



Trajectories of Goth Music Preferences in Adolescence and Psychological Adjustment in Adulthood

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Abstract

Non-mainstream rock music preferences, like goth, are linked to psychological difficulties in adolescence and emerging adulthood. This study explored the persistence of these difficulties into adulthood, while considering gender moderation. From ages 15 to 22, 364 participants (59% female) annually indicated their preference for goth music. Their mental health and well-being were evaluated at age 30 and at ages 13–14 as a control. A latent class growth analysis on their goth preference revealed two trajectories: lower (non-fans; 77%) and higher (fans; 23%). Gender moderation analysis showed that only males on the higher trajectory reported lower well-being and poorer mental health at age 30. Male goth music fans, most likely attracted to this cultural expression of their difficulties, may face increased psychological challenges as adults due to societal gender norms and growing marginalization. This study indeed suggests that an extended affinity for goth music during adolescence and emerging adulthood indicates long-term psychological adjustment challenges among adult male fans.

Keywords Marginal music preferences · Goth rock · Mental Health · Well-being · Adolescence

Introduction

Music can play an important role during the passage through adolescence and emerging adulthood, two developmental periods that are challenging in many ways. This medium is then particularly valued and is likely to be related to identity and social development (Bonneville-Roussy et al., 2013; Miranda et al., 2012; Franken et al., 2017). Knowing that rates of psychological distress are high in adolescence and emerging adulthood (Potterton et al., 2022) and that music preferences may hold a significant role in emotion regulation, it seems important to focus on the link between this medium and psychological health. Music may act as a protective factor but also as a risk factor in the psychological adjustment of fans (Welch et al., 2020). Indeed, adolescents with marginal music preferences derived from non-mainstream rock, such as goth rock,

exhibit more internalized problems (Ter Bogt et al., 2017). However, preferred music styles can evolve along different trajectories. The association between goth rock trajectories from adolescence to emerging adulthood and psychological adjustment in adulthood has never been examined. This study aims to address this question. Considering documented sex differences with respect to psychological difficulties during that period (Nolen-Hoeksema & Hilt, 2009) and marginal music preferences (Ter Bogt et al., 2021b), the moderating effect of sex on these links is examined.

Musical Engagement

Different terms can refer to musical behaviors that mark appreciation of a music style: “Non-Fans”, “Casual/Moderate Fans”, “Super Fans”, and “Passionate or Obsessive Fans” (Barrett, 2020; Gray et al., 2017; Powell et al., 2023). These types of musical behaviors fall on a continuum of appreciation ranging from intolerance to indifference or preference for that music style, with varying degrees of intensity. The term used here will be “fan”. However, it is still important to note the potential variability in the music appreciation of a fan, as the term can refer to someone who is open-minded to a music style and falls somewhere on the spectrum of fandom (Gray et al., 2017).

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Mainstream versus Non-Mainstream Music

Mainstream music encompasses popular music styles, such as pop music, which is intended for a general audience due to its light and accessible nature within the musical culture. Pop music fans are also those who follow, on average, the less problematic mental health trajectories. In contrast, non-mainstream rock music includes styles like heavy metal, goth, and punk that are characterized by their marginal nature in musical aesthetics (often described as loud) and unconventional social groups.

Non-mainstream rock is characterized by its intense and fragmented musical aesthetic and its dark and gloomy musical culture, setting it apart from mainstream music. Some music subgenres derived from non-mainstream rock, like goth, attract fans through themes of psychological discontent, such as a deep sense of “out-of-place-ness”. These subgenres typically adopt a critical stance toward issues of social alienation and stigma that are central to their respective cultures. Goth, a cultural and musical scene often referred to as “the art of darkness” (Thurtle, 2020, p. 55), is primarily based on a darker conception of human existence. These melancholic themes are exhibited through a dramatic musical aesthetic that evokes the heaviness of feelings of fans often experiencing psychological distress (Thurtle, 2020). Among marginalized fans of goth music, alienation is often experienced as social isolation and a sense of emptiness (Lacourse et al., 2001). Once epitomized by the fiercely pessimistic Marilyn Manson, goth music continues to unite its fans through a shared set of values and attitudes which are related to a distressful social marginalization and a deep sense of being misunderstood and rejected (Thurtle, 2020). According to Prinstein and Greca (2002), belonging to a marginalized or nonconformist social subgroup is associated with internalized difficulties, such as lower self-esteem, elevated depressive and anxiety symptoms, and higher levels of loneliness. Identification with the marginalized goth music culture could therefore carry a set of identity and psychological risks among its fans, especially in terms of psychological ill-being, possibly related to their social marginality.

Evolution of Goth Preference from Adolescence to Emerging Adulthood

Ter Bogt et al. (2010) conducted a study over five years, assessing music preferences among 2344 participants (M age = 14.4 at T1; 75.2% female), with data collected on three separate occasions. They observed that non-mainstream rock trajectories are non-linear, especially toward the end of adolescence. These trajectories tend to decrease for most rock fans and increase for a minority. At this time, adolescents transitioning to emerging adulthood

would be more assertive of their true music preferences (Delsing et al., 2008). In a six-wave study, 900 participants (M age = 12.4 at T1; 51.1% female) had their preferences for three non-mainstream rock subgenres (rock, metal, and goth) measured from ages 12 to 21. Nonlinearity appears to distinguish goth music trajectories (Ter Bogt et al., 2010, 2021a). Three trajectories for goth preference emerged from these groups of fans: a lower trajectory (78% of the sample), an intermediate trajectory (15%), and a higher trajectory (7%).

Another longitudinal study by Ter Bogt et al. (2021b) examined 940 participants aged 10–15 years (mean age = 12.4 at T1; 49% female) and showed that goth music experienced a surge in popularity around the age of 14, with approximately 10.8% of adolescents in the study expressing a preference for it. However, its prominence dwindled shortly before age 16, with only 5.5% of participants still embracing it. The group with a stable preference for goth would become marginalized between the ages of 15 and 16. It is, therefore, safe to assume, based on the results of the studies that a stable goth-preferring group from adolescence and in the following years until emerging adulthood would be identifiable from ages 15 to 16. Furthermore, goth music preference would vary by gender, with boys’ preference decreasing significantly between ages 12 and 16 while girls’ preference would be more stable during this period (Ter Bogt et al., 2017).

Links between Marginal Music Preferences and Psychological Adjustment: Social and Identity Theories

Music preferences can draw fans into challenging musical and social environments and affect psychological well-being and mental health. Various psychosocial and social-cognitive mechanisms explain this phenomenon.

Psychosocial mechanisms

Similarity attraction theory posits that we are naturally drawn to individuals who share similar attitudes and preferences (Byrne et al., 1971). According to this theory, adolescents form their social networks based on their music preferences, forming subgroups centered around the psychological themes conveyed by the musical culture (Powell et al., 2023). The Music Marker Theory by Ter Bogt et al. (2017) suggests that social groups formed based on musical preferences are established through the outward display of a musical badge, which represents fans’ music choices as well as their personal and social identities. For instance, forming a social group based on goth music preference could be facilitated by manifesting a style-specific musical badge, such as dark, dramatic clothing and black makeup (Steglich et al., 2006). This badge can also be expressed through

subtler behaviors and attitudes that reflect an affinity for the macabre, such as melancholic emotions and social withdrawal (North & Hargreaves, 2012). Consequently, according to the Music Marker Theory, preferring goth music during adolescence and actively engaging with it would immerse the listener in a musical and social environment characterized by the specific psychological challenges associated with the social marginality of this group.

Sociocognitive mechanisms

The formation of musically homogeneous groups is believed to generate contagion among their members (Dishion & Tipsord, 2011), leading to the internalization of a shared social identity. The shared social identity among fans of various marginalized music styles, such as goth, is associated with psychological issues that can have a negative impact on their psychological well-being (Ter Bogt et al., 2021b). Fans who identify with the goth group tend to emulate the music culture promoted by engaging with its musical content (e.g., song lyrics) and video materials (Slater & Henry, 2013). This sociocognitive mechanism, known as the Peer Group Mediation Model, helps explain the tendency of fans to adapt their behaviors to align with the norms and attitudes conveyed by the mediated music culture, which can sometimes be harmful. For example, Marilyn Manson's musical content (audio and video) conveys the idea that "(...) life is miserable, and the world is dark and hostile (...)" (Ter Bogt et al., 2021a, p. 2489). This socialization process to the norms and attitudes promoted by goth culture has the potential to further reinforce the isolation and social marginalization experienced by goth fans, who may already be familiar with the tendency toward social withdrawal. Consequently, this reinforcement of isolation and social marginality could have a negative impact on their social development and psychological adjustment.

Identity mechanisms

Tajfel & Turner's (1979) approach to social identity suggests that identity construction occurs at both the individual and social levels. Therefore, belonging to a social group based on music preferences would allow musical enthusiasts to refine their identity on both levels (Ter Bogt et al., 2017). An adolescent who has not had the chance to flourish on an individual identity level and relies heavily on the social identity of their musical home group is likely to be more dependent on the group to define him or herself (Marcia, 1980). An identity crisis is thus foreseeable, especially when hyper-conformity is set in motion (Lacourse et al., 2001). A musical culture whose identity revolves around psychosocial problems would represent a risk for the psychological adjustment of fans who identify with it.

Longitudinal Links between Goth Rock and Psychological Adjustment

Adolescent goth fans are often reported to exhibit vulnerabilities that put their psychological adjustment at risk (Bowes et al., 2015; Franken et al., 2017; Ter Bogt et al., 2021a). The longitudinal study by Ter Bogt et al. (2021b) shows that these fans (ages 10–17) would be predisposed to developing internalized problems such as depression and anxiety. Identification with marginal cultures such as goth rock would often lead to social alienation, possibly reinforcing their psychological difficulties. Therefore, goth fans are known to be psychologically vulnerable (Bowes et al., 2015). Examining the link between this music preference and longer-term psychological adjustment would help to capture the extent of the adverse developmental implications in terms of identity, psychology, and social adjustment of a sustained preference for goth during pivotal life stages like adolescence and emerging adulthood. Most of the available studies cover adolescence and emerging adulthood, driven by clear developmental justifications. Thus, established adulthood (from age 30 onwards, according to Mehta et al., 2020) is a neglected period. Yet, exploring the longer-term imprint that a goth preference during adolescence and emerging adulthood may leave on the psychological well-being of potentially marginalized enthusiasts seems important. This long-term investigation is particularly justified as there appears to be a subset of enthusiasts who sustain their preference for goth music over an extended period (Ter Bogt et al., 2010).

Available studies focus on depression and anxiety symptoms (Ter Bogt et al., 2021a, b) but have not examined goth fans' psychological adjustment holistically and inclusively (mental health and well-being). In addition to reporting depression and anxiety symptoms, goth enthusiasts often suffer from loneliness (Thurtle, 2020). Thus, the stigma and ostracism they often experience may account for the isolation characteristic of this group (Van Zalk et al., 2011). This isolation can affect them in various ways, resulting in feelings of loneliness and withdrawal (Ter Bogt et al., 2021b). Finally, to comprehensively investigate psychological adjustment, "positive" manifestations such as life satisfaction and self-esteem must be considered (Ryan & Deci, 2001).

Sex as a Moderator

Goth music culture is not experienced in the same way by male and female fans in terms of dress and aesthetic expression, valued themes, and interpersonal and social understandings (Gray et al., 2017; Thurtle, 2020). Male goth music followers would be more likely to wear leather and spikes, be more likely to focus on darker, more aggressive themes such as death and destruction, and focus more on the music and individual expression of their "goth identity." In contrast, female

followers would wear flowing lace dresses, be more likely to explore themes such as romance and emotional intensity and form close-knit social groups. These gender differences in the lifestyle associated with goth culture are worth considering when examining the psychological adjustment of fans.

In adolescence and emerging adulthood, the prevalence of depressive and anxiety symptoms is higher in females than males (McGuinness et al., 2012; Hankin et al., 1998). In adulthood, although still present, these differences fade somewhat (Nolen-Hoeksema & Hilt, 2009). Given the observed sex differences in marginal music preferences (Ter Bogt et al., 2021b), the interpretation of goth culture (Goulding & Saren, 2009; Thurtle, 2020), as well as psychological well-being and mental health (Nolen-Hoeksema & Hilt, 2009), it would be beneficial to examine the moderating effect of gender on the relationship between a preference for this music style and psychological adjustment. Ter Bogt et al. (2021b) tested this effect in 940 adolescents aged 10–17 years and found no gender difference in the association between goth music preference and internalizing problems. However, it is important to conduct a longitudinal examination of this issue to observe the lasting impact of this potentially gender-differentiated music preference on the psychological development of individuals exposed to goth culture from adolescence to emerging adulthood.

Current Study

This study distinguishes itself from prior research on goth music by examining goth music trajectories, exploring potential long-term effects on mental health and well-being, and considering the moderating role of gender. The first objective of this study is to analyze annual assessments of goth music preference gathered at eight occasions from ages 15 to 22, with the intention of identifying distinct trajectories. It is expected that three trajectories will emerge. The first involves a persistent higher preference for goth throughout the entire period, the second entails an initially higher preference for goth in adolescence that declines during emerging adulthood, and the third reflects a consistent disinterest in goth across the entire period (Hypothesis 1). The second objective is to investigate the associations between the identified trajectories and psychological adjustment in adulthood considering three indicators of mental health (depression, anxiety, and loneliness) and two indicators of well-being (self-esteem and life satisfaction) collected at age 30. These associations will be examined while controlling for the initial levels of these variables measured prior to identifying the trajectories in early adolescence (at 13–14 years of age). It is hypothesized that the group characterized by a continuous preference for goth music will exhibit higher levels of mental health problems and lower levels of psychological well-being at age 30 compared to the other two trajectories (Hypothesis 2).

The third objective is to examine the moderating role of gender in the link between membership to the goth music preference trajectories and mental health and well-being at age 30. This exploratory objective seeks to address the following unexplored question: Does preferring goth music between the ages of 15 and 22 impact the mental health and well-being of men and women differently in adulthood?

Methods

Participants

The data used in this study were derived from a longitudinal study that initially recruited 390 students (M age = 12.38, $SD = 0.42$, 58% female) in 2001 from 6th grade classes within a school board located in the greater Montreal area. Most of the participants (90%) identified as Caucasian and Francophone, originating from families where both parents (mother/father) had equivalent levels of education, with an average of 13.08 years ($SD = 2.68$) for mothers and 13.20 years ($SD = 3.20$) for fathers. Most of the participants came from intact families (69%). These families' average annual income at the beginning of the study was \$48,750 ($SD = 12,500$). Participants underwent repeated assessments until age 30, with 83.6% ($n = 326$) of the original sample participating in the final data collection. The subsample selected for this study includes participants who reported their music preferences on at least one occasion between the ages of 15 and 22 ($n = 364$; 59% female). These participants did not exhibit any significant differences from the rest of the sample ($n = 26$) regarding the socio-demographic variables measured at baseline.

Procedures

At ages 13 and 14, participants completed questionnaires in a classroom setting under the supervision of research assistants. From ages 15 to 22, they participated in structured telephone interviews conducted by trained and supervised research assistants. At age 30, participants completed an online questionnaire. Written parental consent was obtained up to age 18, after which participants gave their own consent. Financial compensation was provided to participants at each data collection time point. This study was approved by the Human Research Ethics Committee of the Université du Québec à Montréal.

Instruments

Goth music preference from 15 to 22 years of age

Goth music preference was measured during the telephone interview using an item based on the Music Preference

Questionnaire (Nater et al., 2005). The interviewer asked the participant if they liked goth naming Marilyn Manson and Nine Inch Nails as examples. The participant was asked to respond using a three-point Likert scale (1 = not at all to 3 = very much).

Mental health and psychological well-being at age 30

Anxiety symptoms The shortened and validated French version of the Penn State Worry Questionnaire (Meyer et al., 1990; Hopko et al., 2003; Gosselin et al., 2001) was used. This eight-item questionnaire assesses general worrying tendency using statements such as “I often worry about things over which I have no control,” to which participants respond on a 5-point Likert scale (0 = not at all to 4 = extremely corresponding). To determine the severity of symptoms, the sum of the responses to each item was calculated; a high score indicated higher levels of anxiety symptoms. The internal consistency of the instrument was excellent ($\alpha = 0.93$).

Depressive symptoms The validated French version of the Beck Depression Inventory (Beck et al., 1961; Bourque & Beaudette, 1982) was used. This 21-item questionnaire assesses depressive symptoms on a four-point scale using statements reflecting a variety of symptoms experienced in the past week that are common in clinically depressed people (sleep disturbance, mood, etc.), such as: “I don’t feel sad;” “I feel sad most of the time;” “I feel sad all the time;” “I feel so sad or unhappy that I cannot stand it.” To determine the severity of symptoms, the sum of the responses to each item was calculated; a high score indicated higher levels of depressive symptoms. The internal consistency of the instrument was excellent ($\alpha = 0.92$).

Loneliness The validated 10-item French version of the UCLA Loneliness Scale (Version 3; Russell, 1996; de Gr ace et al., 1993) was used. This instrument measures the frequency with which participants exhibit markers of loneliness using statements rated on a four-point Likert scale (1 = never to 4 = always), such as, “I feel excluded.” To determine the overall level of loneliness, the sum of the responses to each item was calculated; a high score indicated higher levels of loneliness. The internal consistency of the instrument is excellent ($\alpha = 0.86$).

Self-esteem The validated 10-item French version of the Rosenberg Self-Esteem Scale (Rosenberg, 1965; Vallieres & Vallerand, 1990) was used. This questionnaire measures overall self-esteem and general sense of worthiness using statements rated on a four-point Likert scale (1 = strongly agree to 4 = strongly disagree), e.g., “I think I have a number of fine qualities.” To determine the overall level of

self-esteem, the sum of the responses to each item was calculated; a high score indicated higher self-esteem. The internal consistency of the instrument was excellent ($\alpha = 0.87$).

Life satisfaction The validated five-item French version of the Life Satisfaction Scale (SWLS; Diener et al., 1985; ESV; Blais et al., 1989) was used. This questionnaire measures participants’ overall satisfaction with their lives using statements rated on a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree), e.g., “So far, I have gotten the important things I want in life.” To determine the overall level of life satisfaction, the sum of the responses to each item was calculated; a high score indicated higher satisfaction. The internal consistency of the instrument was good ($\alpha = 0.80$).

Control variables at ages 13–14

Anxiety symptoms The 12-item validated French version of the Social Anxiety Scale (Franke & Hymel, 1984) was used. This instrument includes two subscales, social anxiety and social avoidance, each consisting of six statements rated on a five-point Likert scale (1 = not at all true to 5 = always true), such as: “I feel very nervous when I have to speak in public in front of a group of people” or “I prefer to avoid social situations in which I might be the centre of attention.” A total score was obtained by averaging the responses to the 12 statements. This instrument has good reliability and construct validity (Franke & Hymel, 1984, Hymel & Franke 1985). The internal consistency of the instrument is very good ($\alpha = 0.81$).

Depressive symptoms The 26-item validated French version of the Children’s Depression Inventory (Kovacs, 1983, 1985; Boivin et al., 1994) was used. For each item, participants indicated which option best described their state in the past 2 weeks, e.g., “I feel tired sometimes,” “I am often tired,” or “I am always tired.” To determine the overall level of symptoms, the sum of the responses to each item was calculated; a high score indicated higher levels of depressive symptoms. The instrument’s internal consistency is very good ($\alpha = 0.83$).

Self-esteem The five-item self-esteem subscale of the validated French version of the Self-Perception Profile for Adolescents (Harter, 1988, 2012; Bouffard et al., 2002) was used. The items are organized into pairs of statements that distinguish two types of adolescents regarding self-esteem. First, the participant chooses the type that most closely resembles them (statements on the left or right: e.g., “I am proud of the person I am” or “There are many things I would like to change about myself”). Then, they must indicate whether the statement is entirely or only somewhat

like them. Responses to the items are scored on a four-point scale (1 = lowest perceived self-esteem to 4 = highest perceived self-esteem). A high score indicates higher self-esteem. The instrument's internal consistency was very good ($\alpha = 0.84$).

Statistical Analyses

Analyses were performed using Mplus software version 8.8 (Muthén & Muthén, 1998–2015). Missing data were estimated with the Full Information Maximum Likelihood method. This method estimates, from the entire database, the model parameters that maximize the probability of identifying the observed data (Baraldi & Enders, 2010). Thus, by using this method, participants who did not complete all measurement times or all instruments can be included in these analyses. In addition, because the distributions of some variables were not normal (depression, anxiety, loneliness, self-esteem, and life satisfaction), a robust Maximum Likelihood Ratio estimator was used.

First, a latent class growth analysis (LCGA) was used to identify trajectories of goth music preference. This procedure aims to identify subgroups of individuals within a sample who follow similar developmental trajectories on a repeatedly measured variable (Muthén & Muthén, 2000). Several fit indices are used to identify the optimal number of latent trajectories and the shape of the different curves (e.g., linear, quadratic, or cubic). The Akaike Information Criterion (AIC; Akaike, 1987) and the Bayesian Information Criterion (BIC; Schwarz, 1978) determine the quality of the models when comparing their values (AIC and BIC). The closer they are to zero, the better the fit of the models. Entropy (Celeux & Soromenho, 1996) indicates the percentage of data delineation on the plot. A value of 1.00 indicates perfect delineation. The Vuong–Lo–Mendell–Rubin likelihood ratio test (VLMR;

Lo et al., 2001) and the bootstrap likelihood ratio test (BLRT; McLachlan & Peel, 2000) are indices that compare the model with several classes K to a model with several classes $K-1$. A p value less than 0.05 indicates that the chosen model is significantly better than if one class were removed.

Second, a confirmatory factor analysis was conducted to examine the validity of the latent components subsequently incorporated into the model as dependent variables using goodness-of-fit indices such as the χ^2 test (nonsignificant χ^2 value indicates a good fit), the comparative fit index and the Tucker–Lewis index (CFI/TLI: ≥ 0.95 represent a good fit; Hu & Bentler, 1999), the root mean squares error of approximation (RMSEA ≤ 0.05 indicates a good fit; Browne & Cudeck, 1992), and the standardized root mean squared residual (SRMR < 0.08 indicates a good fit; Marsh et al., 2004). The validity of the latent components, mental health (depression, anxiety, loneliness) and psychological well-being (self-esteem, life satisfaction), is interpreted from these fit indices to determine how well the indicators explain the latent components.

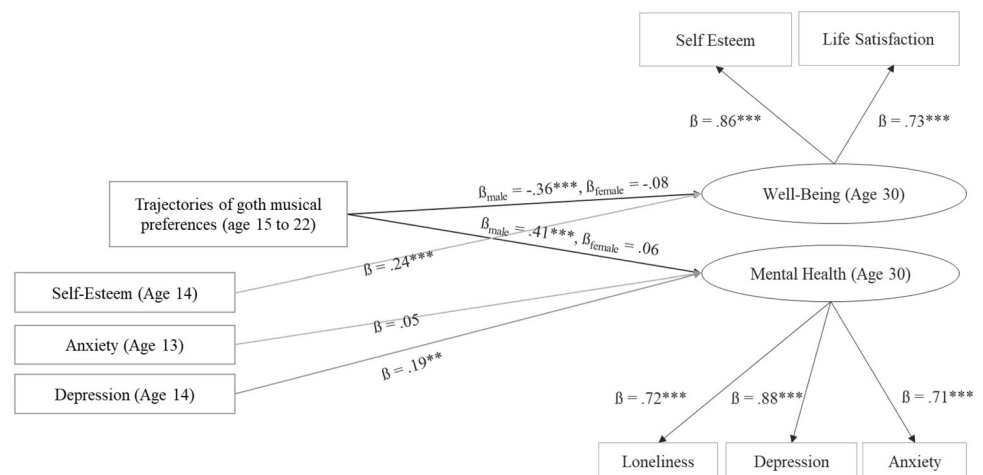
Third, the two latent variables are incorporated into the model, including goth music preference trajectories. Figure 1 illustrates the tested model. To account for potential gender differences, the equivalence of the regression relationships is tested by gender. Baseline levels at ages 13–14 (anxiety, depression, self-esteem) are included as control variables.

Results

Descriptive Statistics

Descriptive statistics and correlations (Spearman) between the variables under study are reported in Table 1 (some variables not being normally distributed: depression, anxiety, loneliness, self-esteem, and life satisfaction). Examination of

Fig. 1 Model of goth music trajectories and psychological adjustment



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

Table 1 Descriptive statistics of variables and correlations

Variables	M (SD)	Correlations																
		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<i>Goth music preference</i>																		
2. Age 15	1.40 (0.65)																	
3. Age 16	1.42 (0.66)	0.32**																
4. Age 17	1.44 (0.66)	0.54**	0.38**															
5. Age 18	1.44 (0.66)	0.57**	0.59**	0.45**														
6. Age 19	1.37 (0.60)	0.52**	0.58**	0.57**	0.50**													
7. Age 20	1.48 (0.65)	0.61**	0.52**	0.46**	0.54**	0.44**												
8. Age 21	1.46 (0.65)	0.58**	0.58**	0.56**	0.56**	0.54**	0.52**											
9. Age 22	1.43 (0.63)	0.58**	0.58**	0.56**	0.54**	0.54**	0.52**	0.52**										
<i>Depression</i>																		
10. Age 14	9.22 (6.54)	0.25**	0.30**	0.27**	0.27**	0.27**	0.27**	0.27**	0.27**	0.27**	0.27**	0.27**	0.27**	0.27**	0.27**	0.27**	0.27**	0.27**
11. Age 30	7.42 (7.04)	0.10	0.64**	0.60**	0.60**	0.60**	0.60**	0.60**	0.60**	0.60**	0.60**	0.60**	0.60**	0.60**	0.60**	0.60**	0.60**	0.60**
<i>Anxiety</i>																		
12. Age 13	2.08 (0.63)	0.21**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**
13. Age 30	1.93 (0.91)	0.45**	0.45**	0.45**	0.45**	0.45**	0.45**	0.45**	0.45**	0.45**	0.45**	0.45**	0.45**	0.45**	0.45**	0.45**	0.45**	0.45**
<i>Loneliness</i>																		
14. Age 30	1.66 (0.60)	0.21**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**	0.19**
<i>Self-esteem</i>																		
15. Age 14	3.15 (0.69)	0.26**	0.21**	0.21**	0.21**	0.21**	0.21**	0.21**	0.21**	0.21**	0.21**	0.21**	0.21**	0.21**	0.21**	0.21**	0.21**	0.21**
16. Age 30	2.50 (0.52)	0.57**	0.57**	0.57**	0.57**	0.57**	0.57**	0.57**	0.57**	0.57**	0.57**	0.57**	0.57**	0.57**	0.57**	0.57**	0.57**	0.57**
<i>Life satisfaction</i>																		
17. Age 30	5.38 (1.29)	0.21**	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**
<i>Moderator</i>																		
18. Sex																		

N = 364. Women = 1, men = 2

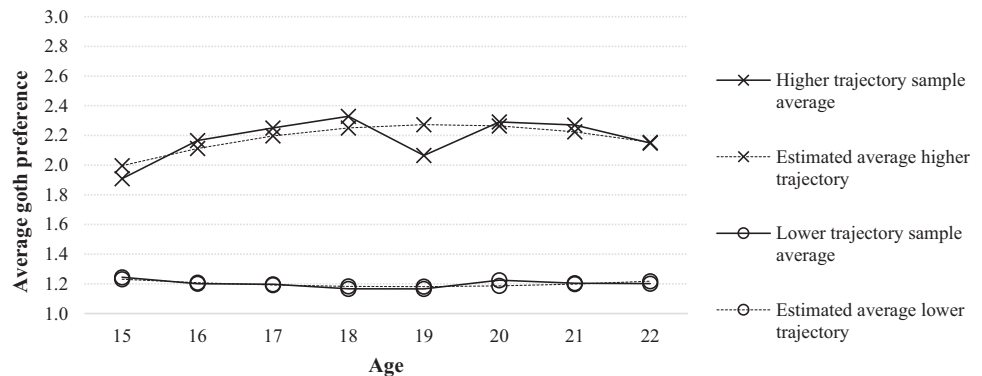
* $p < 0.05$; ** $p < 0.01$

Table 2 Fit indices for two-, three-, and four-class models for goth music preference

Number of classes	AIC	BIC	Lowest posterior probabilities	Entropy	% sample by class	BLRT (p)	VLMR (p)
2	3869.5	3935.8	0.96	0.94	77; 23	0.00	0.00
3	3644.9	3718.9	0.95	0.94	70; 22; 8	0.27	0.26
4	3601.8	3683.6	0.81	0.92	70; 14; 8; 8	0.08	0.07

Bold type indicates best fit

AIC Akaike information criterion, BIC Bayesian information criterion, BLRT bootstrap likelihood ratio test, VLMR Vuong–Lo–Mendell–Rubin likelihood ratio test

Fig. 2 Model with two goth music trajectories (LCGA)

this table reveals that the average goth music preference is relatively stable over time (consistently closer to non-fans). Preferring goth at the dawn of emerging adulthood (age 19) negatively correlates with life satisfaction at age 30. Mental health indicators and well-being indicators are, respectively, positively correlated with each other. Gender was negatively correlated with depressive (at ages 14 and 30) and anxiety symptoms (at ages 13 and 30), suggesting that women suffer more from these problems. Finally, gender was positively correlated with self-esteem (at ages 14 and 30), suggesting that men had higher self-esteem.

Identification of Trajectories

To confirm the relevance of considering multi-trajectory models, a one-trajectory Latent Growth Model was used to determine (1) the heterogeneity in the intra-class variance and (2) the shape of the trajectory a priori. The results show that a quadratic trajectory is the best way to describe the evolution of music preferences. Furthermore, the intra-class variance of the trajectory was significant for all growth factors, suggesting the need to examine multi-class models. Thus, the multi-trajectory models were examined using the LCGA procedure to confirm the existence of different developmental trajectories of goth music preference.

Table 2 reports the fit indices for the goth music preference variable's two-, three-, and four-trajectory models. It was decided to limit these analyses to the four-trajectory model because adding additional classes was not practically

feasible, and the trajectories were not qualitatively different. The two-trajectory LCGA model showed a good fit and was retained for the subsequent steps of the analyses. First, adding more than two classes reduced the number of participants in the smallest class (high trajectory), making comparison analyses impossible. Second, the VLMR and LRT tests suggested that the two-trajectory model was significantly better than the one-trajectory model, and the three-trajectory model was not significantly better than the two-trajectory model (ditto for the four-trajectory model). The goth music preference trajectories are shown in Fig. 2. For parsimony, the nonsignificant growth factors have been constrained to be equal to zero. Consequently, the low trajectory is fitted with the intercept only, and the high trajectory is quadratic. Most of the participants (77%; $n = 280$; 63% female) follow a constant lower goth music preference trajectory (intercept = 1.23; $p < 0.001$), whereas nearly one-quarter (23%; $n = 84$; 46% female) follow a constant high goth music preference trajectory (intercept = 2.01; slope = 1.30; quadratic = -1.53 ; all three parameters are significant at $p < 0.01$). Average posterior probabilities were excellent (0.98 and 0.96), indicating that participants were statistically assigned to their respective trajectories (average posterior probabilities of 1.00 indicate that participants are perfectly assigned to their respective trajectories (Muthén & Muthén, 2000).

Finally, to verify the trajectory model and confirm that the missing data estimation method did not influence model selection, sensitivity analyses were conducted, which consisted of repeating the analyses but only with those who

responded to the eight measurement points ($n = 221$). The results fully confirm the trajectory model, with the best trajectory model remaining with the same values and shape (low trajectory: intercept = 1.20, $p = 0.000$; and high trajectory: intercept = 1.96, slope = 1.38, quadratic = -1.56 , $p < 0.05$ for all parameters), and with similar proportions of participants in each trajectory (low = 77%, high = 23%).

Links between Goth Music Preference Trajectories and Psychological Adjustment

An initial confirmatory factor analysis model was conducted to examine the statistical validity of the latent components of mental health and psychological well-being. The model fit the data ($\chi^2(4) = 24.17$, $p < 0.001$; CFI = 0.96, TLI = 0.91; RMSEA = 0.13 [90% CI = 0.08, 0.17]; SRMR = 0.036). The indicators all contribute significantly and equally to their latent constructs. The standardized coefficient for loneliness, depression, and anxiety on mental health factors are 0.72, 0.88, and 0.71, respectively (all significant at $p < 0.001$). The standardized coefficient for self-esteem and life satisfaction on psychological well-being factors are 0.86 and 0.73, respectively (both significant at $p < 0.001$). This means that the indicators adequately explain the latent variables.

Next, a regression model was created with the trajectories and baseline levels of depressive and anxiety symptoms and self-esteem as predictors (VI) and the latent components (mental health and psychological well-being) at age 30 as dependent variables. To examine gender differences in the links between trajectories, mental health, and well-being, the regression coefficients were examined separately according to gender using a multigroup procedure. The remaining links in the model (i.e., between baseline levels of symptoms and DV) were constrained to be equal between males and females. The model fit was excellent ($\chi^2(47) = 78.34$, $p = 0.001$; CFI = 0.95, TLI = 0.93; RMSEA = 0.07 [90% CI = 0.04, 0.10]; SRMR = 0.07). Additionally, results showed that for males, trajectories predicted psychological well-being ($b = -0.33$; $\beta = -0.36$; SE = 0.05; $p < 0.001$) and mental health ($b = 0.32$; $\beta = 0.41$; SE = 0.10; $p < 0.001$). Thus, males on the high trajectory showed lower psychological adjustment (low well-being and high mental health) than those on the low trajectory. For females, trajectories predicted neither well-being ($b = -0.09$; $\beta = -0.08$; SE = 0.09; $p = 0.40$) nor mental health ($b = 0.07$; $\beta = 0.06$; SE = 0.09; $p = 0.47$). For covariates, which were constrained to be equal by gender, anxiety at age 13 did not predict mental health ($b = 0.04$; $\beta = 0.05$; SE = 0.04; $p = 0.23$), whereas depression at age 14 did predict mental health ($b = 0.01$; $\beta = 0.19$; SE = 0.06; $p = 0.003$). In addition, self-esteem at age 14 predicted well-being ($b = 0.14$; $\beta = 0.24$; SE = 0.06; $p < 0.001$). For males, the model significantly explains 21% of the variance in mental

health, and 15% of the variance in psychological well-being. For females, the model explains 5% of the variance in mental health, and 7% of the variance in psychological well-being, but these coefficients are not significant.

Discussion

A few studies document the links between some non-mainstream rock music preferences, mental health, and psychological well-being in adolescence and emerging adulthood. However, no study has examined the links between goth music trajectories from adolescence to emerging adulthood and fans' psychological adjustment once they reach established adulthood. A longer-term developmental perspective as well as a gender-differentiated examination are proposed to shed new light on this phenomenon. The results of this study (1) show the existence of two trajectories of goth music preference from adolescence to emerging adulthood, and (2) reveal that membership in the higher goth trajectory leads to poorer mental health and lower well-being in adult males.

Trajectories of Goth Music Preference

Two goth music trajectories were identified in this study. The first trajectory, referred to as the lower trajectory, consisted of 77% of the sample. These participants consistently disliked goth music from ages 15 to 22. The second trajectory, known as the higher trajectory, included 23% of the participants who were open-minded about goth music and even displayed a sustained preference for the style during the same period. These findings differ from those of Ter Bogt et al. (2021a), who identified a third trajectory characterized by a temporary infatuation with goth music during mid-adolescence (ages 13–16) that rapidly declined in late adolescence (ages 16–17). The initial expectation was to observe a similar intermediate trajectory, but the absence of such a pattern in the current study might be linked to the exclusion of early/mid-adolescence in the longitudinal design (ages 15–22). A middle trajectory of goth music preference might be discernible in early adolescence, but it becomes indistinguishable from the higher trajectory as individuals transition from adolescence to emerging adulthood. Interestingly, the proportion of participants in the higher trajectory (23%) closely matches the combined proportion of the higher (7%) and middle (15%) trajectories reported by Ter Bogt et al. (2021a).

Goth Preference Trajectories and Psychological Well-being at Age 30

The strength of goth music's predictive value on the psychological adaptation of its male fans is highlighted by this study.

Male goth fans, specifically those on the higher trajectory, exhibited more psychological vulnerabilities at age 30 than non-goth fans. They reported poorer mental health and lower levels of well-being. This finding persisted even after accounting for their psychological vulnerabilities in early adolescence. On the other hand, female goth enthusiasts did not differ from non-goth enthusiasts at age 30 in terms of any of the indicators measured.

Much of the identity construction process occurs during adolescence and emerging adulthood (Bosma, 2001). Within this context, goth enthusiasts are exposed to specific psychosocial and sociocognitive influences associated with their culture. Initially drawn to goth music as an outlet for expressing their psychological struggles, male goth fans might eventually become entangled in a reinforcing cycle that adversely affects their psychological well-being. Sustained exposure to goth culture during adolescence and emerging adulthood and its associated psychosocial challenges could lead them to be isolated within a subgroup where depression, social anxiety, and loneliness are more prevalent (Ter Bogt et al., 2021b). As time passes, these males may conform more and more to this culture's values, potentially leading them to even more stigmatization and marginalization. Adolescents who feel different and marginalized may also view goth culture as a welcoming refuge from their emotionally repressed societal experiences. Men and women would perceive and interpret the themes of goth culture differently during adolescence (Goulding & Saren, 2009). Male enthusiasts are more likely to focus on darker and macabre themes, such as death, and are more invested in individual exploration, while female enthusiasts prioritize emotional expression. The strong preoccupation with negative emotions, coupled with the reality of existing in a world dominated by such emotions, may push male enthusiasts into a cycle of isolation, leading to feelings of depression, anxiety, and intense loneliness. These individuals might be at a higher risk of experiencing psychological challenges associated with social isolation.

Goth music culture would be at odds with the gender norms that men face, which may include social expectations of strength, self-control, and impassivity (Goulding & Saren, 2009). Indeed, this marginal culture gravitates around dark, melancholic, and often macabre themes and is usually positioned in opposition to the norms and values of mainstream society. It, therefore, attracts people who share a particular sensitivity for dark romance, revelation, and emotional intensity. These goth men would be confronted with their inability to meet the standards of masculinity. This additional conflict would add a sense of inadequacy to their already built-in social isolation, negatively affecting their psychological adjustment in adulthood.

Developmental mechanisms can contribute to understanding the long-term effects observed in adult male goth fans. The early thirties typically involve significant developmental tasks

that require a certain level of emotional stability from members of both sexes. Levinson (1977) refers to this developmental period as the time when it becomes important in the eyes of society, for men specifically, to "become one's own man" (p. 21). Men would experience additional social pressure to stabilize themselves, take on responsibilities such as marital commitment, work responsibilities, thus remaining emotionally stable and stoic. These social expectations may clash with the emotional intensity exhibited by these men, who have developed an interest in goth culture from adolescence to early adulthood. As adults, they may face significant stress when confronted with these developmental challenges as they struggle to meet society's standards of masculinity.

On the other hand, a preference for goth music among female enthusiasts could indicate fewer psychological adaptation difficulties in adulthood. As the goth culture is not perceived uniformly by both genders, potential gender distinctions in lifestyle, valued themes, and resulting social dynamics could contribute to differences in enduring psychological challenges. Social expectations and gender norms directed toward women could account for their reduced involvement in a detrimental reinforcement cycle affecting their mental health and well-being. Their inclination to form social groups centered around themes like emotional intensity, vulnerability, and emotional expression might experience higher social acceptance, thus potentially explaining their unaltered long-term psychological adaptation (Welch et al., 2020).

Strengths, Limitations, and Future Studies

This study has some methodological strengths. Longitudinal follow-up spans nearly 20 years with a high retention rate of participants. Goth music preference was assessed eight times between the ages of 15 and 22, which allowed for the identification of goth music trajectories using latent trajectory analyses. Furthermore, as far as current knowledge indicates, this is the only study that has examined the correlates of marginal music preferences into adulthood. Finally, the effect of some confounding variables was considered by including baseline levels of pre-trajectory DVs.

However, this research is not without limitations. First, the sample is relatively homogeneous in terms of socio-demographics, which limits the generalizability of the results. Replicating this study with a more diverse sample (cultures, socioeconomic levels, etc.) would provide a complete picture of the impacts of this marginal music preference on development and adjustment. In addition, the instruments employed are all self-reported, which may result in a common variance bias due to the shared method. It is important to note that this study cannot establish a causal link between musical preference and later vulnerabilities. Various personal factors among goth fans may contribute to lower psychological well-being in adulthood. Several factors were controlled for in the

analysis to minimize potential confounding variables. Additionally, the potential positive effects of listening to or being part of a non-mainstream music group were not measured. However, research suggests that such cultures can provide support for marginalized individuals. It is crucial for future studies to investigate these aspects. Given these limitations, the findings of this study are cautiously presented without making claims of causal inference or generalizability.

Future studies should aim to develop a more comprehensive understanding of goth fans who already exhibit psychological distress in adulthood. Previous research by Ter Bogt et al. (2021a) suggests that the psychological distress experienced by adolescent and emerging adult goth fans may also be associated with physical health issues. They may exhibit both psychological distress and engage in risky behaviors such as problematic use of psychotropic drugs like cannabis and other substances (Ter Bogt et al., 2021b). Obtaining a more holistic view of their psychological adjustment is important, as it appears to indicate widespread distress. Furthermore, since people's liking for goth music appears to stay consistent as they transition from their teenage years to adulthood, it would be valuable for future research to find out whether adults who still enjoy goth also tend to have difficulty adapting psychologically. Additionally, the typical psychological difficulties associated with goth culture, such as depression, anxiety, and loneliness, may be partly influenced by their social isolation, a characteristic of their psychosocial development. Therefore, it would be relevant to investigate the role of the social network, specifically relational satisfaction, as a mediator between this music trajectory and their psychological adjustment. Lastly, it would be valuable to examine further the specific mechanisms through which marginal music preferences may contribute to or mitigate problematic behaviors.

Conclusion

Prior studies have demonstrated that adolescent goth music fans suffer more from internalized problems than non-goth fans. None have investigated the psychological implications of a preference for goth music during adolescence and emerging adulthood on fans as they transition into adulthood. Preferring goth music from 15 to 22 years old poses a risk to the psychological adjustment of its male adult fans. Males who maintain a preference for goth music during those periods suffer more from mental health issues such as depression and anxiety and present a lower well-being at age 30, manifested by their lower self-esteem and life satisfaction. In contrast, these associations are not observed for female fans. Given that having an affinity for goth music appears to be indicative of both short-term and long-term psychological difficulties, clinicians and other professionals should consider musical preferences as potential markers of psychological adaptation

from adolescence to adulthood. Music can help adolescents and emerging adults build their identity and connect with people who share similar tastes and values. In many ways, it can be salvatory. Despite this, it appears that certain music scenes have short and long-term detrimental effects on the psychological adjustment of their fans. Understanding the underlying mechanisms that contribute to the enduring negative impacts of such marginal music preferences on adolescent male fans could potentially restore music's salvatory and protective influence over their developmental trajectory.

Data Sharing and Declaration

The datasets generated and/or analyzed during the current study are not publicly available but are available from the corresponding author (F.P.) on reasonable request.

Authors' Contributions C.M. participated in the statistical analysis, interpreted the data, and drafted the manuscript; F.P. is the principal investigator of the larger longitudinal research project, participated in the interpretation of the data and helped to draft the manuscript; C.-E.W.-G. conducted the statistical analysis and helped to draft the manuscript; E.L. helped to draft the manuscript. All authors read and approved the final manuscript.

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Compliance with Ethical Standards

Conflict of interest The authors declare no competing interests.

Ethical approval Ethical approval by IRB UQAM.

Informed consent Yes.

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