Age trends in musical preferences in adulthood 1:

Conceptualisation and empirical investigation

Date: 25th November 2016

Abstract

This paper aims to fill some gaps in theory and research on age trends in musical preferences in adulthood by presenting a conceptual model that describes three classes of determinants that can affect those trends. The Music Preferences in Adulthood Model (MPAM) posits that some psychological determinants that are extrinsic to the music (individual differences and social influences), and some that are intrinsic to the music (the perceived inner properties of the music), affect age differences in musical preferences in adulthood. We first present the MPAM, which aims to explain age trends in musical preferences in adulthood, and to identify which variables may be the most important determinants of those trends. We then validate a new test of musical preferences that assesses musical genres and clips in parallel. Finally, with a sample of 4,002 adults, we examine age trends in musical preferences for genres and clips, using our newly developed test. Our results confirm the presence of robust age trends in musical preferences, and provide a basis for the investigation of the extrinsic and intrinsic psychological determinants of musical preferences, in line with the MPAM framework.

Keywords: Musical preferences, conceptual model, age differences, test validation

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In the third month after being struck by
lightning, then, Cicoria – once an easy-going,
genial family man, almost indifferent to music
– was inspired, even possessed, by music. […]
"I came to think," he said, "that the only
reason I was allowed to survive was the
music".
Oliver Sacks (2008, p. 6)

Although Cicoria experienced an extraordinary misfortune that caused a neurological disorder, it is not uncommon to hear recounts of such intimate attachments to music, even in the normal population. After his accident, Cicoria, who used to enjoy listening to rock music from time to time, developed an obsession for classical piano music (Sacks, 2008). However, it is extremely unlikely that many adults develop different preferences for music after being struck by lightning. So, what factors contribute to age trends in musical preferences in adulthood? Surprisingly, the psychological determinants of those age trends have hardly been investigated. The present paper is the first of a series of three papers that presents and investigates an integrative model of age trends in musical preferences (this paper), individual as well as social influences in musical preferences (paper 2), and finally perceptual cues (paper 3) as moderators of the age trends in musical preferences.

The specific objectives of the present research are to offer a conceptual framework to study age trends in musical preferences in adulthood and to provide an empirical basis to examine the framework. After the presentation of a new conceptual model, the empirical investigation examines age trends in musical preferences with a sample of over 4,000 adults, using musical genres and musical clips as assessment methods, with fully validated measure of musical preferences.

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Conceptual Framework: the Music Preferences in Adulthood Model

This research is grounded in a unified framework of musical taste: the Music Preferences in Adulthood Model (MPAM). We present the MPAM as an effort to integrate past research on the development of musical preferences in adulthood into a single framework. Although adulthood can be considered a flexible concept, it is accepted that legal age vote is the lower threshold for adulthood, which happens in the majority of case at age 18. Many stages of adulthood have been proposed, the most commonly cited being emerging adulthood (18-25), young adulthood (26-39), middle adulthood (40-65) and older adulthood (65+; Arnett, 2000; Erikson, 1959). Taking a lifespan psychological perspective (Baltes, Staudinger, & Lindenberger, 1999), the MPAM aims to explain changes in musical preferences to try to clarify the mechanisms through which some music is more or less liked with age. The MPAM is based upon the work of Hargreaves, Miell, & Macdonald (2005) on the Reciprocal Feedback Model of Musical Response (RFM, Hargreaves, Miell, & Macdonald, 2005; North & Hargreaves, 2008b; Schubert, Hargreaves, & North, 2014), which suggests that *the listener, the listening situation and contexts,* and *the music* are the influential variables in any musical response. Originally

theorised as a model of musical communication, the RFM has been reviewed and re-conceptualised to understand the processing of music both by the listener and by the performer, and musical imagination (Hargreaves, 2012; Schubert et al., 2014). Taking the RFM as the basis, the MPAM further suggests that those contextual, musical or individual variables are determinants musical preferences, and that they contribute to the shaping of preferences throughout adulthood. That is, in the MPAM, the three determinants are hypothesised to act as the moderators of the relations between age and musical preferences. The conceptual framework underlying the MPAM is sketched in Figure 1. Linking the MPAM (Figure 1) and the RFM (see Hargreaves, 2012), the reader can see obvious similarities. That is, in Figure 1, *individual characteristics* relate to the listener in the RFM, *social influences* relate to the context and finally *the perception of music* relate to the music. In line with literature on psychology and the arts, and as conceptualised in Figure 1, those three determinants can further be classified into two main classes: those that are extrinsic to music (individual differences and social influences) and those that are intrinsic (perception of music, in itself; Chen & Dubinsky, 2003; Leder, Belke, Oeberst, & Augustin, 2004; Lindell & Mueller, 2011; Richardson, Dick, & Jain, 1994; Schäfer & Sedlmeier, 2010).

The MPAM, presented in Figure 1, serves as the basis for the empirical study presented here, and in the two subsequent papers. In sum, we posit that musical preferences vary with age and that the intrinsic and extrinsic determinants may affect the age trends directly.

Insert Figure 1 about here

Extrinsic and Intrinsic Determinants of Musical Preferences

According to the MPAM, the determinants of musical preferences act as *moderators* of the relations between age and musical preferences. The first extrinsic psychological determinant consists of the individual characteristics of the listener (*the listener*), such as their age, gender, education, values and personality traits (Bonneville-Roussy, Rentfrow, Xu, & Potter, 2013; Greenberg et al., 2016; North & Hargreaves, 2007; Rentfrow & Gosling, 2003; Rentfrow & McDonald, 2009). The second extrinsic determinant relates to the social-psychological context in which the music is presented (*the context*) and pertains to how, and how much, individuals are influenced by their social surroundings. Specifically, the social network and interpersonal dispositions, as well as the culture and specific context in which the music is listened to, have been shown to play an important role in musical preferences, especially in childhood and adolescence (Arnett, 1995; Crozier, 1997; Gilliver, Carter, Macoun, Rosen, & Williams, 2012; Hargreaves et al., 2005; North & Hargreaves, 2008a; North, Tarrant, & Hargreaves, 2004; Selfhout, Branje, ter Bogt, & Meeus, 2009; Tarrant, North, & Hargreaves, 2000; Ter Bogt, Mulder, Raaijmakers, & Nic Gabhainn, 2010). Those two exrinsic components can be linked with the functions individuals give to music, be they individual (e.g. emotion regulation) or social (identity expression) (Hargreaves & North, 1999; Schäfer, 2016; Schäfer et al., 2016; Schäfer & Sedlmeier, 2009). The MPAM also suggests that intrinsic determinants of the music (*the music*) also influence musical taste (North & Hargreaves, 2008b). The main intrinsic psychological components of music relate to how individuals perceive musical structure, dynamics, timbre, rhythm/meter, tonality/harmony/pitch and instrumentation. Those, especially dynamics, may affect how music is appreciated in adulthood (Anari, Axelsson, Eliasson, & Magnusson, 1999; Beveridge & Knox, 2009; Brant & Fozard, 1990; Croghan, Arehart, & Kates, 2012; Dunn, de Ruyter, & Bouwhuis, 2011; Florentine, Popper, & Fay, 2011; Rentfrow et al.,

2012; Rentfrow & Gosling, 2003; Schubert, 2004; Schubert et al., 2014). Since no research to date has proposed a unified model that could explain how musical preferences change in adulthood, the three determinants proposed in the MPAM have the potential to explain a great amount of the variability in age trends in musical preferences.

Age Differences in Musical Preferences

Recent evidence in music psychology research has revealed that musical preferences continue to evolve during adulthood (Bonneville-Roussy et al., 2013), thereby contradicting precious findings in the area (e.g. Hemming, 2013; Holbrook & Schindler, 1989). Age trends in musical preferences have been subject to much debate, and very few studies have systematically investigated these differences. The most compelling recent evidence that supports age trends in musical preferences in adulthood comes from large-scale samples of adolescents and adults (Bonneville-Roussy et al., 2013). Specifically, the authors first reported that adults spend almost a fifth of their waking life listening to music. In addition, their results revealed that the level of engagement with music seems to decrease with age. In another study, Schäfer and Sedlmeier (2010) examined participants aged between 18 and 37 years of age who answered questions about their degree of liking towards six music genres. The results have shown a moderate negative linear relationship between age and an agglomerated measure of musical preferences, suggesting that the strength of music liking constantly decreases from late adolescence to middle adulthood. Similar results have been found in Hargreaves and Castell (1987) and Laukka (2006).

In the second part of their investigation, using a sample of more than 254,000 participants aged between 12 and 65 years of age, Bonneville-Roussy et al. (2013) have found clear age trends in musical preferences. Specifically, results revealed that preferences for Sophisticated

(e.g. classical) and Unpretentious (e.g. country) music genres were lowest in adolescence and increased with age. On the contrary, preferences for Contemporary (e.g. hip hop) and Intense (e.g. Rock) music genres peaked early in adolescence and declined with age. Finally preferences for Mellow (e.g. new age) music remained relatively stable with age. Bonneville-Roussy et al.'s explanations of their results support the MPAM. That is, the researchers associated their results with broader age-related social changes, such as in social contexts and networks, and perceptual changes, such as age-related changes in tolerance to loud sounds. In a repeated cross-sectional study, Harrison and Ryan (2010) investigated the musical taste of a large sample of individuals aged 18 to (around) 75 years, over two decades. Their results have confirmed clear patterns of age differences in musical taste. For instance, regarding the classical music genres participants in all cohorts (1982, 1992 and 2002), tended to increasingly like classical music styles with age. In addition, in all cohorts, participants displayed a decline in liking for intense genres (such as rock music) after young adulthood. Descriptive quantitative results have also suggested that musical taste is highly age-specific, supporting the presence of age trends in musical preferences trends (Hays & Minichiello, 2005; Mulder, Ter Bogt, Raaijmakers, Nic Gabhainn, & Sikkema, 2009; North, 2010; North & Hargreaves, 2007).

Qualitative studies on the development of musical preferences have also provided convincing evidence that musical preferences changes with age (Greasley & Lamont, 2006; Greasley, Lamont, & Sloboda, 2013; Lamont & Webb, 2010). Using a diary study, Lamont and Webb (2010) have shown that musical taste fluctuates on almost a daily basis. Using interviews, Greasley and Lamont (2006) have found discontinuities of taste that were influenced by daily social interactions. In addition, qualitative interviews have highlighted that the musical

preferences of adults constantly evolve both in the short-term and over decades, and seem to be influenced by changes in social surroundings (Greasley, 2008; Greasley et al., 2013).

In short, evidence from quantitative and qualitative research supports the components of the MPAM. Musical preferences are not fixed from early adulthood, and clearer age trends in musical preferences are starting to emerge. In addition, these age trends seem to be at least partially influenced by the extrinsic and intrinsic determinants of musical preferences.

Overview of the Present Research

The general objective of this empirical research was to further describe age trends in musical preferences in adulthood, with adults aged between 18 and 65 years of age, in light with the MPAM presented above. Adults aged over 65 are increasingly likely to experience hearing-related deficits (Gordon-Salant, 2005) and have therefore been excluded of this initial investigation. Specifically, although recent research has shed light on some age-related trends in musical preferences in adulthood (Bonneville-Roussy et al., 2013; Harrison & Ryan, 2010; North & Hargreaves, 2007), the reliability and validity of those trends still need to be asserted. Therefore, prior to investigating the factors that affect age trends in musical taste, we need to ensure that those trends are valid and reliable across sample.

The present empirical investigation was driven by two research questions: 1) *Are individuals' conception of music preferences reliable and valid across measurement methods (music genres and clips)?,* and 2) *Are the normative age trends in musical taste reliable and valid between methods?* In the first section, we validate a new test of musical preferences, the Music Genre-Clips Test (MG-CT), with the specific aim to have equivalent measures of musical preferences obtained with music genres and clips, thereby answering Research Question 1. The validation process is summaried below and detailed in the Internet Supplementary Material

accompanying the present paper. In the second section, we answer Research Question 2 by comparing age trends in musical preferences using the musical genres and clips included in the MG-CT.

Development and Validation of the Musical Genre-Clips Test (MG-CT)

Given our overarching aim to examine age trends in musical preferences in adulthood, we first needed to develop a relatively concise test of musical preferences that would measure preferences for musical genres and musical clips (that is, short excerpts of music audio-recordings) in equivalent ways. Some research has highlighted that musical different musical genres and clips may be qualitatively (theoretically) different, each associated with their own psychological characteristics, and activating different self-concepts and cognitive schemas (Kristen & Shevy, 2013; Shevy, 2008). On the contrary, Langmeyer et al. (2012) have found high associations between personality and music assessed with musical genres and clips. With the present test, we aimed to create a psychometrically valid test of musical preferences that would attempt to measure genres and clips in parallel, thereby indirectly examining the qualitative uniqueness of music presented as genres or as audio-recordings, that would be easily accessible to a large audience. We chose the Internet as our favoured method of data collection. The Internet – and, in particular, specialised data collection websites designed by researchers, social media websites such as Facebook and crowdsourcing websites such as Mechanical Turk – provides reliable and varied pools of samples (Gosling, Vazire, Srivastava, & John, 2004; Kosinski, Matz, Gosling, Popov, & Stillwell, 2015). The reliability of Web-based samples is similar to that of traditional samples, provided that robust methods for detecting spurious patterns of answers are applied (Meade & Craig, 2012).

Item Generation

The steps for the generation and selection of items are summarised below. They are detailed in Appendix S1 (internet supplemental material).

Music genres. We collected a pool of 27 genres from previous research (Bonneville-Roussy et al., 2013; Langmeyer et al., 2012; Rentfrow & Gosling, 2003) and also genres that are important in the music industry (from important music charts, *e.g.* "Billboard"), but not covered by prior research.

Music clips. Four experts in various genres (electronic, jazz, rock and classical) were asked to select an average of ten musical clips that would best reflect each musical genre. The experts then excluded some clips and produced additional clips to reflect the full range of each musical genre. Musical clips were taken from two sources: the majority of the rights for the clips were bought on a royalty free website and approximately 20% of the sample clips were music were taken from two Creative Common License websites. In total, 280 excerpts were included in the original validation study, to reflect the 27 genres. These clips were all reduced to 15-second excerpts. The complete list of clips is presented in Appendix S2 of the Internet supplemental material.

Item Selection, Preliminary and Pilot Studies

In order to ensure that the music clips were representative of the hypothesised music genres, we presented the clips to a total of 1,421 adult participants (detailed information is presented in Section 1 of Appendix S1, in the Internet supplemental material). All the studies obtained approval from the University of Cambridge Social and Developmental Psychology

Ethics Board. A questionnaire containing the musical audio-recordings was made available online. In all of the steps, participants were asked to 1) rate their liking for the clips, and 2) associate the musical excerpts with music a genre, according to this question: 'What music genre in this list best describes the music clip?' Participants were presented with five answer choices taken from the music genres list that were selected according to semantic (e.g. bluegrass and country) and phonetic (e.g. punk and funk) similarity to the expected genre. An answer that associated a clip with the expected genre (as rated by the experts) was given a score of 1, and an answer that was incorrectly classified was given a score of 0. In addition, participants were provided with an 'It doesn't play' option (coded missing), which they could select if an excerpt did not load correctly. We conducted analyses on the percentage of accurate answers, inspecting and ruling out clips from each sample until we reached a final set of 63 items, associated with 21 genres (three clips per genre). A reanalysis of the last two steps with the 564 individuals who rated 178 musical excerpts assessing 21 music genres, revealed an average percentage of correct genre classification of 75% per clip, ranging from 41% to 100% (for further information, please see Section 1 of Appendix S1 of the Internet supplemental material).

Examining the Validity of the MG-CT

To support the validation of the test, a Multitrait-Multimethod Matrix method was used (Campbell & Fiske, 1959) in a series of confirmatory (CFA) factor analyses within structural equation modeling (SEM; the thresholds for adequacy of model fit were taken from Marsh et al., 2009) with the 63 musical excerpts and their corresponding 21 genres (three clips per genre). Then, with the genres and clips retained, the structure of musical taste was examined again using

SEM. This section present a summary of the results, that are detailed in Section 2 of Appendix S1 of the Internet supplemental material.

Participants were asked to answer the music genres subset in a first data collection and to provide their email addresses so they could be contacted six weeks later and be sent the second part of the questionnaire (music clips); this procedure ensured minimal cross-contamination of the results of the clips sub-test with the genre sub-test, or vice-versa. As a result, 933 adults were included in the analyses presented here (participants information is presented in Appendix S1). In each wave, respondents answered the following question: 'Do you like this music [clip or style]?' Answers were provided on a 5-point Likert scale ranging from 1 (*strongly dislike*) to 5 (*strongly like*), with the alternative choices 'I don't know this style' and 'It doesn't play' (both coded missing) to control for knowledge of the genres and potential technical problems with the clips. In the music clips data collection, respondents were presented with a random selection of 27 to 35 clips (out of a total 63).

Factorial validity of the music clips. A series of CFA was conducted on the music genres and clips (see Langmeyer et al., 2012, for a similar analytical strategy used in a comparable context). We grouped the three music clips that were hypothesised to be related to the core genres into a single latent factor (e.g. the three *classical* clips). This factor was then regressed onto the hypothesised genre (e.g. *classical*). A summary of the CFA analyses with music genres as covariates is shown in Table 1. The first four models revealed problems with the Alternative, Oldies/Retro, Folk and World/Traditional music clips and genres. Model 5 comprised 17 genres and 51 clips. A closer look at the factor loadings and percentages of variance explained did not reveal any further problematic genres or clips. Modification indices

revealed that correlating two clips residuals of items that were similar in sounds would significantly increase model fit. Model 6, including the two correlations between residuals, was the final model retained, and it adequately fit the data with an adequate CFI and excellent RMSEA and SRMR (Marsh et al., 2009). In light of this information, it was concluded that the final CFA model, with 51 clips and 17 genres represented the musical data well.

Insert Table 1 about here

The final results are shown in Table 2. Clip names and their associated genres are listed in the first column. The second, third and fourth columns include standardised CFA factor loadings on the latent clip factors, standard error of estimates, significance values and standardised regression coefficients of the associated genre label (last row of each genre). The percentage of variance of the item explained by the factor is shown in the last column (first three rows of each genre) as well as the percentage of variance of the genre label explained by the factor (last row of each genre). Standardised factor loadings were adequate, ranging from .50 to .92. The results of Model 6 ensured the construct validity of musical taste by confirming high associations between genres and clips.

Insert Table 2 about here

The estimated means and bivariate correlations between the observed music genre labels and the latent music clip factors for the final 17 observed genres and 17 latent clip factors solution is presented in Table S2 in Appendix S1.

Validity of the MG-CT. In testing the factorial validity of the MG-CT as a whole, we expected that similar factor structures would be found between music genre labels and music clips, measuring the same underlying music dimensions. To test this hypothesis, an exploratory

structural equation model (ESEM), with quartimin rotation comprising two sub-sets of five factors (one sub-set that included music genres and one sub-set that included music clips) was performed (see Bonneville-Roussy et al., 2013, for a similar analytical strategy). First, scores of the three observed indicators (scores on the clips) of the 17 latent factors from the final CFA analysis were averaged. Next, two sets of five factors (five for musical genres and five musical clips) were analysed (following the results of Bonneville-Roussy, 2013, and others [Rentfrow et al., 2012; Rentfrow, Goldberg, & Levitin, 2011], that confirmed a 5-factor solution). Results revealed that the two sets of five factors provided excellent fit to the data, $\chi^2(369) = 816$, $p < .001$, CFI = .95, RMSEA = .036 (.033 - .039), SRMR = .033.

Table 3 shows the standardised quartimin-rotated factor solution for the parallel five genre/clip factors. The first genre dimension comprised country, gospel, pop and R & B/soul, and was named Unpretentious because this dimension was comparable to the Unpretentious dimension in Bonneville-Roussy et al. (2013), using the MUSIC model of musical preferences (Rentfrow et al., 2011) and had a correlation coefficient of $r = .81$ with the first parcelled music clips dimension. The second genre dimension included heavy metal, punk and rock and was highly related to the second parcelled music clips dimension ($r = .86$). The genres and clips dimensions were similar to the Intense dimension in Bonneville-Roussy et al. (2013) and, therefore, the label Intense was maintained (Rentfrow et al., 2011). The third genre dimension included blues, funk, jazz, Latin and reggae and was also highly correlated with the third parcelled music clips dimension ($r = .79$). Because these genres and clips were all, to some extent, variants of jazz music, these dimensions were named Jazzy. A high degree of association was found between the fourth genre dimension (which included classical and opera) and the fourth clips dimension ($r = .89$), and this dimension was named Classical. Finally, the fifth

genres dimension included ambient/chillout, dance/electro and hip-hop/rap music, and was related to the Contemporary dimension used in the MUSIC model (Bonneville-Roussy et al., 2013; Rentfrow et al., 2011); thus, the name of Contemporary was kept and this dimension was correlated (at r = .80) with the fifth clips dimension. As can be seen, the correlation coefficients between the genres and the associated clip dimensions were very high (ranging from r = .79 to r = .89). These results provide further confirmation of the validity of the MG-CT, with a set of two similar five factors.

Insert Table 3 about here

Validity of the MG-CT between age groups. In looking at age differences using a measurement instrument, it is essential to ensure that individuals of different ages understand the instrument in a similar manner. In this study, we used measurement invariance, that is, the measure of equivalence of the MG-CT between age groups. In line with Bonneville-Roussy et al. (2013), we examined configural, metric and scalar invariance of age on the music genres and clip factors of the MG-CT. We first split the sample into three groups: emerging adulthood (18 to 25 years old; n = 443), young adulthood (26 to 39 years old; n = 311) and middle adulthood (40 to 65 years old; n = 179; see Bleidorn et al., 2013). The results are summarised in Table 4. Full results are shown in Section 2 of Appendix S1.

Insert Table 4 about here

In a nutshell, we found the MG-CT to be equivalent between age, demonstrating partial scalar factorial invariance. This means that the MG-CT functioned similarly for people of different ages. The findings of invariance at the factor loadings and intercepts warrant comparisons between the factor and item means of the clips and genres sub-tests across age groups.

Focal Study: Age Trends in Musical Preferences in Adulthood

The objective of this focal study is to provide an answer to Research Question 2: 1) *Are the normative age trends in musical taste reliable and valid between methods?* To do this, we examined whether we would find similar age trends in preferences for musical genres and clips.

Bonneville-Roussy et al. (2013), and others (Harrison & Ryan, 2010; North, 2010; North & Hargreaves, 2007) have found that musical preferences, measured with music genres only, display unique age trends in adulthood. However, it is unknown whether these trends can be generalised to music audio-recordings (clips) or if they can be replicated with independent samples of adults. The present study addresses these limitations by assessing the age trends uncovered through the application of the MG-CT, that has a demonstrated validity (see above).

In line with past research, hypotheses regarding age trends in musical preferences are as follows: 1) liking for musical dimensions associated with more mellow and softer music, such as the classical, jazzy and unpretentious music dimensions would increase as age increases 2) the more forceful and contemporary music dimensions (including rock and hip-hop genres) would decrease with age. In line with past research (Bonneville-Roussy et al., 2013; Holbrook & Schindler, 1989), we expected to find non-linear trends of age. Therefore, linear and quadratic trends of age were examined (U and inverted-U shapes) for the five dimensions of the MG-CT. In order to attend to these objectives, we performed multivariate regressions by age and age quadratic on the Classical, Contemporary, Intense, Jazzy and Unpretentious musical dimensions simultaneously. To assess equality of age trends between genres and clips, multiple group regression analyses were performed (Bonneville-Roussy et al., 2013). Equality constraints were

set between the paths of the genre and clip dimensions, and intercepts and variances were freely estimated.

Participants and Procedure

A total of 4,002 individuals participated in this study over the Internet (Kosinski, Matz, Gosling, Popov, & Stillwell, 2015; see Appendix S1 for detailed information about participants' recruitment) between 19th October 2012 and 21st October 2013. The study received ethical approval from the University of Cambridge Social and Developmental Psychology Ethics Board. Of them, 2,126 answered the Music Genres and 1,876 the Music Clips sections of the questionnaire. In terms of socio-demographic information for the Music Genres sample, 47% were men and 53% were women, with an age range varying from 18 to 65 years old (M = 30.16, SD = 10.90), 34% were full-time workers, 12% were part-time workers, 37% were students, and the remainder were homemakers, retired or others. Of those who answered the Music Genres questionnaire, 76% had at least some university education. 47% of individuals had no musical training, 20% had up to 2 years of training, 25% had between 3 and 8 years of musical training and 10% had 9 years of more. 80% of the sample self-reported as white, 6% as Asian, 4% as black, and the remainder considered themselves as Hispanic, Arabic, multi-ethnic, or declined to respond. Of the available data for music clips, 46% were men and 54% were women. Age varied from 18 to 65 years old (M = 30.22, SD = 11.09), 32% were full-time workers, 12% were part-time workers, 37% were students, and the rest of the sample consisted of homemakers, retired individuals or other. The vast majority had some higher degree education (78%). 46% of individuals had no musical training, 20% had up to 2 years of training, 24% had between 3 and 8 years of musical training and 10% had 9 years of more. 77% of the sample considered

themselves as white, 7% as Asian, 6% as black, and the remainder considered themselves as Hispanic, Arabic, multi-ethnic, or declined to respond[2].

Results

The analyses were performed using the software Mplus, version 7.3 (Muthén & Muthén, 2010). Fit indices for the more constrained model (all age, and age^2 regression paths constrained to be equal across groups) were excellent, χ^2 (10) = 51, p < .001,CFI = .98, RMSEA = .045 (.033 - .058), SRMR = .018. This indicates that age trends for music genres and clips were equal across groups. Table 5 presents the results of the polynomial trends of age (constrained); these trends are plotted in Figure 2.

Insert Table 5 about here

In summary, multiple group equivalence of polynomial regression paths of age show that genres and clips were similar with regards to age trends for the Classical, Contemporary, Intense, Jazzy and Unpretentious music genre and clip dimensions. Figure 2 reveals that, although the intercepts were different (with music genres being generally more liked than their equivalent excerpts of music audio-recordings), the general contour of the trends were very comparable. As can be seen in Figure 2, taste for Classical had a linear (non-significant) shape and was relatively stable. The Contemporary genres were comparatively more liked than the associated clips. Taste for the Contemporary genres and clips followed a quadratic trend that was stable up until middle adulthood, when it began to decrease steeply. Intense music also followed a quadratic trend. For the intense genres, taste slightly increased until middle adulthood, after which it decreased; for clips, taste for Intense music started to decrease from emerging adulthood, and this trend continued until participants reached 65 years of age. Jazzy music genres and clips showed a

quadratic trend, with taste regularly increasing until its peak at the end of middle adulthood. Finally, taste for the Unpretentious music genres was higher than taste for the Unpretentious music clips, as demonstrated in the last section of Figure 2. The quadratic, almost linear, trends reveal that taste for the genres was slightly inflated in young adulthood, whereas it was slightly deflated in the same age group for music clips.

Insert Figure 2 about here

In sum, we have found three broad age trends in musical preferences. An upward trend in which the genres and clips included in the Jazzy and Unpretentious dimensions were increasingly liked with age, a stable trend with the Classical musical genres and clips, and a downward trend, including the Contemporary and Intense genres and clips, that were increasingly disliked with age. We found that the trends were very similar between genres and clips dimensions.

General Discussion

This research examined age trends in musical taste in adulthood, through lens of the music preferences in adulthood model (MPAM). Central to the model is the notion stability and change in musical preferences in adulthood, the fact that taste for music differs or not, with age. The main psychological components of the MPAM that are thought to influence musical preferences are characterised as being intrinsic to the music (the musical properties as perceived by the individual) and extrinsic to the music (individual characteristics and social influences). This model sets stage to further investigation of the determinants of musical preferences in adulthood. Prior to empirically examining the components of the MPAM in depth, it was essential to ensure that the age trends in musical preferences found in past research could be

replicated with different measurement instruments. The empirical investigation that followed the presentation of the MPAM framework aimed at addressing two questions that are fundamental in the operationalisation of the variables included in the MPAM : 1) *Are individuals' conception of music preferences reliable and valid across measurement methods (music genres and clips)?,* and 2) *Are the normative age trends in musical taste reliable and valid between methods?*

We first examined the development and validation of the MG-CT, a test of musical preferences that assesses preferences with musical genre labelling and short excerpts of music audio-recordings (clips). At first, a large number of genres and clips (n > 250 were selected and piloted. The questionnaire was further reduced to a smaller number of genres (n=17) and clips (n = 51) according to the results of the validation studies, and the validity and reliability of this final version was demonstrated. Finally, in a validation study using the MG-CT construct and factorial validity were examined. Results provided strong support for the validity of the MG-CT, including the parallel validity of the genres and clips sub-tests and the age invariance of the measure. Most importantly, using this newly validated measure of musical preferences, we examined age trends in musical preferences in adulthood. We showed three broad age trends in musical preferences that were remarkably similar between genres and clips. These results provide robust support of the age variability component of the MPAM. The specific findings are discussed below.

The five parallel dimensions between genres and clips that emerged from the validation of the MG-CT were Classical, Contemporary, Jazzy, Intense and Unpretentious. Three of the dimensions were similar to those reported in past research, in the MUSIC model (Bonneville-Roussy et al., 2013; Rentfrow et al., 2011; Rentfrow et al., 2012). They are Contemporary, Intense, and Unpretentious music. The Contemporary genres and clips dimensions, which have

also been referred to as Urban in past research (Delsing, ter Bogt, Engels, & Meeus, 2008; Rentfrow et al., 2011), were typified by electronic music, clear and predominant beats and greater dynamics (see Rentfrow et al., 2012, for a discussion of the musical attributes related to those dimensions). The Intense dimensions comprised rough, distorted and loud music and replicated the results of previous studies (see, for a review, Rentfrow & MacDonald, 2009). In the Unpretentious dimension, it could be surprising to see R&B/soul associated with country and gospel. From a musicological perspective, country/bluegrass, R&B/soul and gospel are genres deeply rooted in the south and centre of the USA, and have geographically spread only in recent years (Larkin, 2009). These music styles not only share a common geographical location, but also some musical components. They are all music styles that feature smooth voices and relatively simple melodic and harmonic patterns. Therefore, it is not surprising to see these four music styles clustered. The Classical dimension comprised only classical and opera. A Classical dimension has also been noted in previous research (George, Stickle, Rachid, & Wopnford, 2007; North, 2010). Classical and opera share musical roots, as they are both mostly instrumental and of greater length and complexity than most Western music. Finally, a Jazzy dimension included blues, funk, jazz, Latin and reggae. These music styles developed in parallel from the Afro-American influences of the American south. They are characterised by walking bass or regular rhythms (mostly on the upbeat) and acoustic instrumentations.

In sum, the dimensions found in this study seem to display a clear association with the inner components of music (in past research, the musical dimensions were often associated with characteristics of the listener, e.g. Langmeyer et al., 2012; Rentfrow et al., 2011; Rentfrow & Gosling, 2003). This result could be due to the systematic assessment of musical excerpts and genres in parallel, which put a greater a priori emphasis on the characteristics of the musical

excerpts and their degree of match with associated genres. We have labelled the musical dimensions according to the findings of past music and psychology research. Adequate labelling of musical dimensions has been subject to much debate. We hope that future research will clarify further the meanings and adequacy of labels in music preferences research.

Finally, people of different ages did not differ much in their perception of musical preferences, and the dimensions of taste seemed equally meaningful to people of varying age, as seen in MG-CT's assessment of age-invariance. This implies that analyses involving comparisons between age groups at the mean level of musical taste can be made using this test. The aforementioned results are unique, as they are the first to establish the construct validity of musical taste measurement using music genres and clips, and the age-invariance of these methods.

The second research question related to the shapes of age trends in musical taste and whether the same trends are found when they are measured using music genres or clips. In line with previous studies in music, personality and social psychology, we expected the age trends in musical preferences to be non-linear (Bonneville-Roussy et al., 2013; Holbrook & Schindler, 1989; Leblanc, Sims, Siivola, & Obert, 1996). In past research, age trends have mostly been assessed with adolescents and adults younger than 30. To address this limitation the study discussed here focused on musical taste in adulthood.

An important result pertaining to Research Question 2 is that the trends were highly comparable between samples and measurement methods. Using pooled samples of more than 4,000 individuals, we statistically evaluated the invariance of the age trends between methods. The results showed that age trends in musical taste did not change with method of measurement. Taste for Contemporary and Intense music assessed with both music genres and music clips

decreased with age. Furthermore, taste for the Jazzy and Unpretentious music styles increased with age, whereas taste for Classical music remained stable, regardless of the method of measurement.

Interestingly, musical genres and musical clips have been seen as qualitatively different in past research. The test of musical preferences, the MG-CT, presented here, was developed to provide equivalent measures of taste for both music genres and clips that could be used either separately or simultaneously to assess musical taste. This test overcomes many of the limitations of past research on musical preferences that has used either music genres or music clips as the primary units of measurement (Aucouturier & Pachet, 2003; Bonneville-Roussy et al., 2013; Dunn et al., 2011; Eerola & Ferrer, 2009; Rentfrow et al., 2012, 2011). Our test of preferences for musical genres and clips revealed remarkably similar patterns of musical dimensions, preferences and age trends. This means that, from a psychometrical point of view, musical genres and clips seem to be interpreted similarly by adults; therefore they may not be qualitatively different. Musical genres, or a specific musical clip within a genre, might have similar underlying psychological characteristics and that individuals make similar networks of associations with genres and their clips (Schubert et al., 2014). This avenue of research needs to be explored further.

On a side note, the musical genres included into the Contemporary, Intense and Unpretentious dimensions of music assessed with the MG-CT were constantly preferred over clips throughout adulthood. Two explanations can be offered for these results. First, the musical clips included in the MG-CT were chosen for their degree of convergence with the genres. It is possible that these clips had an unnatural sounding for fans of the Contemporary, Intense and Unpretentious dimensions. Another possible explanation comes from the results related to social

influences. Research has shown that these three genre dimensions, in particular, were more subject to social influences and that taste for music genres, as a whole, was also more prone to social influences (Arnett, 1992, 1995; van Wel, 1994). Therefore, it is likely that people rated the *genres* associated with Contemporary, Intense and Unpretentious music more highly as a means to manage their self-presentation. However, individuals who listened to the musical *clips* were perhaps less likely to manage their self-presentation and as a result have rated the clips as less pleasant than the genres.

Finally, a comparative look at the trends reported confirmed that musical preferences examined with independent samples and measures (genres and clips) followed similar age trends. From these results, it can be concluded that there are three normative age trends in musical taste in adulthood that seem to be robust to method variations: music preferred in emerging adulthood, music that is stable with age and music that is preferred by middle-aged adults. This research provides strong support for the examination of the extrinsic and intrinsic psychological determinants of age trends in musical preferences, in line with the MAMP. These determinants will be investigated in subsequent papers.

Conclusion

The MPAM framework, conceptualised in the present research, represents a much needed attempt to integrate past research on the development of musical preferences in adulthood. This model advances the developmental psychology of music field, as it is the first to integrate the various components that can determine age trends in adulthood, into a single unified framework. The empirical findings presented here indicate that musical preferences consistently evolve with age. The trends reported extend the results of past research as they show that age trends in

musical preferences are robust phenomena. This paper represents a first step towards the understanding of the determinants of musical preferences in adulthood by showing that age trends are equivalent across samples and measurement methods. The cross-sectional nature of the studies represents a limitation that should be overcome in the future. Future research is needed to replicate those trends using extensive longitudinal study designs that would follow individuals' taste over decades. In addition, the examination of the various moderators of age trends in musical preferences presented in the MPAM should shed further light on the most important variables that contribute to stability and change in musical preferences in adulthood.

Acknowledgments

Tables and Figures with the index "S" are available as Supplemental Online Material, which can be found attached to the online version of this article at http://msx.sagepub.com. Click on the hyperlink "Supplemental material" to view the additional files. A dataset containing the musical extracts is available, subject to copyright agreement, at: https://osf.io/4ex7x/?view_only=5a1e3bf734b44199a94927747f7f427f.

This research was supported by the Cambridge Commonwealth Trust and the Social Sciences and Humanities Research Council of Canada granted to the first author. We are grateful to Professor David Hargreaves for his valuable comments on a previous draft of the manuscript.

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Table 1. Summary of the confirmatory factor analysis models linking music genres and music clips

Model	χ^2 (DF)	CFI	RMSEA (95 % C.I.)	SRMR
1. CFA 21 genres	5818 (2982)	.85	.032 (.031-.033)	.07
2. CFA 20 genres	5040 (2700)	.87	.030 (.029-.032)	.07
3. CFA 19 genres	4563 (2432)	.87	.031 (.029-.032)	.07
4. CFA 18 genres	4029 (2178)	.88	.030 (.029-.032)	.07
5. CFA 17 genres	3527 (1938)	.89	.030 (.028-.031)	.06
6. CFA 17 genres with two correlations between residuals	**3493 (1936)**	**.90**	**.029 (.028-.031)**	**.06**

Note. N = 933. Model 1. Basic model. Model 2. Alternative removed; Model 3. Alternative and oldies/retro removed; Model 4. Alternative, oldies/retro and folk-rock removed; Model 5. Alternative, oldies/retro, folk rock and world/international removed; Model 6, correlations added between one clip indicator of funk and one clip indicator of dance, and between one clip indicator of ambient, and one clip indicator of R & B/soul. The model in bold typeface represents the final model.

Table 2. Summary of Model 6: CFA 51 clips and 17 genres

Factor	Estimate	SE E	*p*	R^2
Classical Clips Factor				
Waltz No 11 In G Flat	.73	.03	<.001	.53
Partita For Solo Violin Bouree	.79	.03	<.001	.63
Corillian Overture	.86	.02	<.001	.73
Classical Genre On Classical Clips Factor	.78	.02	<.001	.61
Rock Clips Factor				
My Very Own Hostage	.77	.03	<.001	.59
Sonic Revival	.77	.03	<.001	.59
Swing King Extract	.74	.03	<.001	.54
Rock Genre On Rock Clips Factor	.60	.03	<.001	.36
Jazz Clips Factor				
Waking Walking	.84	.02	<.001	.71
Miles Jazz1	.79	.03	<.001	.63
Solo Piano Jazz Spot	.77	.03	<.001	.59
Jazz Genre On Jazz Clips Factor	.73	.02	<.001	.53
Country Clips Factor				
Renewed Full	.83	.02	<.001	.68
Swinging Doors 1	.85	.02	<.001	.71
Crossroads 1	.85	.02	<.001	.73
Country Genre On Country Clips Factor	.76	.02	<.001	.57
Electro/Techno Clips Factor				
Hypercube Full	.82	.02	<.001	.66
Fallout Full	.90	.02	<.001	.80
Nation Music Full	.89	.02	<.001	.79
Electro/Techno Genre On Electro/Techno Clips Factor	.62	.03	<.001	.38
Heavy Metal Clips Factor				
Scared Shiftless	.83	.02	<.001	.70
Roid Rage	.88	.02	<.001	.78
Aftershocks	.88	.02	<.001	.77
Heavy Metal Genre On Heavy Metal Clips Factor	.82	.02	<.001	.67
Opera Clips Factor				
Barcarole From Tales Of Hoffmann	.92	.01	<.001	.85
Richard Wagner Tannhaeuser Act Ii, Scene 2	.88	.02	<.001	.78
Massenet Don Chisciotte	.86	.02	<.001	.73
Opera Genre On Opera Clips Factor	.79	.02	<.001	.63
Funk Clips Factor				
Funk And Run	.74	.03	<.001	.56
Chunk Of Funk Alt	.82	.03	<.001	.68
Sanford	.76	.03	<.001	.58
Funk Genre On Funk Clips Factor	.59	.03	<.001	.35
Hip-Hop/Rap Clips Factor				

Factor	Estimate	SE E	*p*	R^2
Vinnie Paz, Drag You To Hell Remix	.83	.02	<.001	.69
Purgatory Still Again	.78	.03	<.001	.61
Lucid00, No Song Remix Feat. L-Y3T, Mark Pheonix And Rizzo Mercer	.85	.02	<.001	.72
Hip-Hop/Rap Genre On Hip-Hop/Rap Clips Factor	.80	.02	<.001	.64
Pop Clips Factor				
100 Days	.64	.04	<.001	.45
Miranda X Partymonster	.83	.03	<.001	.68
Natures On The Phone	.80	.03	<.001	.65
Pop Genre On Pop Clips Factor	.60	.03	<.001	.35
Gospel/Religious Clips Factor				
The Lords Prayer Full	.84	.02	<.001	.70
Jubilation 1	.83	.02	<.001	.69
Brother Odell Smith	.68	.04	<.001	.46
Gospel/Religious Genre On Gospel/Religious Clips Factor	.76	.02	<.001	.59
Reggae Clips Factor				
Welcome To Retaliation (Thievery Corporation & Damian Marley Mashup)	.77	.03	<.001	.59
No Doubt Riddim Selecta Op4l Mix 2011	.80	.03	<.001	.65
Rockin 2da Ryddum Widd Me	.82	.03	<.001	.67
Reggae Genre On Reggae Clips Factor	.74	.02	<.001	.54
Punk Clips Factor				
Revolt	.74	.03	<.001	.55
Aliens Exist	.61	.04	<.001	.38
Zampano La Calle	.87	.02	<.001	.76
Punk Genre On Punk Clips Factor	.75	.03	<.001	.57
Blues Clips Factor				
Lil Sonny Boy Hisself-In My Time Of Dying	.73	.03	<.001	.53
Worried Life Blues (Ensayo 06-11-2011)	.81	.03	<.001	.66
Bluesy 1	.73	.03	<.001	.53
Blues Genre On Blues Clips Factor	.69	.03	<.001	.48
Latin Clips Factor				
Ricky Ticky Full	.73	.03	<.001	.54
El Jefe Full	.64	.04	<.001	.40
Hot Sauce	.85	.03	<.001	.71
Latin Genre On Latin Clips Factor	.74	.03	<.001	.55
Ambient Clips Factor				
Drone Boy	.50	.05	<.001	.24
Fusion	.77	.04	<.001	.58
Feel The Heat	.76	.04	<.001	.58
Ambient Genre On Ambient Clips Factor	.59	.04	<.001	.35
R & B/Soul Clips Factor				
R B Hitz, Number 1 Fan	.74	.04	<.001	.53

Factor	Estimate	SE E	*p*	R^2
Knatilo, Ifi	.66	.04	<.001	.45
Devory, Ready To Rush	.68	.04	<.001	.50
R & B/Soul Genre On R & B/Soul Clips Factor	.59	.03	<.001	.34

Note. *N* = 933. Estimates represent the standardised factor loadings of the latent clips factors (three clips per factor). The Genre on Clips rows in each section represent the associations between the genre and its associated clip latent factor. SE E = Standard error of estimate. Scores are standardised. The clips are available for download individually, for single non-commercial use, subject to copyright agreement, at: https://osf.io/4ex7x/?view_only=5a1e3bf734b44199a94927747f7f427f. The full list of clips is presented in Table S4 of the online supplementary material.

Table 3. Parallel factor structures of five dimensions of music genres and five dimensions of music clips and correlations between genres and clips

Indicators/ Dimensions	**Genres**					**Clips**				
	Unpreten	**Intense**	**Jazzy**	**Classical**	**Contemp**	**Unpreten**	**Intense**	**Jazzy**	**Classical**	**Contemp**
Ambient/Chillout	-.06	-.02	.18	.16	**.45**	.06	-.02	.32	.19	**.25**
Blues	.04	.11	**.68**	.07	-.18	.00	.18	**.57**	.03	-.38
Classical	-.03	.05	.02	**.76**	.04	-.04	.05	.00	**.77**	.06
Country/Bluegrass	**.33**	.06	.30	-.03	-.29	**.24**	.05	.19	-.01	-.35
Dance/Electro	.06	.03	-.04	.04	**.72**	.21	.20	.12	.00	**.50**
Funk	-.05	.06	**.53**	.04	.32	-.07	.04	**.75**	-.02	.04
Gospel	**.44**	-.15	.18	.19	-.13	**.50**	-.15	.13	.22	-.21
Heavy Metal	-.11	**.66**	.01	.00	.03	-.16	**.71**	-.02	.06	.14
Hip Hop/ Rap	.31	.03	.09	-.22	**.38**	.33	-.01	.29	-.22	**.29**
Jazz	-.08	-.09	**.60**	.25	.05	-.08	-.05	**.60**	.30	.05
Latin	.22	-.12	**.32**	.24	.05	.15	-.08	**.45**	.20	-.06
Opera	.11	-.01	-.01	**.65**	.00	.10	-.02	.03	**.69**	-.06
Pop	**.58**	.03	-.25	.06	.09	**.69**	.16	-.17	-.04	.08
Punk	.04	**.64**	.01	-.02	.13	.17	**.57**	.12	-.04	.03
R & B/Soul	**.50**	-.06	.27	.01	.15	**.75**	-.09	.03	.03	.02
Reggae	.15	.02	**.57**	-.15	.12	.13	-.02	**.56**	-.12	.13
Rock	.05	**.72**	.03	.06	-.10	.04	**.76**	.00	-.01	-.12
Correlations between Dimensions										
Unpreten Genres	-									
Intense Genres	-.10	-								
Jazzy Genres	.29	.06	-							
Classical Genres	.09	-.05	.40	-						
Contemp Genres	.15	.07	.10	.03	-					
Unpreten Clips	**.81**	-.19	.05	-.01	.11	-				
Intense Clips	-.18	**.86**	-.07	-.09	.08	.00	-			
Jazzy Clips	.23	.06	**.79**	.24	.28	.20	.12	-		
Classical Clips	.14	-.13	.37	**.89**	-.01	.03	-.08	.37	-	

Contemp Clips	-.09	-.10	-.28	-.13	**.80**	.10	.10	-.09	-.18	-

Note. *N* = 933. Contemp = Contemporary; Unpreten = Unpretentious. The correlation coefficient between the corresponding genres and clips dimensions are presented in bold typeface. The genres dimensions contain music genres only and the Clips dimensions contain clips only. Clips dimension: The three clips per genre shown in Table 2 are averaged and labeled with the corresponding genre name. The musical dimensions are in order of appearance in the model.

Table 4. Summary of model fit information for quartimin-rotated ESEM and age invariance

	$\chi 2$	**CFI**	**RMSEA (95 % C.I.)**	**SRMR**	**Δ $\chi 2$**	**Δ CFI**	**Δ RMSEA**	**Δ SRMR**
1. Whole sample	816 (369)	.950	.036 (.033 - .039)	.033				
2. Configural Invariance	1841 (1141)	.926	.044 (.041 - .48)	.050				
3. Metric Invariance	2158 (1381)	.918	.043 (.039 - .046)	.061	317 (240)	-.008	-.001	.011
4. Scalar Invariance	2324 (1429)	.905	.045 (.042 - .048)	.065	166 (48)	-.013	.002	.004
4a. Partial Scalar Invariance	2290 (1427)	.908	.044 (.041 - .047)	.065	132 (46)	-.010	.001	.004

Note. Sample sizes: 18-25, *n* = 443; 26-39, *n* = 311; 40-65 *n* = 179; *N* total = 933. Five ESEM factors for music genres and Five ESEM factors for music clips. Model 1 is the model with all participants combined. Models 2-4a are measurement invariance models. Δ = Difference in fit statistics: Model 3 compared with Model 2; Model 4 and 4a compared with Model 3. Model 4a: Intercept of Hip Hop/Rap genre freed for all age groups.

Table 5. Results of multiple group analysis of age trends in preferences for music genres and clips

	Group Genres					**Group Clips**				
Dimensionsn	**β**	**SE**	**95% CI**		***p***	**β**	**SE**	**95% CI**		***p***
			Low	High				Low	High	
Classical										
Intercept	3.39					3.10				
Age	-.01	.02	-.06	.03	.55	-.01	.02	-.05	.03	.55
Age^2	.04	.02	-.01	.08	.08	.04	.02	-.01	.08	.08
Contemporary		3.71					3.37			
Intercept	3.71					3.37				
Age	**-.08**	**.02**	**-.12**	**-.04**	**.00**	**-.08**	**.02**	**-.12**	**-.04**	**.00**
Age^2	**-.05**	**.02**	**-.09**	**-.01**	**.02**	**-.05**	**.02**	**-.09**	**-.01**	**.02**
Intense										
Intercept	3.84					3.06				
Age	-.04	.02	-.08	.01	.11	-.03	.02	-.07	.01	.11
Age^2	**-.06**	**.02**	**-.10**	**-.02**	**.01**	**-.06**	**.02**	**-.10**	**-.02**	**.01**
Jazzy										
Intercept	3.85					4.05				
Age	**.07**	**.02**	**.03**	**.11**	**.00**	**.07**	**.02**	**.03**	**.11**	**.00**
Age^2	**.05**	**.02**	**.01**	**.09**	**.01**	**.06**	**.02**	**.01**	**.10**	**.01**
Unpretentious										
Intercept	3.40					2.80				
Age	**.18**	**.02**	**.14**	**.22**	**.00**	**.17**	**.03**	**.13**	**.21**	**.00**
Age^2	**.05**	**.02**	**.01**	**.09**	**.01**	**.05**	**.04**	**.01**	**.09**	**.01**

Note. Genre *N* = 2,126; Group Clips, N = 1,876. Regression coefficients come from the constrained model. Standardised regression coefficients are presented. Group R^2 Constrained: Classical = .001; Contemporary = .013; Intense = .007; Jazzy = .012; and Unpretentious = .048.

Figure captions

Figure 1. Musical Preferences in Adulthood Model

Figure 2. Comparison of Age Trends in Preferences for Music Genres and Clips

Note. Genres N = 2,126; Clips N = 1,876. Observed age trends in taste for music genres and clips from participants aged from 18 to 65 years old. The y-axis represents standardised means on the factors (z scores). The constrained scores are presented in Table 5.

Endnotes

[1] The terms music preferences and music taste are used interchangeably in this research.
[2] The high degree of similarity regarding the demographic information between the genres and clips samples is due to the similar recruitment method within the same time frame, that allowed us to recruit to relatively similar, therefore comparable, samples.