An investigation of empathy in male and female fans of aggressive music

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Abstract
Concerns have been raised that persistent exposure to violent media can lead to negative outcomes such as reduced empathy for the plight of others. The present study investigated whether fans of aggressive heavy or death metal music show reduced empathic reactions to aggression, relative to fans of non-aggressive music. 108 participants who self-identified as fans of heavy or death metal, classical or jazz music ($n=36$ per group) were presented with vignettes that described a primary character's reaction (the 'aggressor') in response to a secondary character's irritating action (the 'instigator'). The aggressor's reaction was either non-aggressive, mildly aggressive or strongly aggressive. After each vignette, participants provided ratings of state empathic concern (other-oriented empathy) and personal distress (self-oriented distress). They also completed measures of trait empathy, passion for music and its psychosocial functions. Fans of heavy or death metal exhibited lower trait empathic concern compared with classical and jazz fans. However, only male heavy or death metal fans exhibited lower state empathic concern than male classical and jazz fans. Finally, social bonding was a stronger motivation for heavy or death metal fans to listen to music than for classical fans. Results are discussed in light of research and public concern regarding the effects of long-term exposure to media violence.

Keywords
Empathy, music, preference, aggression, violent media

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Introduction

On July 16, 1990, members of the heavy metal band Judas Priest entered a Nevada court room facing charges that their music had driven two young fans to suicide. The boys had been listening to Judas Priest on December 23, 1985, shortly before their decision to shoot themselves with a 12-gauge shotgun in a church playground. Raymond Belknap died instantly whereas James Vance survived, only to die three years later of a methadone overdose. According to Vance in a letter he wrote to Belknap's mother, they had become mesmerized by the heavy metal music. Nonetheless, on August 24, 1990, the district court dismissed the case (Fontenot & Harriss, 2010).

Such lawsuits reflect an abiding concern that aggressive and violent media exposure can have negative psychosocial consequences, and imply the need for research on the impact of aggressive music on listeners. In order to examine such effects, it is important to operationally define aggression and violence, and to outline the conditions under which music can be said to exhibit aggression and violence. Aggression is any behavior that aims to cause harm to another person who wishes to avoid being harmed (Anderson & Bushman, 2002). Violence is an instance of aggression where the intended harm is more extreme, such as death (Anderson & Huesmann, 2003). Therefore, not all aggression is violence, but violence is always a kind of aggression (Anderson & Bushman, 2002).

Heavy metal music tends to sound aggressive because of its loud, low-pitched, distorted, and often fast percussive sounds that are combined with harsh, guttural vocals that involve growling, screaming, and shouting (Berger & Fales, 2005; Bogue, 2016; Mynett, 2016; Tsai et al., 2010). Death metal is a subgenre of heavy metal music that is often characterized by violent lyrical themes including, but not limited to, torture, mutilation, dismemberment, sexual assault, murder, and Satanism (Bogue, 2016; Warburton, Roberts, & Christensen, 2014). Death metal attracts a large worldwide community of committed fans with its combination of aggressive-sounding music and unambiguously violent lyrics. The popular American death metal band *Cannibal Corpse*, for example, has released multiple albums in the top 40 American Billboard charts with song titles such as 'Relentless Beating', 'Hacksaw Decapitation', 'Necropedophile', and 'She Was Asking for It'. They have sold well over 2 million albums to date (Blabbermouth.net, 2017).

Research has suggested both positive and negative consequences of listening to aggressive and violent music. On the one hand, aggressive music with violent themes may have beneficial effects for fans, such as helping them process negative emotions (Sharman & Dingle, 2015) through experiences of empowerment, joy, and peacefulness (Thompson, Geeves, & Olsen, 2019) – consequences that fans report as important motivations for listening to aggressive music (see also Arnett, 1991). On the other hand, listening to music with violent lyrics can increase aggressive thoughts and feelings in non-fans of the genre, relative to a song by the same band but with non-violent lyrics (Anderson, Carnagey, & Eubanks, 2003). Additionally, listening to aggressive lyrics has been associated with increases in aggressive behavior and decreases in prosocial behavior (Coyne & Padilla-Walker, 2015).

The General Aggression Model (GAM; Anderson & Bushman, 2002, 2018) and the General Learning Model (GLM; Buckley & Anderson, 2006) have been used extensively to predict and explain the effects of exposure to non-musical aggressive and violent media (e.g., violent video games, films, and television shows). The GLM is an extension of the GAM that helps explain how media (violent or non-violent) can have both positive and negative effects on consumers (Buckley & Anderson, 2006). Both models suggest enduring characteristics of a person (e.g., personality, gender, beliefs) and situational factors (e.g., violent media exposure) can influence

a person's cognition, affect, and arousal. Violent media exposure can make aggressive thoughts more accessible, increase negative affect such as anger, and may also increase arousal, thus making an aggressive action more likely (Anderson & Bushman, 2002).

The GAM and the GLM predict desensitized empathic reactions to aggression after repeated exposure to aggressive stimuli (Anderson & Bushman, 2002, 2018; Buckley & Anderson, 2006; Carnagey, Anderson, & Bushman, 2007). For instance, studies have found that players with greater exposure to violent video games showed reduced empathy and desensitized responses to depictions of aggression and violence such as assault and murder (Anderson et al., 2010; Bartholow, Bushman, & Sestir, 2006; Carnagey et al., 2007). Additionally, greater exposure to violent media, including video games, television shows, and films, has been shown to predict lower trait empathy in German adolescents (Krahé & Möller, 2010). Finally, it has been suggested that exposure to violent media may result in desensitization to violent situations, and possibly reduced empathy for victims of violence (Anderson & Bushman, 2018; Carnagey et al., 2007). Such speculations imply that individuals who continuously engage with aggressive or violent music may be somewhat less empathic in real-life settings, either because of pre-existing traits or as a direct consequence of long-term exposure to such music.

However, it is important to note that there is some contention in the violent media literature regarding the prevalence of negative outcomes. For instance, some studies have argued that violent media has a negligible effect on real-world aggressive outcomes outside of the laboratory, while others have reported no significant links between violent media exposure and negative outcomes (e.g., Ferguson, 2015; Ferguson & Kilburn, 2009; Unsworth, Devilly, & Ward, 2007). There is also ongoing debate regarding biased publication of studies with significant effects and strong effect sizes, at the expense of publishing non-significant findings (see Ferguson, 2015; Ferguson & Kilburn, 2009; Prescott, Sargent, & Hull, 2018).

The present study was designed to investigate heavy and death metal music fans' empathic responses to a range of aggressive scenarios described in vignettes. When measuring empathy, it is important to consider that an individual may share an emotional reaction that 'matches' the emotion of an observed other, an experience referred to as emotional empathy (Eisenberg, 2000). Alternatively, an individual can perceive or understand the other person's internal state without sharing the emotion (i.e., cognitive empathy), or experience a divergent emotional response such as anger or *schadenfreude* (Eisenberg, 2000; Eisenberg, Wentzel, & Harris, 1998). In other words, not all emotional responses elicited by the observed experiences or states of others count as empathy; empathy necessarily involves some degree of emotion sharing (Eisenberg, 2000). Empathy may be evaluated either as a transient psychological response to a specific circumstance, called 'state empathy', or as a long-term predisposition to respond empathically to a range of potential circumstances, called 'trait empathy'. State empathy is the situational experience of an empathic emotional reaction at a certain point in time (Nezlek, Feist, Wilson, & Plesko, 2001). Trait empathy is the dispositional tendency of a person to experience an empathic emotional response and is typically cross-situational (Nezlek et al., 2001; Pavey, Greitemeyer, & Sparks, 2012).

It has been argued that both state and trait empathy are strongly associated with emotional experiences such as empathic concern and personal distress (Eisenberg et al., 1998). Empathic concern and personal distress are typically measured using self-report and can be assessed at both a state and trait level. Empathic concern is considered an 'other-oriented' emotion that is associated with altruism and helping behavior; it is an emotional response to the distress of an unfortunate other where emotions such as sympathy, concern, and compassion are felt for the other person (Batson, Early, & Salvarani, 1997). Personal distress is a 'self-oriented' emotional response which refers to aversive personal experiences of discomfort in response to another

person's difficult situation; it is considered to motivate egotistical behavior to relieve one's own discomfort (Batson et al., 1997).

Although it is not yet known whether empathic responses to aggression differ between fans of aggressive and non-aggressive music genres, there is a substantial literature on the connection between empathy and music more generally. In one investigation, participants who listened to prosocial music reported a greater state empathic response to distressed others, in comparison with participants who listened to neutral music (Greitemeyer, 2009). This raises the question of whether exposure to aggressive music would have the opposite effect and desensitize fans to the plight of others, thus decreasing empathy. Clark and Giacomantonio (2013) examined whether different music preferences were associated with differences in trait empathic concern. They found no evidence that music preference was related to significant differences in trait empathy. However, preferences for heavy metal were combined with preferences for rock and alternative music, potentially masking differences in empathy among fans of these three genres.

In another investigation, a preference for more 'intense' (aggressive-sounding, distorted, and loud) music was negatively related to trait empathy, whereas more 'mellow' (slow and relaxing) music was positively related to levels of trait empathy (Greenberg, Baron-Cohen, Stillwell, Kosinski, & Rentfrow, 2015). Thompson et al. (2019) compared levels of trait empathy between fans of violent heavy or death metal music and non-fans and found no significant differences in trait tendencies for empathic concern or personal distress. However, fans and non-fans were not matched in their level of engagement with and preference for music in general. It is not yet known how the trait empathic tendencies of aggressive music fans such as heavy or death metal compare with fans of other music genres and whether their state empathic responses to aggression are similar.

Therefore, the present study aimed to test abiding public concerns that fans of aggressive music lack empathy and whether theories and research on aggressive and violent media exposure hold true for aggressive music. The study examined whether differences exist between fans and non-fans of heavy or death metal music in trait empathic concern and personal distress. The non-fans of heavy or death metal in this study were still avid fans of music: specifically, classical or jazz. These control genres were selected because jazz and classical music have a strong following by fans who are passionate about these genres of music, just as fans of heavy or death metal music are passionate about their preferred music. Jazz, classical, and metal music also have distinct aesthetic qualities such that there is relatively little overlap among fans of the three genres.

State empathic concern and personal distress were measured in response to descriptions of three levels of aggressive behaviors in regular day-to-day contexts, presented to participants using 18 written vignettes. We also investigated whether fans and non-fans report differences in the role that music plays in their lives by asking participants to rate the importance of their respective favored music genres for various functions such as affirming identity and regulating emotion.

Method

Participants

One hundred and eleven Macquarie University students were recruited for the investigation. Sixteen received course credit for their first-year psychology course, 88 received credit for their second-year cognitive psychology course, and seven students were paid AUD$15 for their participation. Three participants were excluded from analyses as they did not understand the

requirements of the study. The remaining 108 participants (mean age = 21.43, *SD* = 4.97; 72 females, 36 males) comprised three groups of 36 fans of heavy or death metal (mean age = 23.28, *SD* = 7.72; 19 females, 17 males), classical (mean age = 20.56, *SD* = 2.06; 28 females, 8 males), and jazz (mean age = 20.44, *SD* = 2.51; 25 females, 11 males). Participants self-identified as fans of these genres when they signed up for the study, which was confirmed verbally upon arrival at the experimental session and by checking that they nominated their respective genre as one of their top three preferred genres. Heavy metal and death metal both met our criteria for aggressive music. Classical and jazz music fans were included to enable a comparison of fans of aggressive music with non-fans who are nonetheless fans of another music genre. This recruitment strategy ensured that all participants were music lovers, and only differed from each other in the genre of music they most enjoyed. The study was approved by the Macquarie University Human Research Ethics Committee (reference number: 5201700152).

Measures and Materials

The study was conducted using the survey software Qualtrics on a desktop computer. The following measures were administered.

Music function questionnaire. A music function questionnaire was used to assess participants' preference for their respective genre and its role in their lives (Schäfer & Sedlmeier, 2009; Schäfer, Tipandjan, & Sedlmeier, 2012). Participants rated on a Likert scale from 1 (I do not agree at all) to 10 (I totally agree) the extent to which they agreed with 16 statements about their preference and use of their respective music genres as: background music, a memory prompt, diversion, emotion regulation, self-regulation, self-reflection, and social bonding.[1] Schäfer et al. (2012) reported this measure to have adequate internal consistency with an Indian sample (α = .58) and good internal consistency with a German sample (α = .82). Good internal consistency was also found in the present study (α = .87).

Passion Scale. The Passion Scale (Vallerand et al., 2003) was used to evaluate whether the fan groups were matched in their level of passion for their respective music genre. While thinking of their particular genre, participants rated their agreement with 17 statements on a scale from 1 (not agree at all) to 7 (very strongly agree). Fans and non-fans of aggressive music did not significantly differ in how passionate they were for their respective music genres, $F(2,105)$ = 1.32, p = .272, η^2_p = .024.[2] Good construct validity has been demonstrated for this measure (Marsh et al., 2013). Previous studies have found good internal consistency of its subscales (harmonious passion: α = .83 to .87; obsessive passion: α = .76 to .82; Carbonneau, Vallerand, Fernet, & Guay, 2008; Vallerand et al., 2008). Good internal consistency for obsessive (α = .79) and harmonious passion (α = .83) was also found in the present study.

Vignettes. A pool of written vignettes was created for the present study, as vignettes are known to be effective triggers of empathic responses (e.g., Funk, Buchman, Jenks, & Bechtoldt, 2003; Negd, Mallan, & Lipp, 2011). An initial pool of 24 vignettes were pilot tested to confirm the final 18 vignettes were matched and to ensure the instigator's action was equally irritating and that the vignettes portrayed three distinct levels of aggression. Six scenarios were devised that described a different situation and set of characters. The scenarios were: (1) supermarket, (2) cinema, (3) bus stop, (4) appointment, (5) gym, (6) parking garage. Each scenario described a primary character's reaction (the 'aggressor') to a secondary character's irritating action (the

'instigator'). There were three variations for each scenario where the aggressor's response was manipulated to be either non-aggressive, mildly aggressive, or strongly aggressive (see online supplemental material for all vignettes). The vignettes had a similar word count, style, and structure. All characters described in the vignettes were male (conveyed through conventionally male names such as 'Geoff' or masculine pronouns such as 'he'). This ensured that the characters' gender did not confound empathic reactions.

Each participant read 6 vignettes that were selected from a pool of 18 (6 scenarios with three aggressive reactions within each scenario). Thirty-six unique combinations of vignettes were generated to ensure that all possible combinations of scenarios and aggressive reactions were represented within each group. Thus, 36 participants were required per group. Two blocks of vignettes were presented in the experiment. In the first block, participants read three vignettes from scenarios 1–3 that included one non-aggressive reaction, one mildly aggressive reaction, and one strongly aggressive reaction, the orders and combinations of which were counterbalanced within each group to distribute any order effects. Similarly, in the second block participants read three vignettes from scenarios 4–6 that included one example of each aggressive reaction. See Appendix for a list of all 36 combinations of scenarios and aggressive reactions used in the experiment.

State empathy questionnaire. A 20-item measure was adapted from Negd et al. (2011) to assess short-term empathic reactions after reading each vignette. The measure consists of two eight-item subscales (state empathic concern and personal distress) and four distractors. Participants rated the extent to which they had experienced a series of emotion adjectives (e.g., 'concerned', 'uneasy', and 'upset') while reading the previous vignette on a scale from 1 (not at all) to 5 (completely). We purposely did not instruct participants to focus on either the instigator or aggressor when making their empathic responses to avoid biasing their perspective when reading the vignettes. State empathy responses were averaged for each subscale and were then averaged across the two blocks for each vignette type. Negd et al. (2011) found good internal consistency for the subscales of empathic concern (α = .89) and personal distress (α = .93). The subscales had adequate to good internal consistency in the present study: empathic concern (α = .75 to .84) and personal distress (α = .84 to .92).

Perspective-taking questions. Participants were asked about the perspective they took when reading each vignette. After each vignette, the characters in the vignette were assigned a letter (e.g., "In this vignette, there was Character A: Geoff, and Character B: the man on his phone"). Character A referred to the aggressor and Character B referred to the instigator. On a scale from 1 (not at all) to 5 (completely), participants rated to what extent they took the perspective of Character A and took the perspective of Character B when making their responses on the state empathy questionnaire.

Interpersonal Reactivity Index. The Interpersonal Reactivity Index (IRI) is a 28-item measure of trait empathy consisting of four subscales: perspective-taking, fantasy, empathic concern, and personal distress (Davis, 1980, 1983). This scale was chosen as it measures more enduring trait empathic tendencies that are relevant to the state empathy variables examined in the present study. Participants were asked to rate how well each item described them on a scale from 0 (does not describe me well) to 4 (describes me very well). Davis (1983) demonstrated that the measure has good construct validity; the subscales had adequate internal consistency for perspective-taking (α = .75–.78), fantasy (α = .75–.78), empathic concern (α = .70–.72), and personal distress (α = .78). All subscales had adequate to good internal consistency in the

present study: fantasy (α = .76), perspective-taking (α = .82), empathic concern (α = .81), and personal distress (α = .82).

Procedure

All participants self-identified as either fans of heavy or death metal, classical or jazz music when they signed up for the study. These self-identifications were verbally confirmed when the participants arrived for the experimental session. Participants were not told that empathy would be assessed, and hence it is unlikely that they altered their responses on the empathy scales to be more socially desirable. Instead, they were told that emotional responses to real-life scenarios would be examined.

After participants provided written and informed consent, they completed the music function questionnaire and the Passion Scale with their respective genre in mind. Next, participants began the first block of three vignettes. Vignettes were presented one at a time. After reading each vignette, participants rated their emotional response to the vignette, which in fact was the state empathy questionnaire. They then answered the perspective-taking questions before moving onto the next vignette. After participants completed the first block, they were given a demographic questionnaire. This also functioned to help reduce fatigue by engaging in a different task. Once the demographic questionnaire was completed, participants commenced the second block of three vignettes. Lastly, participants completed the IRI.

At the completion of the study, participants were provided with a verbal and written explanation of the true purpose of the study and were given an opportunity to ask questions and withdraw their consent for their data to be used further in the study. All participants provided written and informed consent for their data to be used after being debriefed. The study took approximately 20 minutes to complete.

Statistical Approach

To assess differences in trait empathy between the three fan groups, separate 3 x 2 between-subjects ANOVAs were conducted with each of the four IRI subscales as dependent variables and fan group (heavy or death metal, classical, jazz) and sex as between-subject factors. Sex was included in the model as previous research investigating trait empathic responses of fans of heavy or death metal music has reported significant differences between males and females (Thompson et al., 2018). To assess short-term state empathic reactions, two 3 x 3 x 2 mixed ANOVAs (vignette type x fan group x sex) were conducted: one with state empathic concern and one with state personal distress as the dependent variable.[3]

Prior to statistical analyses, the assumptions of all statistical tests were investigated and data were screened for outliers. Alpha was set at .05. To follow up significant main effects, all pairwise comparisons were examined with post-hoc tests in SPSS using the Bonferroni-correction option that applies the relevant correction to alpha while retaining a critical significance value of .05. Therefore, the significance of pairwise comparisons can be interpreted against a Bonferroni-adjusted alpha of .05.

The distribution of some trait empathy scores were significantly non-normal for some of the fan groups. Therefore, these variables were bootstrapped following procedures outlined by Field (2013) using 2000 samples. The bias-corrected and accelerated bootstrap method was conducted as it is considered more accurate than the alternative percentile method (Efron & Tibshirani, 1993). Furthermore, some state empathy scores did not meet the assumption of

normality. As bootstrapping is not an option for repeated-measures factors (Field, 2013), each of the state empathic concern and personal distress scores for the non-aggressive, mildly aggressive, and strongly aggressive vignettes were log transformed. Considering that the violated assumption of normality seemed to be largely driven by positive skew and a leptokurtic distribution of the non-normal state empathy scores, a log transformation was deemed most appropriate (Field, 2013). Analyses were conducted on the log transformed data; however, raw scores are used in figures for ease of interpretation.

Results

Trait Empathic Concern and Personal Distress

As seen in Tables 1 and 2, there was a significant main effect of fan group for trait empathic concern, but not personal distress. Fans of heavy or death metal music had a significantly lower trait tendency to experience empathic concern for the plight of others relative to classical fans, $p = .032$, 95% CI [−5.22, −.17], and jazz fans, $p = .006$, 95% CI [−5.83, −.78]. There was no significant difference in empathic concern between classical and jazz fans, $p = 0.999$, 95% CI [−3.14, 1.91]. Fans of heavy or death metal, classical, and jazz music reported similar trait tendencies to take the perspectives of fictional characters, to take the perspective of others, and to feel self-oriented distress in response to witnessing another person in difficult circumstances. Furthermore, female participants reported significantly higher levels of trait fantasy, empathic concern, and personal distress compared with male participants, regardless of their fan group (see Table 2).

State Empathic Concern and Personal Distress

As can be seen in Table 3, there were no significant differences in state empathic concern or personal distress responses between the three fan groups. However, there was a significant interaction between fan group and sex for both state empathic concern and personal distress. As can be seen in Figure 1, male heavy or death metal fans reported significantly lower state empathic concern, regardless of the level of aggression described in the vignettes, relative to male fans of both classical, $p = .011$, 95% CI [−.26, −.03] and jazz music, $p = .034$, 95% CI [−.21, −.01]. There were no significant differences in state empathic concern between female heavy or death metal fans and classical, $p = .999$, 95% CI [−.07, .09], or jazz music fans, $p = .999$, 95% CI [−.05, .11]. There were also no significant differences in state empathic concern between male fans of classical and jazz, $p = .999$, 95% CI [−.09, .16], or between female classical and jazz fans, $p = .999$, 95% CI [−.06, .09].

Table 1. Group Mean Trait Empathy Responses from the Interpersonal Reactivity Index.

IRI Subscale	Fan Group			Sex	
	Metal	Classical	Jazz	Males	Females
Fantasy	19.50 (4.39)	21.39 (5.41)	20.00 (4.68)	17.81 (4.42)	21.54 (4.62)
Perspective-Taking	17.92 (4.61)	18.47 (5.09)	19.39 (5.58)	19.17 (3.80)	18.31 (5.64)
Personal Distress	11.28 (6.18)	12.78 (5.33)	10.67 (4.64)	8.72 (4.86)	13.00 (5.18)
Empathic Concern	18.61 (5.22)	21.31 (3.60)	21.92 (4.82)	18.19 (4.82)	21.82 (4.31)

Note. Standard deviations are reported in parentheses.

Table 2. ANOVA Results for Trait Empathy Responses from the Interpersonal Reactivity Index.

IRI Subscale	Condition	F	p	η^2_p
Fantasy				
	Fan Group	.27	.765	.005
	Sex	15.65	**< .001**	.133
	Interaction	1.72	.185	.033
Perspective-Taking				
	Fan Group	.75	.476	.014
	Sex	1.22	.273	.012
	Interaction	1.18	.313	.023
Personal Distress				
	Fan Group	.30	.745	.006
	Sex	16.07	**< .001**	.136
	Interaction	1.29	.281	.025
Empathic Concern				
	Fan Group	3.45	**.036**	.063
	Sex	11.14	**.001**	.098
	Interaction	.35	.708	.007

Note. Significant effects are highlighted in bold. df = 2,102 (Fan Group, Interaction); 1,102 (Sex).

Table 3. ANOVA Results for State Empathy Measures.

State Empathy Subscales	F	p	η^2_p
State Empathic Concern			
Fan Group	2.73	.070	.051
Sex	.55	.458	.005
Vignette Type	17.11	**< .001**	.144
Fan Group * Sex	4.71	**.011**	.085
Fan Group * Vignette Type	1.92	.109	.036
Sex * Vignette Type	.29	.746	.003
Fan Group * Sex * Vignette Type	.36	.839	.007
State Personal Distress			
Fan Group	1.40	.251	.027
Sex	.02	.903	.000
Vignette Type	105.67	**< .001**	.509
Fan Group * Sex	4.23	**.017**	.077
Fan Group * Vignette Type	.65	.601	.013
Sex * Vignette Type	.06	.917	.001
Fan Group * Sex * Vignette Type	.16	.936	.003

Note. Significant effects are highlighted in bold. df = 2,102 (Fan Group, Fan Group * Sex); 1,102 (Sex), 2,204 (Vignette Type, Sex * Vignette Type); 4,204 (Fan Group * Vignette Type, Fan Group * Sex * Vignette Type).

Female heavy or death metal fans reported significantly greater state personal distress when compared with female jazz fans, $p = .050$, 95% CI [.00, .19]. There were no significant differences in state personal distress between female heavy or death metal and female classical fans, $p = .999$, 95% CI [–.06, .13], or female classical and female jazz fans, $p = .295$, 95% CI [–.03, .14]. There were no significant differences in state personal distress between male heavy or
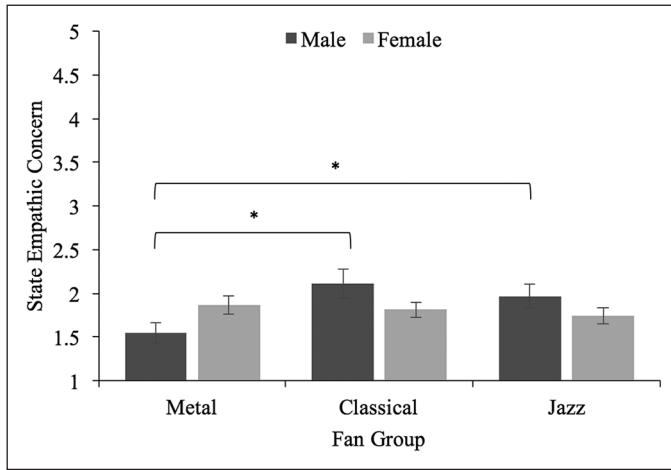
Figure 1. Mean state empathic concern score (from 1–5) for males and females in each of the fan groups. Error bars represent standard error of the mean. * *p* < .05.
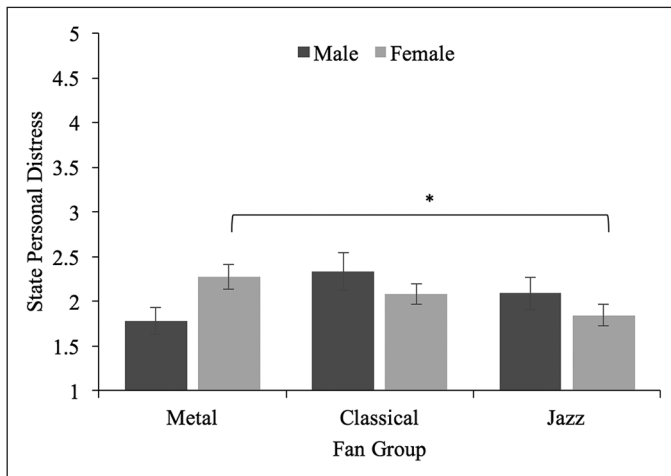

Figure 2. Mean state personal distress score (from 1–5) for males and females in each of the fan groups. Error bars represent standard error of the mean. * *p* < .05.

death metal and male classical fans, *p* = .091, 95% CI [−.25, .01], male heavy or death metal and male jazz fans, *p* = .533, 95% CI [−.18, .05], or male classical and male jazz fans, *p* = .999, 95% CI [−.09, .19]; see Figure 2.

The magnitude of state empathic concern also differed based on the level of aggressive behavior described in the vignettes, regardless of fan group and sex. As can be seen in Figure 3, state empathic concern was significantly greater in the non-aggressive compared with the mildly aggressive vignettes, *p* < .001, 95% CI [.02, .07]. There was significantly greater empathic concern in the strongly aggressive compared with the mildly aggressive vignettes, *p* < .001, 95% CI [.03, .08]. There was no significant difference between the non-aggressive and strongly aggressive vignettes, *p* = .796, 95% CI [−.04, .01].
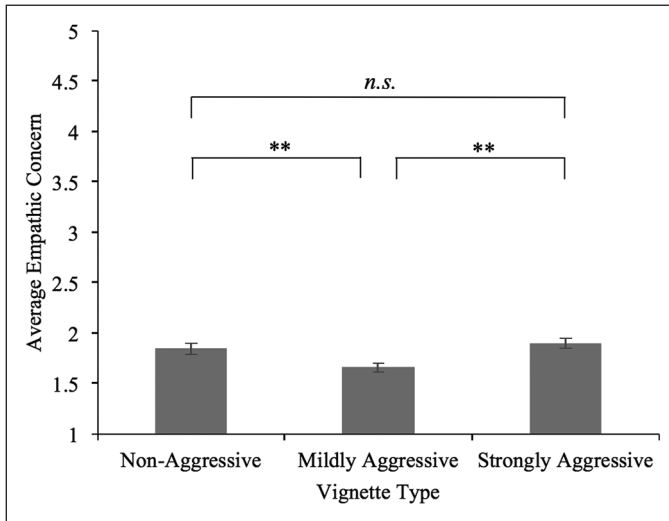
Figure 3. Mean empathic concern score (from 1–5) for each of the vignette types, collapsed across fan status and gender. Error bars represent the standard error of the mean. ** $p < .001$.
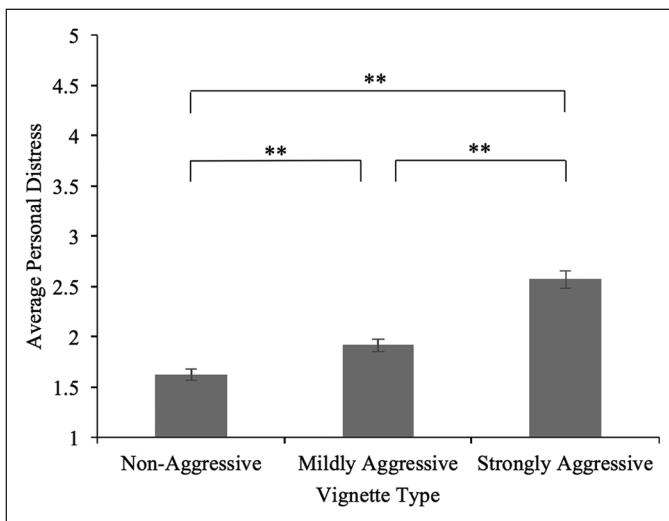
Figure 4. Mean personal distress score (from 1–5) for each of the vignette types, collapsed across fan status and gender. Error bars represent the standard error of the mean. ** $p < .001$.

The magnitude of state personal distress also differed based on the level of aggressive behavior described in the vignettes, regardless of fan group and sex. As can be seen in Figure 4, there was significantly greater personal distress in response to the mildly aggressive vignettes compared with the non-aggressive vignettes, $p < .001$, 95% CI [−.11, −.05]. There was significantly greater personal distress in response to the strongly aggressive vignettes compared with the mildly aggressive vignettes, $p < .001$, 95% CI [.10, .15]. Participants also reported significantly

Table 4. Group Mean Perspective-Taking Difference Scores.

	Metal Fans		Classical Fans		Jazz Fans	
	Males	Females	Males	Females	Males	Females
Non-Aggressive	2.15 (1.03)	2.37 (1.36)	2.63 (.88)	2.04 (.95)	2.00 (1.05)	2.52 (1.09)
Mildly Aggressive	.53 (1.28)	1.71 (1.57)	1.44 (1.32)	.95 (1.13)	1.14 (.84)	1.18 (1.12)
Strongly Aggressive	.26 (1.50)	−.24 (1.46)	−.38 (1.64)	−.50 (1.50)	−.18 (.84)	−.96 (1.23)

Note. Standard deviations are reported in parentheses. Positive difference scores indicate participants took the perspective of the aggressor; negative difference scores indicate participants took the perspective of the instigator. The scale ranged from −4 to +4.

greater personal distress in response to the strongly aggressive vignettes compared with the non-aggressive vignettes, $p < .001$, 95% CI [.16, .24].

Perspective-Taking of the Aggressor

As we did not tell participants whose perspective they should take when reading each vignette (i.e., the perspective of the instigator or the aggressor), we were interested in how they interpreted the situations in each vignette. Difference scores were calculated so that positive scores indicate that participants took the aggressor's perspective to a greater extent and negative scores indicate that participants took the instigator's perspective to a greater extent. In the non-aggressive vignettes, there were no significant differences in perspective-taking between fans of heavy or death metal music and non-fans, $F(2,102) = .04$, $p = .916$, $\eta^2_p = .001$, or between males and females, $F(1,102) = .05$, $p = .826$, $\eta^2_p < .001$. There was also no significant interaction between fan group and sex, $F(2,102) = 1.89$, $p = .157$, $\eta^2_p = .036$. As can be seen in Table 4, regardless of fan group or sex, participants generally took the aggressor's perspective to a greater extent than the instigator's perspective in the non-aggressive vignette (denoted by positive difference scores).

For the mildly aggressive vignettes, there were also no significant differences in perspective-taking between the fans and non-fans, $F(2,102) = .03$, $p = .975$, $\eta^2_p = .001$, or between males and females, $F(1,102) = .88$, $p = .350$, $\eta^2_p = .009$. However, there was a significant interaction between fan group and sex, $F(2,102) = 3.74$, $p = .027$, $\eta^2_p = .068$. Female heavy or death metal fans took the perspective of the aggressor to a greater extent than male heavy or death metal fans, $p = .005$, 95% CI [−2.00, −.37]. There were no significant differences in perspective-taking between males and females in the classical fan group, $p = .322$, 95% CI [−.49, 1.47], or the jazz fan group, $p = .922$, 95% CI [−.93, .84].

In the strongly aggressive vignettes, there were no significant differences in perspective-taking between fans and non-fans, $F(2,102) = 1.62$, $p = .204$, $\eta^2_p = .031$, or between males and females, $F(1,102) = 2.53$, $p = .115$, $\eta^2_p = .024$. There was also no significant interaction between fan group and sex, $F(2,102) = .38$, $p = .686$, $\eta^2_p = .007$. Nevertheless, it is important to note that participants, regardless of their fan group or sex, began to take the instigator's perspective to a greater extent than the aggressor as the aggressor's behavior became increasingly aggressive (denoted by negative rather than positive difference scores).

Functions of Music for Fans and Non-Fans of Aggressive Music

Regardless of sex, music functions to strengthen social bonds to a significantly greater extent for heavy or death metal fans relative to classical music fans, $p = .018$, 95% CI [.14, 1.96], but

Table 5. Group Means for the Music Function Subscales.

Music Function Subscale	Fan Group			Sex	
	Metal Fans	Classical Fans	Jazz Fans	Males	Females
Social Bonding	7.13 (1.69)	6.08 (1.48)	6.89 (1.66)	6.31 (1.46)	6.90 (1.73)
Background	7.11 (2.41)	8.69 (1.41)	8.28 (1.83)	7.36 (2.30)	8.36 (1.80)
Memory Prompt	7.58 (2.21)	7.81 (1.85)	8.44 (1.56)	7.06 (2.27)	8.39 (1.53)
Diversion	7.25 (1.63)	7.01 (1.35)	7.56 (1.54)	6.50 (1.20)	7.66 (1.51)
Emotion Regulation	8.32 (1.38)	7.88 (1.45)	8.63 (1.08)	8.03 (1.34)	8.40 (1.33)
Self-Regulation	7.58 (1.48)	7.70 (1.09)	7.88 (1.18)	7.35 (1.23)	7.91 (1.24)
Self-Reflection	7.52 (1.48)	7.16 (1.15)	7.41 (1.35)	6.85 (1.29)	7.62 (1.29)
Music Preference	7.29 (1.64)	6.30 (1.51)	6.97 (1.56)	6.47 (1.54)	7.04 (1.62)

Note. Standard deviations are reported in parentheses.

not when compared with jazz music fans, $p = .999$, 95% CI [$-.67$, 1.15]. Fans of classical music ($p = .002$, 95% CI [-2.51, $-.66$]) and jazz music ($p = .033$, 95% CI [-2.13, $-.26$]) also reported that they enjoy listening to their respective genres as background music significantly more than heavy or death metal fans (see Tables 5 and 6). Regardless of sex, heavy or death metal fans also reported a significantly greater preference for their genre compared with fans of classical music, $p = .023$, 95% CI [.11, 1.88]. There was no significant difference in preference between fans of heavy or death metal and jazz, $p = .999$, 95% CI [$-.57$, 1.21], or between fans of classical and jazz, $p = .204$, 95% CI [-1.56, .21]. There were no significant differences between heavy or death metal, classical, and jazz music fans in terms of using their respective genres as a memory prompt, for emotion regulation, self-regulation, or self-reflection. Finally, regardless of music genre, females reported a greater preference for music than males and music was more important to them for social bonding compared with males. Females also reported that they use music relatively more than males as a memory prompt, a means of diversion, for self-regulation, and self-reflection.

Discussion

The primary aim of this investigation was to compare three groups of music fans on levels of trait empathy and state empathic reactions to descriptions of aggression. Consistent with research findings on other forms of violent media such as video games, fans of aggressive music with violent themes (e.g., heavy or death metal) reported a lower trait tendency for empathic concern compared with non-fans of aggressive music, yet fans and non-fans reported similar levels of trait personal distress. When compared with male fans of classical and jazz music, male fans of heavy or death metal music reported lower state empathic concern and personal distress in response to descriptions of aggressive behavior. There were no significant differences in state empathic concern and personal distress between female fans of heavy or death metal, classical, and jazz.

Trait Empathic Concern and Personal Distress

Fans of heavy or death metal music reported significantly lower trait tendencies for empathic concern than classical and jazz fans, irrespective of sex. Trait empathic concern was measured

Table 6. ANOVA Results for the Music Function Subscales.

Music Function Subscale	Condition	F	p	η^2_p
Social Bonding				
	Fan Group	3.59	**.031**	.066
	Sex	5.32	**.023**	.050
	Interaction	.42	.658	.008
Background				
	Fan Group	3.94	**.023**	.072
	Sex	3.75	.056	.035
	Interaction	.82	.445	.016
Memory Prompt				
	Fan Group	2.29	.107	.043
	Sex	13.08	$<$ **.001**	.114
	Interaction	.604	.549	.012
Diversion				
	Fan Group	1.00	.371	.019
	Sex	16.99	$<$ **.001**	.143
	Interaction	.41	.663	.008
Emotion Regulation				
	Fan Group	1.15	.322	.022
	Sex	1.84	.178	.018
	Interaction	2.03	.136	.038
Self-Regulation				
	Fan Group	.186	.830	.004
	Sex	3.93	**.050**	.037
	Interaction	.23	.798	.004
Self-Reflection				
	Fan Group	1.13	.326	.022
	Sex	15.98	**.002**	.089
	Interaction	1.93	.151	.036
Music Preference				
	Fan Group	3.27	**.042**	.060
	Sex	5.31	**.023**	.049
	Interaction	.59	.555	.011

Note. Significant effects are highlighted in bold.

with the IRI and refers to one's tendency to feel other-oriented concern in response to the plight of others. This finding is consistent with the predictions of the GAM and GLM, both of which predict that long-term exposure to media with aggressive or violent themes, including music, should desensitize individuals' empathic responses to aggressive and violent scenarios (Anderson & Bushman, 2002, 2018; Buckley & Anderson, 2006; Carnagey et al., 2007). However, this finding contrasts with the results of previous studies that used the same measure of trait empathy, but report no differences in trait empathic concern between fans and non-fans of violent heavy or death metal music (Thompson et al., 2019) or between violent video game players and controls with no violent video game exposure (Szycik, Mohammadi, Münte, & te Wildt, 2017). It is important to note that the control or comparison groups used in Szycik et al. (2017) and Thompson et al. (2019) differed from the carefully chosen between-group controls

implemented in the current investigation. Szycik et al. (2017) excluded participants from their control group who played video games daily. Similarly, Thompson et al. (2019) used a control group of participants who themselves identified as non-fans of violent heavy or death metal music. This group likely included individuals who were not passionate about *any* genre of music. In the present study, the classical and jazz fan groups functioned as control groups that were equally passionate about music when compared with fans of heavy or death metal, but merely directed their passion to different genres of music.

There were no significant differences in trait personal distress between fans and non-fans of heavy or death metal music. Trait personal distress was also measured with the IRI and refers to one's tendency to feel self-focused distress in response to the plight of others. This finding, unlike that relating to empathic concern, does not align with theories of desensitization that predict a reduction of anxiety and fear in response to aggression and violence after repeated exposure to media with aggressive and violent themes (Carnagey et al., 2007); for example, those commonly found in heavy or death metal music. Indeed, the GAM and GLM predict that repeated exposure to violent media should result in long-term changes to the individual (Anderson & Bushman, 2002, 2018; Buckley & Anderson, 2006). In the context of the present study, these models predict that fans of aggressive music should have reduced trait tendencies to feel distressed or anxious in response to witnessing the plight of an unfortunate other. This was not the case. Nevertheless, the finding was consistent with other research on violent music fans (Thompson et al., 2019) and violent video gamers (Szycik et al., 2017); research that did not observe differences in trait personal distress between those who engage with violent media and those who do not.

Overall, these findings suggest that when compared with fans of classical and jazz music, fans of aggressive music have a similar trait tendency to feel self-focused distress in response to the plight of others, but a lower trait tendency to feel other-oriented concern in response to witnessing others in distressing circumstances. As causality cannot be inferred from correlational data, a number of interpretations are plausible. First, it is entirely possible that fans of aggressive and violent heavy or death metal have similar levels of trait empathic concern as the general population, but fans of classical and jazz may have comparatively high empathic tendencies (see also Thompson et al., 2019). Second, somewhat reduced trait empathic concern could be an outcome of repeated exposure to aggressive music and/or violent lyrical themes. Third, lower trait empathic concern may be a pre-existing trait associated with people who gravitate towards aggressive and violent genres of music, whereas higher trait empathic concern may be a pre-existing trait associated with people who gravitate towards classical and jazz music. Finally, environmental, social, political, and/or economic factors associated with the metal, classical, and jazz subcultures may nurture differential levels of trait empathic concern in fans of these three genres.

State Empathic Concern and Personal Distress

Regardless of the level of aggression described in the vignettes, male heavy or death metal fans reported significantly lower state empathic concern, relative to male fans of both classical and jazz. While male fans' state empathic concern responses were congruent with predictions from theories of aggressive and violent media, no significant differences were found between levels of state empathic concern reported by female fans of heavy or death metal, classical, or jazz music. The GAM and GLM propose that gender, like other 'person factors' in the model such as beliefs and personality, can influence how people respond to and interpret a situation (Anderson & Bushman, 2002, 2018; Buckley & Anderson, 2006). For instance, the GAM suggests that

males are more likely to engage in physically aggressive behavior, possibly due to socialization or evolutionary differences (Anderson & Bushman, 2002). However, if aggressive music can affect males and females differently, the factors that can account for such differences remain unclear.

It may be that male and female fans of heavy or death metal engage with the music in different ways. Heavy metal is particularly important in the construction of masculine identity (Rafalovich, 2006; Walser, 2014; Weinstein, 2016). One of the ways music is appreciated by male fans is that it allows them to bond with like-minded peers in a subculture that celebrates and preserves traditional masculine attitudes and values (Brown, 2011). It is unclear if female fans undergo a similar process. Indeed, as heavy metal was developed by men to address male-specific anxieties regarding masculinity, and to date is still a largely male-dominated genre, there is a considerable gap in our understanding as to why female fans can be equally passionate about a genre that at times can promote misogyny and violence against women.

Heavy metal and death metal music may appeal to female fans because it gives them a sense of empowerment and allows them to reject mainstream gender stereotypes by enjoying an aggressive style of entertainment typically considered more 'appropriate' for males (Patterson, 2016; Purcell, 2003; Weinstein, 2016). Nevertheless, the lyrics in most death metal songs in particular are dominated by aggression and violence, often told from a male first-person perspective without any notion of femininity; a strategy that has been referred to as "exscription of the feminine" (Walser, 2014, p. 110). Consequently, male fans likely hear the music as an expression of their feelings (Rafalovich, 2006) whereas female fans may interpret the music as an expression of a male 'other'. In instances where female characters are depicted in the music, they are usually portrayed as the victim of male aggression or the 'femme fatale' (Walser, 2014). Therefore, relative to male fans of jazz and classical music in the present study, male fans of heavy or death metal music may have shown desensitized state empathic responses to acts of male aggression because the music they often listen to normalizes male aggression. Female fans of heavy or death metal music, on the other hand, may be more sensitive to the victims of male aggression often depicted in the music. This may explain, in part, why female fans of heavy or death metal music showed similar state empathic responses to acts of male aggression when compared with female fans of jazz and classical music. It is also possible, however, that the observed sex differences in our investigation were somewhat inflated by the use of self-report measures of empathy, which tend to be less evident in physiological or non-verbal behavioral measures (Eisenberg & Lennon, 1983). In particular, demand characteristics and culturally-prescribed gender norms may partly account for sex differences observed from subjective measures of empathy.

Female fans of heavy or death metal reported greater state personal distress compared with female jazz fans, but not female classical fans. There were no significant differences in personal distress between male heavy or death metal, classical, or jazz fans. Similar to trait personal distress, this finding differed from what desensitization theory would predict; specifically, that fans' feelings of anxiety and distress would reduce after repeated exposure to aggression (Carnagey et al., 2007).

Fans' responses did not appear to be influenced by the level of aggression described in the vignettes. Furthermore, participants' empathic responses were generally low, particularly those representing state empathic concern. Perhaps short, written vignettes are not sensitive enough to elicit differences between empathic responses of fans of different kinds of music. Furthermore, participants may have construed the actions of the instigator as passive-aggressive and therefore failed to empathize with either of the two individuals described. Participants may

have shown higher levels of empathic concern for the 'victim' if asked to respond to examples of unprovoked aggression. These issues await further investigation.

Functions of Music for Fans and Non-Fans of Aggressive Music

Heavy or death metal music fans reported that their music strengthens social bonds to a significantly greater extent than for classical music fans. This finding is consistent with past research where fans of heavy metal reported that the genre plays an important part in their social identity and is a way for them to bond with other fans (Guibert & Guibert, 2016; Weinstein, 2000). However, jazz fans reported that jazz music was similarly important in terms of social bonding in comparison with heavy or death metal and classical fans and the role of their respective genres. Perhaps jazz music falls somewhere between metal and jazz in terms of its function for social bonding. Heavy or death metal may be a genre that is enjoyed more in a group, whereas classical may be enjoyed on a relatively more personal level; jazz may be characterized by a mix of both.

Interestingly, there were no significant differences between heavy or death metal fans, jazz fans, and classical fans in terms of the use of their respective genres for self-reflection, self-regulation, or emotion regulation. In line with past research, heavy or death metal music was shown here to be important in identity, emotion regulation, and self-regulation (Arnett, 1991; Gross, 1990; Guibert & Guibert, 2016; Sharman & Dingle, 2015). However, it appears that these are not unique functions of heavy or death metal, as the classical and jazz fans rated these areas as similarly important. Although there were no significant differences between all three fan groups in emotion regulation, there may still be differences in the type of emotion regulated. For example, past research on fans of aggressive and violent music has found that fans tend to use such music to regulate negative emotions and anger in particular (Arnett, 1991; Sharman & Dingle, 2015; Thompson et al., 2019). It is unclear whether fans of other genres use their music to process similar emotions.

Fans of classical and jazz reported that they enjoy listening to their respective genres as background music more than fans of heavy or death metal. Perhaps aggressive music fans are less likely to listen to heavy or death metal as background music because it is a salient stimulus that they tend to engage with on a more visceral and active level, such as using music to increase energy and motivation to complete physical activities (Thompson et al., 2019; Thompson & Olsen, 2018). Indeed, fans of heavy metal music tend to actively engage with the genre by demonstrating commitment to their music through a passionate understanding of the lyrics and themes (Weinstein, 2000) that is perceptually underpinned by enhanced intelligibility of the acoustically noisy growling vocalizations (Olsen, Thompson, & Giblin, 2018).

Implications, Limitations and Future Directions

Fans of the often aggressive and violent heavy or death metal genres exhibited lower trait tendencies for empathic concern relative to fans of classical and jazz music. This finding has important social implications in that empathic concern is an important motivating factor for instigating prosocial behaviors (Batson et al., 1997; Batson, Fultz, & Schoenrade, 1987; Batson & Powell, 2003). As discussed, however, it is not possible to draw causal inferences from the current findings. Fans of classical and jazz music may have higher empathy than individuals who are not passionate about any kind of music, whereas heavy or death metal fans may have levels of empathy that are similar to that of the general population. Indeed, this interpretation is consistent with previous findings that a preference for 'mellow' music is positively related to

trait empathy (Greenberg et al., 2015) and an investigation that observed no significant differences in trait empathy between fans of violent music and a control group with no particular passion for music (Thompson et al., 2019). The latter interpretation contrasts with concerns by some parent groups, politicians, and censorship boards that long-term exposure to aggressive music and/or violent lyrical themes could have negative psychosocial consequences for fans. As it is impractical to conduct a true experiment on the consequences of long-term exposure to, and enjoyment of, heavy or death metal music, it may not be possible to disambiguate these alternative interpretations. Thus, future research will need to focus on accumulating convergent evidence for different hypotheses using a range of experimental and correlational methods.

Additionally, the present study, like other investigations of extreme or death metal music, recruited a relatively small sample of heavy or death metal fans, and compared them with fans of two other music genres. As fans of classical and jazz music share personality traits and preferences (Rentfrow & Gosling, 2003), it would be useful to expand our sampling to fans of other music genres, and communities other than university students in Australia. Future studies could also investigate what differences may exist between male and female fans of aggressive music with violent themes. Indeed, violent music genres such as death metal and also violent rap music often focus on themes of violence against women, yet these genres have many female fans. How female fans process such content and its effect on their psychosocial well-being is a question that awaits further investigation.

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Supplemental material

Supplemental material for this article is available online.

Notes

1. A minor change was made to one of the six music preference items ("I often visit concerts or discos to listen to this music"); 'discos' was changed to 'gigs' as discos are not relevant to any of the genres examined in this study.
2. In addition to overall passion for music, the Passion Scale (Vallerand, et al., 2003) measures the magnitude of positive 'harmonious' passion and negative 'obsessive' passion. There were no significant differences between the three fan groups for harmonious passion, $F(2,105) = 1.60$, $p = .207$, $\eta^2_p = .030$, or for obsessive passion, $F(2,105) = .10$, $p = .904$, $\eta^2_p = .002$.
3. Differences in state empathic concern and personal distress scores between the two blocks of vignettes were also investigated. Most scores had not significantly changed between the two times; however, jazz fans generally had lower state empathic concern in the second block compared with the first. Analyses were run on scores from the first block only; however, this did not change the results. Therefore, the findings reported here reflect analyses run using the average scores for the corresponding non-aggressive, mildly aggressive, and strongly aggressive vignettes between the two blocks.

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References

Anderson, C. A., & Bushman, B. J. (2002). Human aggression. *Annual Review of Psychology*, *53*, 27–51. doi:10.1146/annurev.psych.53.100901.135231

Anderson, C. A., & Bushman, B. J. (2018). Media violence and the General Aggression Model. *Journal of Social Issues*, *74*, 386–413. doi:10.1111/josi.12275

Anderson, C. A., Carnagey, N. L., & Eubanks, J. (2003). Exposure to violent media: The effects of songs with violent lyrics on aggressive thoughts and feelings. *Journal of Personality and Social Psychology*, *84*, 960–971. doi:10.1037/0022–3514.84.5.960

Anderson, C. A., & Huesmann, L. R. (2003). Human aggression: A social-cognitive view. In M. A. Hogg & J. Cooper (Eds.), *The Sage handbook of social psychology*. Thousand Oaks, CA: Sage Publications.

Anderson, C. A., Shibuya, A., Ihori, N., Swing, E. L., Bushman, B. J., Sakamoto, A., . . . Saleem, M. (2010). Violent video game effects on aggression, empathy, and prosocial behavior in Eastern and Western countries: A meta-analytic review. *Psychological Bulletin*, *136*, 151–173. doi:10.1037/a0018251

Arnett, J. (1991). Adolescents and heavy metal music: From the mouths of metalheads. *Youth & Society*, *23*, 76–98. doi:10.1177/0044118X91023001004

Bartholow, B. D., Bushman, B. J., & Sestir, M. A. (2006). Chronic violent video game exposure and desensitization to violence: Behavioral and event-related brain potential data. *Journal of Experimental Social Psychology*, *42*, 532–539. doi:10.1016/j.jesp.2005.08.006

Batson, C. D., Early, S., & Salvarani, G. (1997). Perspective taking: Imagining how another feels versus imaging how you would feel. *Personality and Social Psychology Bulletin*, *23*, 751–758. doi:10.1177/0146167297237008

Batson, C. D., Fultz, J., & Schoenrade, P. A. (1987). Distress and empathy: Two qualitatively distinct vicarious emotions with different motivational consequences. *Journal of Personality*, *55*, 19–39. doi:10.1111/j.1467–6494.1987.tb00426.x

Batson, C. D., & Powell, A. A. (2003). Altruism and prosocial behavior. In I. B. Weiner, T. Millon, & M. J. Lerner (Eds.), *Handbook of psychology: Personality and social psychology* (pp. 463–484). New Jersey, NJ: John Wiley & Sons, Inc.

Berger, H. M., & Fales, C. (2005). "Heaviness" in the perception of heavy metal guitar timbres: The match of perceptual and acoustic features over time. In P. D. Greene & T. Porcello (Eds.), *Wired for sound: Engineering and technologies in sonic cultures* (pp. 181–197). Middletown, CT: Wesleyan University Press.

Blabbermouth.net. (2017). Cannibal Corpse awarded with plaque signifying sales of more than two million. Retrieved from http://www.blabbermouth.net/news/cannibal-corpse-awarded-with-plaque-signifying-sales-of-more-than-two-million/

Bogue, R. (2016). Violence in three shades of metal: Death, doom and black. In *Deleuze's way: Essays in transverse ethics and aesthetics*. New York, NY: Routledge.

Brown, A. R. (2011). Heavy genealogy: Mapping the currents, contraflows and conflicts of the emergent field of metal studies, 1978–2010. *Journal for Cultural Research*, *15*, 213–242. doi:10.1080/14797585.2011.594579

Buckley, K. E., & Anderson, C. A. (2006). A theoretical model of the effects and consequences of playing video games. In P. Vorderer & J. Bryant (Eds.), *Playing video games: Motives, responses, and consequences* (pp. 363–378). Mahwah, NJ: LEA.

Carbonneau, N., Vallerand, R. J., Fernet, C., & Guay, F. (2008). The role of passion for teaching in intrapersonal and interpersonal outcomes. *Journal of Educational Psychology*, *100*, 977–987. doi:10.1037/a0012545

Carnagey, N. L., Anderson, C. A., & Bushman, B. J. (2007). The effect of video game violence on physiological desensitization to real-life violence. *Journal of Experimental Social Psychology*, *43*, 489–496. doi:10.1016/j.jesp.2006.05.003

Clark, S. S., & Giacomantonio, S. G. (2013). Music preferences and empathy: Toward predicting prosocial behavior. *Psychomusicology: Music, Mind, and Brain*, *23*, 177–186. doi:10.1037/a0034882

Coyne, S. M., & Padilla-Walker, L. M. (2015). Sex, violence, & rock n' roll: Longitudinal effects of music on aggression, sex, and prosocial behavior during adolescence. *Journal of Adolescence*, *41*, 96–104. doi:10.1016/j.adolescence.2015.03.002

Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *JSAS Catalog of Selected Documents in Psychology*, *10*, 85–100.

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, *44*, 113–126. doi:10.1037/0022–3514.44.1.113

Efron, B., & Tibshirani, R. J. (1993). *An introduction to the bootstrap*. New York, NY: Chapman & Hall.

Eisenberg, N. (2000). Emotion, regulation, and moral development. *Annual Review of Psychology*, *51*, 665–697. doi:10.1146/annurev.psych.51.1.665

Eisenberg, N., & Lennon, R. (1983). Sex differences in empathy and related capacities. *Psychological Bulletin*, *94*, 100–131. doi:10.1037/0033–2909.94.1.100

Eisenberg, N., Wentzel, N., & Harris, J. D. (1998). The role of emotionality and regulation in empathy-related responding. *School Psychology Review*, *27*, 506–521.

Ferguson, C. J. (2015). Do Angry Birds make for angry children? A meta-analysis of video game influences on children's and adolescents' aggression, mental health, prosocial behaviour, and academic performance. *Perspectives on Psychological Science*, *10*, 646–666. doi:10.1177/1745691615592234

Ferguson, C. J., & Kilburn, J. (2009). The public health risks of media violence: A meta-analytic review. *The Journal of Pediatrics*, *154*, 759–763. doi:10.1016/j.jpeds.2008.11.033

Field, A. (2013). *Discovering statistics using IBM SPSS Statistics*. Los Angeles: Sage.

Fontenot, M., & Harriss, C. (2010). Building a better PIG: A historical survey of the PMRC and its tactics. *Media, Culture & Society*, *32*, 565–580. doi:10.1177/0163443710367692

Funk, J. B., Buchman, D. D., Jenks, J., & Bechtoldt, H. (2003). Playing violent video games, desensitization, and moral evaluation in children. *Applied Developmental Psychology*, *24*, 413–436. doi:10.1016/S0193–3973(03)00073-X

Greenberg, D. M., Baron-Cohen, S., Stillwell, D. J., Kosinski, M., & Rentfrow, J. (2015). Musical preferences are linked to cognitive styles. *PLOS ONE*, *10*, 1–22. doi:10.1371/journal. pone.0131151

Greitemeyer, T. (2009). Effects of songs with prosocial lyrics on prosocial thoughts, affect, and behavior. *Journal of Experimental Social Psychology*, *45*, 186–190. doi:10.1016/j.jesp.2008.08.003

Gross, R. L. (1990). Heavy metal music: A new subculture in American society. *The Journal of Popular Culture*, *24*, 119–130. doi:10.1111/j.0022–3840.1990.11984163.x

Guibert, C., & Guibert, G. (2016). The social characteristics of the contemporary metalhead: The Hellfest survey. In A. R. Brown, K. Spracklen, K. Kahn-Harris, & N. W. R. Scott (Eds.), *Global metal music and culture: Current directions in metal studies* (pp. 167–189). New York, NY: Routledge.

Krahé, B., & Möller, I. (2010). Longitudinal effects of media violence on aggression and empathy among German adolescents. *Journal of Applied Developmental Psychology*, *31*, 401–409. doi:10.1016/j.appdev.2010.07.003

Marsh, H. W., Vallerand, R. J., Lafrenière, M.-A. K., Parker, P., Morin, A. J. S., Carbonneau, N., . . .Paquet, Y. (2013). Passion: Does one scale fit all? Construct validity of two-factor passion scale and psychometric invariance over different activities and languages. *Psychological Assessment*, *25*, 1–14. doi:10.1037/a0032573

Mynett, M. (2016). The distortion paradox: Analyzing contemporary metal production. In A. R. Brown, K. Spracklen, K. Kahn-Harris, & N. W. R. Scott (Eds.), *Global metal music and culture: Current directions in metal studies* (pp. 68–86). New York, NY: Routledge.

Negd, M., Mallan, K. M., & Lipp, O. V. (2011). The role of anxiety and perspective-taking strategy on affective empathic responses. *Behaviour Research and Therapy*, *49*, 852–857. doi:10.1016/j. brat.2011.09.008

Nezlek, J. B., Feist, G. J., Wilson, F. C., & Plesko, R. M. (2001). Day-to-day variability in empathy as a function of daily events and mood. *Journal of Research in Personality*, *35*, 401–423. doi:10.1006/ jrpe.2001.2332

Olsen, K. N., Thompson, W. F., & Giblin, I. (2018). Listener expertise enhances intelligibility of vocalisations in 'Death Metal' music. *Music Perception*, *35*, 527–539. doi:10.1525/mp.2018.35.5.527

Patterson, J. E. (2016). 'Getting my soul back': Empowerment narratives and identities among women in extreme metal in North Carolina. In A. R. Brown, K. Spracklen, K. Kahn-Harris, & N. W. R. Scott (Eds.), *Global metal music and culture: Current directions in metal studies* (pp. 245–258). New York, NY: Routledge.

Pavey, L., Greitemeyer, T., & Sparks, P. (2012). "I help because I want to, not because you tell me to": Empathy increases autonomously motivated helping. *Personality and Social Psychology Bulletin*, *38*, 681–689. doi:10.1177/0146167211435940

Prescott, A. T., Sargent, J. D., & Hull, J. G. (2018). Metaanalysis of the relationship between violent video game play and physical aggression over time. *Proceedings of the National Academy of Sciences*, *115*, 9882–9888. doi:10.1073/pnas.1611617114

Purcell, N. J. (2003). *Death metal music: The passion and politics of a subculture*. Jefferson, NC: McFarland.

Rafalovich, A. (2006). Broken and becoming god-sized: Contemporary metal music and masculine individualism. *Symbolic Interaction*, *29*, 19–32. doi:10.1525/si.2006.29.1.19

Rentfrow, P. J., & Gosling, S. D. (2003). The do re mi's of everyday life: The structure and personality correlates of music preferences. *Journal of Personality and Social Psychology*, *84*, 1236–1254. doi:10.1037/0022–3514.84.6.1236

Schäfer, T., & Sedlmeier, P. (2009). From the functions of music to music preference. *Psychology of Music*, *37*, 279–300. doi:10.1177/0305735608097247

Schäfer, T., Tipandjan, A., & Sedlmeier, P. (2012). The functions of music and their relationship to music preference in India and Germany. *International Journal of Psychology*, *47*, 370–380. doi:10.1080/00 207594.2012.688133

Sharman, L., & Dingle, G. A. (2015). Extreme metal music and anger processing. *Frontiers in Human Neuroscience*, *9*, 1–11. doi:10.3389/fnhum.2015.00272

Szycik, G. R., Mohammadi, B., Münte, T. F., & te Wildt, B. T. (2017). Lack of evidence that neural empathic responses are blunted in excessive users of violent video games: An fMRI study. *Frontiers in Psychology*, *8*, 1–8. doi:10.3389/fpsyg.2017.00174

Thompson, W. F., Geeves, A. M., & Olsen, K. N. (2019). Who enjoys listening to violent music and why? *Psychology of Popular Media Culture*, *8*, 218–232. doi:10.1037/ppm0000184

Thompson, W. F., & Olsen, K. N. (2018). On the enjoyment of violence and aggression in music [Peer commentary on the paper "An integrative review of the enjoyment of sadness associated with music" by T. Eerola, J. K. Vuoskoski, H. Peltola, V. Putkinen and K. Schäfer]. *Physics of Life Reviews*, *25*, 128–130. doi:10.1016/j.plrev.2018.03.016

Tsai, C. G., Wang, L. C., Wang, S. F., Shau, Y. W., Hsiao, T. Y., & Auhagen, W. (2010). Aggressiveness of the growl-like timbre: Acoustic characteristics, musical implications and biomechanical mechanisms. *Music Perception*, *27*, 209–221. doi:10.1525/MP.2010.27.3.209

Unsworth, G., Devilly, G. J., & Ward, T. (2007). The effect of playing violent video games on adolescents: Should parents be quaking in their boots? *Psychology, Crime & Law*, *13*, 383–394. doi:10.1080/10683160601060655

Vallerand, R. J., Blanchard, C., Mageau, G. A., Koestner, R., Ratelle, C., Léonard, M., . . . Marsolais, J. (2003). Les passions de l'âme: On obsessive and harmonious passion. *Journal of Personality and Social Psychology*, *85*, 756–767. doi:10.1037/0022–3514.85.4.756

Vallerand, R. J., Ntoumanis, N., Philippe, F. L., Lavigne, G. L., Carbonneau, N., Bonneville, A., . . . Maliha, G. (2008). On passion and sports fans: A look at football. *Journal of Sports Sciences*, *26*, 1279–1293. doi:10.1080/02640410802123185

Walser, R. (2014). *Running with the devil: Power, gender, and madness in heavy metal music* (2nd ed.). Middletown, CT: Wesleyan University Press.

Warburton, W. A., Roberts, D. F., & Christensen, P. G. (2014). The effects of violent and antisocial music on children and adolescents. In D. Gentile (Ed.), *Media violence and children* (2nd ed.). Westport, CT: Praeger.

Weinstein, D. (2000). *Heavy metal: The music and its culture*. New York, NY: Da Capo Press.

Weinstein, D. (2016). The empowering masculinity of British heavy metal. In G. Bayer (Ed.), *Heavy metal music in Britain* (pp. 17–31). New York, NY: Routledge.

Appendix

Participant	Block 1						Block 2					
	Trial 1		Trial 2		Trial 3		Trial 4		Trial 5		Trial 6	
	Outcome	Scenario	Outcome	Scenario	Outcome	Scenario	Outcome	Scenario	Outcome	Scenario	Outcome	Scenario
1	SA	3	MA	1	NA	2	NA	4	SA	6	MA	5
2	SA	1	MA	2	NA	3	MA	6	NA	5	SA	4
3	NA	1	SA	2	MA	3	SA	5	NA	4	MA	6
4	NA	2	SA	1	MA	3	SA	4	NA	5	MA	6
5	NA	2	MA	3	SA	1	NA	6	MA	5	SA	4
6	MA	3	SA	2	NA	1	NA	5	SA	4	MA	6
7	SA	3	MA	2	NA	1	MA	6	SA	5	NA	4
8	MA	2	SA	1	NA	3	NA	4	MA	6	SA	5
9	NA	2	MA	1	SA	3	SA	4	MA	6	NA	5
10	SA	1	NA	2	MA	3	MA	4	SA	5	NA	6
11	SA	3	NA	1	MA	2	NA	4	MA	5	SA	6
12	NA	3	MA	1	SA	2	MA	5	SA	4	NA	6
13	MA	3	NA	2	SA	1	MA	6	SA	4	NA	5
14	SA	2	NA	3	MA	1	MA	5	SA	6	NA	4
15	MA	2	SA	3	NA	1	SA	6	NA	5	MA	4
16	SA	3	NA	2	MA	1	SA	5	MA	4	NA	6
17	MA	2	NA	1	SA	3	NA	5	SA	6	MA	4
18	SA	1	NA	3	MA	2	SA	5	NA	6	MA	4
19	MA	3	NA	1	SA	2	NA	6	SA	5	MA	4
20	SA	2	MA	1	NA	3	MA	5	NA	6	SA	4
21	NA	1	MA	3	SA	2	MA	4	NA	5	SA	6
22	NA	3	SA	2	MA	2	NA	5	MA	6	SA	4
23	SA	2	NA	1	MA	3	SA	5	MA	6	NA	4
24	SA	2	MA	3	NA	1	NA	6	SA	4	MA	5
25	NA	3	SA	2	MA	1	MA	5	NA	4	SA	6
26	NA	1	MA	2	SA	3	SA	6	MA	4	NA	5

Appendix (Continued)

| Participant | Block 1 | | | | | | Block 2 | | | | | |
| | Trial 1 | | Trial 2 | | Trial 3 | | Trial 4 | | Trial 5 | | Trial 6 | |
	Outcome	Scenario	Outcome	Scenario	Outcome	Scenario	Outcome	Scenario	Outcome	Scenario	Outcome	Scenario
27	MA	1	SA	3	NA	2	SA	6	MA	5	NA	4
28	MA	3	SA	1	NA	2	SA	4	MA	5	NA	6
29	MA	1	NA	3	SA	2	NA	6	MA	4	SA	5
30	SA	1	MA	3	NA	2	MA	6	NA	4	SA	5
31	MA	2	NA	3	SA	1	SA	6	NA	4	MA	5
32	NA	2	SA	3	MA	1	NA	4	SA	5	MA	6
33	MA	1	NA	2	SA	3	MA	4	SA	6	NA	5
34	NA	3	MA	2	SA	1	SA	4	NA	6	MA	5
35	NA	1	SA	3	MA	2	NA	5	MA	4	SA	6
36	MA	1	SA	2	NA	3	MA	4	NA	6	SA	5

Key

Outcomes
NA = Non-Aggressive
MA = Mildly Aggressive
SA = Strongly Aggressive

Scenarios
1 = Supermarket
2 = Cinema
3 = Bus stop
4 = Appointment
5 = Gym
6 = Parking garage