$. For this analysis, a different variable was a significant predictor: speed of playing ($\beta = 0.402, t = 2.493, p = .017$) positively predicted ICS score. We also tested whether these same variables predicted the

two ICS subscales (inferiority frustration and superiority enjoyment) using multiple regression. The model for inferiority frustration was not significant, $F(4, 39) = 2.174, p = .090$. However, the model for superiority enjoyment was significant, $F(4, 39) = 2.756, p = .041$. More specifically, the only significant predictor within the model was playing speed ($\beta = .385, t = 2.378, p = .022$). See Table 4 for the details of the intrasexual competitiveness regression models.

Discussion

We hypothesized that investment in extreme metal guitar skills fits most closely with the status competition model of cultural displays. In accordance with this prediction, guitar playing habits (number of hours spent practicing per day, amount of practice time spent playing chords, amount of practice time spent playing single-note exercises, and speed of playing) did predict intrasexual competitiveness in terms of the ICS total score. Furthermore, these guitar-playing habits positively predicted the superiority enjoyment subscale of the ICS, with playing speed being the significant predictor of the guitar practicing habits. Thus, those who perceive they play faster than average enjoy feeling superior to their same-sex peers in this skill. In terms of mating success and/or motivation, these same guitar-playing habits did not predict SOI-R total scores or the lifetime number of sexual partners. However, the amount of practice time playing chords did positively predict scores on the desire facet of the SOI-R, so it is related to mating motivation.

These results offer preliminary exploratory support for the status competition model. However, they also do not completely rule out any of the three hypotheses (cultural courtship model, status competition model, or byproduct hypothesis), especially given the exploratory nature of the analyses and the significant relationship with mating motivation. Furthermore, the only significant predictor of intrasexual competitiveness was the perceived speed of playing; a better predictor in terms of the status competition model would have been the amount of time spent practicing complex single-note exercises such as scales, arpeggios, tapping, sweep-picking, and string-skipping, as these are the techniques that more directly display skill in the extreme metal genre. Playing chords quickly is simpler to do, relatively speaking. It could be that the signaling function of extreme metal is not exclusive to only male-male

status-seeking. Perhaps men who play this genre are interested in a greater ability to attract mates, but given their likely lower level of self-esteem (Swami, et al, 2013), have concluded that gaining status from impressing other males is more feasible, and perhaps by doing this it will indirectly someday lead to an enhanced ability to attract mates, even if it is mainly short-term mating opportunities with female metal fans. There is also a tradeoff to be faced with investment in guitar skill and mating opportunities such that the time spent playing is time that cannot be used to attempt to attract mates. The fact that there was a negative (although not significant) association between number of sex partners and hours spent playing guitar supports this tradeoff idea. Hence, it may be that extreme metal guitarists are prioritizing status-seeking over mate attraction through this tradeoff.

Limitations and future directions

There are a number of methodological limitations in this study. Given that the population of extreme metal guitarists is small and we lacked a large amount of funding, we had a small sample size. Also, it is likely difficult to get access to professional guitar players in this genre that are signed to a label (as we only had eight in this category), so our sample may not have accurately represented professional career guitarists and perhaps was more representative of those who play extreme metal as a hobby. There could be psychological differences in motivations for playing between these two populations. It should also be noted that it is difficult even with a sample of professional extreme metal guitarists to know exactly how much practice, effort, and training went into their current level of skill and how it compares to those who have been unable to reach that level of success because the process of learning metal guitar has historically been informal and undocumented academically, and this continues to be the case today with most players learning from social media and other internet sources from other players (Rodriguez & Marone, 2021). Finally, we do not know how many of the guitarists in this sample truly fit under the category of extreme metal guitarists. We wanted to cast a wide net into the metal community, due to the niche nature of the metal community let alone the extreme metal community, but this may have been at the expense of gathering a sample of specifically extreme metal guitarists, especially given the finding that participants generally preferred the Black Sabbath song to the more technical Rings of Saturn song.

The most obvious future direction would be to replicate this study using a larger sample that is made up entirely of professional extreme metal guitarists. Another interesting way to test whether extreme metal guitar-playing fits the status competition model would be through an experimental within-subjects design using a sample of professional career guitarists. In one condition, the audience the guitarists would play a song for would be manipulated to be all female, and in another it would be manipulated to be all male. The outcome of the manipulation would be how much of the song contained complex skills (e.g., sweep-picked arpeggios) versus simple chords. If the guitarists would play songs with mostly chords for a female audience but songs with mostly complex skills for a male audience, this would provide support for the status competition model.

Conclusion

We exploratorily tested the prediction that playing extreme metal guitar fits in accordance with the status competition model for the function of cultural displays rather than the cultural courtship model or the byproduct hypothesis. The current results partially fit with the status competition model as perceptions of fast playing speeds positively predicted enjoyment of feeling superior to other same-sex guitar players. There were no significant findings in terms guitar practicing habits and mating success, however, mating motivation was positively associated especially with playing chords. Taken together, we conclude that these results may hint at male-male competition being involved in extreme metal guitar playing and a possible male-male signaling arms race of musical virtuosity. Such an arms race may be operating in other very specialized or niche domains such as in extreme solo sports, videogaming, and day-trading crypto-currencies. For a more specific example, it has in recent years become popular for young men to do “speed runs” of video games in which they are always competing with others across the internet to finish a video game faster than the current record for the fastest run through a game (Šeļa, et al, 2022). Such niche domains are also neglected in research. The current study is a defensible first step in one of these neglected areas of research, but more studies are needed to reach definite conclusions.

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Table 1. Descriptives for the target variables of guitar practicing habits, mating success/motivation, and male-male competitiveness.

<i>Guitar practice habits variables</i>	Mean	SD
Number of hours spent practicing per day	4.41	0.73
Time spent practicing chords	4.55	2.48
Time spent practicing single note exercises	4.50	2.34
Perception of playing speed compared to others	4.82	2.45
Preference for Black Sabbath	8.25	2.18
Preference for Rings of Saturn	4.18	2.96
<i>Mating success variables</i>		
SOI-R total score	4.65	1.92
SOI-R attitude score	5.74	2.62
SOI-R behavior score	3.07	2.22
SOI-R desire score	5.14	2.35
Lifetime number of sexual partners	13.55	20.14
<i>Intrasexual competitiveness variables</i>		
ICS total score	2.33	0.99
ICS inferiority frustration score	1.80	0.90
ICS superiority enjoyment score	3.63	1.59

Note: Guitar practicing habit variables are scored from 0 – 9 such that higher numbers indicate greater perceived time spent playing chords, single notes, and higher perceived speed compared to others.

Preference scores for songs are scored from 1 – 10 such that higher numbers indicate stronger preference for the song. Also, the variable of hours spent playing *does* refer to the actual number of hours spent practicing per day.

Table 2. Pearson's zero-order correlations between guitar-playing habits, mating variables, and male-male competition variables.

<i>Guitar-playing habits</i>				
<i>Mating variables</i>	Hours spent playing	Time playing chords	Time playing single notes	Perceived playing speed
SOI-R behavior	-.162	.231	.040	.039
SOI-R attitude	.016	.256	.079	.183
SOI-R desire	-.106	.541**	.171	.124
SOI-R total	-.099	.426**	.121	.149
Number of sexual partners	-.148	.330*	.099	.052

<i>Guitar-playing habits</i>				
<i>Intrasexual competition variables</i>	Hours spent playing	Time playing chords	Time playing single notes	Perceived playing speed
ICS-inferiority frustration	.029	.299*	-.041	.298*
ICS-superiority enjoyment	-.055	.323*	.058	.339*
ICS-total	.003	.321*	-.004	.353*

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

Table 3. Multiple regression analyses predicting mating variables (SOI-R and lifetime number of sexual partners) from guitar practicing habits.

Predictor variables	SOI-R total score				SOI-R desire				Number of sex partners			
	β	<i>S.E.</i>	<i>t</i>	<i>Model Statistics</i>	β	<i>S.E.</i>	<i>t</i>	<i>Model Statistics</i>	β	<i>S.E.</i>	<i>t</i>	<i>Model Statistics</i>
				$R^2 = .26$ $F = 2.13$ $p = .073$				$R^2 = .32$ $F = 2.91$ $p = .020$				$R^2 = .15$ $F = 1.08$ $p = .393$
Hours spent practicing	-0.08	0.41	-0.49		-0.11	0.48	-0.75		-0.13	4.65	-0.80	
Time playing chords	0.37	0.11	2.55**		0.52	0.13	3.72***		0.30	1.26	1.90	
Time playing notes	-0.01	0.13	-0.03		0.13	0.15	0.87		0.05	1.46	0.29	
Perceived playing speed	0.09	0.13	0.52		0.04	0.15	0.26		0.02	1.44	0.12	
Black Sabbath preference	0.15	0.13	1.03		0.02	0.15	0.11		0.11	1.46	0.69	
Rings of Saturn preference	0.19	0.10	1.28		-0.01	0.11	-0.04		0.06	1.10	0.39	

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

Table 4. Multiple regression analyses predicting intrasexual competitiveness variables (ICS total score and ICS subscale scores) from guitar practicing habits.

Predictor variables	ICS total score				ICS inferiority				ICS superiority			
	β	S.E.	<i>t</i>	Model Statistics	β	S.E.	<i>t</i>	Model Statistics	β	S.E.	<i>t</i>	Model Statistics
				$R^2 = .24$ $F = 1.96$ $p = .097$				$R^2 = .20$ $F = 1.53$ $p = .197$				$R^2 = .25$ $F = 2.05$ $p = .083$
Hours spent practicing	-0.08	0.22	-0.53		-0.03	0.20	-0.16		-0.14	0.34	-0.86	
Time playing chords	0.25	0.06	1.71		0.25	0.06	1.62		0.24	0.09	1.64	
Time playing notes	-0.19	0.07	-1.16		-0.21	0.06	-1.27		-0.13	0.11	-0.80	
Perceived playing speed	0.39	0.07	2.35*		0.32	0.06	1.89		0.37	0.11	2.23*	
Black Sabbath preference	0.08	0.07	0.54		0.06	0.06	0.39		0.14	0.11	0.96	
Rings of Saturn preference	0.10	0.05	0.66		0.13	0.05	0.81		0.12	0.08	0.81	

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

Appendix

Guitar Practicing Habits Inventory

1. Approximately how many hours per day do you practice playing guitar?
_____ hours
2. How much more time do you spend practicing guitar compared to the average guitar player?
0 1 2 3 4 5 6 7 8 9
I spend no time I spend much more time than most
3. How technical is the type of music you play?
0 1 2 3 4 5 6 7 8 9
Not technical Extremely technical
at all
4. How much of your practice time is spent playing chords?
0 1 2 3 4 5 6 7 8 9
I spend no time I spend all of my practice time playing chords
playing chords
5. How much of your practice time is spent playing single note exercises (solos, scales, arpeggios, tapping, etc.)?
0 1 2 3 4 5 6 7 8 9
I spend no time playing I spend all of my practice time playing these
these
6. Compared to other guitarists you know of, how fast do you play guitar?
0 1 2 3 4 5 6 7 8 9
Slow, not a fast player I play much faster than most
7. Have you ever played guitar along with a metronome?
Yes No
If yes, what is the fastest tempo at which you can still play well?
_____ bpm