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Moody melodies: Do they cheer us up? A study of the effect of sad music on mood

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Abstract

Despite the paradox inherent in the idea that sad music could make people happier, research indicates that an improved mood is amongst the primary motivations that people give for listening to sad music. However, it is not clear whether listeners are always able to achieve such aims. This article reports a study in which 335 participants listened to a piece of self-selected sad music. Before and after-measures of mood were taken, and participants also completed psychometric scales of rumination, absorption and reflectiveness. It was found that both ruminators and non-ruminators had significant increases in depression after listening to self-selected sad music. Furthermore, ruminators did not systematically report that they expected to benefit from listening to sad music, contrary to the literature. Results support the hypothesis that listening to sad music is related to maladaptive mood regulation strategies in some listeners.

Keywords

mood, mood regulation, reflectiveness, rumination, sad music

The question of why people listen to sad music has been of particular interest amongst researchers in music psychology in recent years. It presents a paradox, since in 'real life,' sadness tends to stimulate withdrawal and avoidance behaviors (Levanthal, 2008), while sadness in aesthetic contexts is something that people may actively seek or even enjoy. In fact, this paradox has interested philosophers for centuries with Aristotle being one of the earliest to theorize about the potential benefits of listening to sad music (*Politics*, Book VIII, Section VII). However, there has been little agreement in the philosophical and psychological literature as to whether sad music actually makes the listener sad.

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Empirical studies attempting to address the question seem to yield conflicting results. Manuel (2005, Interpretations, para. 2) conducted a poll amongst friends and colleagues and reports that out of 50 people who responded, very few people claimed that listening to sad music actually made them experience sadness at all. Other self-report studies of subjective experiences outside a laboratory setting relate that participants did experience sadness when listening to sad music (Dillman Carpentier et al., 2008). Mood induction studies such as that of Konečni and colleagues (2008), also found that listeners reported feeling sad when listening to sad music. Other studies similarly report findings that listening to sad music did evoke sadness in their participants (Ladinig & Schellenberg, 2012; Vuoskoski & Eerola, 2012).

Studies investigating motivations for listening to sad music typically report claims by listeners that an improved mood is amongst the primary reasons for listening to sad music (Saarikallio, 2008; Saarikallio & Erkkilä, 2007; Van den Tol & Edwards, 2011). In addition, several studies support the idea that when in a negative mood, listeners may sometimes seek music that matches their mood for mood regulatory purposes (Ladinig & Schellenberg, 2012; Saarikallio & Erkkilä, 2007). Despite the paradox of mood improvement via listening to sad music, research does indicate that listening to sad music may be pleasurable for some listeners or a source of psychological benefit for others and could thus possibly result in an improved mood (Garrido & Schubert, 2011). For example, people with high tendencies towards reflectiveness[1] (the disposition and capacity to reflect and examine the self) may find that sad music can be used as a tool for processing their negative emotions thus resulting in an overall improvement in mood (Garrido & Schubert, 2013; Trapnell & Campbell, 1999). Other listeners with strong capacities for absorption (the capacity to become deeply involved in a task or stimuli), may be able to enjoy the emotional arousal of sad music without the displeasure that usually accompanies an experience of sadness (Garrido & Schubert, 2011). Their mood may be therefore unaltered or even improved after listening to sad music.

However, it is not clear from prior research whether the *goals* for listening to sad music match the *outcomes*. Although people may listen to sad music with the goal of improving their mood, some studies report that listening to sad music may in fact result in a deterioration of mood (Chen, Zhou, & Bryant, 2007; Dillman Carpentier et al., 2008). One explanation for these apparently conflicting results in the literature is that listeners with maladaptive mood regulation strategies such as rumination, may not have effective strategies for managing their moods, and therefore do not achieve that goal with their music choices (Garrido & Schubert, 2012, 2013).

Rumination can be understood as an involuntary focus on negative and pessimistic thoughts (Conway, Csank, Holm, & Blake, 2000; Joorman, 2005). It is strongly related to depression (Nolen-Hoeksema, 1991) and involves an attentional bias towards negative stimuli (Gotlib, Krasnoperova, Neubauer Yue, & Joormann, 2004). It is also associated with behavior that prolongs sadness and a reduced motivation to do things that would improve one's mood (Forbes & Dahl, 2005). While rumination in a more general sense can refer to repetitive thinking patterns that are not necessarily negative, and do not necessarily result in unhealthy outcomes, rumination in the sense discussed above is maladaptive. Trapnell and Campbell (1999) distinguished between this maladaptive type of rumination and an adaptive form of self-reflection which they called 'reflectiveness.'

Trapnell and Campbell developed this distinction between rumination and reflectiveness based on the differences between the traits of Neuroticism and Openness to Experience from the Five-Factor Model of personality, and their association with depression. Openness to

Experience is defined by a general interest and vividness in thoughts, imagination, ideas and emotions. It is generally associated with creativity and openness to new ideas and is considered to be a psychologically healthy trait (McCrae & Sutin, 2009). Trapnell and Campbell found that it was associated with reflectiveness. On the other hand, people with high scores in Neuroticism are prone to negative emotional states such as anxiety, depression, moodiness and irritability (Goldberg, 1990). Trapnell and Campbell found correlations between Neuroticism and rumination.

Indeed, some research has shown that music can be a powerful negative emotional force and part of a pattern of self-destructive behavior (Bushong, 2002). Listeners with unhealthy thinking patterns such as rumination may be unaware of the detrimental effect the music has upon them. They may thus rationalize their behavior or express motivations for the behavior which appear healthy much the same as depression sufferers often claim that they benefit from ruminative behavior when in fact the evidence indicates otherwise (Barnhofer, Kuehn, de Jong-Meyer, & Williams, 2006; Papageorgiou & Wells, 2001).

For example, Papageorgiou and Wells (2001) found that despite the negative consequences of rumination, participants in their study believed that such behavior helped them to better understand past mistakes. Watkins and Baracaia (2001) cited similar reasons given by their sample, including increased self-awareness and the capacity to solve problems or prevent future problems. In fact their study found that the stronger the positive beliefs about the benefits of rumination, the more likely people were to engage in such behavior. It could be argued that music-listeners may apply similar justifications to their own maladaptive behaviors with regards to music-listening.

Therefore, further investigation is needed to clarify whether being in a negative mood prior to listening to sad music will result in an improvement to mood as a result of such listening and whether this is influenced by unhealthy thinking patterns.

The current study therefore attempted to address three questions:

1) Does listening to sad music actually result in an improved mood, particularly in those prone to unhealthy negative thinking patterns such as rumination?
2) To what extent are listeners aware of the effect of sad music upon their mood?
3) Does the mood the listener is in prior to listening to music affect the impact that sad music will have upon mood?

Hypotheses

H^1: Listeners with high scores in Rumination will demonstrate increased or stable scores in depression, mood disturbance or negative valence when compared with their scores on the same measures prior to listening to sad music.

H^2: Listeners with high scores in Absorption and/or Reflectiveness will demonstrate decreased or stable scores in depression or mood disturbance after listening to sad music when compared to scores on the same measures taken prior to listening to sad music.

H^3: Ruminators will claim to have benefited from listening to sad music, despite the increase or stability in depression and mood disturbance levels.

In addition, although no specific hypotheses were formulated in relation to them, Neuroticism and Openness to Experience were included as exploratory variables, given their respective connections to Rumination and Reflectiveness (Trapnell & Campbell, 1999).

Method

Participants

A total of 335 participants were recruited from a university in Australia. They participated in the study in exchange for course credit. Participants had a mean age of 21.1 years (standard deviation 3.6 years; range 17–51 years). The sample was composed of 199 females and 136 males. Most participants had played a musical instrument to varying degrees (90.45%), with those who did describing themselves as either having had at least some formal education in music (49.5%), or being exclusively self-taught (50.5%).

Procedure

Participants completed an online survey in their own time. The survey took participants approximately 20–30 minutes to complete. Data were collected over a period of 2 months.

After the ethics declaration, the opening page of the online survey requested that listeners select a piece of music that makes them (or is likely to make them) sad. This music would be listened to as part of the survey. They were instructed to try to obtain a link on the internet (such as from YouTube) for the piece they chose, if possible, and to try to do the survey on a computer with a good sound system, in a private place and with the use of good quality headphones. However, they were instructed not to actually listen to the music until they were specifically requested to do so within the body of the survey.

This was followed by 91 questions (some of which involved multiple items) grouped according to the various inventories used, as described in the measures section. Half the participants were presented with the personality measures prior to listening to the sad music and the other half completed them after the listening exercise. This was done to control for the possible priming effect of the personality measures on the mood measures and subsequent questions.

The survey software automatically recorded the time from the point at which the participant commenced listening to the self-selected sad piece up to the time that the participant moved to the next task (presumably after having listened to the sad piece), at which point the finish time was stamped onto the survey. This allowed timing of how long the participant spent on the listening exercise and thus allowed us the likelihood that the participant complied with the task. Of course it was not possible to be certain that participants had listened to the entire piece given the online nature of the survey. However, the if the percentage of non-complying listeners remains small, a large participant pool ensured that the sad-music listening time was reasonable reflection of actual sad listening time (Gosling, Vazire, Srivastava, & John, 2004; Tulbure, 2011; Whitty & Joinson, 2009)

Following the completion of the sad music and personality measures, the participants were asked to indicate their selected piece of music that makes them (or is likely to make them) happy, and to provide a link to it. This was listened to as part of the concluding section the survey both for comparative purposes and to allow improvement in mood at the end the survey, should the sad music have put them in a negative mood.

Mood and arousal scores were obtained three times during the survey: prior to listening to the sad music, after listening to the sad music (and prior to listening to the happy music), and after listening to the happy music.

Measures

Rumination & Reflectiveness. Trapnell and Campbell's Rumination Reflection Questionnaire (1999) was included in its entirety. The Rumination subscale is a 24-item questionnaire designed to assess the instance of chronic self-attention and focus on negative thoughts about the past. The authors reported that the internal consistency analysis yielded a score of 0.91 (Cronbach's alpha). The Reflectiveness subscale was also used to allow further examination of the distinction between ruminative and reflective behaviors and the enjoyment of sad music. Agreement with each item was recorded on 5-point scales ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) as in the original scale by Trapnell and Campbell (1999; see Table 1 for a list of all measures used).

Neuroticism and openness to experience. In this study, subscales from the Big Five Aspect Scale (BFAS; DeYoung, Quilty, & Peterson, 2007) were used. DeYoung et al. divide each of the 'Big Five' scales into two aspects. Neuroticism was hypothesized to have two aspects: withdrawal and volatility, while Openness to Experience was argued to include both Intellect and Openness components. These measures of Neuroticism and Openness to Experience were employed in the present study to try to narrow down the particular types of adaptive or maladaptive behaviors that might be implicated in the use of music evoking negative emotions. However, it was possible to obtain scores comparable to scores on other Big Five inventories from the BFAS by adding the scores for the two aspects together. DeYoung et al. (2007) report no significant differences between scores on their scales and those on other commonly used measures of the Big Five in the samples they tested. They report reliability scores of .89 (Cronbach's alpha) for each of the three samples tested for the Neuroticism subscale and of .84, .79 and .81 for each sample for the Openness to Experience subscale.

The BFAS subscales used included 40 short phrases which participants were requested to rate on a scale of 1 to 5 (strongly disagree to strongly agree) to the extent that they agreed the statement applied to them. They were instructed to be as honest as possible, but to try to rely on their initial feelings rather than thinking too much about each item. The statements included items such as 'Seldom feel blue,' 'Am quick to understand things,' 'Enjoy the beauty of nature,' etc. The items on the BFAS subscales were mixed as instructed by the authors of the original scale.

Absorption. The measure for absorption was taken from the Absorption, Intellectance and Liberalism Questionnaire (AIT; Glisky & Kihlstrom, 1993). This instrument included a 12-item subscale for absorption drawn from the Tellegen Absorption Scale (TAS; Tellegen & Atkinson, 1974), one of the most commonly used measures of absorption (Tellegen, 1982). The AIT is reported by the authors (p. 117) to have high reliability (Carmine's theta), with the absorption subscale scoring .84. Agreement with each item was recorded on 5-point scales ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Mood. As a baseline mood measure an abbreviated version of the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971) was used. Several studies have used abbreviated versions of this measure before, arguing that length of the original instrument (65 items) limited its use (Baker, Denniston, Zabora, Polland, & Dudley, 2002; Curran, Andrykowski, & Studts, 1995; Shacham, 1983). The original POMS contained 6 subscales: Tension, Anger, Fatigue, Depression, Vigour, and Confusion, as well as a number of dummy items. The current version retained the majority of items in each subscale as well as a number of the dummy items, while reducing

Table 1. Measures

Name of scale	Variable/s measured	Min	Max
RRQ	Rumination	1	5
	Reflectiveness	1	5
BFAS	Neuroticism:	20	100
	• Withdrawal	10	50
	• Volatility	10	50
	Openness to experience:	20	100
	• Intellect	10	50
	• Openness	10	50
AIT	Absorption	12	60
POMS	Tension	0	28
	Anger	0	28
	Fatigue	0	20
	Depression	0	36
	Vigor	0	28
	Confusion	0	24
	Mood disturbance	0	164
Arousal/valence	Calm/anxious	1	5
	Tired/energetic	1	5
	Sleepy/alert	1	5
	Negative/positive	1	5
SM01	It made me cry which made me feel peaceful and relieved afterward.	1	6
SM02	It reminded me of some sad things in my life which made me feel sadder than before.	1	6
SM03	It made me reflect about sad things in my life and I felt better afterward.	1	6
SM04	I felt as if I could relate to the person singing/playing the music as if they were telling me their own story. It felt good to know that other people sometimes feel like me.	1	6
SM05	I felt sad, but becoming immersed in those feelings was enjoyable.	1	6
SM06	I felt sad, but somehow the sad feelings caused me to feel more alive.	1	6
SM07	I felt sad, and this was not an enjoyable experience for me.	1	6
SM08	Usually this music makes me feel sad, but today it did not.	1	6
SM09	Usually I enjoy this music even though it makes me feel sad, but today I did not want to feel sad, so it was uncomfortable listening to it.	1	6
SM10	The sadness of the music helped me to release bad energy.	1	6
SM11	It made me think of past events in my life, and this nostalgia was a bittersweet experience.	1	6

the number of items to the more manageable figure of 47 with a possible range of total scores from 0 to 164. Reliability tests returned a score of .880 (Cronbach's alpha), indicating that this abbreviated version provided a reliable measure of mood states.

POMS was designed to measure current mood states on the various subscales, as well as an overall 'Mood Disturbance Index.' The version of POMS used consisted of 47 adjectives such as 'friendly,' 'tense,' 'angry' (including some dummy items). Participants were requested to describe how they felt 'right now' by rating each word on the list on a scale of 0 to 4 ('Not at all' to 'Extremely'). The items of the various POMS subscales were presented to participants in mixed form as in the original instrument. In addition, participants were asked to rate how they were currently feeling on a scale of 1 to 5 on a scale of valence as commonly found in bipolar emotion scales (Negative/Positive) (Russell, 1979; Schubert, 1999).

Music listening and perception of its effects. Following the baseline mood measures, all participants were asked to indicate the name and to provide a URL of the music they had selected that made them feel sad. They were then asked to listen to the piece in a separate window (computer screen) and return to the survey window after hearing it in its entirety.

Following some brief questions designed to ascertain whether they had actually listened to the music and had done so under good listening conditions, participants were asked to complete the abbreviated POMS and the valence rating once more in order to be able to determine whether there had been any change from the baseline measures.

The following question contained 11 statements relating to the participants' perception of how the music had affected their moods and emotions (see Table 1: SM01–SM11). Some of these related to good feelings or effects of listening to the sad music, such as 'It made me cry which made me feel peaceful and relieved afterward,' or 'I felt sad, but becoming immersed in those feelings was enjoyable.' Other statements reflected a negative effect from listening to the sad music, such as 'It reminded me of some sad things in my life which made me feel sadder than before,' or 'I felt sad, and this was not an enjoyable experience for me.' Participants were asked to rate each statement on a scale from 1 to 6 ('Definitely does not apply to me' to 'The most important reason for me'). A further question asked participants to describe the key moment of the music for them. This was intended as a check to see if participants were likely to have been listening to the self-selected piece. If nothing was reported and listening time was considerably less than the duration of the piece, the validity of the response could be questionable. The final seven questions gathered demographic data such as gender, age, and musical experience.

The final part of the survey consisted of listening to a self-selected piece of happy music. The same instructions were given as had been given in relation to the sad music. After listening to the happy music, participants completed the mood and valence measures a final time.

Scoring

Scale scores for each of the variables were first calculated. The scores for Rumination, Reflectiveness, and Absorption were calculated as described by the authors. The scales for the subscales of the BFAS were calculated as described by DeYoung et al. (2007). Scores for each aspect; Volatility, Withdrawal, Intellect, and Openness, were obtained by adding scores on each item. The subscale scores for Neuroticism and Openness to Intellect were obtained by adding the scores of their respective aspects.

POMS scores were obtained as described by McNair et al. (1971) by first calculating the scores of each subscale: Tension, Anger, Fatigue, Depression, Vigor, and Confusion, adding the item totals after first reversing negatively scored items. Some items were not included in the scoring having been added to the measure as 'dummy items.' A total Mood Disturbance Index

(MDI) was obtained by adding the scores of all subscales except Vigor, and then subtracting the Vigor subscale scores (since Vigor represented a positive mood state). This method for calculating POMS scores was completed for both instances in which participants completed the measure within the survey.

Results

Preliminary analysis[2]

Analysis was first performed to determine whether there was any significant difference between scores in the two groups who had completed the survey with personality questions either before (PTF, 'Personality Tests First') or after (LF, 'Listening First') the sad music listening experience. Demographic information was closely matched in terms of gender (PTF: 66 males, 104 females; LF: 70 males, 95 females), age (PTF: $m = 21.0$, $SD = 3.8$, Range = 17–50; LF: $m = 21.1$, $SD = 3.4$, Range = 17–51), and level of musical experience (PTF: 92.4% had played a musical instrument, years played $m = 7.69$, $SD = 4.82$, Range = 1–19; LF: 88.5% had played a musical instrument, years played $m = 7.96$, $SD = 5.19$, Range = 1–20). Order effects were tested by conducting a MANOVA to discover whether there were any significant differences between the scale scores, baseline mood and arousal measures according to the order in which the tests were taken. There was no overall significant difference ($F(13, 321) = 1.081$, $p = .375$). It was concluded that order (PTF vs. LF) did not influence responses.

Personality

In keeping with expectations, all personality traits generally considered to be 'unhealthy' in the literature, tended to group together. Pearson product-moment correlations were performed, with significant correlation coefficients found between Rumination and Neuroticism (including both of the sub-facets and the overall Big Five score) (Withdrawal: $r = .564$, $p < .001$; Volatility: $r = .416$, $p < .001$; Neuroticism: $r = .546$, $p < .001$).

In addition, also as would be expected, the more 'healthy' traits were correlated. Specifically, Reflectiveness and Absorption demonstrated significant correlation coefficients with Openness to Experience (including both the sub-facets and the overall Big Five score) (Reflectiveness: $r = .511$, $p < .001$; Absorption: $r = .489$, $p < .001$). These findings, while not particularly important to the hypothesis under examination in this study, support the validity of the measures used.

Baseline mood measures

A Pearson's product-moment correlation analysis was conducted between the personality measures and the baseline measures of mood to see whether Ruminators, or those with high scores on other personality traits may have significantly higher or lower mood states prior to the music listening experience.

The results indicate that there were significant negative correlations between Rumination and Neuroticism with Valence scores ($r = -.369$, $p < .001$ and $r = -.489$, $p < .001$, respectively), suggesting that people with high scores in these traits were in a more negative mood at the outset of the experiment than other participants, regardless of the order of experimental items. There were also significant correlations between Rumination and Neuroticism

with the baseline Tension ($r = .328$, $p < .001$ and $r = .389$, $p < .001$, respectively) and Depression scores from the POMS subscales ($r = .376$, $p < .001$ and $r = .372$, $p < .001$, respectively) as well as the overall Mood Disturbance Index ($r = .346$, $p < .001$ and $r = .421$, $p < .001$, respectively). Neuroticism was also significantly correlated with high baseline levels of anxiety and confusion ($r = .370$, $p < .001$ and $r = .325$, $p < .001$, respectively).

The effect of listening to sad music on mood

Rumination scores were split *post hoc* according to percentiles and groups created containing only the highest 10% (scores > 4.33 $n = 33$) and lowest 10% (scores < 2.58, $n = 33$) of scores (Rumination Groups). Trapnell and Campbell (1999) reported a mean of 3.46 in their sample. Similar *post hoc* divisions were conducted for Absorption (Absorption Groups) and Reflectiveness (Reflectiveness Groups) (Absorption highest: scores > 54, $n = 33$, lowest: scores < 35, $n = 33$; Reflectiveness highest: scores > 4.33, $n = 33$, lowest: < 2.58, $n = 33$). Glisky and Kihlstrom (1993) reported a mean of 41.45 for Absorption in their sample, while Trapnell and Campbell (1999) reported a mean of 3.14 for Reflectiveness in their study.

A mixed between-within subjects ANOVA was first conducted to assess the overall impact of both the sad and happy listening conditions on Depression scores as measured by the POMS subscale. Time (baseline, post-sad music, and post-happy music scores on Depression) was the within-subject factor, and Rumination Group (high and low) was the between-subject factor. There was a significant main effect of Time on Depression (Wilks' lambda = .322, $F(2, 63) = 66.358$, $p < .001$, partial eta squared = .678[3]). There was also a significant interaction effect between Time and Rumination Group, indicating that high ruminators did experience different effects over time from low ruminators (Wilks' lambda = .616, $F(2, 63) = 19.606$, $p < .001$, partial eta squared = .384). The test of between-subject effects indicated that there was also a significant effect of Rumination Group on Depression scores ($F(1, 64) = 59.786$, $p < .001$, partial eta squared .497). Subsequent analyses were carried out and are reported below.

A similar test was conducted to examine the overall impact of both the sad and happy listening conditions on the POMS Mood Disturbance Index, with Rumination Group as the between-subjects factor. Time (baseline, post-sad music and post-happy music scores on Mood Disturbance) was the within-subject factor, and Rumination Group (high and low) was the between-subject factor. There was a significant main effect of Time on Mood Disturbance (Wilks' lambda = .268, $F(2, 63) = 85.977$, $p < .001$, partial eta squared = .732). There was also a significant interaction effect between Time and Rumination Group, indicating that again high ruminators did experience different effects over time on Mood Disturbance scores from low ruminators (Wilks' lambda = .690, $F(2, 63) = 14.158$, $p < .001$, partial eta squared = .310). The test of between-subject effects indicated that there was a significant effect of Rumination Group on Mood Disturbance scores ($F(1, 64) = 33.045$, $p < .001$, partial eta squared .341) (see Figure 3).

Follow-up tests

Follow up tests were performed to determine whether the significant effects in the previous two analyses (Figures 1 and 2) resulted from the sad or happy music listening conditions. A mixed

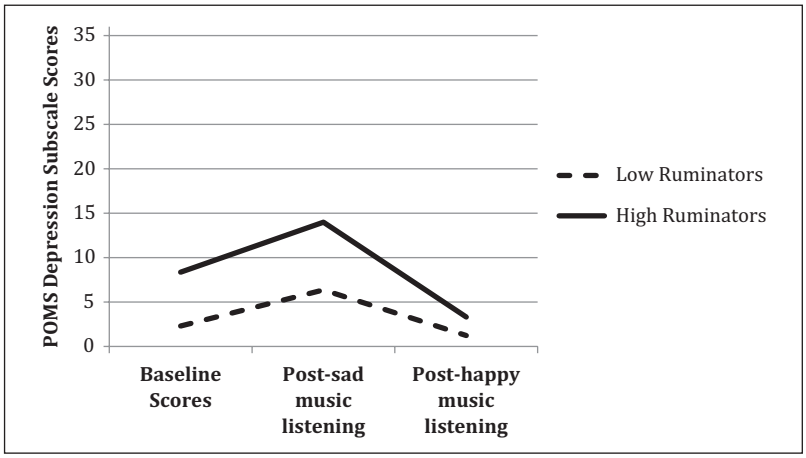

Figure 1. POMS Depression scores across three time measures for Rumination Group (high and low).

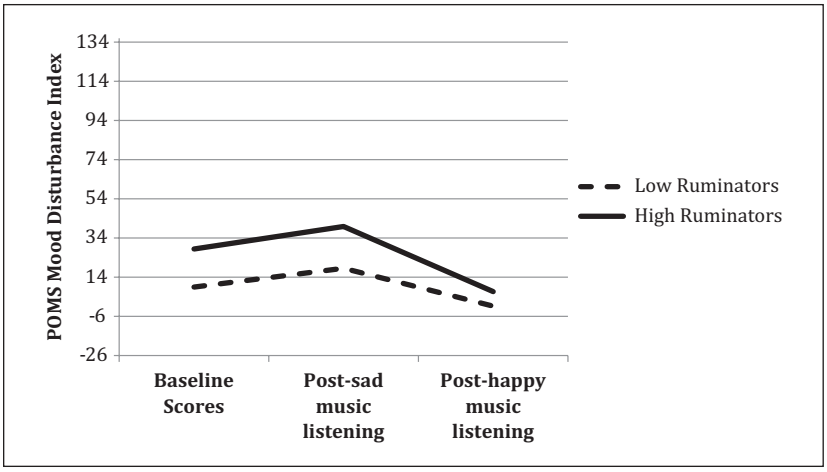

Figure 2. POMS Mood Disturbance Index across three time measures for Rumination Group (high and low).

between–within-subjects analysis of variance was therefore conducted to assess the impact of listening to the self-selected piece of sad music on Depression scores as measured by the POMS subscale. Time (baseline and post-sad music scores on Depression) was the within-subject factor, and Rumination Group (high and low) was the between-subject factor. Consistent with the overall analysis reported above, there was a significant main effect of Time on Depression (Wilks' lambda = .603, $F(1, 64) = 42.184$, $p < .001$, partial eta squared = .397) with Depression scores increasing after listening to sad music (Figure 1). However, the absence of a significant interaction between Time and Rumination Group indicated that Rumination Group was not a significant factor differentiating changes in scores after listening to sad music and that both high and low ruminators experienced consistent effects from listening to sad music (Wilks' lambda = .969, $F(1, 64) = 2.031$, $p = .158$, partial eta squared = .031). These results indicate that Depression scores of all groups increased after listening to sad music. Between subject

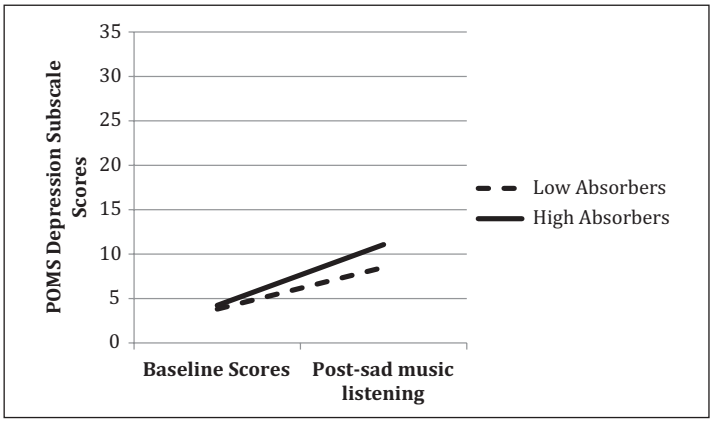

Figure 3. POMS Depression scores across two time measures for Absorption Group (high and low).

effects were also significant with high ruminators having higher Depression scores than low ruminators to begin with (see Figure 1) ($F(1, 67) = 62.702$, $p < .001$, partial eta squared = .483). This is consistent with the results of the correlation analyses reported above.

A similar test was conducted to examine the impact of listening to sad music on the POMS Mood Disturbance Index, with Rumination Group as the between-subjects factor. Results were similar, with Mood Disturbance scores rising significantly after listening to sad music (see Figure 2) (Wilks' lambda = .707, $F(1, 64) = 26.546$, $p < .001$, partial eta squared = .293) but no significant interaction effect of Rumination Group, (Wilks' lambda = .993, $F(1, 64) = .448$, $p = .505$, partial eta squared = .007), indicating that all groups experienced a similar rise in Mood Disturbance scores. Between-subject effects were also significant ($F(1, 64 = 41.842$, $p <$ .001, partial eta squared = .395), with high ruminators having significantly higher Mood Disturbance scores than low ruminators to begin with (see Figure 2).

To compare the results of rumination with that of absorption and reflectiveness in relation to sad music listening, two further mixed between-within subjects analyses of variance were conducted, with Absorption Group (high and low) and Reflectiveness Group (high and low) as the between-subject factors. Again, there was a significant main effect of Time (Wilks' lambda = .541, $F(1, 64) = 54.337$, $p < .001$, partial eta squared = .459) (see Figure 3), but no significant interaction with Absorption Group (Wilks' lambda = .971, $F(1, 64) = 1.899$, $p = .173$, partial eta squared = .029). Between-subjects effects were also non-significant ($F(1, 64) =$ 1.400, $p = .241$, partial eta squared = .021) indicating that Absorption Group did not influence Depression scores from the outset. Results for Reflectiveness Group demonstrated a similar pattern. Depression scores rose with time (see Figure 4) (Wilks' lambda = .576, $F(1, 63) = 46.282$, $p < .001$, partial eta squared = .424) but there was no significant interaction with Reflectiveness Group, Wilks' lambda = 1.000, $F(1, 63) = .002$, $p = .963$, partial eta squared < .001, or significant between-subjects effects, $F(1, 63) = .792$, $p = .396$, partial eta squared = .011. Thus, these results did not support the hypothesis in relation to reflectiveness and absorption.

The effect of listening to happy music

As a further follow-up analysis, a mixed between–within-subjects analysis of variance was conducted to assess the impact of listening to the self-selected piece of happy music on Depression

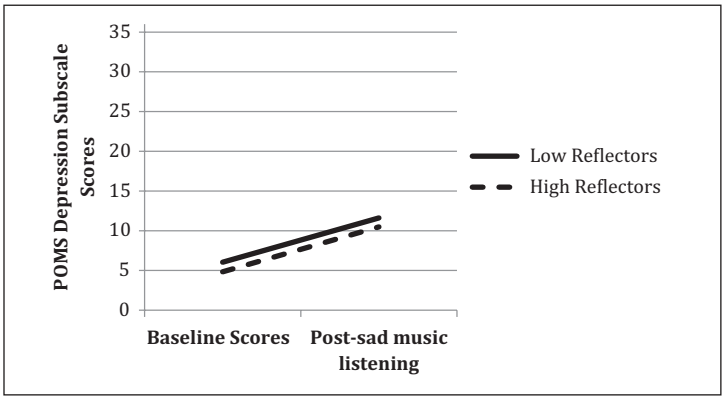

Figure 4. POMS Depression scores across two time measures for Reflectiveness Group (high and low).

scores as measured by the POMS subscale. Time (pre- and post-happy music scores on Depression) was the within-subject factor, and Rumination Group (high and low) was the between-subject factor. There was a significant main effect of Time on Depression, (Wilks' lambda = .363, $F(1, 64) = 112.417$, $p < .001$, partial eta squared = .637) with Depression scores decreasing after listening to happy music (see Figure 1). There was also a significant interaction between Time and Rumination Group (Wilks' lambda = .763, $F(1, 64) = 19.930$, $p < .001$, partial eta squared = .237), indicating that high ruminators experienced a steeper drop in Depression scores after listening to happy music than low ruminators (see Figure 1). Thus, although all groups experienced a similar rise in Depression scores after listening to sad music, high ruminators experienced a more significant drop in Depression scores than other groups after listening to happy music.

Results comparing scores on the Mood Disturbance Index (MDI) before and after listening to happy music were similar, with a significant interaction between Time and MDI scores, (Wilks' lambda = .448, $F(1, 64) = 78.729$, $p < 001$, partial eta squared = .552) and a significant interaction between Rumination Group and MDI scores (Wilks' lambda = .756, $F(1, 64) = 20.662$, $p < .001$, partial eta squared = .244) (see Figure 2). This indicated that high ruminators again experienced a greater impact on Mood Disturbance scores after listening to happy music than others.

Perceived effects of listening to sad music

A final analysis examined the relationship between rumination and the perceived effects of listening to sad music. A MANOVA was conducted with Rumination Group (high and low) as the fixed factor and the 11 items relating to the perceived effect of listening to sad music as the dependent variables (Table 1: SM01–SM11). Results were significant ($F(11, 40) = 4.571$, $p < .001$, Wilks' lambda = .443). Post-hoc ANOVA tests of between-subject effects revealed significant differences for items (listed from largest mean difference to smallest) SM02 ($F(1, 53) = 14.338$, $p < .001$), SM04 ($F(1, 53) = 10.276$, $p = .002$), SM07 ($F(1, 53) = 8.588$, $p = .005$) and SM11 ($F(1, 53) = 13.321$, $p = .001$), with significant results also being found for items SM01 ($F(1, 53) = 4.651$, $p = .036$) and SM03 ($F(1, 53) = 5.781$, $p = .02$).

The items for which significant results were returned in the MANOVA related to both negative and positive effects of listening to sad music. Both items SM01 and SM04 indicated that the

listener felt better after listening to sad music. These results partially supported the hypothesis that high ruminators would claim to have benefited from listening to sad music despite the fact that their mood levels did not improve (H^3). However, the fact that high ruminators also reported feeling worse after listening to sad music (items SM02 and SM07) meant that the implications of the results were somewhat unclear. Therefore, analyses were conducted to examine whether other variables may be influencing the predicted effect of Rumination. A series of regression analyses were conducted on the four items that returned the largest mean differences according to the MANOVA (SM02, SM04, SM07, SM11), to see whether it might be a combination of Rumination with some other factor that was influencing the apparently contradictory results.

OLS Stepwise regression of all personality scores and baseline mood measures onto the item 'Reminded me of sad things in my life; felt sadder than before' (SM2) produced two coefficients in the final model that were entered (with criterion of F to enter < = .05 and probability of F to remove > = .10). These were Rumination, (standardized coefficient of .221, $p < .001$), and baseline Anger scores as measured by the POMS subscale (standardized coefficient of .127, $p = .021$). Adjusted R^2 for the model was .075.

OLS Stepwise regression was then performed as above onto the item 'Felt as if I could relate to person singing/playing. Felt good to know other people felt like me' (SM4). Reflectiveness and baseline Depression as measured by POMS were retained in the model (standardized coefficients of .161 and .024, adjusted $R^2 = .098$, each significant at $p = .05$).

A similar regression analysis was performed on the item 'Felt sad; not an enjoyable experience' (SM07). Rumination and the Big Five Openness to Experience measure were retained in the final model (standardized coefficients of .178 and −.147, adjusted $R^2 = .044$, each significant at $p = .05$), indicating an inverse relationship with Openness to Experience.

A final regression analysis was performed on the item 'Reminded me of past events; a bittersweet nostalgic experience' (SM11). Rumination, Reflectiveness and baseline scores on the Confusion subscale (POMS) were retained in the final model, with standardized coefficients of .133 ($p = .018$), .144 ($p = .008$), and .135 ($p = .015$), respectively. Adjusted R^2 for this model was .064, with each predictor significant at $p = .05$.

Discussion

The current study tested the hypothesis that those with high scores in Rumination would not experience an improved mood after listening to sad music, but that post-listening mood scores would still indicate the presence of depression or low moods. Results indicated that participants with high scores in Rumination and Neuroticism had significantly lower moods and higher tension and anxiety levels than non-ruminators from the outset of the study. As hypothesized, there was no significant mood improvement after listening to sad music (H1). In fact, as Figure 1 demonstrates, depression levels tended to rise after listening to sad music. Therefore, the second hypothesis was supported. What was of surprise, however, was that this effect appeared to be the same for all listeners not just those with high Rumination scores. It had also been hypothesized that those in the high Absorption Group and the high Reflectiveness Group would not experience the same rise in Depression or Mood Disturbance, a hypothesis which was not supported by the findings (H2).

Results in relation to Hypothesis 2 were unexpected. While those in the high Absorption Group or the high Reflectiveness Group appear to have begun participation in the study with lower baseline depression and mood disturbance levels than those in the high Rumination Group, all groups experienced a similarly significant increase in depression and mood

disturbance after listening to sad music as other listeners. It might have been expected given previous findings (Garrido & Schubert, 2011, 2013) that if participants with high scores in Absorption were gaining some pleasure from the emotional arousal of listening to sad music, an increased positivity of mood would have been in evidence. However, this study, unlike the previous studies of Garrido and Schubert, did not relate to participants' usual listening habits, but rather specifically requested that listeners select a piece of music that made them sad. Therefore, we cannot be sure that the music selected by participants in this study would be their preferred choice for listening in everyday circumstances.

In addition, the regression analysis on item SMS4 ('Felt as if I could relate to the person singing. Felt good to know other people felt like me') suggested that the item was predicted by Reflectiveness in addition to baseline Depression scores. This may have some similarity to findings by Jonas, Graupmann and Frey (2006), who reported that when in a negative mood, the participants in their study demonstrated a greater need for information that tended to confirm a prior decision. The authors related this to an increased need to reduce cognitive dissonance when in a negative mood. Although in that study the authors assumed that this had resulted in an improved mood rather than explicitly measuring it, it is possible that the results of our regression analysis demonstrate a similar desire to reduce cognitive dissonance by receiving confirmation through the music that other people experience the same negative emotions. Thus people with high levels of Reflectiveness appear able to derive some benefit from listening to sad music when their prior mood is depressed. This also supports other findings that for those with the adaptive mood regulation habit of reflectiveness, listening to sad music can provide an opportunity to enjoy certain psychological benefits when circumstances require it (Garrido & Schubert, 2013). Mood improvement may not be immediate, since short-term pleasure is postponed in favor of long-term gains, as predicted by mood management theory (Knobloch & Zillmann, 2002).

The same may have occurred in relation to those in the high Absorption group. The mood measures used after the sad-music listening condition in this study did not necessarily distinguish between an experience of sadness that was pleasant and one that was unpleasant. In addition, research is not conclusive as to how far-removed in time from the listening experience the expected improvement to mood resulting from the pleasure would occur. It is possible that the immediacy of the mood measures used in this study resulted in a finding of higher depression whereas measures taken somewhat later might have found different results in relation to those with high capacities for Absorption.

In contrast, although high ruminators began the study with higher Depression scores (as measured by the POMS Depression subscale) than other listeners, they did not derive any greater benefits from listening to sad music than other listeners. When comparing the results for Reflectiveness and for Rumination it seems to indicate that prior mood would not *of itself* be predictive of the effect of listening to sad music on mood. The effect of prior mood on the outcome of listening to sad music is probably highly dependent upon whether the strategies the listener has derived for regulating their moods is either adaptive or maladaptive.

An unexpected but highly interesting finding was that ruminators experienced greater mood improvements than other listeners after listening to happy music. Since previous research indicates a tendency to be attracted to sad music despite its mood lowering effect (Garrido & Schubert, 2012, 2013), this finding supports the argument that they may be engaging in maladaptive mood regulation strategies when listening to sad music. It seems that those with high levels of depression and mood disturbance may derive greater benefits from listening to happy music than other listeners, and therefore despite the justifications of benefit

they may offer for listening to sad music, they would experience more mood improvement if they listened to happy music. However, the fact that the happy music listening condition occurred after depression levels had been elevated by first listening to sad music, makes it difficult to be certain if this effect would also occur in daily life without such artificially-altered mood states. Additionally, it could be reflective of a tendency to emotional instability and mood swings on the part of those prone to depression. Therefore, further investigation will be necessary to clarify this point.

Perceived effects of listening to sad music

It was further hypothesized (H3) that ruminators would still claim to have benefited from the sad music listening experience, despite the lack of improvement in depression levels. However, results revealed a mixture of both positive and negative perceived effects. Participants with high scores in Rumination recognized that they felt sadder after listening to the sad music, and that it was not enjoyable for them, with anger also tending to be related to this perceived effect. However, high ruminators also claimed some benefit from feeling that other people experienced the same emotions as them, or from the opportunity to purge themselves of negative emotions. In addition they reported a 'bittersweet, nostalgic' effect from listening to sad music. Consequently, additional analyses aimed to probe the matter further.

The regression analyses on these items revealed that Rumination was in fact, most strongly associated with a claim to have felt sadder after listening to sad music whereas items claiming benefit from listening to sad music were more strongly associated with adaptive personality traits such as Reflectiveness. The results, therefore, do not support the hypothesis that ruminators will use rational justifications for listening to sad music despite the fact that it doesn't result in an improved mood. Although such justifications are typical of ruminators (Barnhofer et al., 2006; Papageorgiou & Wells, 2001), many participants were cognizant of the negative effect listening to sad music had upon them. Clarification of this issue might result from asking participants to predict the effect the music would have upon them, rather than asking them the actual effect after listening to the music. Such a study design would indicate more clearly whether participants are aware of the effect that sad music has upon them in their daily lives or not.

Alternatively, it is possible that just as some depression sufferers are more self-aware than others, the apparently conflicting results merely reflect these varying levels of awareness amongst participants. Another possible reason for these results could be that ruminators experience mixed emotions when listening to sad music. This is similar to findings in other studies. Evans and Schubert (2008), for example, report that one of their participants described experiencing mixed emotions in response to 'Pachelbel's Canon.' Interestingly, the item relating to listening to sad music resulting in a bittersweet, nostalgic experience, was predicted by both Rumination, Reflection, and Confusion. This may be indicative of a 'confused' or mixed emotional experience involved in listening to sad music, especially for participants with high scores in Rumination who may be more prone to feeling the negative valence of the music than other listeners due to their own negative emotional state.

While support was not found in this study for the hypothesis (H3) that ruminators will justify and rationalize their listening choices, the results in relation to the perceived effects of listening to sad music do tend to support the overall argument that for high ruminators listening to sad music is maladaptive, since moods in fact worsened after listening to sad music while improving significantly after listening to happy music.

Conclusion

The focus of this study differed from previous research in that it aimed to examine the direct effect on mood of listening to a piece of sad music and to focus on the possible maladaptive uses of music. Previous research demonstrates that listeners justify their decision to listen to sad music by claiming various psychological benefits from doing so (Garrido & Schubert, 2013; Saarikallio & Erkkilä, 2007). However, in this article, we wanted to consider the possibility that not all listeners will actually achieve an improved mood after listening to sad music. It was hypothesized that listeners with maladaptive mood regulation strategies such as rumination, would not experience any lessening of depression levels after listening to sad music. In contrast to previous research, the primary aim was to investigate mood outcomes rather than goals or motivations related to mood improvement.

The results of this study confirmed that high ruminators do not experience mood improvements after listening to sad music even though they may report having benefited from the experience. Contrary to expectation however, this effect was not limited to ruminators. Both ruminators and non-ruminators experienced similar increases in Depression scores after listening to sad music. The key difference in findings between ruminators and other listeners appears to be the fact that ruminators experienced greater mood improvement after listening to happy music than other listeners. The fact that they stand to gain more from listening to happy music than other listeners supports the argument that an attraction to sad music on their part is maladaptive.

However, many questions remain to be answered in future research. The study was limited by a design that made it difficult to ensure compliance with the listening instructions. Although the relatively large sample used made inaccurate data unlikely, future studies could benefit from attempting to replicate the results in a more controlled laboratory setting. Further study of the effect of happy music upon depressed listeners with happy music-listening as a controlled condition will also be necessary to confirm the results of this investigation. The question of whether ruminators are aware of the lack of benefit they are deriving from listening to sad music also requires further research. Such investigations will have important implications for the use of music in therapy situations and for enhancing the mood-regulatory benefits that listeners can obtain from music in their everyday lives.

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Notes

1. Throughout this article, we have capitalized the first letter of words when referring to the variable measured in this study, and use all lower cases when using the term in a general sense.
2. All analyses were conducted using statistical software SPSS Version 20.
3. Partial eta squared as a measure of effect size is to be interpreted with caution, as discussed by Pierce, Block, and Aguinis (2004).

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