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Metal Music, Social Comparison, and Aggressive Behavior: Experimental Evidence from a Behavioral Paradigm

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Research on the relationship between music and aggression predominantly relies on self-report studies, with relatively few experimental studies exploring how music interacts with social and evaluative cues to influence aggressive behaviors. The present study examined the combined effects of music genre and social comparison on aggression using the Point Subtraction Aggression Paradigm (PSAP). In two experiments, participants were randomly exposed to either death metal or classical music, while social comparison was manipulated in different ways. In Experiment I, participants received either positive or negative false feedback about their music knowledge. The results showed that aggression, as measured by point subtraction, was highest among participants exposed to death metal music after receiving positive feedback, whereas classical music mitigated this effect. In Experiment II, participants were informed that the music they would hear was either positively or negatively evaluated by their peers. Unlike Experiment I, no significant effects were observed on any of the PSAP outcomes. These findings suggest that the impact of music on aggression depends on the personal relevance of social evaluative cues. By integrating experimental manipulation with a behavioral paradigm and a non-Western sample, this study underscores important boundary conditions in the relationship between music, social comparison, and aggression.

Key words: aggression, social comparison, music, death metal, Point Subtraction Aggression Paradigm (PSAP)

Aggression has long been an important area of social psychology, with researchers dedicated to uncovering both situational and dispositional factors that contribute to aggressive behavior. Laboratory-based paradigms have been developed to assess aggression under controlled conditions, as other techniques frequently face problems such as social desirability and other confounding variables. Among these paradigms, the Point Subtraction Aggression Paradigm (PSAP) has achieved prominence as a widely utilized and validated instrument. This behavioral paradigm challenges individuals by provoking them to

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understand their responses, offering three options: subtract points from an opponent, earn points for themselves, or refrain from responding (Cherek et al., 1996; Golomb et al., 2007). Compared with other paradigms, PSAP offers extensive insights into aggression and is externally valid across a range of populations (Alcorn et al., 2015; Skibsted et al., 2017).

In addition to the PSAP, various experimental paradigms have been employed to examine the relationship between music and aggression under controlled conditions. For instance, prior research has used the Hot Sauce Paradigm (Lennings & Warburton, 2011), noise blast tasks such as the Competitive Reaction Time Paradigm (Hyatt et al., 2017), and behavioral tasks involving problem-solving or frustration induction (e.g., tangram tasks; Warburton et al., 2024). Other approaches have examined aggression through indirect behaviors, such as online interactions (Wowk, 2022) or physical endurance tasks, such as the Ice Water Paradigm (Fischer & Greitemeyer, 2006). Collectively, these paradigms provide converging evidence that exposure to aggressive or violent musical content can influence aggressive thoughts, affect, and behavior, although the magnitude and direction of these effects may depend on moderating variables, such as arousal and individual differences.

Moreover, research suggests that the structural features of music, such as tempo, may play a critical role in shaping emotional and physiological responses. Faster tempos are generally associated with increased arousal, which has been linked to heightened aggression-related outcomes (Dillman Carpentier & Potter, 2007; Kim et al., 2019; Rickard, 2004). Accordingly, some studies have attempted to control for tempo when comparing musical conditions (e.g., Warburton et al., 2024), highlighting the importance of distinguishing between genre effects and basic acoustic properties of music. Recent meta-analytic evidence further supports the link between violent music and aggression, indicating small but consistent associations with aggressive affect, cognition, and behavior (Barlett & Kjærvik, 2025). These findings suggest that the effects of music on aggression are multifaceted and are likely moderated by contextual and individual factors.

One situational factor that can influence aggressive behavior is exposure to music. Heavy metal, particularly death metal, is frequently stereotyped as a genre associated with anger and aggression. Early studies have reported that individuals who are not fans of heavy metal music exhibit heightened arousal and stress responses when exposed to this genre, in contrast to more neutral genres such as country music (Gowensmith & Bloom, 1997). More recent work, however, paints a more nuanced picture. For devoted fans, listening to metal music can act as a mechanism of emotional regulation (e.g., catharsis) rather than a trigger for aggression or frustration (Kneer, 2016; Olsen et al., 2023). Some further suggest that individual differences, musical preferences, and cultural stereotypes may moderate the relationship between metal music and aggressive outcomes (Rubin et al., 2001; Susino & Schubert, 2018). Therefore, while metal music may increase arousal, its impact on aggressive tendencies is inconsistent across different listeners and contexts.

It is important to consider the role of social comparison in understanding aggressive behavior. From a pioneering perspective, Leon Festinger (1954) suggested that people evaluate their capacities and ideas by comparing themselves to others, especially when objective standards are lacking. Comparisons may be upward (with better-performing others) or downward (with worse-performing others), each eliciting different inferences. While downward comparison is often seen as a mechanism for protecting self-esteem, up-

ward comparison has the potential to inspire both admiration and resentment (Collins, 1996). These dual outcomes imply that the effects of social comparison are profoundly shaped by the particular context in which such comparisons are made.

Although there is considerable research on both music and social comparison, only a limited number of studies have examined their combined effects on aggression. Existing research typically examines these variables separately, leaving unanswered questions about how situational signals, such as perceived popularity or social status, interact with music exposure. Research has demonstrated that concerns regarding social status can predict aggressive behaviors (Li & Wright, 2013) and that such aggression is often linked to experiences of social rejection or unfavorable social comparisons (Vaillancourt & Hymel, 2006). By synthesizing these findings with the existing body of music literature, it becomes apparent that negative social comparison information, when coupled with arousing musical stimuli, has the potential to intensify aggressive behaviors. Integrating social comparison theory with current research on music suggests that negative social comparison information, when paired with arousing music, may trigger aggression. However, this proposition remains largely unexplored in the existing studies.

This research aims to bridge the current gap in the literature by investigating how the interaction between music genres, specifically heavy metal and classical music (used as a control), and upward and downward social comparison contexts, influences aggressive behavior, as evaluated through PSAP. This study aims to integrate music studies and social comparison theory to enhance the comprehension of how situational cues influence aggressive behavior.

Furthermore, the present study extends previous studies in three significant ways. Firstly, in contrast to several prior studies that investigated heavy metal fans, we implemented a random exposure design, thereby reducing potential biases associated with prior familiarity and preference. Secondly, aggression was measured through a behavioral observation task using the PSAP, as opposed to self-report scales, which helps to diminish the effects of social desirability and introspective biases. Finally, employing a non-Western sample extends the generalizability of the findings, given that most previous research has been predominantly conducted in Western contexts.

Overview of Studies and Hypotheses

The present study involved two experiments, each conducted after a pilot study that aimed at selecting appropriate musical stimuli (see Appendix A). Both experiments investigated the combined effects of music and social comparison on aggressive behavior, as measured by the Point Subtraction Aggression Paradigm (PSAP).

Experiment I used a 2 (Music genre: death metal vs. classical) × 2 (False feedback: positive vs. negative) between-subjects design. Participants were provided with false feedback on a fictitious music knowledge test: Receiving positive feedback indicated that the person was better than average (downward comparison), while negative feedback implied that the person was worse than average (upward comparison). Experiment II also used a 2 × 2 between-subjects design; however, this time, social comparison was manipulated through peer evaluations of the music to be presented. Participants were informed that the music received either positive ratings from peers (downward comparison) or negative ratings (upward comparison).

It was hypothesized that upward social comparison conditions would induce greater

aggression than downward comparisons, as unfavorable social comparisons are known to increase frustration and provoke hostility (e.g., Bushman & Baumeister, 1998). Furthermore, it was predicted that participants exposed to death metal music would exhibit aggressive tendencies compared to those exposed to classical music. This expectation aligns with existing research indicating that aggressive musical cues enhance arousal and hostile thoughts (e.g., Sharman & Dingle, 2015). Finally, an interaction effect was expected, with the combination of death metal music and upward comparison producing the highest levels of aggression.

An *a priori* power analysis was conducted using G*Power 3.1 (Faul et al., 2007). Based on effect sizes reported in prior research on the PSAP (e.g., Schlüter et al., 2017), Cohen's *f* was set to 0.35 for the 2 × 2 between-subjects ANOVA interaction. With α = .05 and power (1–β) = .90, the required total sample size was estimated as 88. In the present study, this requirement was exceeded in both experiments. Ethical approval for the research was obtained from the Balikesir University Social and Humanities Ethics Committee (2025/02-35). All data supporting the findings of this study are available as Supplementary Files.

Experiment I

Method

Participants and Design

The study employed a 2 (Music genre: death metal vs. classical) × 2 (False feedback: positive vs. negative) between-subjects design. A total of 92 students (M_{age} = 20.04, *SD* = 4.12) from a state university in Türkiye took part in the experiment to earn extra course credit. The sample was predominantly female (91.3%).

Materials and Procedure

Participants were recruited through university-affiliated social media groups (e.g., student WhatsApp groups) and invited to schedule an appointment for the experiment to earn extra course credit. A link to a shared online calendar was provided, displaying available dates and times for laboratory sessions. On the day of the experiment, each desk was equipped with an informed consent form, a folder containing a 15-item "*Music Knowledge Test*" (used for the false feedback manipulation), and a QR code linking participants to the Point Subtraction Aggression Paradigm (PSAP) website.

After obtaining informed consent and demographic information, participants completed a 15-item *Music Knowledge Test*. This test was specifically designed to facilitate the delivery of misleading feedback. The test predominantly comprised challenging questions (e.g., "*What is a crescendo?*") alongside some relatively simple ones (e.g., "*What is improvisation?*"). Participants were given five minutes to complete the test. They were not provided with their actual scores or the correct answers, as the test was not intended to assess genuine musical knowledge. After their test sheets were collected, participants were informed that the researchers would analyze their answers while they listened to music.

Following the test, participants were randomly assigned to listen to either a death metal excerpt or a classical music excerpt for a duration of five minutes. To maximize experimental control and ensure consistent stimulus presentation, a single musical excerpt was selected for each condition based on pilot study results (see Appendix A for a comprehensive justification and pretest results). For the death metal condition, *Of Dull Eyes Borne* by Psycroptic was used, and for the classical

music condition, Erik Satie's *Vexations* was chosen. While this approach enhances internal validity, it is important to note that the findings' generalizability is limited to these specific musical pieces rather than the entire genres. The pilot study demonstrated that the selected excerpts elicited significantly different affective responses, particularly in terms of anger, energy, and relaxation, supporting their suitability for the experimental manipulation.

Subsequently, participants received randomly assigned false feedback. This manipulation involved the use of false feedback, a well-established method in social psychology for effectively altering self-perceptions and inducing specific affective or motivational states (e.g., Baumeister et al., 1993; Heatherton & Polivy, 1991). This approach was deemed essential to experimentally induce social comparison experiences (upward vs. downward) without participants' explicit awareness. A direct manipulation check was deliberately omitted to prevent participants from inferring the study's true purpose or the nature of social comparison manipulation, which could have introduced demand characteristics and compromised the internal validity of behavioral measures. This decision represented a methodological trade-off, prioritizing the ecological validity and covert nature of the manipulation over direct verification of its immediate impact on participants' subjective states. While this approach maintained the integrity of the experimental design, it is acknowledged that the absence of a direct manipulation check means we cannot definitively confirm the extent to which participants consciously processed the false feedback as intended. However, the use of a well-established false feedback paradigm in social psychology provides indirect support for its efficacy in inducing the desired social comparison states. To ensure ecological validity and to avoid extreme emotional responses that might compromise the experimental design, participants received moderate false feedback. In the positive feedback condition, they were told, "*Your test result is above average*," whereas in the negative feedback condition, they were told, "*Your test result is below average."* This phrasing was chosen to induce a realistic sense of upward or downward social comparison without causing undue distress or suspicion, thereby maintaining the manipulation's believability and generalizability. While prior studies have used harsher forms of negative feedback (e.g., Bushman & Baumeister, 1998), the present study opted for more moderate feedback to ensure ethical compliance and maintain ecological validity.

After receiving feedback, participants used their assigned participant numbers to log into PSAP. The PSAP is a well-established paradigm specifically designed to objectively assess human aggressive behavior in a controlled laboratory setting (Kelly & Cherek, 1993). In this task, participants were presented with a series of trials in which they could choose one of three responses: attack the opponent by subtracting points, earn points for themselves, or do nothing. Across 18 trials, aggressive responses were defined as choosing to subtract points from the ostensible opponent. While the accumulation of points did not provide any concrete advantages, aggressive responses were interpreted as behavioral indicators of aggressive tendencies. For each participant, the mean proportions for point subtraction, point earning, and no response were calculated across the 18 trials, with the total summing to 1.00. These values served as dependent variables in the subsequent analyses.

After completing the task, participants were thanked, debriefed on the study's actual purpose, and informed about the nature of the manipulations. The entire experimental procedure lasted approximately 20 minutes.

Results

A 2 × 2 ANOVA was conducted with music (death metal vs. classical) and feedback (positive vs. negative) as between-subjects factors on the proportions of responses allocated to point subtraction, point earning, and no response.

For point subtraction, there was a significant main effect of feedback, $F(1, 86) = 5.33$, $p = .02$, $\eta^2_p = .06$, with participants subtracting points more frequently in the positive feedback condition ($M = .54$, $SD = .22$) than in the negative feedback condition ($M = .44$, $SD = .15$). Although the main effect of music was not significant, $F(1, 86) = 2.14$, $p = .15$, $\eta^2_p = .02$, the interaction between music and feedback reached significance, $F(1, 86) = 4.15$, $p = .045$, $\eta^2_p = .05$. Simple effects analyses revealed that participants in the death metal music condition subtracted points more under positive feedback ($M = .60$, $SD = .20$) compared to negative feedback ($M = .42$, $SD = .19$), whereas no such difference was observed in classical music conditions.

For point earning, there was a significant main effect of music, $F(1, 86) = 5.01$, $p = .03$, $\eta^2_p = .06$, such that participants in the classical condition allocated more responses to point earning ($M = .49$, $SD = .19$) than those in the death metal music condition ($M = .40$, $SD = .18$). The music × feedback interaction was also significant, $F(1, 86) = 7.23$, $p = .009$, $\eta^2_p = .08$. In particular, participants exposed to classical music showed no differences across feedback conditions, whereas those exposed to death metal engaged less in point earning under positive ($M = .33$, $SD = .16$) compared to negative feedback ($M = .49$, $SD = .16$).

For no response, neither the main effects of music nor feedback, nor their interaction, reached significance (all ps > .13).

Discussion

The results of Experiment I indicated that aggression, as assessed through point subtraction responses in the PSAP, was more pronounced when participants received positive rather than negative feedback, particularly in the death metal condition. This pattern was somewhat unexpected, as downward comparison (i.e., negative feedback) has often been associated with increased frustration

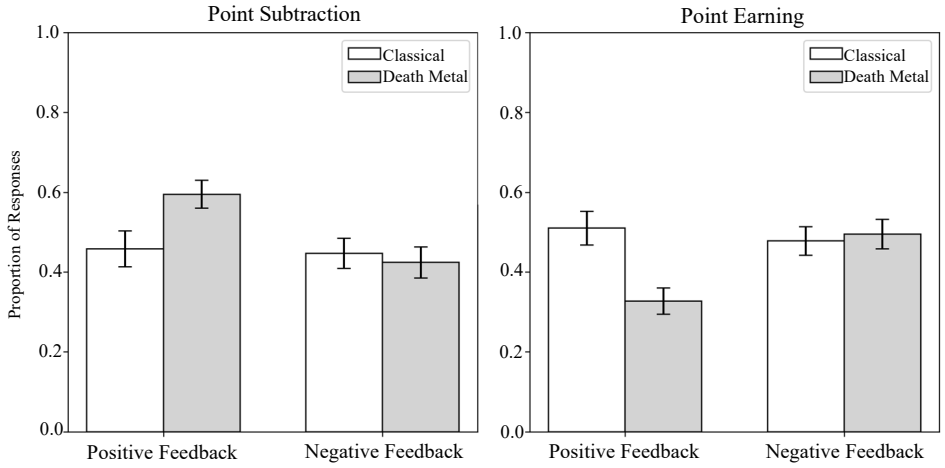


Figure 1 Estimated marginal means by music genre and feedback in Experiment I.

and hostility (Wills, 1981). One possible explanation is that upward comparison may trigger feelings of competitiveness or status threat, which in turn provoke aggressive responses (Collins, 1996; Taylor & Lobel, 1989). In this sense, the "above average" feedback may have intensified sensitivity to potential challenges from the ostensible opponent in the PSAP.

The moderating effect of music further clarifies this outcome. Previous research suggests that death metal may enhance arousal and aggressive affect (Anderson et al., 2003; Gowensmith & Bloom, 1997), which may amplify the impact of threatening or ego-relevant information. Thus, the combination of death metal and positive feedback may have jointly escalated aggressive behavior. In contrast, many forms of classical music have been associated with relaxation (Thoma et al., 2012), which appeared to buffer participants from the negative effect of feedback.

Another noteworthy result was that participants in the classical condition allocated more responses to point earning than those in the death metal condition, irrespective of feedback. This aligns with findings that classical music or calm auditory environments facilitate emotional regulation and support constructive, goal-directed behavior (e.g., Blasco-Magraner et al., 2023). In contrast, the reduced accumulation of points under the death metal music condition, especially after receiving positive feedback, might suggest a shift in motivational orientation from seeking rewards to engaging in competitive aggression.

Overall, Experiment I indicates that when paired with high-arousal stimuli like death metal music, upward comparison might be more unsettling than downward comparison. This pattern highlights the interactive role of social-cognitive processes and environmental cues in influencing aggressive behavior. It also raises important questions about the situational conditions under which aggression is likely to manifest in laboratory tasks.

Experiment II

Method

Participants and Design

The study used a 2 (Music genre: death metal vs. classical) × 2 (Comparison information: upward vs. downward) between-subjects design. A total of 90 students (M_{age} = 22.73, *SD* = 6.56) from a state university in Türkiye took part in the experiment to earn extra course credit. The sample was predominantly female (75.3%).

Materials and Procedure

The same musical excerpts employed in Experiment I were used: *Of Dull Eyes Borne* by Psycroptic (death metal) and Erik Satie's *Vexations* (classical). Participants were randomly assigned to one of two social comparison conditions. In the upward comparison condition, participants were informed that they had been assigned to listen to one of the most favored music excerpts, which students had previously rated as enjoyable, creative, and stimulating. Conversely, in the downward comparison condition, participants were told they had been assigned to one of the least favored excerpts, previously described as boring and incomprehensible. These manipulation texts were presented immediately before the music listening task, and participants were given 90 seconds to read the information (see Blanton et al., 1999; Collins, 1996; Mussweiler, 2003). This procedure was designed to operationalize social comparison processes through evaluative peer feedback, in line with established comparative feedback paradigms used in prior research.

Following the manipulation, participants listened to either the death metal or classical excerpt for five minutes. They then completed a short filler task and two-item manipulation check questions to ensure attention to the comparison text. Finally, participants performed the Point Subtraction Aggression Paradigm (PSAP; Cherek et al., 1997; Kelly & Cherek, 1993), which provided behavioral indices of aggressive, competitive, and neutral responding.

Results

A 2 (Music: death metal vs. classical) × 2 (Comparison information: upward vs. downward) between-subjects ANOVA was conducted on the three PSAP outcomes (point subtraction, point earning, and no response). Across all models, no significant main or interaction effects were observed. For point subtraction, *F*s ranged from < 0.001 to 1.61, *p*s = .21–.97, $\eta^2_p s$ < .02. For point earning, *F*s ranged from <0.001 to 0.39, *p*s = .53–1.00, $\eta^2_p s$ < .01. For inaction, *F*s ranged from 0.001 to 2.18, *p*s = .14–.98, η^2_ps < .03. Thus, neither music type nor social comparison framing, nor their interaction, exerted any measurable influence on participants' behavioral choices in the PSAP.

Discussion

Experiment II aimed to assess whether informing participants that the assigned musical excerpt was either highly favored (upward comparison) or not favored (downward comparison) would alter their responses. Furthermore, the research sought to determine if the genre of music would moderate this potential effect. Contrary to the initial hypotheses, the analysis revealed no statistically significant main effects or interactions across the measures of point subtraction, point earning, or inaction.

One explanation for these null findings is that the comparison manipulation may have lacked sufficient personal relevance. Social comparison effects are most pronounced when the domain of comparison holds personal significance or when the standard is perceived as directly pertinent to one's self-assessment (Festinger, 1954; Mussweiler, 2003). Given that the participants were not music majors and the task did not rely on their musical identity, the information regarding others' preferences for a piece of music may not have elicited strong self-referential reactions.

Another potential explanation is that the manipulation may have been too removed from the aggression task. Previous research indicates that affect or threat induced by comparison tends to diminish swiftly unless it is reinforced (Collins, 1996). In the present study, the comparison message was presented briefly before the music listening session, followed by a filler task, which may have weakened its influence on subsequent behavior.

It is plausible that the PSAP, while sensitive to manipulations involving provocation or frustration (Cherek et al., 1997; Geniole et al., 2017), may exhibit diminished responsiveness to subtle framing cues, such as whether peers previously liked or disliked the music. In this context, the task may primarily capture aggression arising from direct interpersonal threats rather than indirect social evaluations.

Ultimately, the findings may indicate broader boundary conditions of the hypothesized effect. While Experiment I demonstrated that false feedback about personal performance interacted with music to influence aggression, the null effects observed in Experiment II suggest that social comparison involving external stimuli (i.e., the evaluation of music by others) may not be sufficient to produce similar outcomes. Collectively, these results highlight the importance of differentiating between

self-relevant and stimulus-relevant comparisons when examining the social-cognitive precursors of aggression.

General Discussion

Experiment I indicates that the presence of death metal music, when coupled with upward social comparison feedback, amplified aggressive tendencies in a controlled setting. This finding underscores the importance of investigating how musical contexts and social evaluative cues interact to influence aggressive behavior, rather than considering these factors in isolation.

The present research investigated whether exposure to death metal music and different forms of social comparison would influence aggressive behavior in the laboratory, using the Point Subtraction Aggression Paradigm (PSAP). Across two experiments, distinct patterns of findings emerged. Experiment I revealed that the interaction between false feedback regarding test performance and the type of music influenced aggression-related responses. Specifically, participants exposed to death metal music exhibited increased point subtraction following positive feedback as opposed to negative feedback. In contrast, no such differences were observed among participants exposed to classical music. Experiment II, however, revealed no significant effects of social comparison framing (upward vs. downward) or music genre on any PSAP outcomes. Collectively, these findings indicate that music and social evaluative cues may interact to affect aggression, with the nature and significance of the evaluative context playing a pivotal role.

This study is strengthened by several key factors. Initially, in contrast to previous studies that frequently focused on pre-existing fan groups (e.g., metal fans versus non-fans, e.g., Kneer, 2016; Olsen et al., 2023), the current research used random assignment to music exposure, thereby enhancing internal validity. Second, aggression was assessed using the PSAP, a behavioral paradigm designed to bypass the self-report biases and demand characteristics typically associated with introspective measures. Third, the use of a non-Western sample enhances the generalizability of aggression research beyond the predominantly Western contexts in which most studies have been conducted, thereby offering a valuable cross-cultural perspective.

Despite these strengths, it is important to acknowledge certain limitations. One such limitation is the dependence on brief musical excerpts and relatively short exposure durations, which may not adequately capture the cumulative effects of repeated listening or engagement with music in real-world contexts. Another limitation pertains to the manipulations of social comparison. In Experiment I, the false feedback was directly related to the self, which likely triggered more intense emotional and motivational reactions. Conversely, the manipulation in Experiment II, which involved comparisons based on others' evaluations of the music, may have lacked sufficient personal relevance, thereby diminishing its effect on aggressive behavior. It is also important to note that the effectiveness of social comparison manipulations may depend on their personal relevance, which represents a limitation across both experiments. Future research should thus investigate alternative operationalizations of social comparison, encompassing competitive or evaluative contexts that are more directly associated with the self.

A further limitation is related to the homogeneity of the sample. Both experiments primarily involved female university students, raising concerns about the generalizability of the findings to more gender-diverse or older populations. Moreover, cultural values related to music preference and the expression of

aggression may differ significantly; therefore, future research could benefit from comparing samples across various cultural contexts.

While the random exposure design aimed to mitigate bias due to pre-existing familiarity, a related limitation is that participants' individual music preferences were not assessed. This oversight means we cannot ascertain whether participants' pre-existing likes or dislikes for death metal or classical music might have influenced their physiological or emotional responses to the musical stimuli, potentially modulating aggressive behaviors. One more limitation is that familiarity with the selected musical excerpts was not assessed. Prior exposure to the stimuli may influence emotional and behavioral responses, and future studies should account for this factor.

Also, another limitation concerns differences in tempo between the musical stimuli. Faster tempos are known to increase physiological arousal, which may in turn influence aggressive responding. As such, it is difficult to fully disentangle the effects of musical genre from those of tempo. Future research should attempt to match stimuli by tempo to more clearly isolate genre-specific effects.

A further and important limitation of Experiment I is the absence of a direct manipulation check for the false feedback. Although this manipulation is widely used in social psychology (e.g., Baumeister et al., 1993; Heatherton & Polivy, 1991) and has been shown to reliably induce social comparison processes, we did not assess participants' subjective perception of the feedback (e.g., perceived relative performance or perceived social standing). This omission was intentional to minimize demand characteristics and prevent participants from inferring the true purpose of the study. However, this methodological choice means that we cannot empirically confirm whether participants interpreted the feedback as intended. Accordingly, conclusions regarding the effectiveness of the manipulation should be interpreted with this limitation in mind.

Future research should investigate the mechanisms underlying the observed interaction effects. For instance, does music intensify aggression solely when combined with feedback that either threatens or enhances self-evaluation? Furthermore, does mood, arousal, or identification with musical content mediate these outcomes? Using psychophysiological measures, such as heart rate variability and skin conductance, alongside behavioral tasks could yield a more nuanced understanding of these processes.

The findings present several implications for both theoretical and practical domains. Theoretically, the results highlight the necessity of differentiating between self-relevant and stimulus-relevant social comparison processes. Notably, only the former, as demonstrated in Experiment I, yielded measurable effects on aggression. This suggests that the intersection of music and self-evaluative contexts may serve as a critical boundary condition in aggression models. Practically, the findings advise against attributing aggressive behavior solely to violent or extreme music genres. Instead, the social and evaluative contexts in which music is experienced may play a decisive role in influencing behavioral outcomes.

Conclusion

This study investigated the impact of death metal music and social comparison information on aggressive tendencies using the Point Subtraction Aggression Paradigm. The findings from two experiments were inconsistent regarding whether death metal music increases aggression compared to classical music, or whether upward or downward social comparison influences behavioral responses. Experiment I revealed that aggressive tendencies depended on the combination of music and

feedback, whereas Experiment II found no significant effects. The research contributes to the field by using a behavioral paradigm rather than self-reports, employing random music exposure rather than selecting participants based on musical preference, and extending the research beyond Western contexts. The findings underline the multifaceted relationship between musical exposure, social comparison, and aggression. The results suggest that contextual factors, individual differences, and arousal-appraisal processes may influence whether music provokes aggression. These studies lay the groundwork for future research aimed at refining theoretical models and testing them across diverse populations.

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Appendix A

Pilot Study Results

A preliminary pretest was conducted involving 44 undergraduate students to assess the affective responses elicited by two musical excerpts, death metal and classical music. The death metal stimulus selected for the main study was *Of Dull Eyes Borne* by Psycroptic. This piece was chosen because it incorporates the core stylistic features of the genre, including fast tempo (approximately 180–220 BPM), low melodic structure, heavy distortion, and growl vocals, all of which are associated with heightened physiological arousal and potential influence on aggressive responding. The lyrical content is largely unintelligible due to the vocal style, and, given that the participants were non-Western young adults, the semantic meaning of the lyrics was unlikely to affect their responses, making the track a suitable exemplar of death metal. The classical stimulus was Erik Satie's *Vexations*, chosen for its slow tempo (approximately 40–60 BPM) and repetitive, low-arousal structure, which served as a suitable control condition.

The participants evaluated each excerpt across eight dimensions: liking, happiness, anger, distress, relaxation, energy, sadness, and perceived quality. Independent samples *t*-tests were conducted for each dimension. In instances where Levene's test indicated heterogeneity of variance, the Welch-corrected results were reported.

As shown in Table A1, death metal elicited significantly greater anger and energy, whereas the classical excerpt elicited greater relaxation, sadness, and perceived quality. No significant group differences were observed in terms of liking, happiness, or distress. These results supported the selection of the two pieces for the main experiments, as they produced distinct emotional profiles, particularly relevant to arousal and aggression.

Table A1 *Independent samples t-test results comparing classical (control) and death metal excerpts across affective ratings*

	Classical	Death metal	*t*(df)	*p*	Mean Diff	95% CI (LL–UL)	Cohen's *d*
Liking	3.02 (1.87)	2.51 (1.87)	1.27(84)	.208	0.51	-0.29, 1.31	0.27
Happiness	2.51 (1.72)	2.28 (1.74)	0.62(84)	.535	0.23	-0.51, 0.97	0.13
Anger	1.56 (1.39)	3.63 (2.29)	-5.07(69.1)	<.001	-2.07	-2.88, -1.26	1.09
Distress	4.07 (2.28)	4.74 (2.35)	-1.35(84)	.181	-0.67	-1.67, 0.32	0.28
Relaxation	3.12 (1.85)	1.93 (1.70)	3.10(84)	.003	1.19	0.42, 1.95	0.67
Energy	1.53 (1.22)	3.49 (2.28)	-4.95(64.2)	<.001	-1.95	-2.74, -1.16	1.07
Sadness	3.09 (2.00)	1.65 (1.51)	3.78(78.2)	<.001	1.44	0.68, 2.20	0.81
Quality	3.65 (1.78)	2.79 (1.93)	2.14(84)	.035	0.86	0.06, 1.66	0.46

Note. Values are presented as mean (standard deviation). Positive mean differences indicated higher scores for the control (classical) excerpt. Cohen's *d* values were computed using pooled *SD*s.