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Music Preference and the Five-Factor Model of the NEO Personality Inventory

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Student subjects completed an updated version of Litle and Zuckerman's Music Preference Scale, a questionnaire measuring musical preference. They also completed the NEO Personality Inventory (Revised), a measure of the Five-Factor Model of personality. Factor analysis identified three patterns of preference associated with liking for most types of Rock Music, general Breadth of Musical Preference, and liking for Popular Music (such as easy listening). The three factors were employed as dependent variables in canonical correlations to examine relationships with personality. As predicted, most relationships with music preference involved the personality measures extraversion and openness. Extraverts obtained high scores on the Popular Music factor. Open individuals liked a wide range of music types. It was also found that females liked popular music styles more than did males. Particular personality "facets" were examined, as were the effects of musical training and interest. The research extends previous investigations relating preference and personality.

Introduction

Several studies have investigated the relationship between relatively enduring personality dispositions and musical preference. These studies frequently follow Cattell and his colleagues, requiring subjects to rate brief excerpts of recorded music. For example, Cattell and Saunders (1954) found that extraversion was associated with musical choices characterised by strong rhythms, fast tempo, discordant harmonies, and a "joyful but agitated mood". In similar vein, Payne (1980) found that among trained musicians and those familiar with music, extraverts showed a preference for "emotional" music and introverts for music with formal structure. Daoussis and McKelvie (1986) found that extraverts surpassed introverts in their liking for rock music, particularly "hard rock" music. Other studies have found (Wheeler, 1985) or failed to find (Glasgow, Cartier and Wilson, 1985) substantial relationships between musical preferences and personality dispositions.

More recently, a number of investigators have studied preference using the Music Preference Scale (MPS) devised by Litle and Zuckerman (1986). This paper-and-pencil questionnaire simply asks subjects to rate their liking for particular styles of music (ranging from classical to rock), and has the advantage that judgements are much less dependent on the researcher's choice of examples. Of the ten original styles, it is of particular importance here to note that rock music split into three sub-categories (called hard rock, soft rock and classic rock); a single general category incorporating various forms of popular music could be formed from their original "Broadway, movie and TV soundtracks" and "popular" categories, where this latter category included such music styles as disco, top 40 and easy listening music. The scale was developed in an attempt to show the relationship between music preference and Zuckerman's "sensation seeking"

construct. Litle and Zuckerman found that total sensation seeking was correlated positively with liking for all types of rock music and negatively with liking for film and television soundtrack music. Some correlations of the four sensation-seeking subscales with liking for particular music styles were also reported. Litle and Zuckerman included measures of musical training and intensity of musical involvement and found that the second, but not the first, was positively related to total sensation seeking. They concluded that the correlations between musical taste and sensation seeking could not be related to musical training and experience.

Rawlings *et al.* (1995) employed the MPS in an investigation of the relation between music preference and Eysenck and Eysenck's (1976) three-factor model of personality. They used the Eysenck Personality Questionnaire (Revised), which includes scales measuring extraversion, neuroticism and psychoticism, as well as a lie-scale. The main focus of the study was psychoticism or "toughmindedness", which was found to correlate positively with liking for hard rock music, but negatively with liking for popular, soft rock, classical, electronic and soundtrack categories. Extraversion correlated positively with liking for electronic, religious and soundtrack music types; and the lie-scale with soft rock, popular and soundtrack music. In separate studies, Rawlings *et al.* found quite similar patterns of results using music excerpts and chords varying in harshness as were found with the music categories of the MPS. In one study they found that musical training was unrelated to preference, though some earlier studies have found that persons trained in music enjoy atonal and complex music more than do untrained people (Crozier, 1974).

Dollinger (1993) used a shortened form of the MPS to investigate the relationship between music preference and the Five-Factor Model, or Big Five, approach to personality taxonomy as measured by the NEO Personality Inventory (Costa and McCrae, 1985). This model argues for five orthogonal personality dimensions, including extraversion and neuroticism (as in the Eysenckian system), as well as agreeableness, conscientiousness and openness to experience. Dollinger's major focus was the "openness" factor, which was found to predict liking for classical, jazz and soul/rhythm and blues composite categories, as well as more specific categories of new age, reggae, and folk-ethnic music. As in several earlier studies of music preference, extraversion was an important factor in determining preference. In Dollinger's sample, it was positively related to liking for jazz; negatively to liking for gospel music. The extraversion facet "excitement seeking" was positively correlated with liking for hard rock music. Neuroticism was positively related to liking for pop music; agreeableness with liking for classical music.

In light of the research discussed above, it is clear that the Five-Factor Model is an appropriate one to use in future empirical work for as Goldberg (1993) has argued, a "consensus is emerging" in the search for a scientifically compelling taxonomy of personality traits. While influential writers such as Eysenck (1992), Block (1995), Tellegen (1993) and Jackson (Jackson *et al.*, 1996) take issue with this view, the Five-Factor Model has provided an important organising framework for personality research in recent years. The case for the model has been led by Costa and McCrae (1992a) whose NEO Personality Inventory in its various forms remains the most popular measure of the five factors.

Numerous empirical studies relate extraversion to musical preferences. Several of these have been described above. The relationship between openness and musical taste has been investigated in just one study, but the correlations described in

that study are quite strong. Furthermore, there are theoretical grounds why each of these two personality dimensions should reveal correlates with musical preferences.

Considerable research has been carried out using the extraversion construct, largely within the framework of Eysenck's theory. Eysenck (1967) believes that extraverts have a low resting or "tonic" level of cortical arousal. He argues, after Wundt, that organisms seek to maintain an optimal level of arousal which is neither very high nor very low; hence extraverts are "stimulus hungry" in an attempt to increase their cortical arousal nearer to its optimal level. On the other hand, introverts are motivated to avoid stimulating activities in an attempt to reduce their already high arousal levels (Eysenck, 1981). This model is applied by Eysenck to a wide range of situations, including the making of aesthetic judgements (Eysenck, 1982). It should be noted that Eysenck's attempt to explain aesthetic preference within a biological framework is somewhat unusual, and has been challenged even by those working within that framework. For example, Zuckerman (1987) attempts to explain individual differences in sensation seeking with reference to a different "arousal" system. Sensation seeking is a trait which is moderately correlated with extraversion and comparable patterns of music preference have been shown by subjects scoring high on both scales (*cf.* Daoussis and McKelvie, 1986; Litle and Zuckerman, 1986). According to Zuckerman, the high sensation seeker has a high optimal level of arousal of the brain's catecholamine systems related to intrinsic reward, which includes a special responsivity to novel and intense stimuli. A secondary effect of this is to produce *high* cortical arousal in the sensation seeker, in contradiction of Eysenck's view. However, Zuckerman and Eysenck do agree that the extravert and high sensation seeker are both motivated to seek stimulation.

A theoretical framework for openness to experience is much less adequately established. An important step in this direction has been taken in a wide-ranging paper by McCrae (1994). McCrae explores, theoretically and empirically, connections of openness with both the Jungian concept of "intuition" (as operationalised in the Myer-Briggs Type Indicator) and Hartmann's (1991) concept and questionnaire measure of "boundaries in the mind". Openness is also related to certain forms of creativity, as measured by divergent thinking tests (McCrae, 1987). While Costa and McCrae (1992b) disagree with writers such as Eysenck that a personality dimension must be supported by theory linking it to a biological mechanism, McCrae (1994) nevertheless suggests an evolutionary basis for the construct by pointing to the universal nature of the need to explore, to seek novelty and to enlarge our experience.

While Dollinger (1993) found several significant correlations between music preference and the NEO measures of extraversion and openness, a number of aspects of his study suggested that it could be usefully replicated and extended. A rather small sample ($N = 58$) completed all tests; an early version of the NEO personality inventory was used; an abbreviated form of the MPS was employed. Furthermore, it is suggested that a replication of Dollinger's (1993) research using somewhat more sophisticated statistical techniques than simple correlation might enable a fuller understanding of the relationship between patterns of preference and personality. Accordingly, the present paper reports a study in which a larger sample was employed than in the earlier study; the latest version of the NEO personality inventory was used; a full (updated) version of the MPS was presented;

and data were analysed using multivariate statistical techniques. While the extraversion and openness domains, and their respective facets formed the main focus of the study, data relevant to the other three dimensions of the Five-Factor Model will also be examined.

Method

Subjects and Procedure

The subjects were 150 university students (98 females, 52 males) with a mean age of 18·95 years (SD = 2·46). There were 91 first-year psychology students and 59 medical radiations science students, the two groups coming from different universities in Melbourne, Australia. The scales were given, to small groups of subjects, in a single session of about two hours, which also included several other short tasks. Twenty-three subjects did not complete all relevant items and their data were deleted in statistics involving these items.

Questionnaire Measures

Music Preference Scale. The original, 75-item MPS is described in detail by Litle and Zuckerman (1986). As well as including several "demographic" items concerning such factors as music experience and involvement, the scale has ten composite categories, each made up of several items identifying specific music types. Items are included with examples of composers, performers, or titles. Subjects rate on a 5-point scale their enjoyment of the music represented by the item.

The MPS was modified for our study in conjunction with representatives of a leading Melbourne music store. Many items were modified by the inclusion of more up-to-date examples. Four of the composite categories were slightly modified, as follows: the rock item "new wave" was replaced with "alternative"; the item "acid jazz" was added to the jazz category; in the popular category, "disco music in general" was replaced with "dance music in general", "top-40 (jazz orientated)" was removed, and the items "techno" and "rap" were added; the item "world music" was added to the folk/ethnic category. Minor modifications were made to the demographic items, but all items related to musical training and intensity of interest in music (original items 7 to 15) were retained unchanged.

NEO-PI-R. The revised version of the 240-item NEO Personality Inventory (Costa and McCrae, 1992) is the latest edition of this extensively used measure of the Five-Factor Model. Unlike earlier versions, all five of the main factors (or "domains") are each divided into six subscales (or "facets").

Results

Several factor analyses were first carried out. The factor analyses reported throughout this section used the generalised least squares method of extraction because of the robust solutions typically produced by that method (McDonald, 1985). As the items in the analysis were from the same domain and were expected to produce correlated factors, an oblique method of rotation (oblimin) was used. The number of factors to rotate was decided using a scree test and the parallel analysis method of Horn (1960).

First, factor analyses were separately carried out on each of the ten original music categories. All but two of these categories clearly showed a single general factor. The rock music category suggested a three-factor solution, and this category

was divided into three new categories labelled hard rock (punk rock, alternative, heavy metal), soft rock (rock and roll, acid rock, surfer, jazz rock) and pop rock (pop rock and mainstream). The original popular category failed to form a single general factor. At this point, we followed the suggestion of Litle and Zuckerman and put the items in the popular and soundtrack categories together; a factor analysis of these items produced two clear categories which did not correspond with the two original categories. The dance, techno and rap items formed one category (called "dance/techno/rap"); all other popular and soundtrack items formed the second category (called "easy listening").

A similar process of factor analysis was performed on nine preliminary items concerned with asking subjects about their musical background and interests. Two factors were produced. Four questions relating to years of playing and tuition, comprising items 7 through 10 on the original (Litle and Zuckerman) questionnaire, formed the first factor. Four questions relating to the importance of music to the person and the time they spend listening to it, comprising questions 11 through 15 on the original questionnaire, formed a second factor. The scales produced from these two factors by adding the scores of the items in each were respectively called "musical training" and "musical interest". The scales were positively, though not strongly, correlated ($r = \cdot 25$, $p < \cdot 01$).

A factor analysis was then carried out on the various composite categories: the seven unchanged categories, the three rock music categories, and the two categories formed from the popular and soundtrack items. Three factors were rotated, accounting together for 59·4 per cent of the variance. Table 1 shows the results of this oblique rotation.

TABLE 1

Oblimin rotation of generalised least squares factor analysis of music categories.

Music Category	*Factor 1*	*Factor 2*	*Factor 3*
Soft rock	·92	·25	−·05
Hard rock	·65	−·11	−·03
Classical	−·21	·81	·19
Religious	−·22	·67	−·04
Jazz	·28	·65	·02
Folk/ethnic	·16	·60	−·11
Soul/rhythm and blues	·11	·58	·38
Electronic	·03	·45	·20
Country and western	·03	·39	·11
Pop rock	−·00	·03	·83
Easy listening	−·20	·26	·66
Dance/techno/rap	·01	−·10	·47
Percent of variance	*29·7*	*16·7*	*13·0*

The factor scores on the three factors in table 1 were the main dependent variables in the study. Factor 1 (labelled "Rock Music") clearly represents a liking for the major types of rock music, though the popular rock category identified in our early analysis is not included in this factor. Factor 2 was less easily named. It was finally called "Breadth of Preference" because it seemed to represent liking for a broad range of music styles, particularly more traditional forms. Factor 3 ("Popular Music") is made up of three categories not in the original Litle and Zuckerman scale: the two categories developed from the popular and soundtrack items, and the new pop rock category. This factor therefore incorporates certain forms of rock music, as well as such styles as top-40, easy listening and dance. The three factors show small degrees of inter-correlation, with factors 1 and 2 correlating ·06, factors 1 and 3 correlating –·03, and factors 2 and 3 correlating ·21.

A canonical correlation was carried out to examine how the five personality scales, and demographic variables, predict scores on the three music factors. Table 2 shows the eigenvalues and canonical correlations and the significance using Wilks' Lambda of the extra variance added by each additional variable. Three

TABLE 2

Canonical correlations between NEO-PI-R personality scales and music category factor scores and their canonical variables.

Root	*Eigenvalue*	*Variance (%)*	*Canonical r.*	*F(Wilks)*
1	·48	46·58	·57	4·87***
2	·29	28·07	·47	4·51***
3	·26	25·31	·46	5·04***

	Correlations with Canonical Variables		
	1	***2***	***3***
Covariates (NEO-PI-R Scales)			
Sex	·21	–·50	–·38
Musical Training	–·38	–·70	–·21
Musical Interest	–·53	·12	–·28
Neuroticism	·17	–·07	–·05
Extraversion	·49	·05	–·46
Openness	–·53	·25	–·69
Agreeableness	·17	–·17	–·55
Conscientiousness	·04	–·45	·09
Dependent Variables (Music Factors)			
"Rock Music"	–·17	·80	–·58
"Breadth of Preference"	–·54	–·56	–·63
"Popular Music"	·69	–·34	–·64

***$p < ·001$

TABLE 3

Correlations between Extraversion facets and music category factor scores and their canonical variables.

Root	*Eigenvalue*	*Variance (%)*	*Canonical r.*	*F(Wilks)*
1	·48	50·85	·57	4·31***
2	·30	31·66	·48	3·63***
3	·17	17·49	·38	3·00**

	Correlations with Canonical Variables		
	1	***2***	***3***
Covariates (Extraversion Facets)			
Sex	·02	−·57	−·02
Musical Training	−·59	−·42	·29
Musical Interest	−·31	·13	·68
E1 – Warmth	·38	−·70	·15
E2 – Gregariousness	·64	−·36	−·09
E3 – Assertiveness	·16	−·18	·09
E4 – Activity	·04	−·22	·14
E5 – Excitement Seeking	·74	·00	·49
E6 – Positive Emotions	·19	−·51	−·01
Dependent Variables (Music Factors)			
"Rock Music"	·42	·37	·83
"Breadth of Preference"	−·67	−·47	·57
"Popular Music"	·44	−·89	·13

***$p < ·001$ **$p < ·01$

canonical variables account together for 100 per cent of the variance, and the details of these are shown in the bottom section of the table which gives the correlations of dependent variables and covariates with the canonical variable.

The first canonical variable links liking for popular music and low breadth of musical preference with a tendency to be less open to experience, to be extraverted and to show a less intense interest in music. The second canonical variable links liking for rock music and a relative dislike of the other forms of music with a tendency to have experienced little by way of musical training, to be male and to be unconscientious. The third canonical variable is most easily interpreted if all signs are reversed. It links liking for all forms of music with a tendency to be open, agreeable and extraverted.

Separate canonical correlations were carried out using the facets of the extraversion and the openness domains as the covariates, including sex, musical training and musical interest. The three factors derived from our earlier factor analysis again formed the dependent variables.

TABLE 4

Correlations between Openness facets and music category factor scores and their canonical variables.

Root	*Eigenvalue*	*Variance (%)*	*Canonical r.*	*F(Wilks)*
1	·83	68·77	·68	5·15***
2	·31	25·97	·49	2·87***
3	·06	5·27	·25	1·16

	Correlations with Canonical Variables	
	1	***2***
Covariates (Openness Facets)		
Sex	·02	−·41
Musical Training	−·41	−·60
Musical Interest	−·48	·13
O1 – Fantasy	−·26	·20
O2 – Aesthetics	−·89	−·08
O3 – Feelings	−·11	·06
O4 – Actions	−·35	·49
O5 – Ideas	−·61	·12
O6 – Values	−·29	·59
Dependent Variables (Music Factors)		
"Rock Music"	−·39	·83
"Breadth of Preference"	−·82	−·50
"Popular Music"	·30	−·31

***$p < ·001$

For extraversion (Table 3), the first canonical variable associates low breadth of preference and relatively high scores on the other factors with E5-excitement seeking and E2-gregariousness, as well as the tendency to have little musical training. Dislike of popular music is linked negatively to E1-warmth and E6-positive emotions, as well as the tendency to be male and to have little training (variable 2). Rock music, and to some degree breadth of preference, is associated with E5-excitement seeking and to general musical interest in variable 3.

Only two canonical variables were significant at the default (·15) level when the openness facets were examined. These are shown in Table 4. If we reverse all signs for the first variable, breadth of preference is linked to O2-aesthetics and O5-ideas, and to some degree to both musical training and interest. In variable 2, liking for rock music is contrasted with breadth of preference, and is associated with O6-values, O-4 actions and (negatively) with musical training.

Using the Pearson correlation method, the music preference variables (three factor scores and 12 categories) were correlated with the personality variables

extraversion and openness. The five per cent level of significance was clearly too low for use in this study given the large number of correlations to be calculated. Its use would greatly increase the likelihood of a type 1 error. The frequently used Bonferroni adjustment also seemed inappropriate given the exploratory nature of many of the correlations and the tendency of the method to greatly increase the likelihood of type 2 errors in this type of study. The ·001 level was adopted in an attempt to balance the likelihood of making the two types of error (Hays, 1994). The correlations are presented in Tables 5 and 6, with correlations significant at the ·001 level presented in bold.

The pattern of results in Table 5 suggests that extraverted subjects are inclined to enjoy popular music. This follows from the fact that total extraversion, as well as some of the extraversion facets, are correlated to a moderate level with factor 3 and with music categories easy listening and pop rock. The exception to this pattern is E5-excitement seeking, which is related to liking for rock music (factor 1), particularly with hard rock music, but is negatively correlated with liking for classical music.

Table 6 indicates that openness to experience is related to liking for a wide range of music types, particularly those which are of the more traditional styles appearing in factor 2, and those which are rock-orientated. However, the facets

TABLE 5

Pearson correlations of Extraversion (E) and its facets with music factors and categories. (Full names of facets are in table 3 above.)

	E	*E1*	*E2*	*E3*	*E4*	*E5*	*E6*
Factors							
"Rock Music"	·10	·02	·07	·05	·01	**·33**	−·05
"Breadth of Preference"	−·07	·05	−·18	−·01	·06	−·19	·06
"Popular Music"	**·34**	**·40**	**·30**	·12	·11	·22	·25
Categories							
Soft rock	·08	·02	·01	·05	·04	·26	−·03
Hard rock	·11	−·00	·14	−·01	−·03	**·33**	·03
Classical	−·12	−·02	−·21	−·01	·08	**−·27**	·03
Religious	−·13	·01	−·19	−·12	−·04	−·20	·04
Jazz	−·02	·00	−·08	·06	·07	−·07	−·00
Folk/ethnic	−·17	−·07	−·18	−·08	−·14	−·13	−·09
Soul/rhythm and blues	·08	·18	−·04	·05	·08	−·03	·12
Electronic	·01	·06	−·03	·01	−·03	·07	·01
Country and western	−·06	·02	−·08	−·10	−·08	·01	·10
Pop rock	·26	**·34**	·24	·07	·07	·17	·23
Easy listening	**·33**	**·42**	·25	·13	·18	·11	**·30**
Dance/techno/rap	·17	·09	·20	·17	·10	·16	−·03

Note: For $p < ·001$, values are in **bold**.

which are most strongly related to breadth of musical preference are generally different to those related to liking for rock music. The strongest correlations with music types like classical, folk, electronic and jazz are for O2-aesthetics and, to a lesser degree, O5-ideas. On the other hand, preference for rock music is most clearly related to O4-actions and O6-values.

The music preference variables (both factors and categories) were also correlated with the other three Big-5 personality variables and their facets. Of 315 possible correlations, only two of the correlations of the music variables with the other personality measures attained the adopted ·001 level of significance. These were the positive correlations of A1-trust with both factor 3 (r = ·27) and the popular rock category (r = ·28); it is noteworthy that both of these correlations are at the "margin" of statistical significance at the ·001 level.

Similarly, correlations of factors and categories were calculated with musical training and interest. Three of these correlations attained the ·001 level of significance, these being the correlations of musical training with factor 2 (r = ·38) and with the categories of classical music (r = ·42) and religious music (r = ·31).

Although we had included sex biserially in the multivariate analyses described above, we also used t-tests to compare males and females on the three music factors and the various music categories. None of the differences were significant

TABLE 6

Pearson correlations of Openness to Experience (O) and its facets with music factors and categories. (Full names of facets are in table 4 above.)

	O	*O1*	*O2*	*O3*	*O4*	*O5*	*O6*
Factors							
"Rock Music"	**·34**	·17	·17	·10	**·33**	·15	**·35**
"Breadth of Preference"	**·34**	·11	**·52**	·11	·12	**·33**	·04
"Popular Music"	−·13	·02	−·14	·05	−·04	−·18	−·07
Categories							
Soft rock	**·42**	·18	**·29**	·11	**·35**	·24	**·36**
Hard rock	**·32**	·23	·16	·04	**·32**	·10	**·27**
Classical	·26	·02	**·46**	·12	·02	·26	·01
Religious	·18	·09	**·36**	·04	·07	·20	−·13
Jazz	**·29**	·09	**·35**	·05	·17	·26	·10
Folk/ethnic	**·37**	·20	**·44**	·17	·17	·22	·12
Soul/rhythm and blues	·14	·02	·21	·10	·06	·16	−·03
Electronic	**·27**	·21	**·37**	·13	·05	·15	·02
Country and western	·09	·05	·12	−·04	·05	·10	·04
Pop rock	−·06	·06	−·07	·11	−·03	−·18	−·03
Easy listening	−·08	−·03	−·02	·02	−·04	−·05	−·10
Dance/techno/rap	−·19	−·12	−·15	−·00	−·03	−·13	−·10

Note: For $p < ·001$, values are in **bold**.

at the .001 level. Using the five percent level, females obtained significantly higher scores on the Popular Music factor ($t = 2{\cdot}76$, $p < {\cdot}01$), and on the Pop Rock ($t = 2{\cdot}92$, $p < {\cdot}01$), Soul ($t = 2{\cdot}17$, $p < {\cdot}05$) and Easy Listening ($t = 2{\cdot}91$, $p < {\cdot}01$) categories.

Discussion

The results of the canonical correlations and the zero-order correlations are substantially reinforcing. They support the results of earlier studies by showing that extraversion and openness are important personality dimensions in the explanation of music preference, while the domains of the Five Factor Model other than these two are substantially unrelated to preference.

With respect to openness, our data support Dollinger's (1993) earlier work by confirming that this dimension is of particular importance in explaining music preference. Open individuals show a preference for diverse musical styles. They do not, however, prefer popular forms of contemporary music, suggesting that there are limits to their "openness"; they may prefer forms of music which are not commonly liked.

While the pattern of results for the openness dimension is consistent with the view that it is associated with a general willingness to be open to a wide range of rich and novel experiences, it is also noteworthy that there are clear differences in the way the various facets of the more general domain are related to preference. On the one hand, openness is strongly related to breadth of musical preference, but this relationship is mediated largely by the aesthetics and ideas facets. On the other hand, openness is related to liking for rock music, but now the actions and values facets are most clearly involved. Each of these relationships reflects the nature of the particular facet. Many of the forms of music mentioned in factor 2 require a certain degree of sophistication in the appreciation of music, and a thoughtful approach to the subject. The aesthetics facet attempts to measure the importance of music, art and poetry to the individual; the degree to which he or she has developed "a wider knowledge and appreciation to that of the average individual" (Costa and McCrae, 1992a, p. 17). The ideas facet is concerned with curiosity and the breadth and depth of intellectual interest. It would have been surprising if subjects' scores on these facets were not reflected in a broad range of musical preferences, particularly with respect to more demanding musical forms. The values facet is concerned with liberal social and political attitudes and values and the tendency to question authority and tradition. The actions facet is concerned with the willingness to engage in novel, sometimes socially unacceptable, behaviours. Simple observation of song-titles or lyrics shows that music in the rock genre is frequently associated with a rule-questioning, socially radical approach to life.

As in several earlier studies, extraversion is an important factor in explaining preference. Extraversion is particularly associated with liking for popular music. However, as with openness, there is a clear difference in the way the particular extraversion facets operate. The tendency of the extravert to enjoy popular music is dependent on warmth and, to a lesser extent, gregariousness and positive emotions. On the other hand, subjects scoring high on excitement seeking show a tendency to enjoy rock music, combined with a tendency to dislike classical music. The

above relationships may both be explained in terms of the extravert's tendency to seek stimulating situations likely to increase cortical arousal, as described earlier. The distinction which appears in the behaviour of the facets may reflect the tendency to seek such stimulation from both personal and impersonal sources. Warmth, according to Costa and McCrae (1992a) "is the facet of Extraversion most relevant to issues of interpersonal intimacy (p. 17)", such as affection and friendship. Gregariousness is associated with "preference for other people's company" (p. 17). A very large proportion of songs and music in the broad "popular" genre are explicitly concerned with, or are evocative of, interpersonal situations concerned with friendship and love. Excitement-seekers crave excitement and "like bright colors and noisy environments" (p. 17). Such stimulating environments are more likely to be associated with the loud, harsh sounds of much rock music rather than the more concordant sounds of the most frequently heard forms of classical music.

The somewhat idiosyncratic behaviour of the excitement-seeking facet in our study supports Dollinger's decision to look specifically at that facet. Further, our results support Dollinger's finding of a significant correlation (r = ·33 in both studies) between excitement-seeking and liking for hard rock music. However, several of the results of earlier investigations were not supported by our data. Extraversion is not associated with liking for jazz in our study, as it was for Dollinger. The extraversion domain score is not correlated with hard rock, as it was in the study of Daoussis and McKelvie (1986). Our study does not support the relationship of agreeableness and liking for classical music found by Dollinger (1993). The study provides some support to Dollinger in finding a correlation between the openness domain score and liking for jazz and classical music types; however, our correlations were much lower than his and only the jazz correlation attained our adopted ·001 significance level. Furthermore, we did not support his finding of a significant correlation between openness and soul/rhythm and blues. Our results support Rawlings *et al.* (1995) in finding a positive correlation between extraversion and popular music, but do not replicate that study's finding that extraversion correlated with electronic and religious music. Of course, this last study and the Daoussis and McKelvie study both used different measures of extraversion to the one used here.

The demographic variables examined in the study each contributed something to our understanding of musical preference. Females prefer popular music more than males like this type of music. Training in music was associated with breadth of musical preference and, specifically, a liking for classical and religious music types. Further research using a sample with a wider range of musical backgrounds might produce stronger results in this area. Such research might also include a wider range of ages. Age is a variable which was ignored in the present study because of the highly skewed nature of its distribution and its inclusion in future studies, using an appropriate sample, would almost certainly contribute substantially to the prediction of preference.

In conclusion, the study supported the use of a multivariate approach to the examination of music preference. It revealed three major patterns of preference and showed that the personality dimensions of extraversion and openness are related systematically to these patterns.

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