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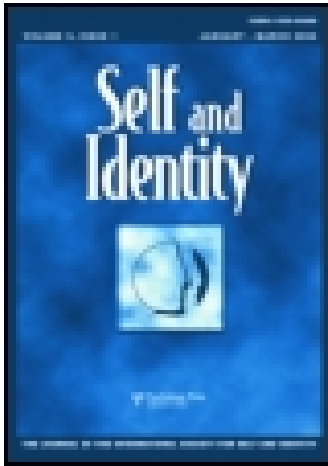
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# Three Decades Later: The Life Experiences and Mid-Life Functioning of 1980s Heavy Metal Groupies, Musicians, and Fans

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Research in the 1980s suggested that young “metalheads” were at risk for poor developmental outcomes. No other study has assessed this group as adults; thus, we examined 1980s heavy metal groupies, musicians, and fans at middle age, using snowball sampling from Facebook. Online surveys assessed adverse childhood experiences, personality, adult attachment, and past and current functioning in 377 participants. Results revealed that metal enthusiasts did often experience traumatic and risky “sex, drugs, and rock-n-roll” lives. However, the “metalhead” identity also served as a protective factor against negative outcomes. They were significantly happier in their youth and better adjusted currently than either middle-aged or current college-age youth comparison groups. Thus, participation in fringe style cultures may enhance identity development in troubled youth.

**Keywords:** Identity development; Adverse childhood experiences; Heavy metal; Personality; Adult attachment.

On the pillow of evil is that Thrice-Great Devil Trismegistus  
Who lulls our hypnotized spirit;  
And the rich metal of our Will  
Is vaporized utterly by this savvy alchemist.  
It is the Devil who holds the strings by which we're moved:  
In revolting objects we find charm.

Les Fleurs du Mal [*Flowers of Evil*], p. 3. Translated by Howard Friedman

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The opening quotation could have been lifted from any number of 1980s heavy metal songs, with their common themes of despair, evil, and personal failure. These are also the feelings commonly experienced by American youth during the transition through adolescence. This quote is, in fact, from the mid-nineteenth century rebel poet and enfant terrible, Charles Baudelaire (1861) and speaks to a common human tendency, being attracted to the dark arts.

Youth in western cultures experience what Erik Erikson called an “identity crisis,” referring not to a complete breakdown in self-knowledge, but to a period crucial for growth and change, wherein young people begin to figure out who they are (Erikson, 1968). Erikson described the search for identity as a journey into the self, a synthesis of one’s own thoughts with one’s perceptions of the culture at large. Youth form their sense of self through active reflection, trying on new hats, and assimilating the values of groups to which they belong, even if those groups are dark or not mainstream (Erikson, 1968). Thus, identity is located within the person, but also without, in the cultures with which they identify. Personality dysfunction, then, stems from a lack of balance, either by becoming too enmeshed in a cultural group and losing one’s self, or shunning social connections and opting instead for complete individuation.

More recent theorizing on youth identity development integrates these core processes of identity formation and expands on them by integrating the concepts of risk and protective factors into a cohesive framework of social cognition. For example, ethnic minority youth must develop individual coping skills to deal with the many risks they face while living in a racist culture that often devalues their contributions. Their eventual sense of self, the development of their identity, then stems from cognitive structures that were developed through reflection on the challenges in their environment and their constantly evolving self-appraisals and coping skills (Spencer, Fegley, & Harpalani, 2003).

When a young person experiences the myriad changes of adolescence, such as puberty, social pressures, and other risk factors, he or she must negotiate these challenges through a continuous process of appraisal and reformulations of the self-image in response to cultural norms. For young people who live in stressful home environments or cultures of rapid social change, their attempts to synthesize a sense of identity often lead them to seek out sub-cultures that make them feel special, unique, or connected to like-minded others (Arnett, 1996).

## Literature Review

Adolescence is a trying time for many parents as well, who see their children struggling with multidimensional developmental challenges, from puberty, to social pressure, peer relations, burgeoning sexuality, and the search for identity (Steinberg & Morris, 2001). When the search for identity results in an affiliation with fringe or edgy groups, such as hip-hop culture, Emo (emotional hardcore rock), Goth, or heavy metal circles, parents often fear the worst. They worry their child will become addicted to drugs, do poorly in school, and grow up to have few successes (Lynxwiler & Gay, 2000). Some early research did indeed suggest that teens who identified with fringe musical genres and subcultures had higher rates of problems such as suicidality and antisocial behavior (Arnett, 1996). Although the search for identity is a normative adolescent experience in western cultures, parents often hope their children will develop an affinity for church groups, school clubs, and other socially acceptable milieu. But some researchers have suggested that identification with rebellious music may actually aid in the development and solidification of a cohesive sense of identity (Schwartz & Fouts, 2003).

*Historical Background for Current Study*

Do dark impulses cumulate? In the current era of shootings, gangs, and other forms of violent social unrest—where commentators often blame “the media”—it is important to explore whether and how teenagers who gravitate toward such musical genres and the accompanying style cultures differ from other teens, and whether they grow up to be different from other adults on key characteristics. Although some enthusiasts meet an early demise from overdose, suicide, or injury, what happens to the others? What does a 1980s groupie, metal rocker, or fan look like decades later?

The subculture of heavy metal music—with its groupies, flamboyant musicians, and substantial fan base—is often stereotyped as a maladjusted fringe group, but next to nothing is known about the psychosocial characteristics of metal enthusiasts across time. Heavy metal music by bands like Iron Maiden reached the peak of popularity in the U.S. in the 1980s, but adolescents who grew up on that music often still listen to it, and a recent study revealed that in the year 2010, over one-third of a sample of adolescents listened to heavy metal music regularly (Leung & Kier, 2010). Also, music preferences have been shown to be relatively stable over time (Delsing, Ter Bogt, Engels, & Meeus, 2008).

In 1989, heavy metal was the largest selling musical genre (Epstein & Pratto, 1990). Parents and others feared that children were being drawn into Satan worship, drug use, wild sex, despair, and worse of all, suicide. The 1987 Surgeon General C. Everett Koop said that heavy metal’s destructive influence was similar to that of pornography (cited in King, 1988). Artists like Judas Priest and Ozzy Osbourne were sued by distraught parents whose children had committed suicide (Moore, 1996). Artists were taken to court and congress heard testimony from artists, parents, and leaders of the Parents’ Music Resource Council (the PMRC), headed by then Senator Albert Gore’s wife, Tipper Gore. The PMRC burned records, made public statements about the harm heavy metal music would cause children, and sought to ban recordings, videos, and other media (Arnett, 1991b). However, it was discovered that the children who died had experienced bouts with depression and troubled behavior before they expressed an interest in heavy metal music and had often come from conflicted or violent families (Moore, 1996).

The lasting legacy of these trials and the work of the PMRC is the “Explicit Content: Parental Advisory” stickers currently found on recorded media, to warn parents that the lyrics or content may not be appropriate for young children. However, the debate was not settled: Was heavy metal bad for kids? Were bad or troubled kids attracted to heavy metal? Like Baudelaire’s nineteenth century poetic rebellions, heavy metal artists of the 1980s often wrote lyrics with troubling imagery and dark themes, which were uncannily popular with adolescents. For example, Iron Maiden’s 1982 song “The Number of the Beast” proclaimed:

I feel drawn towards the evil chanting hordes  
They seem to mesmerize . . . can’t avoid their eyes  
666, the number of the beast  
666, the one for you and me

Should we worry when adolescents gravitate toward such edgy subcultures or is the concern over-blown? Can this phenomenon have a positive side? Non-traditional role models may provide a sense of belonging, as they do not judge youth for being outside the mainstream. Instead, they celebrate it. Such subcultures can provide alternative behavioral expectations and instructions for fashion, relationships, and pre-made attitudes (Took & Weiss, 1994). Could being able to connect emotionally to the music of heavy metal be empowering for youth who feel disconnected from larger society? Such songs often

reflected their life experiences, such as the temptation of drugs and alcohol, and the yearning for a better world. However, the large vocal range and high notes hit by many metal singers brought simple lyrics and complex guitar compositions to an intensity often found frightening by parents and mainstream society.

### *Early Research on Heavy Metal Enthusiasts*

Early psychological research in this area provided some evidence that teens who preferred heavy metal were more disturbed and aggressive—they took more risks (e.g., drinking and driving, sex with many partners), had more psychiatric problems, were higher in sensation-seeking, suicidality, drug use, and family dysfunction, were less optimistic, more impulsive, less conforming, and did more poorly in school (Arnett, 1991b, 1996; Martin, Clarke, & Pearce, 1993; Scheel & Westefeld, 1999; Schwartz & Fouts, 2003; Took & Weiss, 1994). “Metalheads” were found to be more manipulative, cynical, and Machiavellian than non-metal fans (Hansen & Hansen, 1991). King (1988) examined a group of hospitalized youth who had substance abuse problems and found that the children with the most psychological symptoms preferred heavy metal music. He stated that “The attraction of heavy metal music is its message that a higher power controls the world, and that power is hate—often personified by Satan . . . hopeless, troubled youngsters can sink their teeth into this philosophy . . . which makes them feel powerful and in charge” (p. 298). However, in Arnett (1991a) seminal study on a community sample of metalheads, none of the teens professed to worship Satan.

Even in this early work, psychologists were starting to ponder the chicken-and-egg nature of the research question. For example, Arnett found that teens who listened to heavy metal had poorer family relationships and felt disconnected from others. Likewise, Singer, Levine, and Jou (1993) discovered that heavy metal preference was related to delinquency only when parental control was low. In Took and Weiss (1994) study, only earlier grades and a history of counseling (not metal preference) predicted behavior problems. Arnett (1993) posited that perhaps alienated youth gravitated toward music with dark themes, which gave them avenues for expressing their pent-up frustration with adults and society. Similarly, Wooten (1992) found that while those who were mentally ill or substance abusers preferred metal music more often than other genres, this music calmed them down and made them more attentive. In another study, listening to heavy metal positively affected metalheads’ moods (Scheel & Westefeld, 1999). The question remained: Was heavy metal a destructive or constructive force in adolescents’ lives? Or perhaps other variables related to life history might be more revealing when trying to understand the trajectory of adolescents who listen to heavy metal. For example, liking heavy metal failed to significantly predict risk taking behaviors when family relations were taken into account (Arnett, 1991b; Lacourse, Claes, & Villeneuve, 2001; Roberts, Dimsdale, East, & Friedman, 1998).

Moreover, several studies noted that metalheads got *better* grades than other teens, and were even in programs for the academically gifted. Such students discussed the complexity of the music, the intensity of the lyrics, and the high levels of talent and skill of the musicians as variables that attracted them to the genre (Arnett, 1991a; Cadwallader, 2007; Singer et al., 1993). Even though heavy metal preference has been linked to delinquency, 95% of all teens assessed in one study, including metalheads, planned to go to college (Verden, Dunleavy, & Powers, 1989). Cadwallader (2007) found that gifted metalheads used the music to cope with being intellectually superior to, and thus separate from, their peers, in addition to coping with troubled family relationships and low self-esteem.

Contradictory research findings and the fact that those who wrote about both the negative and positive influences of heavy metal were often writing personal opinion pieces not supported by data, made conclusions difficult. For example, Walser (1993), in his book, *Running with the Devil: Power, Gender, and Madness in Heavy Metal Music*, used his personal assessment of the metalheads he met to describe them as friendly and enthusiastic, not negative and cynical. His book is an obvious homage to the genre, comparing the complexities of the chord structures and guitar solos to the sheet music of Vivaldi's works. However, he provided no data to support his claims about the positive developmental outcomes of metalheads.

### *Gender Issues*

There have been some attempts to examine gender issues in heavy metal. For example, Arnett (1991b) found that female metalheads were also more likely to engage in antisocial behavior and that they had lower self-esteem than non-metal fans. Lacourse et al. (2001) found that using metal music for emotional catharsis was a risk factor for suicidality in girls but not in boys. However, Selfhout, Delsing, ter Bogt, and Meeus (2008) found that heavy metal preference predicted problem behaviors for boys but not for girls. Walser (1993) argued that female fans used metal men to empower themselves and break away from traditional gender roles and sexual oppression. For example, girls might hang posters of shirtless metal musicians on their bedroom walls, expressing their own erotic desires. Because heavy metal music was a male-dominated industry, women got into the scene by either imitating the appearance and behavior of the boys, in the case of "real" female metalheads, or by becoming sexual objects for the boys, in the case of "glam chicks" or "groupies" (Krenske & McKay, 2000; Tyner-Owens, 2007; Vasan, 2010). However, little is known about "groupies" as people of interest in their own right. Krenske and McKay (2000) argued that women in general gravitated to metal music to escape stressful or dysfunctional home lives. The current study attempted to examine the lives of self-identified groupies as they played a crucial role in the metal scene and heretofore have been ignored in scholarship on the topic.

### *Individual Differences*

In addition to a lack of attention to gendered groups, there is a paucity of research on individual differences between metal enthusiasts and other groups. Only one study examined rock musicians' personality profiles and found that rock musicians were high on neuroticism, openness to experience, and sensation seeking (Gillespie & Myers, 2000). They were lower on agreeableness and conscientiousness and average on extraversion. Delsing et al. (2008) found that rock fans were low on conscientiousness and high on openness. Listening to heavy metal was related to greater openness to experience. It was not related to neuroticism or agreeableness. Leung and Kier (2010) found that metal enthusiasts had "thrill seeking" personalities.

Rentfrow and colleagues have looked across many samples in different cultures and have developed a "structure of musical preferences," resulting in five factors that cut across genres and relate to the emotional timbre of the music. One of these factors is the intensity of the music. The "intense" feeling structure includes heavy metal music as well as hip-hop. Those who prefer "intense" music have an array of positive characteristics across cultures—they are high on extraversion, openness to experience, dominance, intelligent self-view, and they are highly skilled in verbal tasks (Rentfrow & Gosling, 2003; Rentfrow, Goldberg, & Levitin, 2011).



Interestingly, Zweigenhaft (2008) found that in a college sample, those who preferred heavy metal had the lowest scores on neuroticism. They were low on extraversion, high on openness to experience, low in hostility, and low in achievement striving, and they had higher grades than country music and hip-hop fans. Once again, we are faced with interesting but contradictory findings with little knowledge of long-term outcomes of these youth.

## The Current Study

Despite many negative cultural stereotypes about heavy metal fans, groupies and performers, Gross (1990) suggested that “metal music is predominately a teenage phenomenon. Most metal fans will outgrow the subculture as they become adults ... many of today’s hard core metal fans will no doubt grow up to be outstanding community leaders, no worse for their involvement in the subculture” (pp. 128–129). Unfortunately, no longitudinal studies ever followed up on metalheads over time so Gross’s predictions are difficult to test. Nor have any previous studies examined adult metalheads cross-sectionally. Thus, the current study sought to examine this youth style culture in mid-life by recruiting middle-aged participants who both did and did not gravitate toward heavy metal in the 1980s, in order to assess whether their life trajectories and experiences were significantly different from each other.

The current study examined the differences between metalheads and two comparison samples, both in terms of their developmental histories and current functioning. We examined adverse childhood experiences (neglect, an incarcerated parent) and youthful risky experiences (e.g., using sex as leverage to get something you want, taking drugs), adult attachments styles, adult personality traits, and elements of life success (e.g., income).

We had *four main research questions*: (1) to assess whether middle-aged participants who gravitated toward heavy metal and its cultural identity in the 1980s reported significantly more adverse childhood experiences than a similar aged comparison group that did not favor heavy metal; we also compared both middle-aged groups to a current college student cohort; (2) to examine whether metalheads from the 1980s reported significantly more risky youthful behaviors and experiences than the two comparison groups; (3) to examine whether 1980s heavy metal enthusiasts grew up to have different adult attachment or personality profiles than comparisons; and (4) to compare all groups on life satisfaction and current functioning (happiness, income, missing work due to problems, seeking counseling).

## Method

### *Participants*

The sample consisted of 377 adults with a mean age of 44 years across all middle-aged participants and 21 years for college students. The majority of the sample was heterosexual (85%) and middle class (mean income \$46,268). There were five groupings: Heavy metal groupies, professional heavy metal musicians, metal fans, non-metal middle-aged comparisons, and college student comparisons. Those endorsing heavy metal as their favorite genre of music in the 1980s chose this category based on these band examples provided on the survey: Guns N Roses, Metallica, AC/DC, Def Leppard, Motley Crue, and Iron Maiden.

**Heavy Metal Groupies**

Groupies ( $N = 24$ ) were young women who, in the 1980s, had sexual relationships with metal musicians and often followed bands on tour. Some of the more well-known sexual partners reported by groupies in the current sample included Jon Bon Jovi, Gene Simmons of KISS, David Lee Roth of Van Halen, Billy Idol, Nikki Sixx of Motley Crue, and Ted Nugent.

**Professional Metal Musicians**

Musicians ( $N = 21$ ) were professional band members who regularly played paid gigs, selling anywhere from tens of thousands to millions of albums.

**Metal Fans**

Fans ( $N = 99$ ) were devout metalheads who did not fit into the operational definitions created for this study for “groupie” or “musician.” This category was also appropriate for employees of the metal music business.

**Middle-Aged Comparison Group**

MACs ( $N = 80$ ) were middle-aged participants recruited through snowball sampling who did not identify heavy metal as their preferred musical genre during their 1980s youth. They were recruited to examine whether trends found were common to many middle-agers or whether the metal groups differed significantly on variables of interest. This group was created by combining those who endorsed any category of favored music other than heavy metal. The options provided were: New Wave (B-52s, Duran Duran, Culture Club, The Fixx, Missing Persons, Devo), Pop (Madonna, Michael Jackson, Whitney Houston, Phil Collins, David Bowie, Wham), Rock/Soft Rock (The Police, Foreigner, Journey, U2, Chicago, Bruce Springsteen), or Other/No Favorites.

**College Students**

Students ( $N = 153$ ) were current college students at a California university who were recruited through the psychology department participant pool in order to examine whether trends found were common to youthful experiences in general, or whether metalheads youthful in the 1980s differed on variables of interest from a current youth cohort.

Comparisons across groups. [Table 1](#) details demographic differences between the groups. As many differences between groups on demographic characteristics are driven by the student group (i.e., students have substantially lower age, higher education, etc.), we focused post hoc comparisons on two groups we expected to be similar, Fans and MACs. Since we perform only one post hoc test, there is no adjustment for  $\alpha$  inflation (i.e., this is a liberal comparison). In general, for every comparison there are significant differences between the samples, but Fans and MACs did not differ significantly.

Overall, there were substantial gender differences with all groupies being female and nearly all PMs being Male,  $\chi^2(4, N = 344) = 51.1, p < .001$ . No significant differences existed between Fans and MACs,  $OR = 1.37, 95\%CI [0.68, 2.83]$ . Ethnicity comparisons (focused on European-American vs. All other) showed differences across groups,  $\chi^2(4, N = 376) = 26.6, p < .001$ , that appear driven by the diversity of the college student sample. Again, no significant differences existed between Fans and MACs,  $OR = 1.45, 95\%CI [0.70, 2.99]$ . Focusing on age, college students were substantially younger than all other groups (Robust  $F[4, 45.1] = 1046.2, p < .001$ , robust  $ES = 1.41$ , but there were no significant differences between Fans and MACs,  $d = 0.34, 95\%CI [-0.01, 0.69]$ . Educational differences (HS/some college vs. College/Grad School) appear driven by the college student sample,  $\chi^2(4, N = 354) = 68.0, p < .001$ . Again, Fans and MACs did not

**TABLE 1** Demographic Information for All Groups

Variable	Groupies ( <i>N</i> = 24)	PMs ( <i>N</i> = 21)	Fans ( <i>N</i> = 99)	Students ( <i>N</i> = 153)	MACs ( <i>N</i> = 80)
Gender					
Male	0%	90%	33%	24%	26%
Female	100%	10%	66%	76%	74%
Ethnicity					
European-American	83%	91%	74%	52%	67%
Latino/hispanic	4%	0%	6%	17%	3%
Mixed/other	13%	10%	18%	31%	29%
Mean age	41.4	46.9	42.5	21.0	45.2
Sexual orientation					
Predominantly heterosexual	83%	86%	91%	82%	84%
Predominantly homosexual	4%	5%	5%	3%	8%
Bisexual	13%		2%	10%	7%
Education level					
Finished high school	13%	29%	12%	10%	7%
Some college	38%	29%	39%	78%	37%
College graduate	21%	29%	29%	5%	20%
Graduate degree	21%	5%	13%	2%	29%
Marital status					
Married	55%	43%	38%	5%	53%
Single	17%	29%	23%	73%	12%
Cohabiting	13%	5%	14%	17%	7%
Divorced	8%	19%	18%	0%	22%
Married 2 + times	58%	14%	17%	0%	21%
Employment status					
Full time (35 + hours/week)	54%	70%	61%	4%	54%
Part time (1–34 hours/week)	21%	0.0%	17%	47%	15%
Not employed outside home	17%	1%	5%	42%	11%
Mean annual income	\$43,462	\$98,482	\$44,951	\$6,180	\$38,269

Notes: Totals may not equal 100% if there were missing data or participants checked more than one box. PMs, professional musicians; MACs, middle-aged comparisons.

differ significantly,  $OR = 1.37$ , 95%CI [0.71, 2.67]. Marital status differed (married/cohab/re-married vs. single/divorced/separated) primarily because few college students were married,  $\chi^2(4, N = 360) = 53.3$ ,  $p < .001$ . No significant differences existed between Fans and MACs,  $OR = 0.80$ , 95%CI [0.41, 1.56]. There were significant differences in being married two or more times,  $\chi^2(4, N = 373) = 40.3$ ,  $p < .001$ . These differences were largely attributable to the groupies (more than half married two or more times) and the college group (none married twice or more). Again, no significant differences existed between Fans and MACs,  $OR = 0.76$ , 95%CI [0.33, 1.71]. Employment status differences (*y* vs. *n*) were driven by low levels of employment for college students,  $\chi^2(4, N = 324) = 54.3$ ,  $p < .001$ . No significant differences existed between Fans and MACs,  $OR = 2.35$ , 95%CI [0.64, 9.68].

### Procedure

All middle-aged participants (groupies, musicians, fans and non-metal comparisons) were recruited online using a snowball sampling procedure. Existing Facebook groups related to 1980s heavy metal, groupies, musicians, and 1980s Hollywood metal clubs were approached electronically with a general call for participation in a scientific study examining 1980s metal enthusiasts. They were encouraged to invite their contacts to

participate. Participants were provided with the invitation text and the survey link that they could forward to their associates and friends. Although clearly not a fully representative sample of former groupies and metal musicians, this technique was considered ideal for reaching a heretofore unstudied group. MACs were similarly recruited through a snowball sampling technique using Facebook pages, with a general call out to people between the ages of 35–60 willing to participate in a survey about their life experiences. The study protocol was approved by the first author's university IRB.

For the current youth cohort comparison group, the study was advertised on a university participant pool website, where students signed up electronically to participate. College students completed surveys either using paper-and-pencil in a research lab on campus, or online from a research lab computer. Anonymous paper and pencil surveys were manually entered into the computer by research assistants and checked for accuracy by a second set of research assistants.

Online participants completed the surveys through Survey Monkey and were informed that the survey would take about an hour, and that they could not log out and back in since they could not save any login information to help them continue with the survey. No identifying information or computer IP addresses were collected. Participants were told surveys would be confidential and anonymous. All participants could enter a drawing for \$20 iTunes gift certificates, even if they chose not to complete the survey. A total of 60 such certificates were awarded using a separate email account set up for the drawing. Email addresses were drawn at random from the inbox and issued the gift certificates electronically. If they chose not to complete the survey, participants were told that any data they had completed might be used in the study.

A total of 767 people logged in. Out of that, 394 people viewed one or two pages and logged back out. So in total, 373 people (48% of log-ins) completed the survey. Amongst them, 10 people provided partial data and then logged out. These 10 people were mostly middle-aged white females, similar to the rest of the sample, and their data were used in analyses where possible. Four of them had mostly complete data so were added to the complete sample count, bringing the sample size to  $N = 377$ . Six of them completed less than half of the measures so are not counted in the sample size but their data have been used in analyses when complete.

Upon logging in, participants were asked to read the informed consent sheet and click on yes or no if they agreed to participate. If they clicked on "no," they were logged out of the survey. If they clicked "yes," they were sent to a page asking them their age. If they were over 35, they were routed to the middle-aged version of the survey. Both versions of the survey were fairly similar, but questions referred to "your youth (between the ages of 12–17)" for college students and "in the 1980s" for the middle-aged groups. There were also questions specific to the groupie and musician subgroups, but similar questions about youthful activities were posed to all five groups. Due to the sensitive nature of some of the questions, participants were given a sheet they could print out with low-cost and free counseling services.

Middle-aged participants were asked their favorite type of music between the years 1980–1990. Their choices were: New wave, hard rock/heavy metal, pop, rock/soft rock, or other/no favorite music. Examples of bands from each genre were provided. Those who chose anything but hard rock/heavy metal were collapsed into the Middle-Age Comparison (MAC) group. Those who chose hard rock/heavy metal were taken to a page asking to clarify whether they were groupies, musicians or fans. "Groupie" was operationally defined as someone who "followed bands with such enthusiasm that they would do almost anything to see them, meet them, or be with them, including having sexual relations with them and/or their entourage." Musicians were defined as, "I regularly

got paid to play my music. I played at clubs, auditoriums or stadiums on a regular basis. I may or may not have been signed to a major record label.” Fans were defined as, “I loved hard rock/heavy metal. I may have played in a garage band for fun or may have followed bands enthusiastically, but I do not fit the above descriptions of groupie or band member. This category also applies to those who worked in the music industry.” Survey Monkey then routed each type of participant, using skip-logic, to the questions that were worded specifically for their group, though most questions were quite similar. Variables assessed using well-established psychometrically sound measures were identical for all groups (e.g., personality and attachment style measures).

### *Measures*

#### ***Adverse Childhood Experiences (ACEs) and Maternal Neglect***

A modified version of Felitti’s (Felitti et al., 1998) ACE intake form for Kaiser Permanente health providers (Family Health History; <http://www.cdc.gov/ace/questionnaires.htm>) was used to assess ACEs, such as having been raised by one parent, living with an incarcerated parent, having a family member commit suicide, domestic violence, and other ACEs (13-item;  $\alpha = .76$ ).

Maternal neglect was assessed using Bifulco, Brown, and Harris (1994) Childhood Experiences of Care and Abuse (CECA-Q2) measure, which has demonstrated good inter-rater and cross-reporter reliability (Moran, Bifulco, Ball, Jacobs, & Benaim, 2002). Neglect was coded as a continuous variable indicating the degree of maternal neglect.

#### ***Demographics, Life History, and Current Functioning***

We constructed a “background questionnaire,” which assessed relevant life history variables (e.g., number of sex partners, suicide attempts, seeking counseling, using sex as leverage to get something they wanted, number of marriage partners, missing work due to problems, education, income, etc.). They were asked about happiness levels and sex drive both in their youth and today. This measure also included brief essays, which allowed participants to answer questions in either 100 or 250 words. These essays explored their experiences in either their “youth” for students or “in the 1980s” for middle-aged participants. These qualitative data are not reported in the current article but can be found in Howe and Friedman (2014). The full survey exploring past and current functioning, as well as the essay questions, can be obtained by contacting the first author.

#### ***Adult Attachment Quality***

The Experiences in Close Relationships Scale-Revised (ECR-R; Fraley, Waller, & Brennan, 2000) was used to assess avoidant and anxious adult attachment styles. This is one of the best-validated and most frequently used scales of adult romantic relationship schemas, or internal working models consisting of avoidant or anxious worldviews regarding intimate relationships (Sibley, Fischer, & Liu, 2005). Cronbach’s  $\alpha$  for the current sample were .94 for avoidant and .95 for anxious attachment.

#### ***Personality***

Personality variables were assessed using an 82-item version of the International Personality Item Pool (IPIP; Goldberg, 1992), which assesses the Big Five factors and other personality constructs. These scales have adequate convergent and divergent validity as well as internal consistency found in large, diverse, and international samples (Lim & Robert, 2006; Goldberg, 1999). Cronbach’s  $\alpha$  levels for the current sample are indicated in parentheses. Variables used included *Openness to Experience* (10-item;  $\alpha = .75$ ),

*Conscientiousness* (10-item;  $\alpha = .84$ ), *Extraversion* (10-item;  $\alpha = .87$ ), *Agreeableness* (10-item;  $\alpha = .81$ ), *Neuroticism* (10-item;  $\alpha = .87$ ), *Hypomania* (12-item;  $\alpha = .79$ ), *Sensation Seeking Dangerous Behaviors* (10-item;  $\alpha = .83$ ), and *Sensation Seeking Impulsive Behaviors* (9-item;  $\alpha = .85$ ).

## Results

Several dependent variables were substantially skewed, providing data that violated traditional ANOVA assumptions. For those variables, we employed robust one-way ANOVA approaches with robust explanatory measure of effect sizes (Wilcox, 2012). For this measure, values of 0.15, 0.35, and 0.50 correspond to definitions of small, medium, and large effects (Wilcox & Tian, 2008). For analyses employing robust approaches, multiple comparison tests for mean comparisons use the MCP bootstrap command with probabilities adjusted to account for inflation of familywise  $\alpha$ . Statistical reporting for these variable notes use of Robust F and ES.

Analyses that met assumptions employed LSD comparisons. For all mean comparisons, we provide effect sizes for the comparison ( $d$ ) and a 95%CI around  $d$ . These intervals are not adjusted for inflation of Type I error.

Regarding categorical variables, we adjust group comparisons using the Bonferonni approach (i.e., multiply  $p$  by the number of tests). We present the odds-ratio for each comparison and a 95%CI around the OR. As with mean comparisons, these CIs are not adjusted for Type I error inflation.

**Research Question #1** *Did metal enthusiasts have significantly more adverse childhood experiences than other groups?* There were no significant group differences on individual ACEs such as having divorced parents, living with an alcoholic or criminal parent, or domestic violence between parents. However, when a composite variable was created summing up each group's total ACEs, ANOVAs with LSD post hoc analyses revealed that groupies experienced significantly more total ACEs than musicians, MACs, and students ( $F[4, 352] = 3.49, p = .008, \eta_p^2 = .038$ ; See Tables 2 and 4 for means, standard deviations, and group comparisons). Groupies experienced marginally significantly more ACEs than fans and fans experienced significantly more ACEs than musicians and marginally more ACEs than MACs. There were group differences in the degree of maternal neglect experienced (Robust  $F_4, 44.9 = 7.28, p < .001$ , Robust ES = 0.41). Largely, these results reflected that MACs experienced significantly more neglect than musicians and students.

**Research Question #2** *Did metal enthusiasts engage in significantly more risky behaviors and life experiences than other groups?* There were no statistically significant group differences regarding whether people had attempted suicide in their youth [ $\chi^2(4, N = 376) = 8.28, p = .08$ ], their age at first sexual experience [ $F(4,334) = 1.52, p = .20, \eta_p^2 = .018$ ], or whether they had a problem with alcohol in their youth [ $\chi^2(4, N = 374) = 2.37, p = .67$ ]. However, it is worth noting that almost one third of groupies had attempted suicide (more than double the rates in all other groups) and they also began sexual activity significantly earlier than musicians, which was the only statistically significant comparison in these analyses.

All metal groups reported using alcohol more regularly in their youth compared to other groups,  $\chi^2(4, 377) = 43.49, p < .001$ . Between 71.4–75.0% of metal groups reported such use compared to 36.7% for students and 40.8% for MACs. There were also significant differences in reporting having serious problems with drugs in their youth, with 50% of groupies reporting such problems, compared to 15.2–27% for all other groups ( $\chi^2[4, N = 377] = 16.5, p = .002$ ).

TABLE 2 Means and (SD) for Variables Used in ANOVAs

	Groupies	PMS	Fans	Students	MACs
Adverse childhood experiences (ACEs) and maternal neglect					
Total ACEs	4.1 (2.9)	1.6 (1.6)	3.1 (1.9)	2.6 (2.5)	2.3 (2.5)
Maternal neglect	16.5 (7.8)	11.7 (3.3)	16.2 (7.8)	13.0 (7.3)	17.5 (7.3)
Risky behaviors and life experiences					
Age first sex	15.4 (2.1)	17.7 (5.1)	16.5 (2.7)	16.4 (2.8)	16.8 (3.7)
Sex partners lifetime	39.5 (30.2)	313.1(450.6)	42.1 (119.0)	5.8 (7.1)	33.7 (72.9)
Sex drive in youth	80.0 (23.4)	91.7 (16.5)	76.1 (21.0)	56.2 (31.5)	64.4 (27.2)
Sex partners past year	1.3 (1.4)	3.8 (11.5)	1.3 (1.4)	1.6 (1.3)	1.2 (1.0)
Attachment and personality					
Avoidant attach	41.8 (12.7)	40.1 (13.4)	40.1 (14.1)	43.2 (15.7)	38.2 (14.9)
Anxious attach	48.2 (22.2)	37.4 (13.7)	42.5 (16.7)	47.3 (15.4)	40.0 (14.3)
Openness	39.6 (7.9)	39.8 (5.0)	39.8 (6.1)	39.9 (5.7)	40.5 (5.5)
Conscientious	35.9 (9.5)	37.7 (5.9)	36.9 (7.0)	35.3 (6.9)	37.0 (6.6)
Agreeable	36.8 (6.4)	37.2 (6.7)	37.3 (6.6)	37.1 (6.7)	39.0 (5.6)
Neurotic	25.7 (9.0)	21.5 (7.5)	25.2 (7.8)	26.5 (8.3)	24.4 (7.4)
Extraversion	36.7 (6.9)	38.4 (6.3)	35.5 (8.4)	33.0 (7.7)	36.1 (6.6)
Hypomania	33.2 (8.5)	31.5 (7.7)	31.3 (7.5)	35.1 (7.1)	30.5 (7.1)
Sensation seeking dangerous	18.7 (6.7)	23.8 (6.5)	21.5 (8.1)	26.3 (8.4)	22.7 (8.1)
Sensation seeking impulsive	27.0 (7.5)	27.3 (5.9)	26.4 (7.6)	29.0 (6.5)	24.4 (6.1)
Life satisfaction and current functioning					
Current happiness	80.6 (22.0)	83.1 (16.4)	76.8 (20.6)	75.3 (19.1)	76.7 (19.8)
Happiness in youth	80.1 (19.3)	86.3 (25.8)	76.2 (22.7)	64.5 (23.2)	
Mean income	43,462 (2,842)	98,482 (118,499)	44,951 (3,122)	6,180 (7,221)	38,369 (3,526)

Note: PMS, professional musicians; MACs, middle-aged comparisons.

Groupies reported using sex as leverage to get something they wanted (money, power, backstage passes, jobs) at higher rates than other groups (41.7% compared to 28.6%, 5.3–9% for other groups),  $\chi^2(4, N = 305) = 35.0, p < .001$ . Unfortunately, the student group had too much missing data for this variable to be meaningfully considered in regard to comparisons with a current youth cohort. See Table 3 for all  $\chi^2$  percentages.

Interestingly, there were significant group differences in the number of sexual partners over their lifetimes, but musicians were the ones with more partners than all other groups (Robust  $F(4, 33.0) = 18.5, p < .001$ , robust ES = 1.32). They averaged over 300 lifetime partners, compared to fewer than 40 for the groupies. On a scale of 1–100, musicians also reported the highest level of sex drive in their youth (Robust  $F(4, 64.5) = 38.1, p < .001$ , robust ES = 0.51). Musicians were significantly higher in sex drive than fans, MACs, and students, but were not higher in youthful sex drive than groupies. Groupies and metal fans reported significantly higher sex drives in their youth than current students.

Musicians also reported the highest rates of sexually transmitted infections in their youth than all other groups, with 33.3% reporting such incidences (compared to 7.6–18.4% for other groups),  $\chi^2(4, N = 327) = 13.39, p = .01$ . Unfortunately, the student group had too much missing data for this variable to be meaningfully considered in regard to comparisons with a current youth cohort. Musicians appeared to have the greatest number of sexual partners within the year prior to the taking the survey than any other group. However, this result was largely driven by one musician who reported 50 partners. The difference did not reach significance using analyses accounting for this outlier (Robust  $F(4, 70.0) = 1.66, p = .17$ , robust ES = 0.34). See Table 2 for means and standard deviations for ANOVA results and Table 3 for percentages in  $\chi^2$  results (Table 4).

**Research Question #3** *Do metal enthusiasts differ from comparisons on adult attachment styles or personality variables?* Groups did not differ on levels of avoidant attachment, [ $F(4,317) = 1.45, p = .22, \eta_p^2 = .018$ ]. Groups did differ on anxious (Robust  $F(4, 35.6) = 3.19, p = .02$ , robust ES = 0.29), with LSD post hoc analyses indicating that students were significantly more anxiously attached than MACs. Groupies had the highest mean scores for anxious attachment of all five groups but these differences were not statistically significant. See Table 2 for means and standard deviations (Table 5).

There were no statistically significant group differences on the personality variables of openness ( $F[4, 342] = 0.21, p = .94, \eta_p^2 = .002$ ), conscientiousness (Robust  $F(4, 44.9) = 1.18, p = .33$ , robust ES = 0.20), agreeableness ( $F[4, 341] = 1.29, p = .27$ ,

**TABLE 3** Percentage of Each Group Responding “Yes” to Each Variable Used in  $\chi^2$  Analyses

Variable	Groupies	PMs	Fans	Students	MACs
<b>Risky behaviors</b>					
Attempted suicide	29.2	0.0	15.2	12.7	13.8
Alcohol prob youth	30.4	15.0	29.0	23.7	25.3
Used alcohol youth	75.0	75.0	72.0	43.3	40.8
Drug problem youth	50.0	25.0	27.0	15.2	22.7
Used sex as leverage	47.6	33.3	11.0	9.3	5.3
STIs in youth	16.7	36.8	8.2	10.8	18.4
<b>Life satisfaction and current functioning</b>					
Regrets from youth	34.8	30.0	31.0	44.9	52.0
Sought counseling	58.3	20.0	53.5	49.4	69.7
Work days physical	38.9	5.6	14.6	28.0	16.9
Work days mental	16.7	0.0	5.6	20.0	18.2

Note: PMs, professional musicians; MACs, middle-aged comparisons.



TABLE 4 Group Comparisons (Means)

	Groups vs. PMs	Groups vs. fans	Groups vs. students	Groups vs. MACs	PMs vs. fans	PMs vs. students	PMs vs. MACs	Fans vs. students	Fans vs. MACs	Students vs. MACs
Adverse childhood experiences (ACEs) and maternal neglect										
Total ACEs	$p = .002$ , $d = 1.06$ [0.38, 1.73]	$p = .09$ , $d = 0.39$ [-0.09, 0.86]	$p = .01$ , $d = 0.59$ [0.12, 1.06]	$p = .005$ , $d = 0.70$ [0.19, 1.21]	$p = .02$ , $d = 0.59$ [0.09, 1.08]	$p = .10$ , $d = 0.42$ [-0.06, 0.90]	$p = .39$ , $d = 0.31$ [-0.20, 0.82]	$p = .16$ , $d = 0.18$ [-0.08, 0.44]	$p = .06$ , $d = 0.29$ [-0.02, 1.73]	$p = .41$ , $d = 0.12$ [-0.17, 0.40]
Maternal neglect	$p = .38$ , $d = 0.60$ [0.03, 1.18]	$p = .99$ , $d = 0.07$ [-0.30, 0.57]	$p = .14$ , $d = 0.69$ [0.16, 1.33]	$p = .99$ , $d = 0.21$ [-0.28, 0.62]	$p = .25$ , $d = 0.40$ [0.06, 0.69]	$p = .99$ , $d = 0.08$ [-0.41, 0.54]	$p < .001$ , $d = 0.71$ [0.31, 1.08]	$p = .06$ , $d = 0.46$ [0.17, 0.76]	$p = .99$ , $d = 0.27$ [-0.08, 0.64]	$p < .001$ , $d = 0.85$ [0.53, 1.24]
Risky behaviors and life experiences										
Age first sexual experience	$p = .02$ , $d = 0.60$ [-0.04, 1.23]	$p = .14$ , $d = 0.42$ [-0.05, 0.90]	$p = .18$ , $d = 0.35$ [-0.10, 0.80]	$p = .07$ , $d = 0.41$ [-0.08, 0.90]	$p = .15$ , $d = 0.36$ [-0.15, 0.87]	$p = .10$ , $d = 0.41$ [-0.09, 0.90]	$p = .29$ , $d = 0.22$ [-0.30, 0.74]	$p = .74$ , $d = 0.05$ [-0.22, 0.32]	$p = .56$ , $d = 0.09$ [-0.22, 0.40]	$p = .35$ , $d = 0.13$ [-0.15, 0.42]
Sex partners lifetime	$p = .038$ , $d = 0.61$ [0.14, 1.13]	$p = .038$ , $d = 0.62$ [0.05, 1.36]	$p < .001$ , $d = 3.31$ [2.20, 4.98]	$p = .03$ , $d = 1.12$ [0.39, 1.97]	$p < .001$ , $d = 1.20$ [0.53, 2.21]	$p < .001$ , $d = 1.72$ [0.77, 3.35]	$p < .001$ , $d = 1.10$ [0.50, 2.00]	$p < .001$ , $d = 0.79$ [0.47, 1.00]	$p = .99$ , $d = 0.11$ [-0.24, 0.39]	$p < .001$ , $d = 1.20$ [0.82, 1.79]
Sex drive in youth	$p = .51$ , $d = 0.92$ [0.16, 2.41]	$p = .99$ , $d = 0.29$ [-0.07, 0.65]	$p < .001$ , $d = 0.74$ [0.42, 1.02]	$p = .09$ , $d = 0.73$ [0.37, 1.25]	$p = .03$ , $d = 0.71$ [0.35, 1.04]	$p < .001$ , $d = 1.06$ [0.74, 1.36]	$p < .001$ , $d = 1.25$ [0.99, 1.93]	$p < .001$ , $d = 0.53$ [0.25, 0.77]	$p = .29$ , $d = 0.33$ [0.02, 0.67]	$p = .74$ , $d = 0.27$ [0.02, 0.54]
Sex partners past year	$p = .99$ , $d = 0.19$ [-0.35, 0.74]	$p = .97$ , $d = 0.03$ [-0.58, 0.24]	$p = .92$ , $d = 0.31$ [-0.20, 0.51]	$p = .98$ , $d = 0.11$ [-0.33, 0.57]	$p = .99$ , $d = 0.10$ [-0.60, 0.92]	$p = .99$ , $d = 0.23$ [-0.43, 0.57]	$p = .92$ , $d = 0.29$ [-1.13, 0.53]	$p = .99$ , $d = 0.33$ [0.02, 0.51]	$p = .22$ , $d = 0.04$ [-0.29, 0.22]	$p = .16$ , $d = 0.35$ [-0.01, 0.50]

(continued overleaf)

TABLE 4 (Continued)

	Groupies vs. PMs	Groupies vs. fans	Groupies vs. students	Groupies vs. MACs	PMs vs. fans	PMs vs. students	PMs vs. MACs	Fans vs. students	Fans vs. MACs	Students vs. MACs
Attachment and personality										
Avoidant attachment	$p = .74$ $d = 0.13$ [-0.56, 0.82]	$p = .64$ $d = 0.12$ [-0.38, 0.62]	$p = .71$ $d = 0.09$ [-0.39, 0.57]	$p = .35$ $d = 0.25$ [-0.26, 0.76]	$p = .99$ $d = 0.00$ [-0.58, 0.58]	$p = .45$ $d = 0.20$ [-0.35, 0.75]	$p = .67$ $d = 0.13$ [-0.45, 0.71]	$p = .14$ $d = 0.20$ [-0.07, 0.48]	$p = .46$ $d = 0.13$ [-0.20, 0.46]	$p = .03$ $d = 0.32$ [0.03, 0.62]
Anxious attachment	$p = .99$ $d = 0.47$ [-0.20, 1.20]	$p = .99$ $d = 0.26$ [-0.36, 0.97]	$p = .99$ $d = 0.01$ [-0.77, 0.77]	$p = .99$ $d = 0.41$ [0.29, 1.20]	$p = .99$ $d = 0.25$ [-0.21, 0.70]	$p = .29$ $d = 0.62$ [0.08, 1.12]	$p = .99$ $d = 0.19$ [-0.34, 0.77]	$p = .65$ $d = 0.30$ [-0.02, 0.64]	$p = .99$ $d = 0.11$ [-0.24, 0.44]	$p = .03$ $d = 0.45$ [0.17, 0.45]
Openness	$p = .90$ $d = 0.03$ [-0.60, 0.66]	$p = .90$ $d = 0.03$ [-0.44, 0.50]	$p = .83$ $d = 0.03$ [-0.41, 0.48]	$p = .52$ $d = 0.14$ [-0.33, 0.62]	$p = .97$ $d = 0.00$ [-0.53, 0.53]	$p = .97$ $d = 0.0$ [0.51, 0.51]	$p = .67$ $d = 0.12$ [-0.41, 0.65]	$p = .89$ $d = 0.00$ [-0.27, 0.27]	$p = .44$ $d = 0.12$ [-0.20, 0.43]	$p = .46$ $d = 0.12$ [-0.16, 0.40]
Conscientious	$p = .99$ $d = 0.08$ [-0.61, 0.65]	$p = .99$ $d = 0.07$ [-0.53, 0.71]	$p = .99$ $d = 0.13$ [-0.61, 0.80]	$p = .99$ $d = 0.12$ [-0.53, 0.78]	$p = .99$ $d = 0.03$ [-0.41, 0.46]	$p = .99$ $d = 0.26$ [-0.15, 0.81]	$p = .99$ $d = 0.03$ [-0.49, 0.57]	$p = .99$ $d = 0.22$ [-0.08, 0.51]	$p = .99$ $d = 0.05$ [-0.28, 0.39]	$p = .54$ $d = 0.29$ [0.01, 0.59]
Agreeable	$p = .85$ $d = 0.05$ [-0.58, 0.67]	$p = .73$ $d = 0.08$ [-0.39, 0.55]	$p = .84$ $d = 0.05$ [-0.40, 0.50]	$p = .15$ $d = 0.38$ [-0.10, 0.86]	$p = .94$ $d = 0.03$ [-0.48, 0.54]	$p = .95$ $d = 0.00$ [-0.49, 0.49]	$p = .27$ $d = 0.33$ [-0.19, 0.85]	$p = .80$ $d = 0.03$ [-0.24, 0.30]	$p = .09$ $d = 0.28$ [-0.04, 0.59]	$p = .03$ $d = 0.30$ [0.02, 0.58]
Neurotic	$p = .11$ $d = 0.50$ [-0.16, 1.15]	$p = .77$ $d = 0.06$ [-0.41, 0.54]	$p = .67$ $d = 0.10$ [-0.36, 0.55]	$p = .49$ $d = 0.18$ [-0.30, 0.67]	$p = .09$ $d = 0.48$ [-0.05, 1.00]	$p = .02$ $d = 0.61$ [0.10, 1.11]	$p = .53$ $d = 0.38$ [-0.16, 0.91]	$p = .21$ $d = 0.16$ [-0.10, 0.42]	$p = .53$ $d = 0.12$ [-0.20, 0.43]	$p = .07$ $d = 0.27$ [-0.01, 0.56]
Extraversion	$p = .50$ $d = 0.25$ [-0.40, 0.91]	$p = .53$ $d = 0.15$ [-0.33, 0.62]	$p = .04$ $d = 0.48$ [0.02, 0.94]	$p = .75$ $d = 0.09$ [-0.40, 0.58]	$p = .17$ $d = 0.36$ [-0.18, 0.89]	$p = .01$ $d = 0.70$ [0.18, 1.22]	$p = .65$ $d = 0.35$ [-0.20, 0.89]	$p = .01$ $d = 0.32$ [0.05, 0.57]	$p = .65$ $d = 0.08$ [-0.23, 0.39]	$p = .01$ $d = 0.42$ [0.13, 0.70]

(continued overleaf)

TABLE 4 (Continued)

	Groupies vs. PMs	Groupies vs. fans	Groupies vs. students	Groupies vs. MACs	PMs vs. fans	PMs vs. students	PMs vs. MACs	Fans vs. students	Fans vs. MACs	Students vs. MACs
Hypomania	$p = .51,$ $d = 0.21$ [-0.45, 0.86]	$p = .32,$ $d = 0.25$ [-0.23, 0.72]	$p = .32,$ $d = 0.23$ [-0.23, 0.69]	$p = .17,$ $d = 0.35$ [-0.14, 0.84]	$p = .94,$ $d = 0.03$ [-0.51, 0.56]	$p = .08,$ $d = 0.44$ [-0.08, 0.96]	$p = .67,$ $d = 0.12$ [-0.42, 0.67]	$p < .001,$ $d = 0.48$ [0.21, 0.74]	$p = .55,$ $d = 0.10$ [-0.21, 0.41]	$p < .001,$ $d = 0.57$ [0.28, 0.86]
Sensation seeking dangerous	$p = .05,$ $d = 0.78$ [0.11, 1.44]	$p = .16,$ $d = 0.37$ [-0.12, 0.85]	$p < .001,$ $d = 0.91$ [0.44, 1.39]	$p = .05,$ $d = 0.52$ [0.01, 1.02]	$p = .27,$ $d = 0.29$ [-0.22, 0.80]	$p = .23,$ $d = 0.29$ [-0.20, 0.78]	$p = .61,$ $d = 0.14$ [-0.38, 0.66]	$p < .001,$ $d = 0.56$ [0.30, 0.83]	$p = .35,$ $d = 0.15$ [-0.17, 0.46]	$p = .003,$ $d = 0.42$ [0.13, 0.70]
Sensation seeking impulsive	$p = .90,$ $d = 0.04$ [-0.58, 0.67]	$p = .72,$ $d = 0.08$ [-0.39, 0.54]	$p = .23,$ $d = 0.26$ [-0.18, 0.71]	$p = .13,$ $d = 0.41$ [-0.08, 0.88]	$p = .63,$ $d = 0.12$ [-0.38, 0.63]	$p = .35,$ $d = 0.23$ [-0.26, 0.72]	$p = .07,$ $d = 0.48$ [-0.05, 1.00]	$p = .008,$ $d = 0.34$ [0.08, 0.60]	$p = .07,$ $d = 0.28$ [-0.03, 0.60]	$p < .001,$ $d = 0.66$ [0.37, 0.94]
Current happiness	$p = .70,$ $d = 0.04$ [-0.58, 0.67]	$p = .41,$ $d = 0.08$ [-0.39, 0.54]	$p = .23,$ $d = 0.26$ [-0.18, 0.71]	$p = .41,$ $d = 0.41$ [-0.08, 0.88]	$p = .22,$ $d = 0.12$ [-0.38, 0.63]	$p = .11,$ $d = 0.23$ [-0.26, 0.72]	$p = .22,$ $d = 0.48$ [-0.05, 1.00]	$p = .55,$ $d = 0.34$ [0.08, 0.60]	$p = .96,$ $d = 0.28$ [-0.03, 0.60]	$p = .62,$ $d = 0.66$ [0.37, 0.94]
Happiness in youth	$p = .99,$ $d = 0.23$ [-0.40, 0.92]	$p = .99,$ $d = 0.20$ [-0.25, 0.61]	$p = .04,$ $d = 0.66$ [0.28, 1.05]	$p = .06,$ $d = 0.77$ [0.32, 1.29]	$p = .99,$ $d = 0.40$ [-0.10, 0.85]	$p = .03,$ $d = 0.82$ [0.41, 1.27]	$p = .03,$ $d = 0.97$ [0.50, 1.56]	$p < .001,$ $d = 0.52$ [0.27, 0.81]	$p < .001,$ $d = 0.54$ [0.25, 0.93]	$p = .99,$ $d = 0.06$ [-0.23, 0.34]
Mean income	$p = .58,$ $d = 0.91$ [0.23, 2.10]	$p = .99,$ $d = 0.06$ [-0.46, 0.62]	$p < .001,$ $d = 2.83$ [1.61, 5.56]	$p = .99,$ $d = 0.31$ [-0.18, 0.96]	$p = .39,$ $d = 0.77$ [0.08, 1.40]	$p < .001,$ $d = 5.16$ [2.41, 9.76]	$p = .03,$ $d = 1.18$ [0.53, 2.07]	$p < .001,$ $d = 1.64$ [1.13, 2.71]	$p = .64,$ $d = 0.36$ [0.01, 0.81]	$p < .001,$ $d = 1.21$ [0.87, 1.98]

$p, d$  [95% CI around  $d$ ].

**TABLE 5** Group Comparisons (Percentages)

	Groups vs. PMs	Groups vs. Fans	Groups vs. Students	Groups vs. MACs	PMs vs. Fans	PMs vs. Students	PMs vs. MACs	Fans vs. Students	Fans vs. MACs	Students vs. MACs
Attempted suicide in youth	$p = .08$ , OR = 0.00, [0.00, 1.42]	$p = .99$ , OR = 2.29 [0.68, 7.14]	$p = .35$ , OR = 2.80 [0.87, 8.27]	$p = .69$ , OR = 2.69 [0.75, 9.24]	$p = .63$ , OR = 0.00 [0.00, 1.02]	$p = .90$ , OR = 0.00 [0.00, 1.53]	$p = .86$ , OR = 0.00 [0.00, 1.64]	$p = .99$ , OR = 1.22 [0.55, 2.67]	$p = .99$ , OR = 1.18 [0.46, 3.13]	$p = .99$ , OR = 0.97 [0.40, 2.44]
Alcohol problem youth	$p = .99$ , OR = 2.42, [0.45, 17.1]	$p = .99$ , OR = 1.07 [0.33, 3.11]	$p = .99$ , OR = 1.40 [0.45, 3.95]	$p = .99$ , OR = 1.29 [0.39, 3.96]	$p = .99$ , OR = 0.43 [0.08, 1.67]	$p = .99$ , OR = 0.57 [0.10, 2.13]	$p = .99$ , OR = 0.52 [0.09, 2.12]	$p = .99$ , OR = 0.38 [0.71, 2.41]	$p = .99$ , OR = 1.20 [0.58, 2.52]	$p = .99$ , OR = 0.92 [0.47, 1.85]
Used alcohol youth	$p = .99$ , OR = 1.00 [0.20, 4.86]	$p = .99$ , OR = 1.17 [0.39, 3.96]	$p = .003$ , OR = 5.12 [1.82, 16.69]	$p = .04$ , OR = 4.20 [1.40, 14.45]	$p = .99$ , OR = 1.17 [0.36, 4.49]	$p = .01$ , OR = 5.12 [1.66, 18.98]	$p = .07$ , OR = 4.19 [1.28, 16.34]	$p < .001$ , OR = 4.41 [2.49, 7.94]	$p < .001$ , OR = 3.62 [1.85, 7.23]	$p = .99$ , OR = 0.82 [0.45, 1.51]
Used sex as leverage	$p = .99$ , OR = 1.79 [0.42, 8.25]	$p = .001$ , OR = 7.17 [2.11, 25.42]	$p < .001$ , OR = 8.67 [2.63, 29.66]	$p < .001$ , OR = 15.62 [3.74, 80.72]	$p = .16$ , OR = 3.98 [0.98, 15.45]	$p = .045$ , OR = 4.81 [1.22, 18.04]	$p = .005$ , OR = 8.68 [1.77, 48.54]	$p = .99$ , OR = 1.21 [0.41, 3.50]	$p = .99$ , OR = 2.21 [0.58, 10.26]	$p = .99$ , OR = 1.83 [0.50, 8.32]
STIs in youth	$p = .99$ , OR = 0.35 [0.06, 1.73]	$p = .99$ , OR = 2.21 [0.44, 9.28]	$p = .99$ , OR = 1.64 [0.35, 6.18]	$p = .99$ , OR = 0.89 [0.19, 3.28]	$p < .001$ , OR = 6.33 [1.64, 24.44]	$p = .03$ , OR = 4.73 [1.32, 16.37]	$p = .83$ , OR = 2.55 [0.72, 8.68]	$p = .99$ , OR = 0.74 [0.25, 2.08]	$p = .46$ , OR = 0.40 [0.14, 1.09]	$p = .99$ , OR = 0.54 [0.21, 1.35]
Regrets from youth	$p = .99$ , OR = 1.24 [0.29, 5.55]	$p = .99$ , OR = 1.19 [0.39, 3.36]	$p = .99$ , OR = 0.66 [0.23, 1.76]	$p = .99$ , OR = 0.50 [0.16, 1.42]	$p = .99$ , OR = 0.95 [0.27, 2.96]	$p = .99$ , OR = 0.53 [0.16, 1.55]	$p = .80$ , OR = 0.40 [0.11, 1.25]	$p = .25$ , OR = 0.55 [0.31, 0.96]	$p = .05$ , OR = 0.42 [-0.21, 0.81]	$p = .99$ , OR = 0.33 [0.42, 1.36]
Sought counseling	$p = .10$ , OR = 5.37 [1.23, 29.1]	$p = .99$ , OR = 1.21 [0.45, 3.37]	$p = .99$ , OR = 1.43 [0.55, 3.84]	$p = .99$ , OR = 0.61 [0.21, 1.78]	$p = .06$ , OR = 0.22 [0.05, 0.75]	$p = .13$ , OR = 0.26 [0.06, 0.85]	$p < .001$ , OR = 0.11 [0.02, 0.39]	$p = .99$ , OR = 1.18 [0.69, 2.02]	$p = .15$ , OR = 0.50 [0.25, 0.98]	$p = .03$ , OR = 0.42 [0.23, 0.78]

(continued overleaf)

TABLE 5 (Continued)

	Groups vs. PMs	Groups vs. Fans	Groups vs. Students	Groups vs. MACs	PMs vs. Fans	PMs vs. Students	PMs vs. MACs	Fans vs. Students	Fans vs. MACs	Students vs. MACs
Drug problems youth	$p = .89$ , OR = 2.92 [0.71, 13.8]	$p = .29$ , OR = 2.68 [0.97, 7.44]	$p < .001$ , OR = 5.51 [2.01, 15.25]	$p = .10$ , OR = 3.36 [1.15, 9.96]	$p = .99$ , OR = 0.90 [0.23, 2.95]	$p = .99$ , OR = 1.85 [0.48, 6.04]	$p = .99$ , OR = 1.14 [0.28, 3.94]	$p = .20$ , OR = 2.06 [1.06, 4.03]	$p = .99$ , OR = 1.26 [0.60, 2.72]	$p = .99$ , OR = 0.61 [0.29, 1.31]
Work days physical	$p = .16$ , OR = 10.16 [1.07, 513.94]	$p = .16$ , OR = 3.66 [1.01, 12.79]	$p = .99$ , OR = 1.63 [0.49, 5.09]	$p = .45$ , OR = 3.07 [0.82, 11.22]	$p = .99$ , OR = 0.34 [0.01, 2.62]	$p = .41$ , OR = 0.15 [0.00, 1.05]	$p = .99$ , OR = 0.29 [0.01, 2.29]	$p = .22$ , OR = 0.44 [0.20, 0.94]	$p = .99$ , OR = 0.84 [0.32, 2.24]	$p = .94$ , OR = 1.90 [0.85, 4.53]
Work days mental	$p = .70$ , OR = 0.00 [0.00, 2.33]	$p = .99$ , OR = 3.31 [0.47, 19.20]	$p = .99$ , OR = 0.80 [0.14, 3.17]	$p = .99$ , OR = 0.90 [0.14, 3.96]	$p = .99$ , OR = 0.00 [0.00, 5.54]	$p = .36$ , OR = 0.00 [0.0, 1.00]	$p = .50$ , OR = 0.00 [0.00, 1.22]	$p = .20$ , OR = 0.24 [0.07, 0.68]	$p = .13$ , OR = 0.27 [0.07, 0.88]	$p = .99$ , OR = 1.12 [0.49, 2.67]

Note: N/a odds ratios exist when one group produced a frequency of zero in a category.

$\eta_p^2 = .015$ ), or neuroticism ( $F[4, 342] = 2.03, p = .09, \eta_p^2 = .023$ ). There was a significant group difference on extraversion ( $F[4, 344] = 4.08, p = .003, \eta_p^2 = .045$ ), with students being lower in extraversion than the other groups. There was also a significant group difference for hypomania ( $F[4, 338] = 5.48, p < .001, \eta_p^2 = .061$ ), with LSD post hoc analysis showing students as more hypomanic than both metal fans and MACs. Groups differed significantly on sensation seeking—dangerous behaviors ( $F[4, 344] = 7.58, p < .001, \eta_p^2 = .081$ ), with students engaging in significantly more dangerous behaviors than all other groups except musicians. Groupies had the lowest mean scores on sensation seeking—danger, significantly lower than musicians, MACs, and students, possibly due to their high levels of anxiety. College students also engaged in significantly more sensation seeking—impulsive behaviors than MACs and fans ( $F[4, 351] = 5.45, p < .001, \eta_p^2 = .058$ ). See [Table 2](#) for means and standard deviations.

### *Comparing fans and MACs*

To provide additional evidence for the similarity of fans and MACs, we provide Bayes Factors for comparisons between the two groups in this section. The Bayes Factor (BF) statistic addresses the strength of evidence for the null versus alternative hypotheses. BF values greater than 1.0 in the context of these analyses suggest greater support for the null with values 3.0 or greater indicating substantial evidence and values greater than 10.0 indicating strong evidence. Most of the comparisons found substantial support for the equality of the two groups. Specifically, avoidant attachment ( $BF = 4.2$ ), anxious attachment ( $BF = 3.7$ ), openness ( $BF = 4.3$ ), conscientiousness ( $BF = 5.8$ ), neuroticism ( $BF = 4.7$ ), extraversion ( $BF = 5.3$ ), hypomania ( $BF = 4.8$ ), and dangerous sensation seeking ( $BF = 3.9$ ) comparisons found substantial support. Whereas evidence for equivalence was weaker for agreeableness ( $BF = 1.4$ ) and impulsive sensation seeking ( $BF = 1.3$ ).

**Research Question #4** *Do metal enthusiasts differ in their life satisfaction and current functioning compared to middle-aged non-metal peers or college students?* There were significant group differences in how many days of work were missed in the past month due to mental ( $\chi^2 [4, N = 311] = 12.7, p = .013$ ) or physical health problems ( $\chi^2 [4, N = 308] = 12.3, p = .015$ ) but these variables were too skewed for even the robust analyses to compensate. There were no significant differences in how happy the groups rated themselves on current happiness in life, on a scale of 0–100 ( $F(4, 360) = 0.89, p = .47, \eta_p^2 = .010$ ). When reflecting back on their youth, the metal groups recalled being significantly happier (Robust  $F(4, 46.4) = 46.4, p < .001, \text{robust ES} = 0.47$ ) compared to non-metal groups. Musicians and fans reported being significantly happier in their youth than MACs and students did. In addition, groupies reported significantly more youthful happiness than students. Also, all metal groups were less likely to report having regrets about their youthful experiences, with about one third reporting having regrets, compared to 44.9% of students and 51.3% of MACs ( $\chi^2 [4, N = 376] = 10.24, p = .037$ ).

There were also significant group differences for having sought psychological counseling for emotional problems in their lifetimes ( $\chi^2 [4, 377] = 18.39, p < .001$ ), with 69.7% of MACs rating highest and musicians rating lowest use, at 20%.

All groups were fairly highly educated. Groups differed on current annual income (Robust  $F(4, 29.7) = 41.0, p < .001, \text{robust ES} = 0.60$ ) with musicians making significantly more on average than all other groups, which did not differ from each other, except for the fact that, not surprisingly, students made significantly less than all other groups. See [Table 2](#) for means and standard deviations for ANOVAs and [Table 3](#) for  $\chi^2$  percentages.

### *Invitation for Open Commentary*

When offered the chance to provide any free-response insights about their youth cohorts, across all five groups, participants often wrote about the similarities between all adolescents, the common struggles, and the search for identity. One MAC summed it up by saying, “the transient emotions of youth may have been short-lived, but they were incredibly honest . . . we all have to go through the fire, each in our own times, if we’re ever going to forge our true selves.” For insights from the metal groups stemming from more in-depth open-ended qualitative measures, see Howe and Friedman (2014).

## **Discussion**

As Baudelaire challenged bland romanticism and helped launch gritty, urban modernity in his poetry, modern rebellious groups like heavy metal fans, groupies and musicians challenge conventional views of adolescent rebellion. Despite the challenges of ACEs and other stressful and risky events in their youth, all three metal groups reported higher levels of youthful happiness than either MACs or students. They also were less likely to have any regrets about things they did in their youth compared to MACs and students. In fact, MACs sought psychological counseling for emotional problems more than any other group, indicating a less happy and fulfilling perspective on their 1980s adolescence. In support of the astute comment by the MAC participant above, in one-third of the analyses, there were no statistically significant group differences in life experiences or current functioning between the five groups assessed. This suggests similar developmental trajectories and adult functioning in members of the general population, both young adults and middle-aged people.

The Bayesian analyses were particularly helpful in illustrating what Erikson so astutely noted over 40 years ago, that identity crises, periods of intense longing, experimentation, and self-reflection, are normative for all adolescents. These metalheads were well aware of the larger culture’s stereotypes and misgivings about their chosen style culture yet they reflected on their group membership with pride and developed skills to cope with their angst about the world at large, the mainstream culture which they abhorred (Howe & Friedman, 2014). As current identity development theorists assert, youth in western cultures actively construct their own identities based on continuous self-reflection, observations of the broader culture, and their own burgeoning abilities to critically think about and cope with the ramifications of what it means to be them (Spencer et al., 2003).

It must be noted, however, that this was a community sample of relatively high functioning individuals who volunteered to participate and report about their lives. For example, unlike previous studies (e.g., Gillespie & Myors, 2000; Leung & Kier, 2010; Rentfrow et al., 2011), very few personality differences were found between the groups. Despite the fact that metalheads were marginalized by the larger European-American society, future research should examine these same variables with members of other style cultures that do not enjoy the benefits of white privilege, such as hip hop enthusiasts (e.g., Clay, 2003). Identity researchers have found that youth of color have to not only struggle with their own personal search for self, but they must cope with the knowledge that they will never be truly accepted by the larger culture in which they live, even if they don’t identify with fringe style cultures (Spencer et al., 2003). Thus, the identity processes in diverse youth may differ and coping skills, acculturation, and mental health should be assessed in addition to the personality and life experience variables investigated herein.

Despite the similarities found between our five comparison groups on many of the variables investigated, there were some noteworthy group differences, some with medium

to large effect sizes, which shed light on the previous controversies regarding metalheads' experiences and adjustment. For example, metal musicians scored significantly higher on sensation-seeking dangerous behaviors than groupies, but did not differ from other groups, nor did they differ from other groups on neuroticism, extraversion, or openness, as had been suggested by past work. In fact, college students scored high on many measures of poor adjustment, such as anxious attachment styles, hypomania, sensation-seeking dangerous behaviors, and sensation-seeking-impulsive behaviors, in comparison to the middle-aged groups. They also scored lower than everyone else on extraversion. This suggests a developmental reduction in extreme moods and behaviors as people age, which has also been shown in past work (e.g., Arnett, 2002; Gross et al., 1997). Longitudinal work following members of youth style cultures over time could shed light on whether, in fact, these are normative age-related trends.

In support of early work on metalheads (Arnett, 1991b, 1996; Martin et al., 1993), as well as popular conceptions of this style culture, participants from the metal enthusiast groups did live the risky "sex, drugs, and rock-n-roll" lifestyle to a greater degree than both their same-age peers and a current cohort of young adults. For example, all metal groups reported regularly using alcohol in their youth to a greater degree than did the MACs or students. Also, they reported significantly higher sex drives in their youth than either MACs or students. Those metal enthusiasts who identified most strongly with the style culture reported the most striking differences in comparison to other groups. For example, musicians had the strongest sex drive, and the greatest number of sexual partners over their lifetimes, as compared to all other groups. Related to this, musicians contracted the highest numbers of sexually transmitted infections of any of the other groups. They also reported frequently using sex as leverage to get what they wanted in the 1980s, as did groupies, who utilized this strategy for self-gain the most of any group. In addition to using sex as leverage in their youth, fully half of the groupies reported significant problems with drugs in their youth and one third had attempted suicide.

In support of previous research and theorizing on women in the metal culture (Krenske & McKay, 2000; Walser, 1993), it did appear that groupies experienced high numbers of adverse childhood experiences (ACEs) and perhaps gravitated toward the style culture to find a sense of purpose or kinship. In addition to experiencing more ACEs than all other groups, they also had the highest mean scores for anxious attachment, though small sample size may have affected the lack of statistical significance for this difference. They were the group most likely to be married more than two times, to have serious drug problems in their youth, and to have attempted suicide. As Erikson (1968) suggested when discussing poor adjustment during the search for identity, because heavy metal was a male-dominated industry and the men set the rules for the style culture, perhaps the groupies lacked true individuation and were overly enmeshed in the style culture, losing themselves to the whims of those with more power. With a small sample size for both sub-groups, it is difficult to draw conclusions so future work should proceed with a more clearly delineated gendered lens regarding the structure of the style culture under investigation.

Interestingly, musicians had very low levels of ACEs and child maltreatment in their histories, as well as low scores on attachment difficulties, suggesting another fruitful avenue for future gendered analyses of groupie and musician subcultures. The musician subgroup was well adjusted, happy, and had no significant history of trauma. This indicates that males and females may gravitate toward fringe style cultures for different reasons, a hypothesis that warrants future examination.

These results support previous research from the 1980s and 1990s that metalheads engaged in risky sexual and substance-related behaviors, and that metal fans, and groupies, in particular, came from troubled families characterized by turmoil. Qualitative data



reported in Howe and Friedman (2014) suggest that heavy metal groupies found solace in the music they loved and the sexual intimacy they found with musicians. Likewise, fans and musicians alike felt a kinship in the metal community, and a way to experience heightened emotions and intense connections with like-minded people, which seemed to contribute to their eventual positive identity development. This supports earlier theorizing (Arnett, 1993; Scheel & Westefeld, 1999; Schwartz & Fouts, 2003).

Today, these middle-aged metalheads are middle class, gainfully employed, relatively well educated, and look back fondly on the wild times they lived in the 1980s. In fact, the metal groups were less likely than both comparisons to have regrets about things they did in their youth. Metalheads in general were not significantly more likely to attempt suicide or have sex at earlier ages than other youth, nor were they more likely to miss work due to physical or mental health problems as adults, which departs from earlier work (e.g., Arnett, 1991b). In fact, their middle-aged comparison cohorts were most likely to experience maternal neglect, to seek psychological counseling, and to report having a less happy experience growing up as youth in the 1980s. These findings suggest that fringe style cultures can attract troubled youth who may engage in risky behaviors, but that they also may serve a protective function as a source of kinship and connection for youth seeking to solidify their identity development (Arnett, 1993; Schwartz & Fouts, 2003).

### Limitations and Suggestions for Future Work

This study used self-report and retrospective data in an effort to ascertain promising directions for future study; the design is limited by all the usual caveats regarding interpretation commonly found in such studies. The participants were volunteers who had access to Facebook and Survey Monkey and wanted to tell their stories anonymously to researchers. Thus, they may be higher functioning than other metalheads who may have died early, declined to participate, or experienced problems in employment, relationships, and so on, as they grew up. Still, their levels of positive adjustment compared to both middle-aged and younger cohorts are striking, and run counter to most stereotypes. Comprehensive future work should follow youth involved in distinct style cultures longitudinally so that developmental trajectories can be more clearly delineated.

Because the metal style culture was traditionally European-American and working to middle class, the current sample reflects this. Similar studies should be attempted with diverse fringe youth style cultures such as hip hop or rap enthusiasts, in order to assess whether, indeed, all youth struggle with the same issues of the search for identity and meaning, as our five sub-groups here indicate (e.g., Clay, 2003). Our subsamples of groupies and musicians were quite small and thus conclusions should be made with caution until confirmed by future work. Are those who affiliate with such groups a danger to themselves or others (Fried, 2003; Took & Weiss, 1994)? Boer et al. (2011) suggest that cultural identity in terms of music preferences reflects shared values which lead group members to emotionally bond with each other. One of the most common findings in the psychological literature is that social support is a crucial protective factor for troubled youth (e.g., Ungar, 2011). Contrary to popular stereotypes, this study reveals that such beneficial support may sometimes come from culturally vilified outgroups.

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