EMOTION MEMORY AND MUSIC: A CRITICAL REVIEW AND RECOMMENDATIONS FOR FUTURE RESEARCH.

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Abstract

In this chapter we briefly but critically review current research on music-induced emotions, and the emotional response to music evoked memories. Current research struggles with finding appropriate approaches to investigate music-evoked memories. One new method is the use of self-selected rather than experimenter-selected music.

As part of an empirical study we tested the validity of using self-selected music to study music-evoked memories. Moreover, with the use of self-selected music, we tested and confirmed the hypothesis that music that evokes sad memories is more like to portray sad than happy emotions. It was additionally found that familiarity of self-selected music is linked to liking, aesthetic value, meaningfulness, intensity of emotional response, vividness of mental imagery, and detail of the memory.

Keywords: music-evoked memories, positive or negative emotions, self-selected music.
1 INTRODUCTION

“Music is a moral law. It gives soul to the universe, wings to the mind, flight to the imagination, a charm to sadness, and life to everything.” (Plato, 428 BC –348BC)

“Music produces a kind of pleasure which human nature cannot do without”. (Confucius, 551-479 BC)

Almost everyone loves to listen to music, and music has a strong impact on people’s lives. More specific, recent findings show that the average western person has about 140 different music groups on his or her computer’s music library (1) and listens to music for three and half hours per day (2). Music is the number one topic that University students discuss when they are just getting to know each other (3). Moreover, humans have been engaged in the making of instrumental music for at least 1000 years (4), but likely way longer (5). This conclusion was based on the findings on uncontested bone flutes which were made from wing bones of a swan, and were indicated by scientist to date back to 36,800 ± 1000 years ago (4). It is understood that even our common ancestors the Neanderthals already engaged in musical activities including singing and playing instruments (5).

The use of advanced research methods in contemporary music psychology research is breathing new life into music listening research. This includes a growing body of research into the role of emotions in music, a topic which interested scholars for centuries, such as Confucius (551-479 BC), Plato (428 BC-348 BC) and Aristotle (350 BC) and the use of music for memories.

In this chapter, we will review findings from contemporary research in music and emotion in more detail and also relate it to the research that has currently been done on the topic of music-evoked memories. Based on our review we will propose a relatively new and alternative way to research music-evoked memories and emotions. More specific, we will make an argument for researching self-selected music based on findings of our review and research that indicates that familiarity of music enhances a variety of different music listening experiences.

1.1 Emotions and music

Contemporary research in the field of emotions and ‘listening’ can be roughly categorized into three main topics. These are studies that (a) explore how music can be used to self-regulate affect (b) studies that focus on how music portrays affect (c) and studies that test how music conveys affect. Whereas the later field of research is centred within the broader field of music and self-regulation.

1.1.1 Music and self-regulation

Music has been implicated to be a versatile and effective tool to regulate emotions, as well as cognitions (6, 7). For example, a recent study suggests that music listening is most often used as a tool for regulating affect after talking to friends (8). Participants in this study reported that they consciously tried to regulate their affect in over 50 percent of music listening episodes and that almost half of the other episodes influenced how they felt. When people had to rate the most effective ways through which they regulated affect and cognitions it was found that, among a variety of options (specific time alone, engage in memories, think about future events, eat, reading a book or magazine, and watch TV or film), music listening was most effective. Music listening was also rated as most often used in comparison to all others options when trying to distract, disengage, vent, feel pleasant, reduce tension, cope, and to engage in suppression or denial. In addition, relaxation, distraction, and active coping were more often used for affect regulatory goals when listening to music in comparison to the strategies of introspection and venting (8, 9). In other words, music listening is an effective and often used tool to regulate a variety of different affective states.

Two researchers from Finland (6) were among the first to provide a broad theoretical framework of how music can be used to regulate affect. In a qualitative study, they explored the music related activities that 11 Finish adolescents employed to regulate their affective states. Seven different types of regulatory strategies were generally used in an attempt to improve and control affect. These strategies were: Entertainment, using music for creating a nice atmosphere and happy feelings; Revival, using music for personal renewal and getting new energy when feeling stressed and tired; Strong sensation, using the music as a means to search for strong emotional experiences; Discharge, using music as a means to forget unwanted feelings and thoughts; Solace, using music to search for feelings and being accepted. They noted that “one musical activity could serve as
a means for realizing multiple regulatory strategies, even at the same time” (p. 102, 6). In line with these findings, recent findings have shown that people’s daily music favourites reflected daily events and do not always reflect long-term music favourites (10).

### 1.1.2 Music portrays affect

When asked to indicate the emotions portrayed by music, people easily recognised which emotions are expressed and portrayed (11, 12, 13). More specifically, the results of several recent reviews indicate that even though small differences exist in the accuracy of perception of expressed emotions in music, the general perception of emotions in music is robust, especially for happy and sad music (11, 12, 13). In other words, self-identified happy and sad music is almost as accurately recognized for sounding happy or sad by a listener, as music selected by a researcher based on musical features.

The musical features that are typical to happy and sad music have also been studied by many different researchers. In one of the overview studies on this topic (14), it was concluded that emotion perception in music stems from the features of the music, such as tempo, mode and sequence of tone use, instrument choice, dynamics, and volume. For example, it has been found that music with a slow pace, low sound level, and minor chords does often portray and elicit more sadness than music with a fast tempo, high sound level and major chords, which are believed to be the characteristics of happy music (11, 14, 15). Performers typically use different techniques to convey emotions while playing. Happy emotions are typically expressed by staccato articulation and louder intensities, whereas sadness is expressed by soft, dynamics, legato articulation, and soft tempo (16, 17). Furthermore, many of these features are thought to show similarities to expressive voice features (18) and some might be universals (19).

### 1.1.3 Music conveys affect

Recently, researchers (20) also took on the task of summarizing the many theories resulting from the rapidly growing field of research on music’s emotional effect on people. Based on these findings the researchers created a theoretical framework which includes six different pathways through which music affects people’s emotions: brain stem reflexes, which refers to when “fundamental acoustical characteristics of the music are taken by the brain stem to signal a potentially important and urgent event” (p. 364); evaluative conditioning, which refers to music that “has been paired repeatedly with other positive or negative stimuli” (p. 364); emotional contagion, which refers to when “the listener perceives the emotional expression of the music, and then ‘mimics’ this expression internally, which by means of either peripheral feedback from muscles, or a more direct activation of the relevant emotional representations in the brain” (p. 365); visual imagery, which refers to when a listener experiences emotions “because he or she conjures up visual images (e.g., of a beautiful landscape) while listening to the music. The emotions experienced are the result of a close interaction between the music and the images” (p. 366); episodic memory, which refers to when “music evokes a memory of a particular event in the listener” and therefore results in experiencing emotions (p. 367); musical expectancy, which refers to when “a specific feature of the music violates, delays, or confirms the listener’s expectations about the continuation of the music”, and therefore results in experiencing emotions (p. 368).

Later research by Juslin (21) added Aesthetic judgment to the list of pathways through which music can induce emotion. Aesthetic judgment, refers to a subjective evaluation of the aesthetic value of the music based on an individual set of weighted criteria. In line with these findings recent research has found that this listening to sad music in adverse situations can be an adaptive strategy to enhance a sad mood if the music is either selected based on its aesthetic value (22), or to help one work through one’s negative emotions, or distract the self (22).

Another group of researchers (23) conducted a study with a focus on catching emotional experiences that are not commonly mentioned in relation to (non-music) everyday life emotional experiences. They concluded that music-evoked emotional experiences can be roughly divided into 10 groups, which are: Tender-longing, amazement, tranquillity, joy, activation, power, sensuality, transcendence, dysphoria and sadness. The results of their study also showed that people actively listen to music to self-induce the following emotions: Joyful activation (happy/ excited), sadness (sad/ depressed), tension (stressed/ tense), power (energetic), peacefulness (calm/ relaxed) and nostalgia (thoughtful/ melancholic/ nostalgic) (23). Recent research on emotions evoked by episodic memories during music listening has indicated that these emotions can be of all kind but that nostalgia is experienced most often (24). It has additionally been found that music evoked episodic memories are particularly emotionally ‘vivid’ when it regards music from adolescence and young adulthood (24).
1.1.4 Music conveys and portrays affect

Gabrielsson (25) outlined the importance of differentiating between perceived and conveyed emotions. With regards to this distinction it may be interesting to note that of the list of processes described above emotional contagion is the only process that links musical emotional expressions with induced emotions (24). However, research has identified that empathy with a performer or composer to whom expressions might be attributed (24, 26), can additionally induce emotion in a listener that are similar to those expressed in the music. More specific, recent research (26) has found that emotional contagion and trait empathy can predict the strength of the link between recognized and felt emotions in music listening.

1.1.5 Other research

Other research on ‘music and emotions’ focuses on topics such as the effects of personal and situational factors that influence the perception of emotions expressed in music (27) and preferred music (28) among several others. As these topics are less relevant to the current paper we will not review these studies in detail here.

1.1.6 Music and emotions reviewed

To summarize, contemporary research on music and emotions is extensive and includes a variety of topics. Music is a powerful and versatile tool for regulating emotions, and contemporary research on emotion and listening includes a variety of mental health disciplines. Researchers have clearly established how music can be used in everyday life for psychological purposes such as to change emotion, intensify and enhance affect (6,7,8,9,10). Whereas, researchers have identified what kind of musical features play a role emotions perception in music (11, 14, 15, 16, 17). Researchers have additionally identified the psychological and physiological processes that are active before and during affective responses to music (18, 19, 20, 21, 22). Researchers have also identified what kind of emotions people experience as a reaction to music (11, 12, 13, 23, 25, 26) and how these emotions are different to emotions experienced as a reaction to non-music stimuli (23, 24). Moreover, researchers have engaged in several other research projects in which these topics mentioned before were related to personal and situational factors (27, 28).

1.2 Music-evoked memories and emotions.

Probably the second most important topic that is studied in relation to music listening is music-evoked memories, and in specific their link to emotions. This is not surprising as research indicates that emotional music we have heard at specific periods of our life is strongly linked to our autobiographical memory and hence closely involved in forming our view about our own self (29). Moreover, Scherer and Zetner (30), noted that music is one of the most powerful cues in bringing emotional experiences from memory back into awareness. They explained that this as follows; “first, music is quite a pervasive element of social life and accompanies many highly significant events in an individual’s life - religious ceremonies, marriage, burial rites, dancing, and other festivities, etc. Thus, there are many associations between musical elements and emotionally charged memories. Second, music, like odours, may be treated at lower levels of the brain that are particularly resistant to modifications by later input, contrary to cortically based episodic memory (e.g. LeDoux 1992).” (see 31 for LeDoux)

Research on music-evoked memories and emotions is extensive, however many opportunities to extend this type of research exist as well. Next, we will briefly summarize the psychological processes involved in music-evoked memories and emotion, and the motivations for recalling music-evoked memories and nostalgia. After this review we will discuss the relevance to a new research approach within this field. We posit that there is a need for more studies that focus on self-selected music in empirical research. Moreover, to demonstrate evidence of the validity of this approach we will test hypotheses about sad music-evoked memories, and link familiarity of music to increased psychological experience as a result of hearing music.

1.2.1 The psychological processes

Research provides strong evidence that music evoked-memories are accompanied by emotions. For example, in a recent study participants were asked to listen to popular music fragments, and then they self-reported their experiences. Their reports involved rating several statements and answering several open ended questions. The results of this study indicated that, on average, 30% of the popular music fragments evoked memories. Moreover, of such musical fragments, most of them evoked memories, which in turn evoked various emotions, which were primarily positive, such as happiness,
joyfulness, nostalgia, excitement, feeling energized, love and being excited (P 852, 32). Music did not have to be familiar in order to evoke a memory, as roughly 3% of music listening episodes that were unfamiliar to the listener evoked an autobiographic memory (32).

One popular theory that explains this link between music-evoked memories and emotion is by Bower (33), who proposes that emotions are used as contextual information linked to remembered information. This theory has been referred to as “the semantic associative network model of memory” and posits that emotions are represented in a network of nodes together with words, pictures or music. Stimulation of emotion nodes lowers the threshold of excitation of all associatively linked nodes, which in turn, helps to retrieve emotional information from our memory. It helps to explain the strong connection between music-evoked memories and emotion. Indeed, a variety of different studies have found that music is processed in areas in the brain that are relevant to processing emotion as well as to retrieving and processing memory (34).

1.2.2 Motivations for recalling memories

In order to better understand people’s voluntarily engagement in listening to music that evokes memories, as well as emotions, it is important to consider research on nostalgia (as explained above (24)). Wildschut and colleagues (35) described nostalgia as a bittersweet emotion: feeling nostalgic includes happiness with elements of negative emotions; it is a complex emotion with unique signatures and characteristics. Barrett and others (36) indicated that sad moods can motivate people to listen to music as a means to retrieve nostalgic memories. Moreover, research on nostalgia (35) also suggests that individuals frequently engage in nostalgia to repair their own moods. Additionally, individuals who rated high on nostalgia proneness items were more likely to select happy music than individuals who rated low on nostalgia proneness (37). However, in order to interpret these findings it is important to note that most of these studies looked at nostalgia in general, whereas Batcho (p 362, 37) noted that ‘one can remember without being nostalgic, but one cannot be nostalgic without remembering’. Interestingly, most of these studies did not examine the emotional valance of the experienced nostalgia. This suggests a stronger focus on positive/happy rather than negative/sad nostalgia (as outlined above).

In some of the earlier research on music-evoked memories and emotions (38) the effects of listening to experimenter-selected happy or sad music were examined. It was found that music had an impact on the total number of recalled childhood memories in the happy condition, but no significant effect of was found on eliciting sad memory recall, when compared to the happy music for the sad music condition. Moreover, recent research has compared accuracy of memory across emotions, higher accuracy rates were found in memories for musical clips expressing fear and, to some extent, happiness, but not for sadness (39). When interpreting such results it is important to remember that the music in this study and in other studies (see chapter by Ritchie, this volume) was experimenter-selected. Moreover, research suggests that people in general prefer happy over sad music (40, 41), and that liking for familiar and novel music impacts on emotional reactivity to the music (42) as well as on people’s ability to recognize the music (43, 44). What remains unclear is the relative importance of selecting the same music for all participants in comparison to requiring each participant to select their own music for a lab procedure or research task.

As indicated above, a challenge of current research on music-evoked memory and nostalgia is a stronger focus on positive/happy music-evoked memories and nostalgia and negative/sad music-evoked memories and nostalgia. For example, research has yet to identify the emotions portrayed in music associated with music-evoked sad memories. Several recent studies suggested that even though some participants were more likely to select a cheerful, upbeat and happy song, in an attempt to supplant one’s negative emotions when feeling sad, most participants were more likely to select a gloomy and sad song, in an attempt to work through one’s negative emotions while feeling sad (22, 45 46).

In line with these findings, we think that people will be more likely to select sad music for retrieving sad-music evoked memories. We anticipate that music that elicits these kind of memories will be more likely to portray sad than happy emotions. We tested such ideas in a study.

1.2.3 The need for a different approach: Self-selected music
A huge challenge in the study of music-evoked autobiographical memories is ‘finding a suitable way to study them’ (p. 846) (48). One common approach to studying music-evoked memories is letting participants listen to several different pieces of music, and then monitoring their response to those pieces of music via self-report. However, most of the music that people hear is not selected by others, but rather selected by the listener itself (49, 50). Despite these findings, researchers in the combined field of music emotion and autobiographical memories do not often study self-selected music.

We propose that studying self-selected music has several advantages. For example, when investigating people’s reaction to new age music selected by the researchers, North and Hargreaves (41) found a positive linear relationship between familiarity and liking, whereas other research also indicated a link between familiarity and liking which stayed stable independent of people’s mood (51). Similarly to these findings, results of a review indicated a strong relationship for familiarity of the music, with liking as well as with emotional response (52, 53, 54). To extend on these findings, a series of recent studies has indicated that music that is conventional or familiar to listeners is perceived to be more meaningful (55).

1.2.4 Aim of this study:

The research conducted for this study had two aims. First, we wanted to test if people will be more likely to attach a sad memory to a music piece that could be qualified as portraying sad emotions rather than happy emotions.

**Hypothesis 1:** Sad music-evoked memories are generally more strongly associated with music that portrays sadness than with music that portrays happiness.

Second, to elucidate the advantage of studying participant-selected music, we investigated several potential psychological advantages of listening to familiar music. In line with the literature outlined above, we hypothesised the following:

**Hypothesis 2:** Familiarity ratings of the music will be linked to increases in perceived aesthetic value, enjoyment during listening, intensity of emotional response, perceived meaning in music, vividness of mental imagery, and detailed recollection of memory.

2 METHODS

2.1 Design

A correlation study was conducted with a sample of volunteers who were rewarded with credit that could be used to purchase goods on an online website. The invitation stated that researchers were looking for volunteers for a study on music that evokes a sad memory, who would be able to listen to some music on their computer. This invitation included a link to the website on which the study was conducted, and an information sheet and a consent form were presented prior to the survey which was presented on this website.

2.2 Measurements

Participants were first asked to respond to several questions about their personality. They were then asked to think of a piece of music that reminded them of a sad event or an occasion that makes them feel sad (which they would listen to later). The instructions were as follows: ‘Think of a piece of music that will likely remind you of a sad event or sad occasion when listening to it. (This piece of music can be any piece of music, it does not have to have certain specific music features/qualities.)’ Before listening to the music they rated several statements about why they had decided to mention this specific piece of music. These questions included statements such as; ‘This is a beautiful piece of music’ or ‘This music is meaningful to me’. Next they were asked to search for the piece of music on their computer or online and listen to the music as soon as they had found it. It was specified that we did not want them to do anything else (such as watch the video clip or browse the internet) until the music had ended. They then answered several questions on the perception of emotions in the music, on their emotional experience during music listening and on the memories conveyed by the music (see Tables 1 and 2). All items were rated on a 7-point Likert scale that ranged from 1 (I do not agree with this at all) to 7 (I do very much agree with this). The research ended with several questions to help statistically control for potential biases in recalled affect. Upon completing the questionnaire
participants were thanked and given the principal investigator’s contact information for further questions. The entire procedure was approved by the ethics committee of the School of Psychology, University of Kent.

To test if participants did really listen to the music we included on item that asked people to indicate how much of the music they had listened to. To test if people understood the purpose of our study people had to rate the following statement (which people had to rate before listening to the music); ‘The memories attached to this song are sad.’ A total of 10 participants were removed from the sample based on their response to these questions.

2.3 Participants

Participants included 80 volunteers, 34 men and 46 women. Their mean age was 44.24 years (SD = 14.06). Seventy-five participants indicated that they were Americans, and five participants indicated a different nationality.

3 RESULTS

Hypothesis 1: Sad music-evoked memories are generally more strongly associated with music that portrays sadness, than with music that portrays happiness.

To test the first hypothesis we conducted several paired sampled t-tests. Results of the t-tests were significant, confirming our hypothesis that sad music-evoked memories are more likely to be evoked by music that portrays sadness than by music that portrays happiness. (Table 1).

Hypothesis 2: Familiarity ratings of the music will be linked to increases in: perceived aesthetic value, enjoyment during listening, intensity of emotional response, perceived meaning in music, vividness of mental imagery, and detailed recollection of memory.

To test the second hypothesis we conducted several regression analyses for which familiarity with the music was the independent variables. These regression analyses were conducted while controlling for the fading affect bias, and while not controlling for the fading affect bias. Results of these regression analyses were significant for most (but not for all) of the anticipated effects (Table 2). This largely confirmed our second hypothesis.

Table 1: Means, standard deviations (SD), and mean differences in the perceived happiness and sadness for self-selected music that evokes sad memories.

<table>
<thead>
<tr>
<th></th>
<th>Happy (SD)</th>
<th>Sad (SD)</th>
<th>difference</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>If I would have never heard this piece of music before and would have heard it for the first time I think I would consider this piece of music to be a… piece of music.</td>
<td>5.25 (1.79)</td>
<td>2.79 (1.85)</td>
<td>2.46 (3.44)</td>
<td>6.37*</td>
</tr>
<tr>
<td>If I would have never associated this memory with the music this piece of music would make me ….</td>
<td>4.88 (1.73)</td>
<td>3.20 (1.93)</td>
<td>1.68 (3.44)</td>
<td>4.35*</td>
</tr>
<tr>
<td>I think that other people who listen to this piece of music consider this to be a… piece of music.</td>
<td>5.45 (1.45)</td>
<td>2.94 (1.94)</td>
<td>2.51 (3.07)</td>
<td>7.31*</td>
</tr>
</tbody>
</table>

*p < .001. All of the results above remained significant with comparable p-values when each analysis controlled for the effect of the amount of times that people had shared their memory with other people and the amount of weeks passed since the event. Results can be requested by contacting the authors.

Table 2: The effects of familiarity on a variety of different effects of music listening.

<table>
<thead>
<tr>
<th>Questions asked before hearing the music</th>
<th>Beta</th>
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<th>Beta</th>
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<tbody>
<tr>
<td>The music brings back memories</td>
<td>0.15</td>
<td>1.41**</td>
<td>0.45</td>
<td>4.41**</td>
</tr>
</tbody>
</table>
The music is meaningful to me  0.43  4.36**  0.44  4.24**
I love this type of music  0.50  5.29**  0.54  5.71**
This is a beautiful piece of music  0.32  3.07*  0.35  3.31**

Questions asked after hearing the music
The music induces strong emotional experiences  0.34  2.99*  0.35  2.90*
Listening to this piece of music makes me re-live feelings I experienced earlier.  0.43  4.58**  0.50  5.04**
Listening to this piece of music makes me re-live experiences  0.49  5.27**  0.50  4.91**
I really experienced the beauty of the lyrics of the music  0.27  2.53*  0.27  2.44*
I really experienced the beauty of the piece of music  0.32  3.12*  0.35  3.25*
how significant is this memory to who you are/have become  0.02  0.88  0.03  0.22
How detailed is your memory  0.14  1.30  0.08  0.72
How emotional does this memory make you  0.22  2.11*  0.19  1.70
How vivid was the mental imagery of the memory  0.24  2.26*  0.20  1.78
Empathy (entire scale)  0.15  1.38  0.15  1.33
Nostalgia proneness (entire scale)  0.00  -0.03 -0.02 -0.15

*p < .05. **p < .005. The left part of the table shows effects that controlled for effect of the amount of times that people had shared their memory with other people and the amount of weeks passed since the event.

3 CONCLUSIONS

In this chapter we aimed to briefly and critically review current research on music emotions, and the emotional response to music-evoked memories, with a focus on recommendations for future research. A review of the research suggests an ongoing struggle with identifying appropriate approaches to investigate music-evoked memories (26). Based on an evaluation of current approaches, we proposed a relatively novel method to this field of music research. We proposed to introduce participant-selected rather than experimenter-selected music.

We think that reluctance in using participant-selected music in their research can be explained, in part, by the novelty of this approach. It is possible that researchers believe that self-selected music will not objectively portray the emotions that the researcher is interested in; however, as outlined in our review (11, 14, 15, 16, 17), individuals are very well able to distinguish between emotions portrayed in music. As implicated by our empirical research, research that focuses on self-select music, rather than experimenter-selected music, will yield stronger effects in some research and applied contexts. Our results suggest links between familiarity, liking, meaning, perceived and experienced aesthetic value, as well as with emotional response, amount of detail for memories, and vividness of mental imagery. Only when we controlled for the recalled affect (i.e., the fading affect bias) (56, 57), we found a significant relationship between familiarity and how emotional people felt after retrieving the memory. The same occurred for vividness of mental imagery after listening. Such effects suggest that future research should also take these variables into account when looking into music-evoked memory and emotion.

Several recent studies adopt the approach to investigate the effects of participant-selected music, to explore individuals’ self-regulatory use of sad music when feeling sad (20, 47), or individuals’ use of music to regulate mood states (6). Research reveals new processes that are relevant to understanding the effects of music-evoked autobiographical memories on experienced affect. Follow-up research on this topic will build on these results, such as by reflecting on prior knowledge, conducted on music selection (8, 9, 20, 22). To summarize, we conclude that using participant-selected music in research could indeed strengthen and enrich current ideas about music-evoked memory and emotions.

Finally, based on a review of current research on music-evoked memory and emotion, we posited a lack of current research that distinguishes between music-evoked memories; each evokes positive/ happy or negative/ sad emotions. We tested and confirmed the main hypothesis: Music that evokes sad memories is more like to portray sad than happy emotions. Future research may also look at a
variety of other emotions (e.g., anger, hope). A stronger focus on personal or situational variables may deepen our understanding of how emotion and autobiographical memories are associated with music.

FOOTNOTE

Research indicates that recalled emotional content of emotions can change. More specific, time passed since the recalled event as well as the sharing of the emotional experience may contribute to bias in recollection (56, 57). It is for this reason that we added 2 questions to our research for which people had to report on the time passed since the event as well as on the amount of times that people shared their music-evoked memory with others. It has to be noted that biases are more applicable to intensity of emotions, but rarely affect the valance of emotions (56).
REFERENCES


