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Personality and music: Can traits explain how people use music in everyday life?

Tomas Chamorro-Premuzic[1]* and Adrian Furnham[2]

[1]Goldsmiths, University of London, UK
[2]University College London, UK

This paper reports the results of a study on the relationship between individual differences and specific uses of music, referring to why and how people use music in everyday life. Questionnaire data from 341 respondents showed that open and intellectually engaged individuals, and those with higher IQ scores, tended to use music in a rational/cognitive way, while neurotic, introverted and non-conscientious individuals were all more likely to use music for emotional regulation (e.g. change or enhance moods). Results suggest that individual differences in personality and cognitive ability may partly determine the way in which we experience music. Limitations and suggestions for future studies are discussed.

The past decade has seen increasing research into the study of the psychological aspects of music. In particular, Rentfrow and Gosling (2003) systematically addressed some of the major questions regarding the importance of music in everyday life, including its relationship to individual differences. There have also been studies attempting to shed light on the links between music and several aspects of social behaviour (Hargreaves & North, 1997, 1999; North, Hargreaves, & McKendrick, 1997, 2000), as well as the role of music as a constituent factor of individuals' social identity (North, Hargreaves, & O'Neill, 2000; Tarrant, North, & Hargreaves, 2000; Tekman & Hortaçsu, 2002).

However, questions remain, particularly regarding the relationship between individual differences and different uses of music in everyday life, namely, whether different people listen to music in different or similar ways and why they may choose to do so (Kemp, 1996; Rentfrow & Gosling, 2003). The questions of why and how people experience music in everyday life is an important one given that music is a ubiquitous aspect of all human cultures and has been associated with broad psychological functions, in particular emotion regulation and coping. Psychologists have often emphasized the fact that music, in any of its widely different forms and contents, can evoke powerful emotional reactions in people. Thus, in one of the first published articles on individual

* *Correspondence should be addressed to Dr Tomas Chamorro-Premuzic, Department of Psychology, Goldsmiths, University of London, New Cross, London SE14 6NW, UK (e-mail: pss02tc@gold.ac.uk).*

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differences and music, Myers (1922) concluded that '[N]owhere in art or nature as in music do we more keenly feel this "uplifting of the soul" as we term it' (p. 71).

In the present article, we explore several possibilities in which established personality traits and intelligence measure may be linked to different specific motives and ways in which music can be used for in everyday life.

Uses of music

Philosophers have long speculated about the functions of music and the purpose of listening to music in human beings (e.g. Hamilton & Cairns, 1996; Jourdain, 1998; Russell, 1945). According to Aristotle (350BC/1997), music was the most influential phenomenon that an audience could be affected by. Psychoanalysts, on the other hand, conceptualized music (and other artistic products) in terms of 'sublimation', that is, the transformation of sexual instincts into socially rewarded products and activities (Freud, 1922). More recent psychological and empirical studies into the uses of music suggest that individuals, in particular young people, use music for the purpose of impression-management, i.e. to create an external image to others (North, Hargreaves, & O'Neill, 2000; Tarrant *et al.*, 2000). Thus, music may help individuals to consolidate their sense of identity by establishing in-group preference and exclusivity.

Other studies (e.g. Tekman & Hortaçsu, 2002) have indicated that individuals choose to listen to music as background to other activities, mere appreciation or rhythmic accompaniment. Technological advances in digital music systems (e.g. cd, dvd and mp3 players) have made listening to music cheap and available everywhere and at all times. Today, people can listen to music while driving, cycling, studying, working or travelling by plane, train or bus. As North, Hargreaves, and Hargreaves (2004) recently noted:

> . . . people now actively *use* [music] in everyday listening contexts to a much greater extent than hitherto. They are still exposed to music in shops, restaurants, and other commercial environments without active control: But they also control its use in the home, in the car, while exercising, and in other everyday environments. It might be expected that they should do this in order to achieve different psychological ends, such as creating certain mood states, or changing their levels of emotional arousal. Music can now be seen as a *resource* rather than merely as a commodity. (p. 42, italics in the original)

Personality, intelligence and music

Recent research has revealed important information about the relationship between individual differences and musical preferences. In fact, much more is known now about the psychology of musical preferences (for different artists, styles or genres) than uses of music in general, largely thanks to Rentfrow and Gosling's (2003) recent series of studies. In a large-scale analysis of US data, the authors found that the structure of musical preferences could be organized in terms of reflective/complex, intense/rebellious, upbeat/conventional and energetic/rhythmic compositions, and that these dimensions are not only associated with the level of complexity, emotionality and energy of musical compositions, but also individual differences in personality, ability and self-perception. This suggests that 'individuals might select styles of music that allow them to send a message to others about who they are or how they like to be seen' (Rentfrow & Gosling, 2003, p. 1,251). However, Rentfrow and Gosling did not explore the extent to which different individual difference factors are likely to influence the way in which people use music, and concluded that 'a theory of music preferences should

also explain how individuals make use of music. One possibility is that individuals use music as a means of regulating emotions in everyday life' (p. 1,252).

Indirectly, the associations between individual difference variables and different dimensions of musical preference indicate that personality and intelligence may partly determine the way individuals use music, that is, *why* and *how* they choose to listen to it. If, say, intellectual individuals, such as those who score highly on the openness to experience dimension or IQ, tend to prefer reflective/complex to upbeat/conventional music, one may expect them to use music in rational/intellectual rather than emotional ways, implying higher levels of cognitive processing. These differences may be noticeable in preferences for classical or jazz music, not because these genres are unlikely to elicit emotions but because their complexity is more likely to suit those who seek intellectually stimulating experiences, particularly among the younger generations who are typically under-exposed to genres other than pop, rock or electronic music.

Extraverts, on the other hand, may use music to increase their arousal, especially during monotonous tasks such as cleaning, jogging and data-entry. Accordingly, the experience of music may partly be a function of differential levels of arousal (Yerkes & Dodson, 1908), specifically whether the average resting level of arousal is high or low. Several studies have suggested that background music causes larger interference with other cognitive processes in the case of introverts than in extraverts (see Furnham & Bradley, 1997; Furnham & Strbac, 2002; Furnham, Trew, & Sneade, 1999; Robinson, 1996, 1998).

The relationship between uses of music and other personality traits seems less clear, although some links may also be expected. For instance, neuroticism/emotional stability, a trait which refers to an individual's tendency to experience negative affectivity and regulate emotions, may be associated with emotional uses of music, and this has been the focus of much cognitive research in recent years (Juslin, 1997a, 1997b, 2000; Juslin & Laukka, 2003; Juslin & Sloboda, 2001). Specifically, neurotic individuals may be expected to be more sensitive to the emotional effects of music and use music for emotional regulation purposes. Conversely, conscientiousness, a trait that is negatively related to creativity and psychoticism (Digman, 1997; Eysenck, 1992, 1993), may be inversely correlated with the level of likelihood to use music for emotional regulation. Conscientious individuals, to some extent the opposite of artistic, intuitive and imaginative people (Costa & McCrae, 1992; Eysenck, 1992, 1993; Matthews & Deary, 1998), may therefore be more likely to experience music in rational ways.

Individual differences in uses of music

This study explores the relationship between established individual differences (the Big Five personality traits, IQ and Typical Intellectual Engagement [TIE]) (Costa & McCrae, 1992; Goff & Ackerman, 1992) and different uses of music – as assessed through a purpose-designed self-report inventory. Several hypotheses can be stated:

(*H1*) There will be three major different uses of music, namely emotional (i.e. music for emotional regulation such as mood manipulation), cognitive (i.e. rational musical appreciation or intellectual processing of music) and background (i.e. music as background for social events, work or interpersonal interaction).

(*H2*) To the extent that *H1* is supported, it is expected that: (*H2a*) Neuroticism will be positively correlated with emotional use of music (i.e. neurotic individuals will be more likely to use music for emotional purposes). (*H2b*) Extraversion will be positively related to background use of music (i.e. extraverts will be more likely to use music while

working or interacting with others). (*H2c*) Openness and TIE will be both positively correlated with cognitive music use (i.e. individuals who are open and likely to engage/invest in intellectual activities will tend to experience music intellectually).

(*H3*) Again, to the extent that *H1* is supported, it is predicted that there will be a significant and positive correlation between IQ and TIE and intellectual use of music, such that higher IQ scores are associated with rational/cognitive appreciation of music.

Method

Participants

A total of 341 (241 females and 100 males) students from British and American universities (from various nationalities, faculties and fluent in English) took part in this study. Age ranged from 17 to 41, $X = 19.9$ ($SD = 2.9$). All participants completed the psychometric measures during classes.

Procedure and measures

Participants were tested in four group sessions, in a large lecture theatre, and in the presence of several invigilators who ensured appropriate test administration. First, they completed the Wonderlic Personnel Test (Wonderlic, 1992), which was the only timed measure in this study. Following this, they handed in the self-report inventories (Big Five, TIE and Uses of Music Inventory), for which there was no time limit. Participants completed all measures individually and anonymously, although a code was used to match cases and compile the overall data file, as well as to provide feedback to participants who requested it. Methodological details on the psychometric instruments are provided below.

(a) The Wonderlic Personnel Test (WPT) (Wonderlic, 1992): This 50-item test is administered in 12 minutes and measures general intelligence. Scores can range from 0 to 50. Items include word and number comparisons, disarranged sentences, serial analysis of geometric figures and story problems that require mathematical and logical solutions. The test has impressive norms and correlates very highly ($r = .92$) with the WAIS-R (Wechsler, 1958) IQ test (see Wonderlic, 1992).

(b) Personality was assessed by using the Neuroticism, Extraversion, Openness, Five Factor Inventory (NEO-FFI) (Costa & McCrae, 1992). This 60-item, non-timed questionnaire, measures the Big Five personality factors, i.e. neuroticism, extraversion, openness to experience, agreeableness and conscientiousness. Items involve questions about typical behaviours, which are answered on a five-point Likert scale (ranging from 'strongly disagree' to 'strongly agree'. The manual reports extensive indices of reliability and validity (see Costa & McCrae, 1992).

(c) TIE: This construct was assessed through the 59-item inventory developed by Goff and Ackerman (1992). Participants respond on a six-point Likert-type scale and high scores represent their preference and tendency to engage in intellectual activities (e.g. arts, philosophical discussions, problem solving).

(d) Uses of Music Inventory: This self-report questionnaire was specifically designed for this study and comprised 15 items which were answered on a five-point Likert-type scale (ranging from 'strongly disagree' to 'strongly agree'). Item selection was determined by the results of a preliminary qualitative pilot study and a review of the literature (summarized in the introduction). The pilot study involved 24 female and 19 male university students, aged 18 to 52 ($X = 21.34$, $SD = 3.67$), from different degrees and courses. Although not representative of the overall population, the pilot sample was representative of the study sample. Students took part in several focus group and open interview sessions. Questions were open-ended and non-directive in nature, designed to

elicit views regarding music, when it was listened to and why. Participants were told prior to the group sessions that there were no right or wrong answers, and that it was their ideas concerning music that were being explored. Key questions and the explanation of what the interview entailed were held constant to ensure comparability. Interviews/group sessions were recorded on audiotape following the written consent of the respondent. A thematic analysis was then conducted whereby interviews were transcribed and a coding frame drawn up and developed by close examination of the full set of transcriptions. Categories were derived to systematize the content, reflecting the themes that emerged from the interviews/group sessions. The analyses was carried out using the Atlas-ti software, which allows for the substance and prevalence of each theme to be ascertained. The most frequent and common responses were associated with manipulation/regulation of emotions (e.g. 'to cheer me up', 'when I feel down', 'after I've had a bad day'), rational appreciation of music (e.g. 'admire their music', 'understand *x* genre', 'talented performer') and as background to other activities ('when I study', 'when I work', 'when I'm out with friends'). Accordingly, items were designed to tap into these implicit dimensions and explore differences in uses of music in terms of emotional (e.g. 'listening to music really affects my mood'), cognitive (e.g. 'listening to music is an intellectual exercise for me') or background (e.g. 'I enjoy listening to music while I work') benefits for the user. Details on the structure of this inventory, including all items, are reported in the results section (notably Table 1).

Table 1. Structure matrix and item loadings for the uses of music inventory

	M(emot)	M(cog)	M(back)
1. Listening to music really affects my mood	**.81**		
2. I am not very nostalgic when I listen to old songs I used to listen to (R)	**.74**		
3. Whenever I want to feel happy I listen to a happy song	**.64**		
4. When I listen to sad songs I feel very emotional	**.57**		
5. Almost every memory I have is associated with a particular song	**.56**		
6. I often enjoy analysing complex musical compositions		**.74**	
7. I seldom like a song unless I admire the technique of the musicians		**.66**	
8. I don't enjoy listening to pop music because it's very primitive		**.66**	
9. Rather than relaxing, when I listen to music I like to concentrate on it		**.63**	
10. Listening to music is an intellectual experience for me	−.38	**.60**	
11. I enjoy listening to music while I work			**.77**
12. Music is very distracting so whenever I study I need to have silence (R)			**.64**
13. If I don't listen to music while I'm doing something, I often get bored	−.44		**.56**
14. I enjoy listening to music in social events			**.49**
15. I often feel very lonely if I don't listen to music			**.47**
Eigenvalues	3.30	1.86	1.59
Scale reliability (Cronbach's α)	.78	.85	.76

Note. $N = 264$. Loadings $<.30$ suppressed. M(emot)= emotional use of music (e.g. emotional regulation), M(cog)= rational/cognitive use of music (intellectual appreciation), M(back)= background use of music (e.g. background, parties), (R) = reversed item.

In addition, participants were asked to rate whether they (a) liked or disliked and (b) recognized several musical artists/genres/composers. The selection of genres was adapted from the large-scale factor-analytic survey reported by Rentfrow and Gosling (2003), in which the authors used classical, jazz, blues, folk, alternative, rock, heavy metal, country, pop, religious, sound tracks, rap/hip hop, soul/funk and electronica/dance as genres. Participants' responses were recorded on a two-point scale, namely, 'yes' = 1 point/'no' = 0 points. Despite the variety of musical styles and artists, principal component analysis (PCA) with varimax rotation identified a single factor of self-reported musical knowledge/recognition. A similar analysis of the likes/dislikes responses showed there to be only one factor on which all items loaded. Thus, participants tended to either like or dislike most styles, and they also tended to either recognize most styles or none. Items were totalled to form a single score for each variable and the Pearson correlation between like and recognition factors was $r = .49$, $p < .01$.

Results and discussion

The 15 items of the self-report Uses of Music Inventory were reduced through PCA and three underlying factors were extracted on the basis of eigenvalues larger than 1 and the results of a scree test. The first factor was labelled emotional use of music – M(emot) – and accounted for 22% of the variance. M(emot) refers to the extent to which individuals use music for emotional regulation, e.g. inducing positive or negative moods that may change an individual's experienced emotionality or enjoy the pleasure induced by experiencing the emotion itself. This factor included items such as 'Listening to music really affects my mood' and 'Whenever I want to feel happy I listen to a happy song'. The second factor was labelled rational/cognitive use of music – M(cog) – and accounted for 12% of the variance. Scores on the M(cog) factor were interpreted as an indicator of the degree to which individuals listen to music in an intellectual manner, for example focusing on the performers (e.g. judging the quality of his/her interpretation), analyzing the structure of the composition or examining the score and parts played by different instruments. Sample items of the M(cog) factor are 'I often enjoy analysing complex musical compositions' and 'Rather than relaxing, when I listen to music I like to concentrate on it'. The third factor was labelled background use of music – M(back) – and accounted for 11% of the variance. M(back) assessed the extent to which an individual is likely to use, tolerate and enjoy music while working, studying, socializing or performing other tasks in general. Thus high scores on M(back) refer to high likelihood of using music as the background to other activities and, accordingly, low distractibility levels. The M(back) factor included items such as 'I enjoy listening to music while I work' and 'If I don't listen to music while I'm doing something, I often get bored'. Oblique rotation (oblimin with Kaiser normalization) was performed on the data to obtain a clearer solution and maximize loadings. The overall amount of variance accounted for was 45%. Structure matrix and items (with factor eigenvalues and scale reliabilities) are reported in Table 1. This solution was in line with initial predictions (H1) and the findings of the pilot study.

An alternative solution was tested by extracting four, rather than three, factors. This included the original first two factors, M(emot) and M(cog), but divided the loading of the items of the original third factor [M(back)] onto two different factors. This revealed one factor composed of the two items that focused on music as a background to other activities ('Music is very distracting so whenever I study I need to have silence', 'If I don't listen to music while I'm doing something, I often get bored'), and another factor

containing the other two items of the original M(back) factor, which emphasized social use ('I enjoy listening to music in social events') and company use ('I often feel very lonely if I don't listen to music'). Of these two factors, however, only the first (background use of music) showed sufficient reliability and a large enough eigenvalue, while the second (social/company) had an eigenvalue of 1.01 and was deemed unreliable. Thus, the analysis was based on the original three-factor solution reported above, which interpreted M(cog), M(emot) and M(back) as the three major uses of music examined in this study.

All three factors were modestly but significantly intercorrelated. M(cog) was negatively correlated with both M(emot) ($r = -.25$, $p < .01$) and M(back) ($r = -.19$, $p < .01$). The correlation between M(emot) and M(back) was $r = .26$, $p < .01$.

Using *t* tests for gender, and correlations for age, it was established that there were no significant gender or age differences in any of the three uses of music factors. There were also no significant personality–gender or personality–age interactions either.

Table 2 presents the correlations between individual differences measures and the Uses of Music Inventory (including preferences and recognition scores). IQ was significantly correlated with M(cog) scores ($r = .30$, $p < .01$) (this confirmed H3).

Table 2. Individual difference correlates of the uses of music inventory

	M(emot)	M(cog)	M(back)	Like	Recog
1. IQ	−.05	.30**	−.06	.16*	.10
2. TIE	.15	.51**	.09	.16*	.37**
3. Neuroticism	.30**	.00	.03	−.09	−.10
4. Extraversion	−.16*	−.10	.05	.08	.06
5. Openness	−.11	.32**	.01	.16	.12
6. Agreeableness	−.09	−.01	.00	.01	.03
7. Conscientiousness	−.22**	.04	−.15	−.01	.04

Note. $N = 341$. M(emot)= emotional use of music (e.g. emotional regulation), M(cog)= rational/cognitive use of music (intellectual appreciation), M(back)= background use of music (e.g. background, parties). Like = styles/artists/genres participants liked, Recog = styles/artists/genres participants reported to recognize. IQ = Wonderlic Personnel Test (Wonderlic, 1992), TIE = typical intellectual engagement (Goff & Ackerman).
*$p < .05$; **$p < .01$.

TIE was significantly correlated with M(cog) ($r = .51$, $p < .01$) (this supported H2c) and recognition ($r = .37$, $p < .01$). Openness to experience was significantly and positively correlated with M(cog) ($r = .32$, $p < .01$) (further supporting H2c). Neuroticism (low emotional stability) was positively and significantly correlated with M(emot) ($r = .30$, $p < .01$) (this provided support for H2a). Conscientiousness ($r = -.22$, $p < .01$) was significantly and negatively correlated with M(emot).

Thus results suggest that there are different reasons as to why individuals choose to listen to music in everyday life, and that these uses are significantly related to established personality traits. Most notably, an individual's level of TIE, which refers to the extent he/she is interested in intellectual investment and knowledge acquisition/increase, is largely associated with his/her tendency to experience music in a rational/cognitive way, for instance by focusing on the performance of the musicians or the musical structure of a composition. No wonder, then, that intellectually engaged individuals

reported higher music recognition and preference ratings. This use of music seems to characterize open individuals, too, no doubt because of the similar intellectual profile of individuals high in openness to experience (Goff & Ackerman, 1992). 'The general tendency to experience negative affect such as fear, sadness, embarrassment, anger, guilt and disgust is the core of the Neuroticism domain' (Costa & McCrae, 1992, p. 14). Likewise, people with higher IQs seem to use music in a more rational/cognitive fashion.

On the other hand, individuals high in neuroticism, similarly to those low in extraversion and in conscientiousness, were all more likely to use music in emotional ways, that is, focusing on content rather than structure. Emotional uses of music seem characterized by intentional mood regulation, e.g. choosing sad music when one is sad, happy music when one is happy or spontaneous alteration of affect by music. In a sense, this use of music is the opposite of rational/cognitive (cerebral, intellectual) musical appreciation, as the negative correlation between M(cog) and M(emot) would seem to confirm ($r = -.25$, $p < .01$).

The fact that higher neuroticism is associated with a greater tendency to use music emotionally appears to fit the very nature of neurotic individuals, who are typically emotionally unstable and experience higher intensity of emotional affectivity, particularly negative affects (such as anxiety, depression and sadness) (Costa & McCrae, 1992). On the other hand, introverts may simply be more affected by music because of their higher resting levels of arousal (Eysenck & Eysenck, 1985), thus being more sensitive to the effects of music. Nevertheless, in the present study, extraversion was not positively associated with background uses of music. Although not predicted, the correlation between conscientiousness and emotional use of music is indirectly in line with the more rational/cognitive use of music found in intellectual (higher TIE) individuals, as TIE and conscientiousness are partly overlapping constructs (Goff & Ackerman, 1992). Furthermore, low conscientiousness has often been described in terms of higher psychoticism or artistic creativity, which may partly explain the correlations found in this study (see, for instance, Costa & McCrae, 1992; Eysenck & Eysenck, 1985).

The aim of this paper was to investigate the trait (personality and ability) correlates of different uses of music. Thus, we examined three possible ways in which individuals use/listen to music and identified individual differences in personality and intelligence underlying different uses of music. Results indicated that people listen to music for rational/cognitive appreciation, emotional regulation (e.g. to change or reinforce moods) or simply as background to other activities (e.g. studying, socializing, working). Individuals who listen to music in a rational/cognitive way tended to be more open and intellectual (i.e. high on TIE), as well as have higher IQ scores, while those who used music for emotional regulation were more likely to be introverted (rather than extraverted), neurotic (rather than emotionally stable) or unconscientious.

Although there has been a considerable lack of research into the relationship between individual differences and uses of music prior to this paper, our results concur with the growing body of empirical evidence on the nature of musical preferences. For instance, our findings are consistent with those of Rentfrow and Gosling's (2003), who showed that open individuals tend to prefer complex music such as classical or jazz. The same applies to individuals with higher intellectual ability scores.

Naturally, there are many limitations to the present studies, which were based predominantly on young American and British University students and focused on a limited number of personality traits and musical types. For example, our uses of music

inventory only assessed individual differences in three different uses of music, but there are arguably other possible ways in which people use this. Individuals may differ in the extent to which they use music to communicate certain attitudes or aspects of their personality, and in terms of using music for physical and artistic activities, such as dancing. Another use of music largely unaddressed by our studies is whether it can be used to express emotion merely through its connection to things outside itself or whether it contains an intrinsic emotional valence within itself (Meyer, 1956).

Furthermore, as test–retest data for our scale are not yet available, we cannot be sure of whether the different uses of music we assessed referred to stable (trait) or sporadic (situational) differences between individuals. On the other hand, larger, more representative, samples, for example from Eastern culture, should be examined to assess the generality of these findings, and other personality and ability traits such as psychoticism, emotional intelligence, sensation-seeking and creativity, as well as hobbies and vocational interests, should be studied. Emotionality and intellect appear to be major components underlying the processes of musical appreciation, and specific individual differences affecting each of these components need to be identified and replicated. In addition, previous studies have shown that gender plays a strong role in emotional response to music, such that females tend to respond more strongly than males to the emotional effects of music (e.g. Coffman, Gfeller, & Eckert, 1995; Kamenetsky, Hill, & Trehub, 1997; Panksepp, 1995). Although the present studies did not find any gender differences in uses of music, future studies should explore this possibility as well as the mediating or moderating role of individual difference variables in the relationship between gender and emotional responses to music.

Despite the methodological weaknesses and conceptual limitations highlighted above, our findings provide important empirical evidence for those concerned with some of the dominant individual difference variables involved in everyday uses of music. In particular, they imply that those known, and well-established, traits that allow us to distinguish and compare between different individuals, notably neuroticism, extraversion, openness to experience, cognitive ability and the more novel construct of TIE, may also explain why certain individuals are more likely to use music in emotional or rational ways. Bearing in mind the many variables that may mediate and moderate our choice and motive for listening to music, the consistency with which personality and intelligence factors are associated with an individual's style for listening to music, is quite remarkable.

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