

# Personality Traits, Music Preferences and Depression in Adolescence

Dave Miranda and Michel Claes\*

*Université de Montréal, département de psychologie (Canada)*

## ABSTRACT

This six-month longitudinal study was conducted with 311 adolescents and verifies: (1) if music preferences can predict depression; (2) if personality traits can predict music preferences; (3) if music listening can represent a protective factor against depression. Results indicate that Soul music listening (e.g., hip hop, R&B) is a predictor of lower depression levels in adolescent girls. Personality dimensions from the Big Five reveal various predictive relations with music preferences, for instance Openness predicts music eclecticism. Soul music listening is a moderator of the predictive relationship between Neuroticism and depression levels in adolescent girls, thus pointing to a possible protective effect. Research paths for studies on music and adolescent development, personality traits, and evolutionary psychology are succinctly discussed.

## INTRODUCTION

Music is rooted in the evolution of human nature and it currently represents one of the most omnipresent phenomena of human life (McDermott and Hauser, 2005; Sloboda and O'Neill, 2001). Music's innermost property might be the pleasure it provides, however its potential adaptive function for humans remains contentious in developmental and evolutionary psychology. In recent years, infants' emotion regulation from maternal singing has been targeted as a potential adaptive function of music (e.g., Trehub, 2003). Music listening has also implications for

\*Correspondence should be addressed to: Michel Claes Ph.D. Université de Montréal, Psychology department C. P. 6128, succursale Centre-Ville, Montreal (Quebec), Canada, H3C 3J7. Tel: 1 (514) 343-7984.  
E-mail: [michel.claes@sympatico.ca](mailto:michel.claes@sympatico.ca)

This paper was part of the doctoral dissertation of the first author.

psychosocial adaptation in adolescence, particularly for resolving developmental tasks, such as identity formation, social adaptation with peers, yet also emotion regulation (North, Hargreaves and O'Neill, 2000; Russel, 1997; Tarrant, North and Hargreaves, 2000, Zillmann and Gan, 1997). Developmental studies concerning the adaptive role of music in adolescence are nevertheless rare and research on music listening and depression in adolescence has received even less interest (Miranda and Claes, *in press*). This research caveat is surprising taking into consideration that music has significant links with and potent influences on emotions (Juslin and Sloboda, 2001; Peretz and Zatorre, 2003), that it is reported to regulate mood in adolescence (North et al., 2000), and that depression is a highly prevalent and problematic psychopathology in adolescence (Birmaher et al., 1996; Lewinsohn and Essau, 2002). Furthermore, within the debate regarding the developmental significance of music in youth, music preferences in adolescence have been frequently alleged to stem from personality characteristics, for instance sensation seeking (e.g., Arnett, 1992). This popular hypothesis is compelling, yet few studies have verified or deepened its theoretical and empirical validity.

### **Music preferences and depression in adolescence**

From a developmental perspective, music preferences are representative of adolescent subcultures, which provide behavioral patterns that are shared with peers as a badge for their universal youth culture (Bakagiannis and Tarrant, 2006; Russel, 1997; Zillmann and Gan, 1997). These music subcultures are resulting from diverse maturational processes in adolescence, such as identity formation, self-determination, and transition from the family to peers (Zillmann and Gan, 1997). In French Canadian adolescents, music preferences can be structured upon five factors: Metal (e.g., heavy metal, alternative rock, punk rock); Soul (e.g., hip hop, R&B, reggae); Pop (e.g., pop rock, pop); Classical (e.g., classical, jazz, blues); Electronic (e.g., techno, trance) (Lacourse, Claes and Villeneuve, 2001; Miranda and Claes, 2007). The developmental significance of music preferences in adolescence could be compounded by the influence of music on emotions and music's emotion regulation. Therefore, this study raises the question as to whether music preferences can predict depression levels in adolescence.

Soul music often includes positive messages, such as references to partying, dancing, achievement, perseverance, and coping (e.g., hip hop), while also to romantic love, seduction, optimism, and hope (e.g., R&B). Soul music might attract the less depressed adolescents and ultimately diminish their depressive symptoms or maintain these at a low level (Miranda and Claes, 2007). Pop music encompasses highly commercialized songs often skillfully crafted to entertain and please most listeners (Frith, 2001), nonetheless they carry developmentally-relevant themes about interpersonal issues dear to adolescents, such as romantic relationships, friendships, and school adaptation (Schwartz and Fouts, 2003; Zillmann and Gan, 1997). Pop music lyrics may be preferred by the less depressed adolescents and eventually reduce or maintain their depressive symptoms at a low level (Miranda and Claes, 2007). Metal music is often characterized by the artistic exploration of more negative themes, such as despair, mental pain, death, suicide, and depression (Arnett, 1992; Hansen et Hansen, 1991; Crozier, 1997; Starr and Waterman, 2006), thus it might sound appealing to the more depressed adolescents and eventually maintain or reinforce their depressive symptoms (Miranda and Claes, 2007).

Cross-sectional studies have reported relations between Metal music and more depression or suicidal ideations in adolescent girls, yet also relations between Soul music, Pop music and lesser depression or suicidal ideations in adolescent girls (e.g., Martin, Clarke and Pearce, 1993; Miranda and Claes, 2007; Miranda and Claes, *in press*; Scheel and Westefeld, 1999). Thus, one can ask if Metal music is a potential risk factor of depression in adolescent girls, while Soul and Pop music listening in adolescent girls are potential protective factors against depression. If one follows principles of developmental psychopathology for risk and protective factors (e.g., Rutter, 1985), then in order to identify Metal music as a potential risk factor it is necessary to test its predictive effect on depression longitudinally; similarly in order to identify Soul and Pop music as potential protective factors one has to test their moderation effect (buffer effect) on a predictive link between a risk factor and depression. Hence, this longitudinal study verifies whether these music preferences are either risk factors of or protective factors against depression in adolescence.

## Personality traits and music preferences in adolescence

Personality (Bouchard and McGue, 2003) and music (McDermott and Hauser, 2005) are both influenced by genetic and environmental factors. Personality (Buss, 1999) and music (Peretz, 2005) are also both related to human nature and evolution. Music preferences can be attributable to social and cultural learning (Crozier, 1997; Russel, 1997), but personality traits could also be involved. Research suggests that trait dispositions can lead individuals to select and create physical environmental stimuli that correspond with their personality traits (Gosling, Ko, Mannarelli and Morris, 2002) and music is one of these environmental stimuli (Rentfrow and Gosling, 2003). Thus, music preferences can be partially tributary of personality traits and represent cues about one's personality (Rentfrow and Gosling, 2003; Rentfrow and Gosling, 2006). This study verifies whether personality traits can predict music preferences in adolescence.

The theoretical framework of this study is the Big Five taxonomy, which suggests five dimensions of personality: Extraversion is the level of energetic engagement in social environments and of positive emotionality; Agreeableness is the level of capability to maintain prosocial interpersonal relationships; Conscientiousness represents the level of impulse control and of goal orientation; Neuroticism is the level of emotional instability and of the perception that the environment is distressing and threatening; Openness is the degree of intellectual and experiential breadth and depth (see Caspi and Shiner, 2006; John and Srivastava, 1999).

The majority of studies linking personality and music preferences has been conducted with university students and seldom have they used the Big Five as a conceptual framework (e.g., Crawford and Strapp, 1994; Dillman-Carpentier, Knobloch and Zillmann, 2003; Dollinger, 1993; McNamara and Ballard, 1999; North, Desborough and Skarstein, 2005; Rawlings and Ciancarelli, 1997; Rentfrow and Gosling, 2003). From the Big Five, Extraversion and Openness are probably the personality dimensions which are the most strongly related to music preferences (Rawlings and Ciancarelli, 1997). In adolescence, sensation seeking was associated with complex music (Glasgow and Cartier, 1984) and heavy metal music (Arnett, 1992). Schwartz and Fouts (2003) have found that among adolescents' personality profiles, listeners of heavy music (e.g., heavy metal) were less conventional, listeners of light music (e.g., pop) were more conventional, while eclectic listeners had the most normative profile. Recently,

the longitudinal study of Delsing, Ter Bogt, Engels and Meeus (2008) have indicated that personality traits from the Big Five can predict music preferences in adolescence (Rock, Elite, Urban, and Pop/Dance). Because we were unaware of their study at the time we developed our own set of hypotheses, we will describe their results later in our discussion, nevertheless, we will see that our results are compatible with theirs.

## Objectives and hypotheses

The first objective of this study is to verify whether music preferences can predict depression levels in adolescence. Four co-occurring problems of depression are controlled (anxiety, drug use, academic problems, and antisocial behavior; Birmaher et al., 1996; Lewinsohn, Roberts, et al., 1994), along with time spent listening to music per week and importance given to lyrics. According to the literature on music preferences and depression; it is hypothesized that preference for Metal music will predict higher depression levels in adolescent girls, because it conveys more negative themes on average; whereas preference for Soul music and Pop music will predict lower depression levels in adolescent girls, given that their songs communicate more positive themes on average.

The second objective of this study is to examine whether personality traits can predict music preferences in adolescence. The literature has documented that Extraversion is associated with Pop music (Rawlings and Ciancarelli, 1997), upbeat/conventional music (e.g., Pop), energetic/rhythmic music (e.g., hip hop) (Rentfrow and Gosling, 2003), and liking for rap, hip hop, and R&B music (North et al., 2005). Therefore, Extraversion should predict more preferences for Soul music (e.g., hip hop, R&B, reggae) and Pop music (e.g., Pop, pop rock) as defined in this sample of adolescents. Rentfrow and Gosling (2003) have also reported that Agreeableness and Conscientiousness could be related to upbeat/conventional music (e.g., Pop). Thus, Agreeableness and Conscientiousness could predict more preferences for Pop music in this sample. Neuroticism could also predict more preferences for Metal music, given that its songs often explore negative themes (e.g., despair, depression) pertaining to emotional instability. Lastly, Openness has been related to reflective/complex music (e.g., classical), intense/rebellious music (e.g., heavy metal) (Rentfrow and Gosling, 2003), unconventional music, and preference for diverse music styles (Dollinger, 1993;

Rawlings and Ciancarelli, 1997). Consequently, Openness should predict more preferences for sophisticated, unconventional, rebellious, or unusual music preferences (e.g., Classical, Metal, Electronic) as defined in this sample of adolescents, and foremost music eclecticism – a strongly diversified taste for different music styles.

The third objective is to verify if music listening can represent a potential protective factor against depression in adolescence. If either Soul or Pop music preferences can predict lower depression levels, then it will be considered if they can represent protective factors against depression. If they are protective factors, then either Pop or Soul music listening should moderate (buffer) the predictive effect of a possible risk factor of depression, such as Neuroticism (Enns and Cox, 1997; Klein, Durbin, Shankman and Santiago, 2002). Given that emotion regulation from music listening is more particular to adolescent girls (North et al., 2000); higher levels of either Soul or Pop music preferences should buffer the predictive effect of Neuroticism on depression levels in adolescent girls.

## METHOD

### Participants and procedure

A self-report questionnaire was distributed to French-Canadian adolescents who attended 9th, 10th, and 11th grade in a Montreal (Canada) high school. Information regarding the research purpose, consent form, and confidentiality was printed on the questionnaire and was also explained in class before distribution started. The initial sample was composed of 405 adolescents at baseline (T1), of which 362 were followed-up six months later (T2). In order to be part of the study, participants had to be bilingual (attend French and English regular or advanced classes), to be listening to their favorite music for at least one year and for at least one hour per week. The final longitudinal sample is composed of 311 participants (166 girls and 145 boys) aged between 15 and 18 years ( $M=15.75$ ;  $SD=.79$ ). Most parents were married (79.2%) and of immigrant descent (62% of them were born outside Canada). Most fathers (86.5%) and mothers (64.6%) had full time employment and completed at least high school degrees (92.3% and 95% respectively).

## Measures

*Music preferences.* Participants indicate their level of preference on a five-point scale (1=I do not like that at all; 5=I like that a lot) for various music styles (e.g., classical) with examples of representative artists (e.g., Beethoven). A previous study has used an equivalent scale with 23 music styles structured by five factors of music preferences in adolescents: Metal, Soul, Electronic, Pop, and Classical (Miranda and Claes, 2007). This study uses an updated scale with 38 music styles, from which 33 produced an equivalent five-factor structure (variance explained = 54.80%; principal axis factoring, varimax orthogonal rotation) with good internal consistency: Metal ( $\alpha=.91$ ); Soul ( $\alpha=.88$ ); Electronic ( $\alpha=.84$ ); Pop ( $\alpha=.65$ ); Classical ( $\alpha=.88$ ). Music eclecticism consists in the mean level of scores on all items. Across six months, each music factor had satisfying differential (rank order) continuity ( $p<.001$ ): Metal ( $r_s=.84$ ); Soul ( $r_s=.80$ ); Electronic ( $r_s=.71$ ); Pop ( $r_s=.71$ ); Classical ( $r_s=.74$ ) and satisfying absolute (mean-level) continuity (repeated measures ANOVA; Greenhouse-Geisser  $F$ ;  $p>.05$ ): Metal (T1  $M=2.37$ ;  $SD=1.02$  & T2  $M=2.34$ ,  $SD=.99$ ;  $F=1.26$ ); Soul (T1  $M=3.71$ ,  $SD=.94$  & T2  $M=3.68$ ;  $SD=.92$ ;  $F=.88$ ); Electronic (T1  $M=2.56$ ,  $SD=.81$  & T2  $M=2.61$ ,  $SD=.84$ ;  $F=2.24$ ); Pop (T1  $M=3.16$ ,  $SD=1.02$  & T2  $M=3.20$ ,  $SD=.98$ ;  $F=.89$ ); Classical (T1  $M=2.27$ ,  $SD=.71$  & T2  $M=2.29$ ,  $SD=.70$ ;  $F=.32$ ).

*Depression.* The levels of depression were measured with a French version of the 21-item *Beck Depression Inventory* (Bourque and Beaudette, 1982). Adolescents reported on the scale (0 to 3) how much and how frequently they have experienced various symptoms of depression in the past two weeks. In this study, this scale displays an excellent internal consistency ( $\alpha=.89$ ).

*Personality traits.* The five dimensions of personality were measured with a French adaptation (Morizot, 2007) of the *Big Five Inventory* (John and Srivastava, 1999). Participants rated on a 5-point scale (1=disagree strongly; 5=agree strongly) the extent to which statements corresponded to them. In this study, the internal consistency and test-retest reliability ( $p<.001$ ) of each dimension is satisfying: Extraversion ( $\alpha=.79$ ;  $r_s=.72$ ); Agreeableness ( $\alpha=.66$ ;  $r_s=.68$ ); Conscientiousness ( $\alpha=.78$ ;  $r_s=.67$ ); Neuroticism ( $\alpha=.77$ ;  $r_s=.67$ ); Openness ( $\alpha=.71$ ;  $r_s=.70$ ).

*State anxiety.* The levels of state anxiety were measured with a French version of the 21-item *Beck Anxiety Inventory* (Freeston, Ladouceur, Thibodeau, Gagnon and Rhéaume, 1994). Adolescents

reported on the scale (0 to 3) how much and how frequently they have experienced various symptoms of anxiety in the past two weeks. This scale also displays an excellent internal consistency in this study ( $\alpha = .89$ ).

*Drug Use.* Drug use was assessed with a 10-item scale inspired from the work of Le Blanc, McDuff, Fréchette, Langelier, Levert and Trudeau-Le Blanc (1996) with French Canadian adolescents. Participants reported on a 6-point scale (1=never; 6=everyday) the frequency of their use of various substances, such as tobacco, alcohol, cannabis, stimulants, narcotics, and hallucinogenic drugs. This scale has a satisfying internal consistency in this study ( $\alpha=.68$ ).

*Academic problems.* The scale of academic adaptation problems calculates the probability of dropping out of high school in percentages from high school grades, high school years of lateness, and academic self-engagement, and was validated with French Canadian adolescents (Janosz and LeBlanc, 1997; see also Janosz, LeBlanc, Boulerice and Tremblay, 1997; Janosz, LeBlanc, Boulerice and Tremblay, 2000).

*Antisocial behavior.* The antisocial behavior scale is inspired from the work of Le Blanc (1994) with French Canadian adolescents and is composed of 14 items that assess the occurrence of violence, theft, and vandalism in the last 12 months. Participants reported the frequency of their behavior on a four-point scale (1=never; 4=very often), for instance: "Did you physically assault somebody?" This scale obtained excellent internal consistency in this study ( $\alpha=.85$ ).

*Importance given to lyrics and time spent listening to music.* A single-item measure of importance given to lyrics was used. Participants were asked if they liked songs for the lyrics or for the music on a five-point bipolar scale (1=for the lyrics; 5=for the music). Another item asked participants to report how many hours and minutes per week they spend listening to music.

## RESULTS

### Attrition analyses

Preliminary analyses revealed almost no differential attrition for participants absent from school at the six months follow-up ( $n=43$ ; 10.62%;  $p>.003$ ): Metal ( $t=-.30$ ); Soul ( $t=-.24$ ); Electronic ( $t=1.50$ ); Pop ( $t=2.24$ ); Classical ( $t=.41$ ); Extraversion ( $t=.52$ ); Conscientiousness ( $t=1.66$ ); Neuroticism ( $t=-1.70$ ); Openness



( $t=1.42$ ); Eclecticism ( $t=.63$ ); depression ( $t=-1.75$ ); state anxiety ( $t=-1.42$ ); drug use ( $t=-2.28$ ); antisocial behavior ( $t=-2.39$ ); importance given to lyrics ( $t=-1.18$ ); music listening time ( $t=-.40$ ). Participants lost to attrition were found to have scored higher on academic problems ( $t=-4.84$ ) and lower on Agreeableness ( $t=3.11$ ) at baseline ( $p<.003$ ).

## Music preferences and depression

Table 1 displays the partial correlations that were conducted in order to verify if music preferences (Metal, Soul, and Pop) can predict depression levels in adolescents at the six month follow-up. Levels of state anxiety, antisocial behaviors, drug use, academic problems, importance given to lyrics, and time spent listening to music per week were controlled. Results indicate that Soul music at T1 is correlated negatively with depression levels in adolescent girls at T1 and T2. Pop music at T1 is correlated positively with depression levels in adolescent boys at T1.

## Personality traits and music preferences

Table 2 reports the correlations between the Big Five dimensions of personality at baseline and the five music preferences at the six month follow-up for girls and boys. Extraversion predicts more preferences for Soul music in adolescent girls and boys. Conscientiousness predicts more preferences for Pop music in adolescent girls. Openness predicts more preferences for Metal and Classical music in adolescent girls and boys, yet also lesser preferences for Soul music in adolescent girls and more preferences for Electronic music in adolescent boys. Openness also predicts more music eclecticism in adolescent girls and boys.

## Music preferences, neuroticism and depression

Table 3 summarizes the moderated hierarchical regression analysis that was performed, in order to test Soul music at T1 as a moderator of the predictive link between Neuroticism at T1 and depression levels in adolescent girls at T2 (interaction effect of Neuroticism T1  $\times$  Soul music T1; Aiken and West, 1991; Baron and Kenny, 1986). In the first step, Neuroticism

TABLE 1

Partial correlations between the five music preferences at T1 and depression levels at T1 and T2 for girls (n=166) and boys (n=145).

	Metal		Soul		Electronic		Pop		Classical	
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
Depression level T1 <sup>a</sup>	.03	-.02	-.24**	-.05	-.05	.11	-.04	.17*	.08	-.03
Depression level T2 <sup>a</sup>	.02	-.04	-.20**	-.05	-.09	.01	-.04	.10	-.05	-.02
State anxiety	.07	-.03	.00	.11	.06	-.02	-.03	-.03	-.01	.01
Antisocial behaviors	.11	-.02	.06	.04	.03	-.10	-.20**	-.19*	-.20**	-.20**
Drug use	.09	.11	.10	.13	.19**	.05	-.11	.05	-.11	.08
Academic problems	-.11	-.11	.16*	.14*	-.02	-.06	-.33***	-.12	-.12	-.14*
Listening time per week	.06	.04	.12	.13	.06	.00	-.13	-.08	-.08	-.04
Importance given to lyrics	-.01	-.15*	.14*	.18*	-.02	-.13	.00	.06	-.04	-.16*

<sup>a</sup>Levels of state anxiety, antisocial behaviors, drug use, academic problems, importance given to lyrics, and time spent listening to music per week are controlled for T1.

Note. \*p<.05 \*\*p<.01 \*\*\*p<.001

TABLE 2

Correlations between the Big Five dimensions of personality at T1 and the five music preference factors at T2 for girls (n=166) and boys (n=145).

	Metal		Soul		Electronic		Pop		Classical		Eclecticism	
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
Extraversion	-.07	-.02	.34***	.19*	.09	.11	-.04	-.03	-.10	.05	.12	.11
Agreeableness	-.03	.02	.09	.02	.10	.06	.10	.05	.05	-.05	.12	-.01
Conscientiousness	-.07	-.08	.01	.08	.10	-.03	.20**	.10	.06	-.03	.05	.01
Neuroticism	.06	-.07	-.10	.00	-.02	-.01	.11	.02	.09	.07	.03	.03
Openness <sup>a</sup>	.24**	.29***	-.16*	-.10	.08	.34***	.02	.05	.18*	.25**	.19**	.28***

<sup>a</sup>Removing the item pertaining to music from the Openness scale did not significantly change the correlations; therefore the full scale was used for these final results.

Note. \*p<.05 \*\*p<.01 \*\*\*p<.001

TABLE 3

Hierarchical regression analysis for Neuroticism and the interaction between Neuroticism and music listening (Soul music) predicting depression levels in adolescent girls at T2 (n=166)

	Predictors <sup>a</sup>	$\beta$	$t$	$\Delta R^2$
Step 1	Neuroticism T1	.35	4.90***	
	Soul music T1	-.14	-1.98*	.15***
Step 2	Neuroticism T1	.36	5.11***	
	Soul music T1	-.12	-1.65	
	Neuroticism T1 $\times$ Soul music T1	-.19	-2.61*	.03*
Total $R^2 = 18\%$ ; $F(3, 162) = 12.37^{***}$				

<sup>a</sup>Variables were centered before the interaction term was created (Cohen *et al.*, 2003).

Note. \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

predicted higher depression levels ( $\beta = .35$ ;  $t = 4.90$ ;  $p < .001$ ), while Soul music predicted lower depression levels ( $\beta = -.14$ ;  $t = -1.98$ ;  $p < .05$ ) ( $R^2 = 15\%$ ;  $F(2, 163) = 14.63$ ,  $p < .001$ ). In the second step, Neuroticism interacted with Soul music ( $\beta = -.19$ ;  $t = -2.61$ ;  $p < .05$ ) and this interaction term increased the proportion of variance predicted in depression ( $\Delta R^2 = 3\%$ ;  $F(3, 162) = 6.80$ ,  $p = .01$ ). Post hoc slope analyses (Cohen, Cohen, West and Aiken, 2003) were conducted for Neuroticism by setting regressions at one standard deviation above and below the centered mean of Soul music. At low levels of preference for Soul music, Neuroticism predicted higher depression levels ( $\beta = .55$ ;  $t = 5.33$ ;  $p < .001$ ). At high levels of preference for Soul music, Neuroticism did not predict depression levels anymore ( $\beta = .18$ ;  $t = 1.79$ ;  $p > .05$ ). Therefore, higher Soul music listening at T1 moderated the predictive link between Neuroticism at T1 and depression levels at T2 in adolescent girls.

## DISCUSSION

### Music preferences and depression

The first objective of this study was to verify whether music

preferences could predict depression levels in adolescence. Results confirm the hypothesis that higher preferences for Soul music can predict lower depression levels in girls over the course of six months. The present gender difference can be partially accounted for by the fact that adolescent girls present greater emotion regulation with music listening than boys (North et al. 2000). However, results also contradict the hypothesized longitudinal link between Pop music and lesser depression in girls. Thus, it is possible that Pop music is not a potential protective factor against depression in adolescent girls. These results also contradict the hypothesized longitudinal link between Metal music and more depression in girls, although previous cross-sectional studies had found links (e.g., Martin et al., 1993; Miranda and Claes, 2007). This longitudinal evidence suggests that Metal music listening is probably not a risk factor of depression in adolescence.

Music preferences can perhaps expose adolescents to positive or negative songs' lyrics that can ultimately reinforce or diminish their depression levels (Miranda and Claes, 2007). Accordingly, Soul music listening can perhaps have a partial influence on the depression levels of adolescent girls, because it often includes positive songs, but obviously this causal inference remains to be duly verified by future experimental studies. This rational on the potential influence of Soul music on adolescent girls can be supported by the fact that adolescents spend numerous hours listening to music (Roberts, Henriksen and Foehr, 2004) and that adolescent girls present more emotion-oriented behaviors toward music listening than boys (North et al., 2000).

The potential influence of songs could pertain primarily to their lyrics. Given that Soul music regularly conveys positive messages (e.g., achievement, hope), which are probably greatly inspired by an African-American cultural heritage and artistic expression of coping with life adversities – it could perhaps diminish depression in adolescent girls who experience positive emotional uplifts from the lyrics. However, Pop music could have also predicted lower depression levels in girls, because it communicates positive themes about important issues in adolescence. The variance was perhaps affected by participants lost to attrition, given that they had lower levels of preferences for Pop music ( $p=.03$ ), which were not formally significant due to Bonferroni adjustments. Metal music should also have predicted higher depression levels in girls, given that it conveys more negative themes (e.g., despair, death, depression). This unexpected absence of predictive relation might be clarified by the fact that this study controlled for several co-occurring

problems of depression (anxiety, drug use, academic problems, and antisocial behavior). This result could be akin to a study which indicated that the link between some Metal music songs and suicidal risk in girls disappears when other risk factors are controlled (Lacourse et al., 2001).

The potential influence of songs' musical characteristics should also be explored. Happiness and sadness are the most recognizable emotions in music (Kallinen, 2005). Pop and Soul songs are often composed in major mode, with fast tempo, fluid rhythms, familiar melodies and consonant harmonies. Such musical characteristics can be associated with higher aesthetic appreciation and positive emotions (Berlyne, 1971; Bruner, 1990; Crozier, 1997; Dalla Bella, Peretz, Rousseau and Gosselin, 2001; Gabrielsson and Lindström, 2001; North and Hargreaves, 1997). Thus, Soul music's prediction of lesser depression in adolescent girls can perhaps partially stem from the songs' musical properties which can potentially induce positive mood. Conversely, Metal music is frequently composed in minor mode, with unusual melodic arrangements, and dissonant chords (Arnett, 1991, 1992; Zillmann and Gan, 1997), such musical characteristics are often associated with lower aesthetic appreciation, tension, anger, and sadness (Gabrielsson and Lindström, 2001; Zillmann and Gan, 1997). Hence, perhaps Metal's music could have predicted more depression, yet this empirical study does not support this possibility.

### Personality traits and music preferences

The second objective of this study was to examine if personality traits can predict music preferences in adolescence. The longitudinal results support that **music preferences are partially predictable from personality traits** in adolescence, which adds on previous cross-sectional studies in adulthood (e.g., Rentfrow and Gosling, 2003) and the recent longitudinal study in adolescence (Delsing et al., 2008). In sum, the present longitudinal study in adolescence offers additional developmental evidence in favor of the classic notion that personality can potentially influence music preferences (Kemp, 1997; Rentfrow and Gosling, 2003).

Extraversion predicts more preferences for Soul music in adolescents, which supports our hypothesis. This result is coherent with previous cross-sectional studies which linked Extraversion with liking for rap, hip hop, and R&B music in adults (North et al., 2005). Our result is particularly compatible with the work of **Delsing et al. (2008)** which indicated that

Extraversion in adolescence is related to Urban music (e.g., hip hop, R&B), a music preference akin to Soul music. Some authors have suggested that Extraversion may incline to seek stimuli from music in order to obtain optimal arousal (Dollinger, 1993; Rawlings and Ciancarelli, 1997), such stimuli are present in Soul music (e.g., fast tempo, fluid rhythms). Furthermore, Delsing et al. (2008) suggest that adolescent extraverts may like Urban music because it is frequently associated with social gatherings, such as parties. Extraversion did not predict preferences for Pop music in adolescents, which does not support our hypothesis. Perhaps highly extraverted adolescents in the environmental context of this study were initially inclined to choose either Soul music or Pop music, but ultimately favored the former due to various social influences (e.g., peers).

Agreeableness did not predict more preferences for Pop music, which does not support our hypothesis. This result could have been expected because Pop music conveys messages regarding the quality of friendships and romantic relationships (Schwartz and Fouts, 2003). Differential attrition may be involved here, given that participants absent at follow-up were significantly less agreeable. Conscientiousness predicts more preferences for Pop music in adolescent girls, which partially supports our hypothesis. Neuroticism did not predict preferences for Metal music, hence this result does not support our hypothesis. In sum, adolescents who enjoy listening to Metal music, which lyrics can often relate to themes of emotional instability, do not seem to be emotionally unstable themselves. Similarly, Delsing et al. (2008) have also reported that Neuroticism in adolescence was not associated with Rock (e.g., heavy metal, punk), a music preference akin to Metal music. Rentfrow and Gosling (2003) have also reported similar cross-sectional findings with college students.

Results support our hypothesis that adolescents high on Openness may be inclined to select sophisticated, unconventional, rebellious, or unusual music in adolescence, given that Openness predicted higher preferences for Metal and Classical music in adolescent girls and boys, yet also higher preference for Electronic music in adolescent boys. Our results are compatible with those of Delsing et al. (2008) which indicated that Openness in adolescence is related to unconventional musical taste, such as Elite (e.g., jazz, classical) and Rock (e.g., heavy metal, punk), which are respectively akin to Classical and Metal music. Above all, Openness predicted music eclecticism in adolescent girls and boys, which supports our hypothesis that Openness predisposes adolescents toward a strongly diversified taste in music, while

converging with previous studies in adulthood (e.g., Dollinger, 1993; Rawlings and Ciancarelli, 1997). Previous authors have suggested that such links between Openness and music preferences may be due to high Openness inclining individuals to be interested in an extensive array of rich and original cultural products (Dollinger, 1993; Rawlings and Ciancarelli, 1997). Thus, if Openness leads individuals to develop more music eclecticism, then perhaps this process is particularly intense in adolescence, when time devoted to music listening increases significantly (Roberts et al., 2004).

### **Music listening as a protective factor against depression**

From a developmental perspective, the third objective was to verify if music listening could represent a potential protective factor against depression in adolescence. Because Pop music preferences did not predict depression, only Soul music was considered as a potential protective factor. Results revealed that the predictive link between Neuroticism and depression levels is buffered by high preferences for Soul music in girls, which confirms the hypothesis that Soul music may act as a potential protective factor against depression in adolescent girls. This result can perhaps support a process proposed by Rentfrow and Gosling (2006), which suggests that some personality characteristics may be regulated by different music characteristics. This finding also adds to the notion that music listening can have adaptive emotion regulation functions in adolescence, which may be more present in girls (North et al., 2000).

Lastly, our results indicate that music preferences in adolescence remain stable during a high school year, since each music factor displayed absolute and differential continuity across six months. Our short-term results are compatible with those of Delsing et al. (2008) which indicated that music preferences in adolescence were increasingly stable over the course of three years.

## **CONCLUSION**

### **Limitations**

Results' generalization is limited by the convenience sample and some differential attrition. Two puzzling results were also present. In girls, Openness predicted lesser preferences for Soul music. This



unexpected result may be due to the fact that Soul music was the most preferred music in this study and thus, perhaps, the most common music choice from the perspective of adolescent girls in this sample. In boys, preference for Pop music was associated with more depression. This unexpected result might be tentatively compared to two previous findings. Adolescent listeners of light music (e.g., pop) can be less emotionally stable (Schwartz and Fouts, 2003) and boys confronted with interpersonal issues can find love-celebrating songs more displeasing (Gibson, Aust and Zilmann, 2000). Also, most possible links between personality traits and music preferences were not significant, which reminds us that other factors (e.g., social, cultural) have a role in defining tastes for music in adolescence, notably peer affiliation (see Miranda and Claes, in press). Lastly, this longitudinal study used the term predictive “effect” for sake of clarity, yet no causality can be established from its correlations.

## Contributions

This longitudinal study is probably one of the first to indicate predictive relations between personality traits, music preferences, and depression in adolescence. Soul music is a predictor of lower depression levels in adolescent girls in the short term; this can be theoretically explained by the songs lyrical and musical characteristics associated with positive emotions – compounded with the likelihood that girls present more emotion regulation with music listening than boys. This study also presents additional empirical evidence that personality traits can predict music preferences in adolescence in the short term. This result can support a theoretical process proposed by Rentfrow and Gosling (2006), which suggest that personality incline individuals toward experiencing pleasure from different music styles. Openness predicts music eclecticism in adolescence and this may represent the best candidate for a trait-disposition toward music preferences. Soul music listening represents a potential protective factor against depression in adolescent girls in the short term, which probably involves adaptive emotion regulation from music listening in adolescent girls.

From a developmental perspective, it seems that emotion regulation from music listening can be involved in the psychosocial adaptation of adolescent girls. Possible emotion regulation from everyday music listening is currently receiving support from research in adolescent depression (e.g., Miranda and Claes, 2007;

Miranda and Claes, in press), yet also from music psychologists who have theorized that music listening is used to manage daily depression levels (e.g., Sloboda and O'Neill, 2001). Rentfrow and Gosling (2006) have also suggested that some personality characteristics may be regulated by music listening. Furthermore, this study may have some modest implication for a broader evolutionary perspective; given that music listening is related to human nature and was able to buffer the predictive effect of another characteristic of human nature – Neuroticism. Therefore, this study might offer some relevant developmental evidence in adolescence, for researchers who have suggested that music could have served an adaptive function in human evolution through emotion regulation (e.g., Trehub, 2003). Trehub (2003) has indeed underscored some parallel between infants' emotion regulation from maternal singing and emotion regulation from music listening in adolescence. In sum, perhaps one adaptive function of music listening in adolescent girls' current development, which may be related to remote human evolution processes, is its protective role against depressive symptoms which can interfere with optimal psychosocial functioning.

## ACKNOWLEDGEMENTS

This study was supported in part by a scholarship for doctoral studies awarded to the first author by the *Fonds québécois de la recherche sur la société et la culture* (FQRSC) from the province of Quebec (Canada).

## REFERENCES

- Aiken, L.S. and West, S.G. (1991). *Multiple regression: testing and interpreting interactions*. Sage; Newbury Park.
- Arnett, J. (1992). The soundtrack of recklessness: Musical preferences and reckless behavior among adolescents. *Journal of Adolescent Research*, 7, 313–331.
- Arnett, J. (1999). Adolescents and heavy metal music: From the mouths of metalheads. *Youth and Society*, 23, 76–8.
- Bakagiannis, S. and Tarrant, M. (2006). Can music bring people together? Effects of shared musical preference on intergroup bias in adolescence. *Scandinavian Journal of Psychology*, 47, 129–136.
- Baron, R.M., and Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–1182.

- Berlyne, D.E. (1971). *Aesthetics and psychobiology*. Appleton-Century-Crofts; New York.
- Birmaher, B., Ryan, N.D., Williamson, D.E., Brent, D.A. Kaufman, J., Dahl, R.E., Perel, J. and Nelson, B. (1996). Childhood and adolescent depression: A review of the past 10 years. Part I. *Journal of the American Academy of Child and Adolescent Psychiatry*, **35**, 1427–1439.
- Bouchard, T.J. and McGue, M. (2003). Genetic and environmental influences on human psychological differences. *Journal of Neurobiology*, **54**, 4–45.
- Bourque, P. and Beaudette, D. (1982). Étude psychométrique du questionnaire de depression de Beck auprès d'un échantillon d'étudiants universitaires francophones. *Canadian Journal of Behavioral Science/Revue Canadienne des Sciences du Comportement*, **14**, 211–218.
- Bruner, G.C. (1990). Music, mood, and marketing. *Journal of Marketing*, **54**, 94–104.
- Buss, D.M. (1999). Human nature and individual differences: The evolution of human personality. In *Handbook of personality: Theory and research 2nd. Edition* (L.A. Pervin and O.P. John, eds.), pp. 31–56. Guilford; New York.
- Caspi, A. and Shiner, R.L. (2006). Personality development. In *Handbook of child psychology, 6th edition, volume 3: Social, emotional, and personality development* (N. Eisenberg (vol. Ed.), W. Damon and R.M. Lerner, eds.), pp. 300–365. John Wiley and Sons; Hoboken.
- Cohen, J., Cohen, P., West, S.G. and Aiken, L.S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd edition). Lawrence Erlbaum; Mahwah.
- Crawford, H.J. and Strapp, C.M. (1994). Effects of vocal and instrumental music on visuospatial and verbal performance as moderated by studying preference and personality. *Personality and Individual Differences*, **16**, 237–245.
- Crozier, W.R. (1997). Music and social influence. In *The Social Psychology of Music* (J. Hargreaves and A.C. North, eds.), pp. 67–83. Oxford University Press; New York.
- Dalla Bella, S., Peretz, I., Rousseau, L. and Gosselin, N. (2001). A developmental study of the affective value of tempo and mode. *Cognition*, **80**, B1–B10.
- Delsing, M.J.M.H., Ter Bogt, T.F.M., Engels, R.C.M.E. and Meeus, W.H.J. (2008). Adolescents' music preferences and personality characteristics. *European Journal of Personality*, **22**, 109–130.
- Dillman Carpentier, F., Knobloch, S. and Zillmann, D. (2003). Rock, rap, and rebellion: Comparisons of traits predicting selective exposure to defiant music. *Personality and Individual Differences*, **34**, 1–13.
- Dollinger, S.J. (1993). Personality and music preference: Extraversion and excitement seeking or openness to experience? *Psychology of Music*, **21**, 73–77.
- Enns, M.W. and Cox, B.J. (1997). Personality dimensions and depression: Review and commentary. *Canadian Journal of Psychiatry*, **42**, 274–284.
- Freeston, M.H., Ladouceur, R., Thibodeau, N., Gagnon, F. and Rhéaume, J. (1994). L'inventaire d'anxiété de Beck: Propriétés psychométriques d'une traduction française. *L'Encéphale*, **20**, 47–55.
- Frith, S. (2001). Pop music. In S. Frith, W. Straw and J. Street (Eds.), *The Cambridge companion to pop and rock* (pp. 93–108). Cambridge University Press; New York.
- Gabrielsson, A. and Lindström, E. (2001). The influence of musical structure on emotional expression. In *Music and emotion: Theory and research* (P.N. Juslin and J.A. Sloboda, eds.), pp. 223–248. Oxford University Press; New York.

- Gibson, R., Aust, C.F. and Zilmann, D. (2000). Loneliness of adolescents and their choice and enjoyment of love-celebrating versus love-lamenting popular music. *Empirical Studies of the Arts*, 18, 43–48.
- Glasgow, M.R. and Cartier, A.M. (1984). Conservatism, sensation seeking and music preference. *Personality and Individual Differences*, 6, 395–396.
- Gosling, S.D., Ko, S.J., Mannarelli, T. and Morris, M.E. (2002). A room with a cue: personality judgments based on offices and bedrooms. *Journal of personality and Social Psychology*, 82, 379–398.
- Hansen, C.H. and Hansen, R.D. (1991). Schematic information processing of heavy metal music lyrics. *Communication Research*, 18, 373–411.
- Janosz, M. and LeBlanc, M. (1997). Les décrocheurs potentiels au secondaire : prévalence, facteurs de risque et dépitage. *Prisme*, 7, 12–27.
- Janosz, M., Le Blanc, M., Boulerice, B. and Tremblay, R. (1997). Disentangling the weight of school dropout predictors: A test on two longitudinal samples. *Journal of Youth and Adolescence*, 26, 733–759.
- Janosz, M., Le Blanc, M., Boulerice, B. and Tremblay, R. (2000). Predicting different types of school dropouts: A typological approach on two longitudinal samples. *Journal of Educational Psychology*, 92, 171–190.
- John, O.P. and Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. In *Handbook of personality, theory and Research* (L.A. Pervin and O.P. John, eds.), pp. 102–138. New York: The Guilford Press.
- Juslin, P.N. and Sloboda, J.A. (2001). *Music and emotion : Theory and research*. Oxford University Press; New York.
- Kallinen, K. (2005). Emotional ratings of music excerpts in the western art music repertoire and their self-organization in the Kohonen neural network. *Psychology of Music*, 33, 373–393.
- Kemp, A. (1999). Individual differences in music. In *The social psychology of music* (J. Hargreaves and A.C. North, eds.), pp. 25–45. Oxford University Press; New York.
- Klein, D.N., Durbin, C.E., Shankman, S.A. and Santiago, N.J. (2002). Depression and personality. In I.H. Gotlib and C.L. Hammen (Eds.), *Handbook of depression* (pp. 115–140). The Guilford Press; New York.
- Lacourse, E., Claes, M. and Villeneuve, M. (2001). Heavy Metal Music and Adolescent Suicidal Risk. *Journal of Youth and Adolescence*, 30, 321–332.
- Le Blanc, M. (1994). Échelle de troubles de comportement et délinquance. In Le Blanc, M., McDuff, P., Fréchette, M., Langelier, S., Levert, F. and Trudeau-Lecblanc, P. (1996). *Manuel sur des mesures de l'adaptation sociale et personnelle pour les adolescents québécois*. School of Psychoeducation and the Groupe de recherche sur les adolescents en difficulté, University of Montreal.
- Le Blanc, M., McDuff, P., Fréchette, M., Langelier, S., Levert, F. and Trudeau-Lecblanc, P. (1996). *Manuel sur des mesures de l'adaptation sociale et personnelle pour les adolescents québécois*. School of Psychoeducation and the Groupe de recherche sur les adolescents en difficulté, University of Montreal.
- Lewinsohn, P.M. and Essau, C.A. (2002). Depression in adolescence. In *Handbook of depression* (I.H. Gotlib and C.L. Hammen, eds.), pp. 541–559. The Guilford Press; New York.
- Lewinsohn, P.M., Roberts, R.E., Seeley, J.R., Rohde, P., Gotlib, I.H. and Hops, H. (1994). Adolescent psychopathology: II. Psychosocial risk factors for depression. *Journal of Abnormal Psychology*, 103, 302–15.
- Martin, G., Clarke, M. and Pearce, C. (1993). Adolescent suicide: Music preference as an indicator of vulnerability. *Journal of the American Child and Adolescent Psychiatry*, 32, 530–535.

- McDermott, J. and Hauser, M. (2005). The origins of music: Innateness, uniqueness, and evolution. *Music Perception*, **23**, 29–59.
- McNamara, L. and Ballard, M.E. (1999). Resting arousal, sensation seeking, and music preference. *Genetic, Social, and General Psychology Monographs*, **125**, 229–250.
- Miranda, D. and Claes, M. (2007). Musical preferences and depression in adolescence. *International Journal of Adolescence and Youth*, **13**, 285–309.
- Miranda, D. and Claes, M. (in press). Music listening, coping, peer affiliation and depression in adolescence. *Psychology of Music*.
- Morizot, J. (2007). *Big Five Inventory (BFI): Adaptation for adolescents*. Unpublished research report. School of Psychoeducation, University of Montreal, Montreal, Canada.
- North, A.C., Desborough, L. and Skarstein, L. (2005). Musical preference, deviance, and attitudes towards music celebrities. *Personality and Individual Differences*, **38**, 1903–1914.
- North, A.C., Hargreaves, D.J. and O'Neill, S.A. (2000). The importance of music to adolescents. *British Journal of Educational Psychology*, **70**, 255–272.
- Peretz, I. (2005). The nature of music. *International Journal of Music Education*, **23**, 103–105.
- Peretz, I., Gagnon, L. and Bouchard, B. (1998). Music and emotion : Perceptual determinants, immediacy and isolation after brain damage. *Cognition*, **68**, 111–141.
- Peretz, I. and Zatorre, R. (2003). *The cognitive neuroscience of music*. Oxford University Press; New York.
- Rawlings, D. and Ciancarelli, V. (1997). Music preference and the five-factor model of the NEO Personality Inventory. *Psychology of Music*, **25**, 120–132.
- Rentfrow, P.J. and Gosling, S.D. (2003). The Do Re Mi's of everyday life: The structure and personality correlates of music preferences. *Journal of Personality and Social Psychology*, **84**, 1236–1256.
- Rentfrow, P.J. and Gosling, S.D. (2006). Message in a ballad: The role of music preferences in interpersonal perception. *Psychological Science*, **17**, 236–242.
- Roberts, K.R., Dimsdale, J., East, P. and Friedman, L. (1998). Adolescent emotional response to music and its relationship to risk-taking behaviors. *Journal of Adolescent Health*, **23**, 49–54.
- Roberts, D.F., Henriksen, L. and Foehr, U.G. (2004). Adolescents and media. In R. M. Lerner and L. Steinberg (Eds.), *Handbook of adolescent psychology*, 2nd edition pp. 487–521. John Wiley and Sons; Hoboken.
- Russel, P.A. (1997). Musical tastes and society. In J. Hargreaves and A.C. North (Eds.), *The social psychology of music* pp. 141–158. Oxford University Press; New York.
- Rutter, M. (1985). Resiliency in the face of adversity : Protective factors and resistance to psychiatric disorder. *British Journal of Psychiatry*, **147**, 598–611.
- Scheel, K.R. and Westefeld, J.S. (1999). Heavy metal music and adolescent suicidality: An empirical investigation. *Adolescence*, **34**, 253–273.
- Schwartz, K.D. and Fouts, G.T. (2003). Music preferences, personality style, and developmental issues of adolescents. *Journal of Youth and Adolescence*, **32**, 205–213.
- Sloboda, J.A. and O'Neill, S.A. (2001). Emotions in everyday listening to music. In P.N. Juslin and J.A. Sloboda (Eds.), *Music and emotion : Theory and research* pp. 415–429. Oxford University Press; New York.
- Starr, L., and Waterman, C. (2006). *American popular music: The rock years*. Oxford University Press; New York.

- Tarrant, M., North, A.C. and Hargreaves, D.J. (2000). English and American adolescents' reasons for listening to music. *Psychology of music*, 28, 166–173.
- Trehub, S.E. (2003). Musical predispositions in infancy: An update. In I. Peretz and R. Zatorre (Eds.), *The cognitive neuroscience of music* pp. 3–20. Oxford University Press; New York.
- Zillmann, D. and Gan, S. (1997). Musical taste in adolescence. In J. Hargreaves and A.C. North (Eds.), *The social psychology of music* pp. 161–187. New York; Oxford University Press.